

**CONTEXTUAL DIFFERENTIATION OF ABSORPTIVE CAPACITY:
EMPIRICAL AND CONCEPTUAL DEVELOPMENT**

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ABSTRACT

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Technological and market knowledge are among the most valuable resources that a firm can utilize for competitive advantage. Absorptive Capacity (ACAP) or a firm's ability to acquire, assimilate, transform, and apply knowledge, has long been a central construct in organizational studies. Yet, there is limited research on a marketing context of ACAP. In Essay 1, I extend the scope of ACAP beyond technology-related context and develop a comprehensive model integrating performance-enhancing mechanisms and antecedent processes of ACAP in market-related context. The survey results suggest that ACAP of market knowledge positively influences firm performance by enhancing customer acquisition and retention capability of the firm. The findings also indicate that market orientation, trust, and ties strength are significantly related to both exploring and exploiting dimensions of ACAP. Finally, the mediating role of a firm's balance in cost leadership and differentiation strategic focus is also discussed.

In addition, I separately conduct another survey to explore the ACAP of technological knowledge. Mixed findings in previous studies on a debate between innovation- and quality improvement-performance relationships prompt the need for further research investigation of the underlying mechanisms. Consistent with ambidexterity literature, the findings suggest that a firm's balance in explorative and exploitative innovation strategy (Strategic EE Ratio) will effectively facilitate an implementation of market orientation within a firm; thus, enhancing both exploring and exploiting dimensions of ACAP. As a result, strong ACAP will enhance innovativeness and new product quality, leading a firm to improve new product performance and

increase overall firm performance. Also, the empirical test reveals a curvilinear effect of Strategic EE Ratio and market orientation, and supports a mediating role of market orientation in a Strategic EE Ratio-ACAP relationship. In addition, the moderating effects of technological and quality orientation are discussed. In both essays, I conclude with a discussion of the implications for practice and future research.

Universally, the critical roles of ACAP and a strategic balance between exploration and exploitation are reinforced by the empirical results of both essays.

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I dedicate this dissertation to my beloved family.
Particularly to my understanding and patient husband,
who has strongly assisted me in fulfilling my goal of getting a doctoral degree;
to my parents for always supporting all of my decisions unconditionally;
to my grandmother, late grandfather, family members, and friends
for their love and care throughout my life.

Finally, I dedicate this work to my academic advisor and dissertation chair,
Professor Roger Calantone,
who always believes in me and fully supports
not only my dissertation completion
but also my pursuit of academic excellence.

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TABLE OF CONTENTS

LIST OF TABLES.....	x
LIST OF FIGURES.....	xi
INTRODUCTION.....	1
CHAPTER 1	
ESSAY 1: THE EFFECT OF MARKET ORIENTATION, TRUST, AND TIES ON FIRMS' CUSTOMER AND COMPETITOR INTELLIGENCE ABSORPTIVE CAPACITY AND FIRM PERFORMANCE.....	5
Introduction.....	5
Theoretical Background and Hypotheses.....	8
<i>Competitor and Customer Intelligence ACAP.....</i>	<i>8</i>
<i>Antecedents of Firms' Customer and Competitor Intelligence ACAP.....</i>	<i>10</i>
<i>Market Orientation.....</i>	<i>10</i>
<i>The Mediating Role of Cost/Differentiation Balance.....</i>	<i>12</i>
<i>Ties Strength.....</i>	<i>13</i>
<i>Trust.....</i>	<i>13</i>
<i>From Firm's ACAP to Firm Performance and the Mediating Roles of Customer Acquisition and Retention.....</i>	<i>14</i>
Methodology.....	19
<i>Sample and Data Collection.....</i>	<i>19</i>
<i>Measures.....</i>	<i>20</i>
<i>Market Orientation.....</i>	<i>20</i>
<i>Trust.....</i>	<i>21</i>
<i>Ties Strength.....</i>	<i>22</i>
<i>Cost/Differentiation Balance</i>	<i>22</i>
<i>Absorptive Capacity</i>	<i>22</i>
<i>Customer Acquisition and Retention</i>	<i>24</i>
<i>Firm performance</i>	<i>24</i>
<i>Control variables</i>	<i>25</i>
Analysis and Results.....	26
<i>Assessing the Reliability and Validity of Measures.....</i>	<i>26</i>
<i>Structural Model.....</i>	<i>30</i>
<i>Direct Effects.....</i>	<i>30</i>
<i>Mediation Effects of Cost/Differentiation Balance, Customer Acquisition, and Customer Retention</i>	<i>30</i>
Discussion.....	35
<i>Theoretical Contributions and Managerial Implications.....</i>	<i>35</i>
<i>Limitations and Future Research Directions.....</i>	<i>37</i>
REFERENCES.....	40

CHAPTER 2

ESSAY 2: EMPIRICAL ANALYSIS OF ABSORPTIVE CAPACITY AND THE STRATEGIC EXPLORATION-EXPLOITATION RATIO ON FIRM AND PRODUCT INNOVATION OUTCOMES.....

Introduction.....	48
Theoretical Background and Hypotheses.....	51
<i>The Strategic Exploration to Exploitation Ratio (Strategic EE Ratio) and Its Effect on Market Orientation.....</i>	53
<i>The Strategic EE Ratio-Market Orientation Relationship.....</i>	54
<i>Competitive Intensity and its Effect on Firm's Market Orientation</i>	56
<i>The Effect of Market Orientation on Two Dimensions of ACAP.....</i>	56
<i>Different Effects of 2 Dimensions of ACAP on Firm's Innovativeness</i>	58
<i>Moderating Effect of Technological Orientation.....</i>	59
<i>Two Dimensions of ACAP and New Product Quality.....</i>	60
<i>Moderating Effect of Quality Orientation.....</i>	61
<i>Firm Innovativeness and New Product Performance.....</i>	62
<i>The Effect of New Product Quality on New Product Performance.....</i>	63
<i>The Effect of New Product Performance on Firm Performance.....</i>	64
<i>The Effect of Quality Offsets on Subjective and Objective Firm Performance.....</i>	65
Methodology.....	68
Sample and Data Collection.....	68
Measures.....	69
Strategic EE Ratio.....	69
Competitive Intensity	70
Market Orientation	70
Absorptive Capacity	70
Firm Innovativeness	71
New Product Performance	71
New Product Quality	72
Quality Offsets	72
Technological Orientation	73
Quality Orientation	73
Firm performance	73
Control variables	74
Analysis and Results.....	75
Assessing the Reliability and Validity of Measures.....	75
Structural Model.....	80
Mediating effect of Market Orientation.....	82
Discussion.....	85
Theoretical Contributions and Managerial Implications.....	85
Limitations and Future Research Directions.....	89
REFERENCES.....	91

LIST OF TABLES

Table 1: Overview of Essays.....	4
Table 1.1: Essay 1 Summary of Hypotheses	18
Table 1.2: Essay 1 Validity Composition.....	27
Table 1.3: Essay 1 Correlation Matrix and Descriptive Statistics of Measures.....	29
Table 1.4: Essay 1 Structural Results.....	33
Table 2.1: Essay 2 Summary of Hypotheses.....	67
Table 2.2: Essay 2 Validity Composition.....	76
Table 2.3: Essay 2 Correlation Matrix and Descriptive Statistics of Measures.....	79
Table 2.4: Essay 2 Structural Results.....	83

LIST OF FIGURES

Figure 1.1: The Conceptual Model of Absorptive Capacity and Its Effects on Firm Performance.....	9
Figure 2.1: The Conceptual Model of Absorptive Capacity and the Strategic Exploration to Exploitation Ratio on Firm and Product Innovation Outcomes.....	52

INTRODUCTION

Despite difficulties acquiring, assimilating, transforming, and applying knowledge due to a lot of organizational and personal barriers including its tacit essence, one cannot deny that most of the firm's critical resources are embedded in their personnel's knowledge in forms of expertise, skills, and in deep understandings of technologies, markets, customers, and competitors. Many research studies have explored the importance of transferring and applying tacit knowledge within an organization or between organizations (Cavusgil, Calantone, and Zhao 2003; Gupta and Govindarajan 2000; Szulanski 1996) including how it can enhance and differentiate the firm's capability to compete in the market, and thus lead to superior firm performance (Hunt and Morgan 1995, 1996). Researchers defined a construct "Absorptive Capacity (ACAP)" as "an ability to learn from external knowledge through processes of knowledge identification, assimilation and exploitation" (Cohen and Levinthal 1990). Later, the term ACAP was reconceptualized and linked to organizational routines and strategic processes through which firms acquire, assimilate, transform, and apply knowledge to gain and sustain the organizational competitive advantage (Zahra and George 2002).

I extend the scope of ACAP beyond traditional technology-related context to include market-related context, particularly customer and competitor intelligence. In recent years, an increasing body of research has examined the antecedents and consequences of ACAP and how ACAP is linked to innovation-related performance measures and overall firm performance (e.g., Abecassis-Moedas and Mahmoud-Jouini 2008; Atuahene-Gima 1992; Cohen and Levinthal 1990; Jansen, Van den Bosch, and Volberda 2005; Lichtenthaler 2009). Yet, a large number and broad range of papers using the ACAP construct raise important concerns about the importance

of context specific effects of ACAP. Due to the early association of the construct with R&D-related contexts and perhaps the ease of measuring innovation levels, an overwhelming majority of researchers use the construct with a focus on similar R&D contexts, although they tended to use differing measures with little concern for triangulation with prior studies (Lane, Koka, and Pathak 2006). However, in addition to the technological knowledge that a firm actually acquires, assimilates, transforms, and applies during its ACAP processes (Cohen and Levinthal 1990; Tsai 2001), market knowledge is also a critical important component of a firm's ACAP.

Several studies support that a firm's capability in generating and integrating market knowledge is regarded as a core organizational competence, which can enhance competitiveness (Hamel and Prahalad 1994; Li and Calantone 1998). Nevertheless, research on different context specific effects of ACAP, especially on the ACAP of market knowledge (i.e., customer and competitor intelligence) is still limited. This shortcoming indicates a need for more research on the market knowledge ACAP.

Market knowledge, especially those associated with customer and competitor intelligence, has unique characteristics which comprise of explicit and tacit elements and is very sensitive and critical to corporate advantage and competitive strategy. Therefore, the ACAP of market knowledge—customer and competitor intelligence—is subject to different knowledge-flow processes than those associated with technology-related ACAP. Different organizational factors and conditions are required to encourage or support the ACAP processes of competitor and customer intelligence. The formal and informal flows of market intelligence within the organization are a critical determinant of the competitive alertness of a firm (Dickson 1992). Therefore, trust, ties strength, and market orientation become more crucial factors in the ACAP

processes since these factors strongly support both the formal and informal communications and flows of knowledge.

For example, since competitor and customer intelligence are mostly gathered and analyzed by sales or marketing personnel, the recipient's trust on credibility of such market related information become more crucial and explicit than that of technological knowledge. As Moss (1979) noted, the prime interest of salespeople is making sales since their incentives and benefits are mostly tied with sales target, so they may not be objective observers or reporters of reliable information regarding customer and competitor intelligence. As a result, lack of the trust either within or between departments may reduce the motivation to receive such intelligence from or even transfer it to that party. Furthermore, advice and examples from such party are likely to be challenged and resisted (Szulanski 1996; Walton 1975).

Essay 1 will examine the antecedents of the firm's ACAP of customer and competitor intelligence, including how its relationship with firm performance is mediated by customer acquisition and retention rates. Focal antecedents to be explored in the study are market orientation, interdepartmental ties strength, and trust. While Essay 1 examines the antecedents and consequences of ACAP in the specific marketing context, Essay 2 will separately explore the ACAP of technological knowledge with a focus on R&D and engineering's perspective. Specifically, Essay 2 examines how competitive intensity and a strategic exploration to exploitation ratio affect the ACAP of technological knowledge through market orientation, including how the latter influences firm performance via firm innovativeness, new product development and quality improvement, and new product performance.

In sum, the overview of each Essay is shown in table 1 below.

Table 1: Overview of Essays

	Title	Main Constructs	Empirical Settings
Essay 1	The Effect of Market Orientation, Trust, and Ties on Firms' Customer and Competitor Intelligence Absorptive Capacity and Firm Performance	Market Orientation, Trust, Ties, Absorptive Capacity, Customer Acquisition and Retention, Firm Performance	Online survey targeting sales and marketing managers in publicly traded firms in multiple service and manufacturing industries in the U.S.
Essay 2	Empirical Analysis of Absorptive Capacity and the Strategic Exploration to Exploitation Ratio on Firm and Product Innovation Outcomes	Competitive Intensity, Strategic Exploration to Exploitation Ratio, Absorptive Capacity, Market Orientation, Firm Innovativeness, New Product Quality and Performance, Quality Offsets, Firm Performance	Online survey targeting R&D, new product development, and engineering managers in publicly traded firms in multiple manufacturing industries in the U.S.

CHAPTER 1

ESSAY 1: THE EFFECT OF MARKET ORIENTATION, TRUST, AND TIES ON FIRMS' CUSTOMER AND COMPETITOR INTELLIGENCE ABSORPTIVE CAPACITY AND FIRM PERFORMANCE

Introduction

If we know that smarter firms perform better, what is a key performance indicator of the firms being smarter in the most useful fashion? Many answers have been prepared to this question. However, key performance indicators must explain the source of knowledge, identify the use of knowledge, and accommodate the context specific of each firm when it is to be applied. Considering these criteria, which construct should we use as a key indicator to define the firms' smartness?

Absorptive capacity (ACAP) has long been a central construct in several research areas in organizational studies. Researchers have proposed several conceptual models of ACAP (Camison and Forez 2009; Cohen and Levinthal 1990). Zahra and George (2002) have reformulated a term "ACAP" and further broaden its definition to be a set of organizational routines and strategic processes by which firms acquire, assimilate, transform, and apply knowledge to gain and sustain a competitive advantage. These four dimensions are widely used in ACAP literature to empirically test ACAP's influences on a variety of product and firm performance outcomes (Abecassis-Moedas and Mahmoud-Jouini 2008, Atuahene-Gima 1992; Jansen, Van den Bosch, and Volberda 2005; Lichtenthaler 2009).

Since ACAP is evidently an indicator of firm performance and seems to fit the three criteria as mentioned above, can we conclude that a firm with higher ACAP will be smarter than the others? Unfortunately, the answer remains unclear. Most of the past ACAP literature did not

pay much attention on the importance of context specific effects of ACAP. In particular, they mainly focused on R&D context rather than marketing context when studying ACAP. Besides technological knowledge, market knowledge—customer and competitor intelligence—is a critical component of a firm's ACAP in a free market economy since a firm's central principle and driving force is a competition (or, in other words, the intensity of the rivalry between sellers for the demand of buyers or customers; Dickson 1992). Thus, firms that are most alert to learn directly from competitors' moves and strive hardest in their search for more efficient and effective ways to serve their customers' needs will be the most competitive in the market (Dickson 1992). Significantly, firms with customer and competitor intelligence ACAP can apply and commercialize opportunities for a use of technological knowledge in creating new products, improving quality, or developing process innovation (Teece 2007; Van den Bosch, Volberda, and de Boer 1999).

In seeking to address this shortcoming and answer the key question of how to identify firms' smartness, this study intends to make a theoretical contribution by proposing a comprehensive model, integrating performance-enhancing mechanisms and antecedent processes of ACAP in a marketing context. Also, I provide empirical evidence of and insight into how trust, ties strength, and market orientation enhance a firm's capability to acquire, assimilate, transform, and apply both competitor and customer intelligence; and how these two dimensions of ACAP enhance firm performance. The goal is to clarify the essence and the role of ACAP in marketing context in organizational learning and sustainable competitive advantage. The findings also provide insights for managers and executives in managing their market knowledge ACAP to improve customer acquisition and retention as well as firm performance. The remainder of this study is organized as follows. I first present the theoretical background and

proposed hypotheses. Next, research methodology and findings are discussed. Finally, I conclude with a discussion of managerial implications, limitations, and directions for further research.

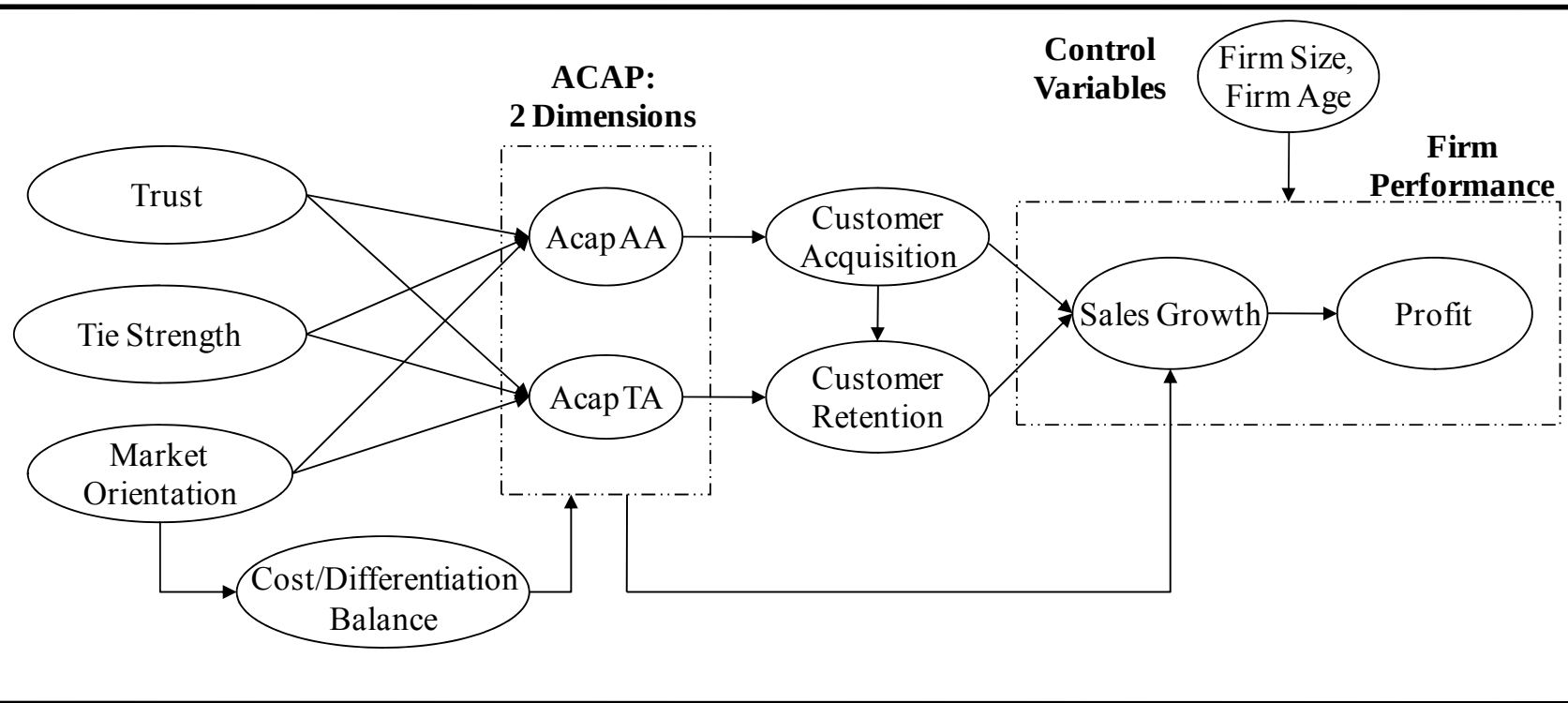
Theoretical Background and Hypotheses

The nature of the issue being investigated in this study compels the conceptual base for the hypotheses to be drawn from three streams of literature: absorptive capacity, organizational learning, and market orientation. This literature suggests that the firm's ACAP of market knowledge (i.e., customer and competitor intelligence) is affected by three key antecedents—market orientation, trust, and interdepartmental ties strength, including how ACAP-firm performance relationship is partially mediated by customer acquisition and intention (See Figure 1.1).

Competitor and Customer Intelligence ACAP

There has been an interesting growth in the ACAP literature over the past two decades. Since its first definition of “an ability to learn from external knowledge through processes of knowledge identification, assimilation and exploitation,” established by Cohen and Levinthal (1990), the term “ACAP” has been reconceptualized and defined as a firm's dynamic capability pertaining knowledge acquisition, assimilation, transformation, and application to gain and sustain a competitive advantage (Zahra and George 2002). For simplicity, the extent of the acquisition and assimilation or, in other words, the exploring activities of customer and competitor intelligence will be referred to as “ACAP_AA.” Likewise, the extent of the transformation and application or, in other words, the exploiting activities of customer and competitor intelligence will be referred to as “ACAP_TA.” In addition, since this study intends to examine the ACAP of customer and competitor intelligence, their unique characteristics will be of primary focus. There are several definitions of competitor and customer intelligence with various dimensions. For example, Wright, Pickton, and Callow (2002) defined competitor intelligence as the

Figure 1.1: The Conceptual Model of Absorptive Capacity and Its Effects on Firm Performance¹



¹ Supportive organizational culture influenced both ACAP_AA and ACAP_TA; however, it caused significant disruption to the overall model and was dropped from further consideration.

activities by which a company determines and understands its industry, identifies and understands its competitors, determines and understands their strengths and weaknesses, and anticipates their moves. Kelly (2006) defined customer intelligence as a comprehensive understanding of customers and their behavior, which will enable a more pointed customer contact and a higher degree of customer loyalty. In brief, competitor intelligence could be summarized as the knowledge that enables us to know what competitors have and their competing strategy, while customer intelligence could be considered as the knowledge that enables us to know what the customers need and their buying decision model.

A challenging point for managing the firm's ACAP of customer and competitor intelligence is that many firms fail to a) consistently acquire and disseminate competitor and customer intelligence collected from or by the front-line units (e.g., marketing and sales managers), b) transform or integrate this knowledge into the general market intelligence system, or c) successfully apply the intelligence to increase their competitive differentiation and/or customer value delivery, which in turn will enhance superior financial performance (Festervand, Grove, and Reidenbach 1988; Le Meunier-FitzHugh and Piercy 2006).

Antecedents of Firms' Customer and Competitor Intelligence ACAP

Market Orientation. The concept of market and customer orientations has long been developed for more than five decades although no clear distinction was carefully made among definitions of customer-oriented, market-oriented, and market-driven (Day 1994). To provide a clearer view, Narver and Slater (1990) conceptualizes that market orientation comprises customer orientation, competitor orientation, and inter-functional coordination, while also focusing on firm's financial performance. Market orientation facilitates the firms to have a more

clarified strategic focus and vision and enhance firm innovativeness, which consequently leads to higher competitive advantage and superior firm performance (Hurley and Hult 1998; Jaworski and Kohli 1993; Kohli and Jaworski 1990; Kumar et al. 2011).

Customer and competitor intelligence are generally collected by the front-line units such as marketing, sales, or customer service personnel since personnel in these units have opportunities to directly interact with their customers and to experience competitors' products and services in a market. However, both the customer and competitor intelligence generated locally by front-line units does not automatically diffuse within the team or throughout the organization due to a lot of barriers such as causal ambiguity, tacit dimension of such intelligence, weak relationship between source and recipient, and lack of motivation to share knowledge (Becker and Knudsen 2006; Cohendet and Steinmueller 2000; Osterloh and Frey 2000; Polanyi 1962; Reed and DeFillippi 1990; Szulanski 1996). A market orientation can be manifested in several ways with respect to the acquisition, assimilation, transformation, and application of customer and competitor intelligence. The major characteristics and nature of market orientation, e.g., customer and competitor orientation, help stimulate an intra-firm acquisition, assimilation, transformation, and application mechanisms of customer and competitor intelligence by increasing the "eagerness to share and help others" (Gupta and Govindarajan 2000) and encouraging the sharing intelligence activities either at the individual or group level. Thus, I hypothesized the following:

H1a: A positive relationship exists between market orientation and ACAP_AA.

H1b: A positive relationship exists between market orientation and ACAP_TA.

The Mediating Role of Cost/Differentiation Balance. On the basis of Porter's (1985) work on generic business-level strategies, a firm's balance in cost and differentiation strategies refers to the extent to which their firms focus on low cost or differentiation strategy or both. When a firm shifts their strategic focus from cost leadership to be more differentiated in terms of products or services offered to customers, it needs to spend more time and resources on acquiring, assimilating, transforming or integrating, and applying market knowledge in an attempt to create uniquely desirable products or services for their target customers. In particular, knowledge about customers' wants and needs including specific competitors' moves that might affect a firm's competitive position in either short or long run are of the essence to a firm's strategic shift towards the differentiated standpoint in the market. Thus, I expected that:

H2a: A positive relationship exists between cost/differentiation balance and ACAP_AA

H2b: A positive relationship exists between cost/differentiation balance and ACAP_TA

Furthermore, since market-oriented firms place a strong emphasis on how their rivals compete in the market and how to effectively and efficiently anticipate customer needs and to customize/develop goods and services to satisfy those needs (Slater and Narver 1994; Kirca, Jayachandran, and Bearden 2005), this will enhance firms' ability to differentiate themselves from the competitors, and thus encourage the acquisitions, assimilation, transformation, and application of market knowledge. Similarly, a focus on interfunctional coordination across business units within market-oriented firms facilitates communication flows of market knowledge, so this will help reducing learning period and expediting learning curve, and eventually reducing costs associated with differentiation. As a result, differentiation strategy

becomes more attractive and firms' ACAP in both dimensions will enhance. Therefore, I expected the followings:

- H2c: An indirect relationship exists between market orientation and ACAP_AA, mediated by cost/differentiation balance.
- H2d: An indirect relationship exists between market orientation and ACAP_TA, mediated by cost/differentiation balance.

Ties Strength. The strength of an interpersonal connection or ties can also affect a transfer process of knowledge either within a firm or across firms (Granovetter 1973; Hansen 1999). Individuals who frequently share communications or have strong emotional attachment with each other are more likely to exchange or share knowledge than those who communicate infrequently or who are not emotionally attached (Reagans and McEvily 2003). In addition, since the customer and competitor intelligence consists of both explicit and tacit knowledge in which the latter is hard to articulate and requires a process of externalization (i.e., converting tacit knowledge into an explicit concept), close partners will have higher opportunities to detect the knowledge or information needed (Cavusgil, Calantone, and Zhao 2003; Nonaka 1994). This would enhance both the explorative and exploitative aspects of a firm's ACAP. Thus:

- H3a: A positive relationship exists between ties strength and ACAP_AA.
- H3b: A positive relationship exists between ties strength and ACAP_TA.

Trust. As shown in several prior research studies, trust is viewed as another important construct which is correlated to the effectiveness of knowledge and information transfer (Morgan and Hunt 1994; Tsai and Ghoshal 1998, Zand 1972). The reluctance of some recipients to accept

the knowledge or information because the source unit is not perceived as reliable, trustworthy, or knowledgeable, has long been widely accepted among research scholars (Szulanski 1996; Zaltman, Duncan and Holbeck 1973). Lack of trust may reduce the motivation to acquire such intelligence from that source, disseminate it to the other team members, or even transform and apply it for a more specific use. More importantly, trust could become even a more crucial antecedent since most competitor and customer intelligence are collected by sales or marketing personnel and that the prime interest of sales/marketing manager is making sales/profit which makes them not objective observers or reporters of reliable information (Moss 1979).

Several research studies proposed a mediating role of trust between strong ties—the closeness and interaction frequency of a relationship between two parties—and a receipt of useful tacit knowledge (e.g., Levin and Cross 2004) or a use of strong ties as a proxy for trust construct (Gulati 1994). However, considering a high level of interfunctional coordination and routines among sales and marketing managers, they are more likely to cooperate with each other even though they have no prior personal relationship or know nothing about another party's credibility and competence. Therefore, trust and ties strength can separately influence the extent of either explorative or exploitative dimensions of the ACAP, and none of them has a mediating role in this relationship. That is:

H4a: A positive relationship exists between trust and ACAP_AA.

H4b: A positive relationship exists between trust and ACAP_TA.

From Firm's ACAP to Firm Performance and the Mediating Roles of Customer Acquisition and Retention

The ACAP literature provides theoretical and empirical evidence that both explorative (acquisition and assimilation) and exploitative (transformation and application) dimensions of a firm's ACAP can be important determinants of firm performance. A high level of exploratory learning helps firms to acquire external knowledge and to sustain superior performance based on first mover advantages, strategic flexibility, responsiveness to customers, and avoidance of "lock-out effects" and "competency traps" (Hamel 1991; Leonard-Barton 1992; Lichtenthaler 2009; Zahra and George 2002). On the other hand, the transformation and application dimensions of ACAP facilitate firms in maintaining the assimilated knowledge, combining it with other knowledge, and reactivating it when necessary (Marsh and Stock 2006), including applying it according to market's needs. This exploitative dimension of ACAP allow firms to achieve superior innovation and performance based on retaining, integrating, and applying assimilated knowledge in innovation processes (Zahra and George 2002; Lichtenthaler 2009).

Most studies in this area focus on firms' absorptive capacity of technological knowledge such as a new technology which could be acquired from an external technology source (e.g., Cassiman and Veugelers 2006; Lichtenthaler 2009), rather than that of market knowledge such as customer and competitor intelligence. For example, common operationalizations of ACAP have been R&D spending, or the proportion of technology or R&D staffs relative to the total number of employees (e.g., Cohen and Levinthal 1990; DeCarolis and Deeds 1999). However, it is widely accepted that both technological and market knowledge are identified as critical components of prior knowledge (Lichtenthaler 2009). In addition, several studies evidently support that a firm's competence in generating and integrating market knowledge can enhance new product advantage (Cooper 1992; Day 1994; Griffin and Hauser 1992) and be regarded as a

core organizational competence (Hamel and Prahalad 1994; Li and Calantone 1998; Sinkula 1994).

Consistent with that of technological knowledge, exploratory learning of competitor and customer intelligence facilitate firms in enhancing their capacity to understand changing environments, strengthening creativity, and increasing their ability to spot new market opportunities, e.g., discover a market niche or expand their product lines to preemptively acquire new target segments, thus this will contribute to an increase in new customer acquisitions and thereby enhancing the firms' superior performance in meeting emerging needs of customers in the marketplace (Levinthal and March 1993). In a similar way, exploitative learning of competitor and customer intelligence increases a firm's ability to sense the market, retain its incoming market information for accessible retrieval when required, and apply such market knowledge to effectively and efficiently respond to emerging customers' needs, e.g., improving product quality or refining after-sale services to retain existing customer bases, thereby improving their customer retention and allowing firm to reach superior financial and market performance (Day 1994; Dickson 1992).

Therefore, this study includes the following hypotheses:

H5a: A positive relationship exists between ACAP_AA and a firm's sales growth.

H5b: A positive relationship exists between ACAP_TA and a firm's sales growth.

H6a: A positive relationship exists between ACAP_AA and a firm's customer acquisition.

H6b: A positive relationship exists between ACAP_TA and a firm's customer retention.

H6c: An indirect relationship exists between ACAP_AA and a firm's sales growth, mediated by a firm's customer acquisition.

H6d: An indirect relationship exists between ACAP_TA and a firm's sales growth, mediated by a firm's customer retention.

Consistent with previous marketing research, I expect that customer acquisition also affects customer retention (Thomas 2001, Coviello, Winklhofer, and Hamilton 2006). The role of transactional marketing in increasing a customer base provides a foundation for developing a firm's customer portfolio and customer relationship (Blattberg and Deighton 1996; Johnson and Selnes 2004). Thus, I hypothesized:

H7: A positive relationship exists between customer acquisition and customer retention.

Previous research studies support the influence of sales growth on profitability for several reasons, for instance, 1) sales growth provides opportunities for economies of scale and learning curve benefits, 2) an increase in sales indicates that a firm generally utilizes capacity more fully, which spreads fixed costs over more revenue resulting in higher profitability, and 3) sales growth may also provide additional market power, based upon the industry structure, which firms can use to enhance financial performance (Brush, Bromiley, and Hendrickx 2000). A positive effect of sales growth on profitability would not be a surprise; however, I include a hypothesis as a baseline for demonstrating a complete concept of a proposed model. Therefore:

H8: A positive relationship exists between a firm's sales growth and its profitability.

All hypotheses in this study are summarized in table 1.1 as shown below.

Table 1.1: Essay 1 Summary of Hypotheses

Hypothesis	Hypothesized Effect
Hypothesis 1a	A positive relationship exists between market orientation and ACAP_AA.
Hypothesis 1b	A positive relationship exists between market orientation and ACAP_TA.
Hypothesis 2a	A positive relationship exists between cost/differentiation balance and ACAP_AA
Hypothesis 2b	A positive relationship exists between cost/differentiation balance and ACAP_TA
Hypothesis 2c	An indirect relationship exists between market orientation and ACAP_AA, mediated by cost/differentiation balance.
Hypothesis 2d	An indirect relationship exists between market orientation and ACAP_TA, mediated by cost/differentiation balance.
Hypothesis 3a	A positive relationship exists between ties strength and ACAP_AA.
Hypothesis 3b	A positive relationship exists between ties strength and ACAP_TA.
Hypothesis 4a	A positive relationship exists between trust and ACAP_AA.
Hypothesis 4b	A positive relationship exists between trust and ACAP_TA.
Hypothesis 5a	A positive relationship exists between ACAP_AA and a firm's sales growth.
Hypothesis 5b	A positive relationship exists between ACAP_TA and a firm's sales growth.
Hypothesis 6a	A positive relationship exists between ACAP_AA and a firm's customer acquisition.
Hypothesis 6b	A positive relationship exists between ACAP_TA and a firm's customer retention.
Hypothesis 6c	An indirect relationship exists between ACAP_AA and a firm's sales growth, mediated by a firm's customer acquisition.
Hypothesis 6d	An indirect relationship exists between ACAP_TA and a firm's sales growth, mediated by a firm's customer retention.
Hypothesis 7	A positive relationship exists between customer acquisition and customer retention.
Hypothesis 8	A positive relationship exists between a firm's sales growth and its profitability.

Methodology

Sample and Data Collection

To test a proposed model (See Figure 1.1), I conducted a web-based survey with marketing and/or sales managers working for service and manufacturing companies publicly traded in the U.S. and international stock exchange. Following previous literature (Hult, Ketchen, and Slater 2005; Slater and Olson 2001), this study relied on marketing and sales executives to assess the subjective elements of the study since most of them related to marketing culture, procedures, and strategic behaviors. Also, competitor and customer intelligence are mostly collected and exploited by sales and marketing managers. The online survey was administered by a professional research firm. A random sample of 1,499 qualified respondents was selected from the research firm's proprietary online panel of potential respondents. To ensure the appropriateness and quality of the respondents, I screened the potential participants based on whether they were knowledgeable of the processes and strategy in sales and marketing areas. Participants who fit all of the screening criteria were allowed to proceed to the survey. This approach is consistent with the selection of key informants knowledgeable about organizational matters by virtue of their position (John and Weitz, 1988). All respondents were informed about the confidentiality of their responses. To increase a response rate, the respondents received compensation from the marketing research company for participating in the survey.

Of the 1,499 contacts in the sample frame, 253 responses were received, for a response rate of 16.9%. Due to poor quality of responses or a large amount of missing data on key variables, 108 responses were excluded, yielding a final sample of 145 usable questionnaires. Following Armstrong and Overton's (1977) procedure to assess nonresponse bias, no significant

differences were found between early and late respondents on the scales or the performance indicators

For robustness, the sampling frame was obtained from multiple industries: chemicals and allied products; industrial and commercial machinery and computer equipment; electronic, electrical equipment & components, transportation equipment; measuring/analyzing /controlling instruments, communications; electric, gas, and sanitary services; finance, insurance, and real estate services, business services, and others. Respondents had worked with their respective firms for an average of 11.5 years. Firm information was collected in the survey and verified independently by the research firm. Objective firm performance outcomes including other firm characteristics (e.g., firm age, number of employees, SIC, and etc.) were obtained from the secondary source—WRDS, annual reports, and company web sites—to avoid common methods bias.

Measures

In general, the key constructs in this study are operationalized using existing well-validated scales or measures adapted from existing scales reported in previous studies (i.e., Lichtenthaler 2009; Jaworski and Kohli 1993). Except for customer acquisition, retention, and cost/differentiation balance scales, which were developed based primarily on Blattberg and Deighton (1996) and Porter (1985) respectively.

Market Orientation. A firm's market orientation is defined as organization-wide generation and dissemination of market intelligence on current and future customer needs, including organization-wide responsiveness to such information (Jaworski and Kohli 1993; Kohli and Jaworski 1990). A major focus of market orientation on customers and competitors

facilitates inter-functional coordination (Narver and Slater 1990), e.g., the firm will conduct more frequent meetings with customers, hold more interdepartmental meetings to discuss market trends, or respond quicker to satisfy changes in customer needs (Calantone and Di Benedetto 2007), and thus stimulating both the exploring and exploiting mechanisms of customer and competitor intelligence. On the basis of prior studies (e.g., Calantone and Di Benedetto 2007; Narver and Slater 1990; Song and Parry 1992, 1994, 1996, 1997a, b; Parry and Song 1994), I measured market orientation with eight items that tapped the extent to which sales and marketing department interact with customers and other functional areas when developing competitive intelligence. Also, I asked the respondents to evaluate the speed with which the firm could respond to competitive changes or to satisfy changes in customer needs (Calantone and Di Benedetto 2007).

Trust. I adapted the four items of trust from the work of Levin and Cross (2004). These scales captured two dimensions of trust: 1) Benevolence-based trust, and 2) Competence-based trust. Competence-based trust represents a cognitive component derived from confidence in the reliability and competence of another party, while benevolence-based trust demonstrates a behavioral component derived from confidence in the intentions, motivations, integrity, or benevolence of another party (Johnson et al. 1996; Moorman, Deshpande and Zaltman 1993; Ring and Van de Ven 1992). In the process of knowledge or intelligence acquisition, assimilation, transformation, and application, trust in another party's competence and reliability should also affect the perceived usefulness of knowledge received, thus increasing the willingness to listen to, absorb, and take further action for a purposeful use of such knowledge or intelligence, while trust in another party's benevolence, or in other words, a belief that another party who provides knowledge or intelligence has intentions of goodwill and will behave in a

fashion beneficial to both parties, likely shapes the extent to which knowledge seekers will be forthcoming about their lack of knowledge, even after seeking out the knowledge source, and so creates conditions for learning (Levin and Cross 2004).

Ties Strength. Prior research suggested that ties or relationship strength facilitated the acquisition and transfer of tacit knowledge among team members and eventually increased team performance (Hansen 1999, 2002; Reagans and McEvily 2003). Interdepartmental ties strength is defined as collaborations among employees across departments, comprising 1) interaction frequency, 2) extended history, and 3) mutual confiding (Cavusgil, Calantone, and Zhao 2003; Granovetter 1973). Ties strength will foster employee's intrinsic motivation by raising their perceived self-determination and establishing psychological contracts (Osterloh and Frey 2000), thereby encouraging the exploration and exploitation of intelligence. In this study, ties strength was measured by four items representing frequency of interaction, confidence in each other, the desirability of maintaining the relationship, and the overall extent of inter-departmental relationships within a firm (Cavusgil, Calantone, and Zhao 2003).

Cost/Differentiation Balance. On the basis of Porter's (1985) generic business-level strategies of cost leadership and differentiation, a firm's balance in cost and differentiation strategies was measured with a single item that asked respondents to indicate the extent to which their firms focus on low cost or differentiation strategy or both. The item used an 11-point scale anchored by "100% Focus on Low Cost Strategy (-5)," "Balance Strategy with Cost and Differentiation Equally Pursued (0)," and "100% Focus on Differentiation Strategy (5)."

Absorptive Capacity. The concept of ACAP has long been considered one of critical determinants for organization learning and innovation (e.g., Cohen and Levinthal 1990; Lane, Koka, and Pathak 2006; Zahra and George 2002). The operationalization of this construct was

adapted from Lichtenthaler (2009). The 14 items tap two dimensions of ACAP: 1) knowledge acquisition and assimilation, and 2) knowledge transformation and application. Instead of focusing on technological knowledge context as shown in previous literature, this study aims to explore a context of market knowledge (i.e., customer and competitor intelligence) as a critical component of a firm's ACAP. Therefore, I adjusted the technological context of all 14 items to reflect the market knowledge context. The first seven items addressed a firm's activities of environmental scanning and monitoring including observing, acquiring, and absorbing market knowledge from external sources. The examples of adjusted items are: "We are the best in our industry at scanning the environment for new market knowledge," "We often acquire market knowledge in response to competitive opportunities," and "We thoroughly observe customer trends and recent competitor strategic efforts." The other seven items captured firm's proficiency in transforming and applying knowledge. The examples of revised items are: "We are proficient in transforming market knowledge into new products," "Our employees are capable of sharing their market expertise to develop new products," and "We regularly apply market knowledge to develop new products." To ensure the respondents' consistent understanding of the term "market knowledge," the definition was explicitly shown at the beginning of ACAP's survey items as follows: "Market knowledge is defined as knowledge of customer and competitors, e.g., customer behaviors and their buying decision model, industry understandings, and competitors' strengths and weaknesses."

The use of holistic measurement approach to the ACAP of market knowledge rather than differentiating between customer and competitor knowledge/intelligence is worthy of specific comment. To support this concept, the respondents were asked to evaluate the extent to which the firm's 1) knowledge on customers and 2) knowledge on competitors would

beneficial/essential to the firm's ability to acquire, assimilate, transform, and apply market knowledge. No significant differences ($p = .105$) were found in the mean level of the effect on ACAP between knowledge on customers (mean = 6.021, sd = 1.115) and knowledge on competitors (mean = 5.800, sd = 1.194). Thus, to reduce a complexity of the model, a more aggregated measure of ACAP of market knowledge was chosen.

Customer Acquisition and Retention. According to Blattberg and Deighton (1996), customer acquisition rate is defined as a proportion of the prospects that a firm can convert into customers, while customer retention rate is referred to a proportion of the customers that a firm succeeds in keeping. Based upon these definitions, two subjective items were developed to assess: 1) how well a firm can perform in converting prospects into customers during the past two years, using a 7-point scale anchored by "Very Poor (1)" and "Excellent (7)," and 2) its customer acquisition performance relative to major competitors, using a 7-point scale anchored by "Much worse than Competitors (1)" and "Much Better than Competitors (7)." Similarly, the customer retention is measured by two items to assess a firm's performance in retaining existing customers and how it performs in keeping customers relative to major competitors.

Firm performance. Consistent with previous research in the broader marketing literature (e.g., Coviello, Winklhofer, and Hamilton 2006; Homburg and Pflesser 2000), two aspects of firm performance were assessed: 1) sales growth, and (2) profitability. Sales growth during the past two years was measured by two items, one of which was subjective (sales growth relative to competitors), another was objective (change in sales). Firm profitability during the past two years was captured by three items. Two were objective measures (ROI and ROA), and one was subjective (firm profitability). The approach of combining subjective and objective measures is common in the marketing literature (e.g., Calantone, Cavusgil, and Zhao 2002).

Control variables. Several factors influence the extent of ACAP and performance outcomes. Consistent with previous literature, this study includes two control variables that influence performance outcomes: firm size and firm age. Firm size, defined as a number of employees, can affect a firm's performance, since larger firms tend to possess more resources and market power to enhance performance, than smaller firms (Chandy and Tellis 1998). Firm age, referred to a number of years in operation since establishment, is another control variable that can affect firm performance since more complementary resources are likely to be built or acquired with increasing firm age (Teece 1986).

Analysis and Results

Assessing the Reliability and Validity of Measures

I estimate the equations in the proposed model simultaneously using partial least squares, the most accepted variance-based structural equation modeling technique (PLS-SEM). The main reason for using PLS-SEM is that a research objective of this study is identifying and predicting key driver constructs in an exploratory manner. PLS-SEM estimates the path relationships with the objective of minimizing the error terms and maximizing R^2 values of the target endogenous constructs, thus this feature helps achieve the prediction and theory development objectives of this study (Hair, Hult, Ringle, and Sarstedt 2013). In addition, other reasons to choose this method are that 1) PLS-SEM has no identification issues with small sample sizes, 2) it is a non-parametric method that does not require multivariate normal distribution, thereby placing minimum requirements on measurement levels, and 3) this method can handle complex relationships as contained in the proposed model (Chin 1998; Hair, Hult, Ringle, and Sarstedt 2013; see Figure 1.1). To ensure the adequate sample size, I conduct a power analysis together with a 10 times rule as suggested by Barclay, Higgins, and Thompson (1995). Since the maximum number of independent variables in the measurement and structural model of this study is six, a significant level (α) of 0.05 (one-tailed) and a desired statistical power ($1-\beta$) of 0.80 for detecting R^2 value of at least 0.25 or 0.10 would require a minimum sample size of 62 or 128 accordingly (Hair, Hult, Ringle, and Sarstedt 2013, p.21). This figure is within the bound of the sample size ($N=145$) obtained in this study.

With PLS-SEM path modeling, I assessed the psychometric properties of the measurement instruments including reliability, convergent validity, and discriminant validity

using approaches that Fornell and Larcker (1981) developed for a PLS-SEM context. Table 1.3 provides a correlation matrix, together with details of each construct's composite mean, and standard deviation. To assess the reliability of the measures using composite reliability (CR) and average variance extracted (AVE), all scales have CR greater than 0.7, which exceeds the cut-off value suggested by Nunally and Bernstein (1994), and all scales return AVE values greater than 0.6 in excess of the 0.5 minimum threshold value suggested by Bagozzi and Yi (1988; 2012). To demonstrate convergent validity, all factor loadings, ranging from 0.61 to 0.96, exceeds the 0.5 guideline (Peterson 2000; Bagozzi and Yi 2012). Details of factor loadings, CR, and AVE are shown in table 1.2.

Table 1.2: Essay 1 Validity Composition

Scales	Variables	Factor Loadings
Market Orientation (MO) AVE = .62 CR = .91	MO1 MO2 MO3 MO4 MO5 MO6 MO7 ^a MO8 ^a	.83 .75 .77 .82 .82 .72
Trust AVE = .76 CR = .94	Trust1 Trust2 Trust3 Trust4 Trust5	.74 .89 .93 .89 .88
Ties Strength (Tie) AVE = .84 CR = .95	Tie1 Tie2 Tie3 Tie4	.93 .89 .94 .91
Cost/Differentiation Balance (COSDIF) AVE = N.A. CR = N.A	CosDif1	N.A. (single-item measure)

Table 1.2 (cont'd)

Scales	Variables	Factor Loadings
Absorptive Capacity: Acquisition & Assimilation (AcapAA) AVE = .71 CR = .94	AcapAA1	.86
	AcapAA2	.91
	AcapAA3	.89
	AcapAA4	.88
	AcapAA5	.71
	AcapAA6	.81
	AcapAA7	.83
Absorptive Capacity: Transformation & Application (AcapTA) AVE = .74 CR = .95	AcapTA1	.91
	AcapTA2	.90
	AcapTA3	.88
	AcapTA4	.77
	AcapTA5	.84
	AcapTA6	.85
	AcapTA7	.86
Customer Acquisition (CusAc) AVE = .92 CR = .96	CusAc1	.96
	CusAc2	.96
Customer Retention (CusRe) AVE = .88 CR = .93	CusRe1	.92
	CusRe2	.95
Sales Growth (Sales) AVE = .62 CR = .75	Sales1	.93
	Sales2	.61
Profit AVE = .61 CR = .82	Profit1	.75
	Profit2	.79
	Profit3	.80

^a Items were dropped from the scale after measurement purification.

I assessed discriminant validity in two ways. First, interconstruct correlations, which should significantly depart from 1.0 (Bagozzi et al. 1991), were examined. All correlations are significantly smaller than 1.0. Second, as recommended by Fornell and Larcker (1981), the square root of AVE (i.e., the diagonal values in table 1.3) should exceed the correlations among constructs (i.e., the off-diagonal values in table 1.3). As resulted in table 1.3, the square root of AVE or diagonal values are significantly higher than the construct correlations or off-diagonal values, indicating that each construct shares more variance with their measures than with other

constructs in the model. All in all, these results collectively support the reliability, convergent validity, and discriminant validity of all constructs. These psychometric properties are sufficiently strong to enable an interpretation of structural model parameters.

Finally, since this study involves cross-sectional survey data, I undertook a test for common method variance effects, using Lindell and Whitney's (2001) marker variable assessment test. A result shows that for all significant effects of the antecedents and their consequences on the dependent variable, the corresponding bivariate correlation coefficients remain statistically significant at $p < 0.05$ when partialling out an unrelated "marker variable" (Lindell and Brandt 2000; Lindell and Whitney 2001). Thus, I conclude that the effects due to common method bias are negligible. The above analysis and the fact that I have deployed secondary data from Compustat, annual reports, and company web sites for firm performance outcomes and control variables makes us confident that common method bias does not compromise the results of the proposed model.

Table 1.3: Essay 1 Correlation Matrix and Descriptive Statistics of Measures

	AcapAA	AcapTA	Profit	CosDif	CusAc	CusRe	MO	Sales	Ties	Trust
AcapAA	0.84									
AcapTA	0.80	0.86								
Profit	0.22	0.27	0.78							
CosDif	0.21	0.31	0.15	N.A.						
CusAc	0.50	0.58	0.34	0.06	0.96					
CusRe	0.43	0.49	0.42	0.07	0.71	0.94				
MO	0.55	0.68	0.21	0.26	0.55	0.45	0.79			
Sales	0.37	0.49	0.58	0.20	0.55	0.64	0.35	0.78		
Ties	0.55	0.67	0.27	0.23	0.54	0.46	0.73	0.36	0.92	
Trust	0.52	0.58	0.25	0.14	0.46	0.51	0.50	0.36	0.55	0.87
Mean	5.65	5.26	1.87	1.01	5.12	5.37	4.73	2.74	5.15	5.82
SD	1.04	1.19	0.43	2.49	1.16	1.22	1.20	0.79	1.26	0.99

Note: The diagonal elements are square root of the AVE.

N.A. = not applicable.

Structural Model

I tested the hypotheses using PLS-SEM with SmartPLS 2.0 M3 software. The variance explained and the sign including significant level of path coefficients can be used to assess nomological validity, even though PLS-SEM does not attempt to minimize residual item covariance, and thus there is no summary statistic to measure the overall fit of the proposed model (Hair et al. 2013; Smith and Barclay 1997). With the exception of two paths, most path coefficients were significant ($p < 0.05$); and all significant paths were in the expected direction.

Direct Effects

Table 1.4 (model 1 or “baseline” model) shows the results for the antecedents and consequences of ACAP_AA and ACAP_TA. The positive and significant effects of market orientation ($\beta = .26, p < .01$; $\beta = .36, p < .01$), ties strength ($\beta = .20, p < .01$; $\beta = .26, p < .01$), and trust ($\beta = .28, p < .01$; $\beta = .25, p < .01$) on ACAP_AA and ACAP_TA support H1a, H1b, H3a, H3b, H4a, and H4b respectively. The positive effect of ACAP_TA ($\beta = .41, p < .01$) on a firm’s sales growth is significant, whereas the effect of ACAP_AA is not significant. These results support H5b but not H5a. The results in table 1.4 (model 1) also show that the positive effect of sales growth ($\beta = .48, p < .01$) on a firm’s profitability is also significant; thus supporting H8.

Mediation Effects of Cost/Differentiation Balance, Customer Acquisition, and Customer Retention

As shown previously, market orientation has positive and significant effects on both ACAP_AA and ACAP_TA. When considering the mediating effect of cost/differentiation (see model 2 in table 1.4), I found that it had a positive and significant effect on ACAP_TA ($\beta = .13, p < .01$),

which supports H2b. The inclusion of cost/differentiation balance leads to a slight decrease in the effect size of market orientation (from .36 to .33), but it remains significant, suggesting partial mediation (total effect $\beta = .37$, $p < .01$; direct effect $\beta = .33$, $p < .01$; indirect effect $\beta = .04$, $p < .05$); therefore, H2d is supported. However, the effect of cost/differentiation balance on ACAP_AA is not significant; thus, H2a and H2c are not supported.

Further, the results in model 2 show that customer acquisition ($\beta = .15$, $p < .01$) and customer retention ($\beta = .43$, $p < .01$) have positive and significant effects on a firm's sales growth. These results support H6a and H6b. The inclusion of customer retention leads to a decrease in the effect size of ACAP_TA (from .41 to .21), but it remains significant, suggesting partial mediation (total effect $\beta = .26$, $p < .01$; direct effect $\beta = .21$, $p < .01$; indirect effect $\beta = .05$, $p < .05$); therefore, H6d is supported.

Since the ACAP_AA is not directly related to sales growth, testing for mediating effect for these variables might violate Baron and Kenny's (1986) suggestion. However, several studies in innovation and various research fields have argued that a test of X to Y association might be more powerful if the mediation was taken into account; therefore, this constraint could be relaxed without hampering the validity of the mediation analysis (De Luca and Atuahene-Gima 2007; Preacher and Hayes 2004; Shrout and Bolger 2002; Sobel 1982). In other words, it is possible to find a significant, indirect effect even when there is no evidence for a significant, direct effect (De Luca and Atuahene-Gima 2007; Preacher and Hayes 2004). Recent research also suggests that there should be only one requirement to establish mediation, that the indirect effects from X to M and from M to Y be significant (Zhao, Lynch, and Chen 2010). Consistent with these previous studies, the results show that the indirect effect for ACAP_AA is significant (total effect $\beta = .13$, $p < .01$; direct effect $\beta = -.08$, n.s.; indirect effect $\beta = .21$, $p < .01$), in support

of H6c². Finally, the result shows that customer acquisition ($\beta = .64, p < .01$) has positive and significant effect on customer retention; thus, H7 also is supported. Among control variables, firm age is negatively related to sales growth ($\beta = -.18, p < .01$) and profitability ($\beta = -.26, p < .01$), while firm size ($\beta = .18, p < .05$) is positively related to sales growth but not profitability.

In sum, the results of this study suggest five conclusions. First, market orientation, ties strength, and trust are positively related to both ACAP_AA and ACAP_TA. Second, market orientation has both direct and indirect effect on ACAP_TA (through cost/differentiation balance). Third, cost/differentiation balance does not influence ACAP_AA. Fourth, ACAP_TA has both direct and indirect effects (via customer retention) on a firm's sales growth, whereas ACAP_AA only has an indirect effect (via customer acquisition) on sales growth. Fifth, consistent with previous studies, customer acquisition influences customer retention, while a firm's sales growth also significantly affects its profitability.

² For indirect effects in PLS-SEM, we obtained total, direct, and indirect effects estimates and significance using SmartPLS 2.0 M3 bootstrap estimation procedure with 500 resamples (Hair, Hult, Ringle, and Sarstedt 2013).

Table 1.4: Essay 1 Structural Results

Alternative Model	Model 1 (Baseline Model)				Model 2 (Test Mediating Effects)							
	R ²	AcapAA	AcapTA	Sales	Profit	AcapAA	AcapTA	CosDif	CusAc	CusRe	Sales	Profit
		0.40	0.57	0.31	0.39	0.40	0.58	0.07	0.25	0.52	0.51	0.4
MO->AcapAA	0.26**					0.25**						
Tie->AcapAA	0.20**					0.19*						
Trust->AcapAA	0.28**					0.29**						
MO->AcapTA			0.36**				0.33**					
Tie->AcapTA			0.26**				0.25**					
Trust->AcapTA			0.25**				0.25**					
AcapAA->Sales				-0.00							-0.08	
AcapTA->Sales				0.41**							0.21**	
Age->Sales				-0.27**							-0.18**	
Size->Sales				0.16							0.18*	
Sales->Profit					0.48**							0.50**
Age->Profit					-0.26**							-0.26**
Size->Profit					-0.02							-0.01
Mediating Effects												
MO->CosDif								0.26**				
CosDif->AcapAA						0.06						
CosDif->AcapTA							0.13**					
AcapAA-> CusAc									0.50**			
AcapTA->CusRe										0.12*		

Table 1.4 (cont'd)

Alternative Model	Model 1 (Baseline Model)				Model 2 (Test Mediating Effects)						
	AcapAA	AcapTA	Sales	Profit	AcapAA	AcapTA	CosDif	CusAc	CusRe	Sales	Profit
CusAc->CusRe									0.64**		
CusAc->Sales										0.15**	
CusRe->Sales										0.43**	

* $p < .05$ (one-tailed test for hypotheses, and two-tailed test for control variables).

** $p < .01$ (one-tailed test for hypotheses, and two-tailed test for control variables).

Discussion

Theoretical Contributions and Managerial Implications

The objective of this study is to answer the question: If we know that a smarter firm performs better, will a firm with higher ACAP be smarter than the others? Or, in other words, can we use ACAP as a key indicator to define a firm's smartness? As outlined earlier, besides the performance relationship, three additional criteria which should be considered when selecting the key indicators are the ability to: 1) explain source of knowledge, 2) identify the use of knowledge, and 3) accommodate the context specific of the firm. Theoretically, both exploring and exploiting dimensions of ACAP seems to fit the first two criteria. However, the conventional assumption of technological ACAP might not accommodate the context specific of the firms, particularly those in the service industries. To provide a more precise answer to the above question, I tested a proposed comprehensive model which identifying the integrating performance-enhancing mechanisms and antecedent processes of ACAP in a marketing context. I challenged the limiting assumption of previous ACAP research by considering ACAP outside the context of R&D and found that a firm's ability to transform and apply market knowledge, especially those associated with customer and competitor intelligence, has both direct and indirect positive effects on a firm's growth in sales. Also, a firm's ability to acquire and assimilate market knowledge has an indirect positive effect (through customer acquisition) on sales growth. The findings lend support to the above criteria that both dimensions of market knowledge ACAP are positively related to firm performance.

Extant research in ACAP of technological knowledge, despite its substantial contribution in the field, has been studied intensively among hi-tech or manufacturing firms, thereby limiting

their scope to accommodate the other context specific of firms operating in other industries, for instance, finance, insurance, real estate, and retailing services. However, ACAP of market knowledge is robust across a more diverse set of industry contexts. In addition, this study with a multi-industry sample ranging from hi-tech manufacturing firms to non-technical service firms evidently supports the third criteria that ACAP of market knowledge could accommodate the context specific of the firm. Thus, I can conclude theoretically and empirically that ACAP could be used as an indicator of a firm's smartness.

What drives a firm's market knowledge ACAP? Are they different from those of technology-related ACAP? This study contributes to the debate by showing that the ACAP of market knowledge is subject to different knowledge-flow processes since its main components—customer and competitor intelligence—have unique characteristics which comprise of explicit and tacit elements and is very sensitive and critical to corporate advantage and competitive strategy. Thus, different organizational factors and conditions are required to encourage or support the market knowledge ACAP. As hypothesized, trust, ties strength, and market orientation are key determinants and positively influence both dimensions of ACAP since these factors strongly support both the formal and informal communications and flows of tacit elements of market knowledge. Based upon the results in both measurement and structural models, trust and ties strength are distinct constructs and separately influence each dimension of market knowledge ACAP.

Considering a nonsignificant mediating effect of cost/differentiation balance on a relationship between market orientation and ACAP_AA, I arrive at a possible and interesting explanation. Consistent with previous literature, market-oriented firms strongly facilitates the acquisition and assimilation of customer and competitor intelligence since they are both

customer- and competitor- oriented. Also, a focus on generating and disseminating new market knowledge directly enhances ACAP_AA and does not necessarily depend on the level of firm's differentiation.

Contrary to the expectation, I found no support for the direct, positive effect of ACAP_AA on sales growth. Instead, I found that ACAP_AA positively influences sales growth through customer acquisition. This implies that the increase in sales that results from a firm's ability to acquire and assimilate market knowledge determines the extent to which a firm could convert their prospects into customers. Although both market knowledge acquisition/assimilation and customer acquisition activities are considered important factors to firm performance, this study offers the new insight that the customer acquisition is a route that makes a firm's ability to acquire and assimilate market knowledge a more valuable resource for a firm.

The findings have direct implications for managers. For top executives, this study highlights the importance of a firm's ability to acquire, assimilate, transform, and apply market knowledge—particularly customer and competitor intelligence—and how it positively influences firm performance by enhancing a firm's ability to convert prospects into customers and retain existing customers. This study also suggests interdepartmental relationship and trust including a firm's focus on market-oriented activities strongly facilitate both informal and formal flows of market knowledge, and thus enhance market knowledge ACAP.

Limitations and Future Research Directions

This study accrued some limitations which highlight several avenues for future research. First, it investigated interdepartmental trust and ties relationship by drawing on the perspective of

marketing and sales managers. While a dyadic perspective, that is data from R&D, engineering, and other business units, would be desirable, it is notoriously difficult to obtain such data through a survey. The second limitation is rooted in cross-sectional nature of the results, which prevents us from exploring the effects of the antecedents of both dimensions of market knowledge ACAP and their consequences over time. Third, this study emphasizes the importance of market knowledge ACAP and links it with customer acquisition/retention and performance, but it does not address the issue of how multiple context of ACAP, i.e., ACAP of technological knowledge, might be integrated or carried out. Further research may take a more comprehensive view of this construct.

Several issues, which may highlight worthwhile avenue for future research, arose from this study. First, the model does not purport to represent all possible antecedents and consequences of market knowledge ACAP. This study has contributed to existing ACAP literature by investigating the ACAP in marketing context and incorporating marketing factors, i.e., market orientation, customer acquisition, and customer retention into the model. This is important because it moves the concept of ACAP beyond technology-oriented and strategic management focus. Further research could also account for other organizational and marketing factors, such as organizational culture, customer satisfaction, and customer loyalty, as more proximate antecedents or consequences of ACAP. Second, this study investigated the different effects between two dimensions of ACAP—exploring and exploiting knowledge. Though these two dimensions proved to be crucial in previous ACAP research, other dimensions of ACAP, e.g., routines versus non-routines (or extra work), trust/ties related versus unrelated, reward/feedback required versus not required, also worth exploring.

Finally, although the samples included firms publicly listed in the U.S. and international stock exchange, key informants were limited to managers who primarily work in the U.S. Thus, future research should examine the generalizability of the results in different cultural contexts. A study of cultural interactions between two groups of entities (e.g., firms and countries) may offer insight into how firms manage, control, and reward their ACAP-related processes.

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CHAPTER 2

ESSAY 2: EMPIRICAL ANALYSIS OF ABSORPTIVE CAPACITY AND THE STRATEGIC EXPLORATION-EXPLOITATION RATIO ON FIRM AND PRODUCT INNOVATION OUTCOMES

Introduction

“Quality should be central to everything a company does, not an afterthought. Quality makes money. It’s one of the highest payback investments an executive can make (Sirkin 2012).”

According to a theory of competitive rationality (Dickson 1992), when deciding on market strategy, firms seldom simply adopt a satisfactory solution since they are bounded by resource and institutional constraints. Thus, the theory states that firms will often choose the most attractive alternative that fits the firms’ abilities and resource capabilities—financial and human capital—which would help them improve both its market effectiveness and efficiency (e.g., developing innovative products/services and improving quality, in order to fulfill their customers’ expectation and create satisfaction). However, since most firms always face resource-constrained marginal utility maximization, they have to trade-off between available alternatives to achieve their customer preferences. Balancing between choices of quality improvement and new innovative product development is critical to performance outcomes of the firms and economic incentives of their executives. High quality, as well as cost-benefit ratio and function relative to competitors, can enhance the customer’s perception of new product advantage and superiority (Montoya-Weiss and Calantone 1994). Likewise, product innovativeness is viewed as a strong indicator of new product performance. However, given limited resources and different

managerial practice in the two approaches, it would be very arduous to push two efforts at the same time.

Practitioners believe in the importance of quality as a foundation of firm market and financial performance. As quoted in Business Week Online by a senior consultant at Boston Consulting Group, “Too many people in industry see quality as a “cost”—something that can be cut or sacrificed to enhance the bottom line. But not all costs are equal. Some, such as product quality costs, create long-term value and build the brand (Sirkin 2012).” On the contrary, some researchers found that both product and process innovation show stronger relationship with firm performance or, in other words, quality is relatively inferior in its impact on firm performance compared to innovation (Prajogo and Ahmed 2007), while the others shows that more than 90% of ambidextrous firms that commit simultaneous quality improvement and innovation efforts achieve their performance goals (O’Reilly, Harreld, and Tushman 2009; O’Reilly and Tushman 2004).

To reconcile these differences in the existing literature and proclaim its implication involving top management’s strategic decision, this study brings in a theory of competitive rationality, together with absorptive capacity (ACAP) and innovation literature, to explain how top executives can shift or balance their strategic focus between these two approaches—quality improvement or new product innovation—by allocating their resources on either explorative or exploitative learning strategies and activities, including how this process might be affected by intensive rivalry and a firm’s market orientation. The influence of both alternatives on new product performance and firm performance outcome are examined in order to seek managerial implications when allocating resources and organizing the firm’s structure. Also, I explore the moderating mechanism of technological and quality orientation in strengthening (or weakening)

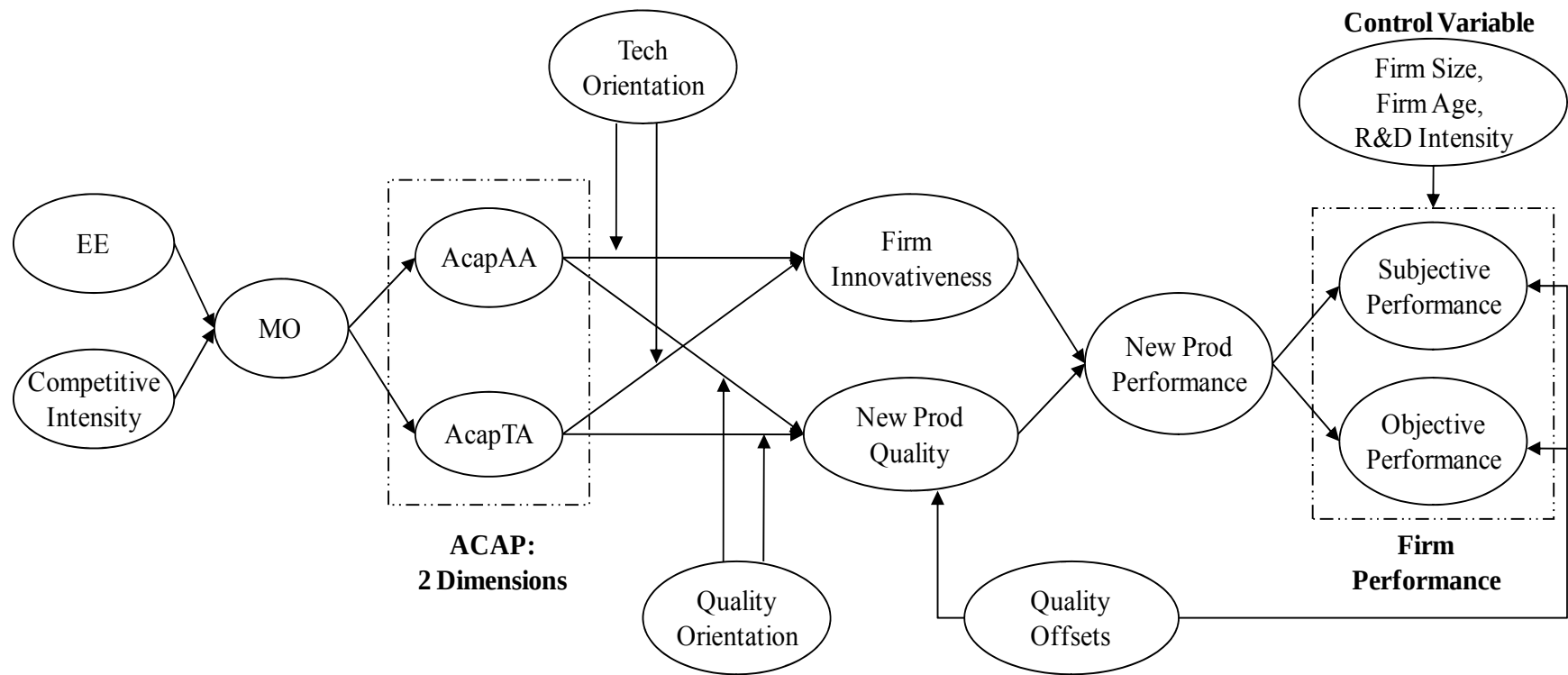
relationships between each dimension of ACAP and firm innovativeness and new product quality. In addition, a relationship between an exogenous strategic factor—quality offsets—and both subjective and objective firm performance is investigated to give managers an insight of how to manage these offsets, in forms of warranties and/or guarantees, as a tool to enhance firm performance.

I organize the rest of this study as follows: First, I develop a comprehensive model of the drivers and innovativeness/quality outcomes of each dimension of ACAP, and how these relationships affect performance outcomes. Next, I focus on the moderators of ACAP-innovativeness and ACAP-quality relationships. Then, I explain the data collection including measurement and structural model, and present the results. Finally, the theoretical contribution, managerial implications, limitations, and directions for future research are concluded.

Theoretical Background and Hypotheses

I developed a conceptual framework shown in Figure 2.1 on the basis of three streams of literature: competitive rationality, absorptive capacity, and innovation. The posited framework depicts relationships among antecedents and consequences of the exploratory and exploitative dimensions of ACAP, as well as the relationships involving the influences of ACAP on firm performance via firm innovativeness, new product quality improvement, and new product performance. Adopting market orientation perspective, I postulate that the emergence of a firm's ACAP of technological knowledge can be affected by two sets of factors—strategic exploration to exploitation ratio and competitive intensity—through a firm's implementation of market orientation. Additionally, the effects of two potential moderators—technological and quality orientation—on the ACAP-firm innovativeness and ACAP-new product quality relationships were explored. Theoretical rationale for both direct and moderating effects appears in the following sections.

Figure 2.1: The Conceptual Model of Absorptive Capacity and the Strategic Exploration to Exploitation Ratio on Firm and Product Innovation Outcomes



The Strategic Exploration to Exploitation Ratio (Strategic EE Ratio³) and Its Effect on Market Orientation

Exploration and Exploitation Balance. With increasing attention from researchers and practitioners, balancing two fundamentally different learning activities between exploration and exploitation has become a dominant issue in organizational and management theory (e.g., March 1991, 2006). Exploration creates, experiments, and discovers new knowledge, whereas exploitation selects, refines, makes use of, and improves existing knowledge. The interesting questions of 1) whether exploration and exploitation are two ends of a continuum or orthogonal to each other, and 2) how firms should achieve a balance between exploration and exploitation via ambidexterity or punctuated equilibrium are still under investigation (Gupta, Smith, and Shalley 2006; Katila and Ahuja 2002; Koza and Lewin 1998; March 1991; Rothaermel 2001). According to Gupta, Smith, and Shalley (2006), the relationship between exploration and exploitation depends very much on whether the two compete for scarce resources and whether the analysis focuses on a single or on multiple domains. In particular, they argue that if the analysis involves action in multiple and loosely connected domains, then the exploration and exploitation are conceptualized as orthogonal and ambidexterity be viewed as the appropriate adaptation mechanism for balancing the need for both exploration and exploitation. On the other

³ Unlike studies that use absolute difference between explorative and exploitative strategies to demonstrate a relative balance (or imbalance) between the two strategies (e.g., He and Wong 2004), we created a strategic EE ratio measure as follows:

$$\text{Strategic EE Ratio} = \frac{\sum \text{Exploration} - \sum \text{Exploitation}}{\sum \text{Exploration} + \sum \text{Exploitation}}$$

This formulation of the strategic EE ratio provides both distance and location (i.e., a relative distance) of the difference between explorative and exploitative strategies, while the use of absolute difference can only offer a simple distance but not a relative one, which may mislead interpretations of EE's relationship with other constructs.

hand, if the analysis focuses on a single domain (i.e., individual or subsystem), then the exploration and exploitation are conceptualized as two ends of a common continuum and punctuated equilibrium (i.e., temporal cycling between long periods of exploitation and short bursts of exploration) be viewed as the appropriate adaptation mechanism of such balance (Gupta, Smith, and Shalley 2006). In sum, previous research posits that an ambidextrous firm, i.e., a firm with a balance in exploration and exploitation, can synchronously pursue both exploration and exploitation via loosely coupled and differentiated subunits or individuals, each of which specializes in either exploration or exploitation (Gupta, Smith, and Shalley 2006), in order to be adaptive and achieve persistent success (March 1991).

Despite the increasing number of studies referring to a balance of exploration and exploitation as a key driver of ambidexterity organization (Adler, Goldoftas, and Levine 1999; Katila and Ahuja 2002; Knott 2002), the empirical evidence remains limited in this area. In particular, although there have been several conceptual and empirical studies underlying the curvilinear relationship between firm's strategic exploration to exploitation ratio and its performance (e.g., Gupta, Smith, and Shalley 2006; Uotila et al. 2009), to my knowledge, no study has been found to provide empirical results regarding this effect on the firm's market orientation and how this relationship influences ACAP and product innovation outcomes including firm performance.

The Strategic EE Ratio-Market Orientation Relationship. Market orientation has emerged as one of the most important factors in fostering innovativeness and performance of a firm in contemporary marketing research. Conceptually, market orientation refers to organization-wide activities that are related to the generation and dissemination of market intelligence including organizational responsiveness to such intelligence (Jaworski and Kohli

1993; Kohli and Jaworski 1990). Since market orientation comprises customer orientation, competitor orientation, and inter-functional coordination, market-oriented firms have more clarified strategic focus and vision which enhance firm innovativeness; and consequently leads to higher competitive advantage and superior firm performance (Hurley and Hult 1998; Jaworski and Kohli 1993; Kohli and Jaworski 1990; Kumar et al. 2011).

Marketing and organizational research to date has considered the effects of interdepartmental conflict as one of the key antecedents of market orientation (Jaworski and Kohli 1993; Kennedy, Goolsby, and Arnould 2003; Kirca, Jayachandran, and Bearden 2005). As suggested by O'Reilly, Harrell, and Tushman (2009), a firm with a balanced focus between explorative and exploitative strategies shares a common fate and be in competition with other organism while having mechanisms that suppress within-group competition. These characteristics and mechanisms reduce interdepartmental conflict, thereby supporting an implementation of market-oriented activities within a firm. Thus, I posit that the highest level of market orientation emphasis will occur at an intermediate or balanced (threshold) level of the firm's exploration and exploitation due to the reduced conflict among business units or functional departments within a firm. Also, the imbalanced focus between explorative and exploitative strategies, either exploration is greater than exploitation or vice versa, will create interdepartmental conflict arising from divergent goals, thereby distorting a firm's emphasis on market orientation.

Thus, I expected that:

H1: The relationship between the firm's strategic exploration to exploitation ratio and a firm's emphasis on market orientation is inverted V-shape.

Competitive Intensity and its Effect on Firm's Market Orientation

Although several extant studies focus on the moderating impact of competitive intensity, defined as the degree of competition that a firm faces, on a market orientation-performance relationship (e.g., Grewal and Tansuhaj 2001; Slater and Narver 1994), some researchers argue that external factor such as competitive intensity can be considered an antecedent of market orientation (e.g., Jaworski and Kohli 1993; Lusch and Laczniak 1987). The theory of competitive rationality provides a support rationale to the latter concept by stating that the intensified competition creates a drive for firms to adapt to a more competitive environment and motivate them to develop or refine business philosophies such as the market orientation concept in search for new ways of serving customers and be more efficient and effective than their competitors (Dickson 1992; Lusch and Laczniak 1987). Since intensive competition increases incentives for a firm to become more market-oriented, I hypothesized that:

H2: Increased competitive intensity is positively associated with a more emphasis on the market orientation of a firm.

The Effect of Market Orientation on Two Dimensions of ACAP

ACAP is defined as a firm's dynamic capability to pertain knowledge acquisition, assimilation, transformation, and application that allow firms to gain and sustain their competitive advantage (Zahra and George 2002). The concept of ACAP has long been considered one of critical determinants for organization learning and innovation (e.g., Cohen and Levinthal 1990; Lane, Koka, and Pathak 2006; Zahra and George 2002). Increasingly, researchers pay attention in investigating the influence of ACAP in a variety of organizational study areas (Abecassis-Moedas and Mahmoud-Jouini 2008; Atuahene-Gima 1992; Hurley and

Hult 1998). Past research on a firm's ACAP has focused mostly on two sets of dimensions of the ACAP: 1) the learning or exploring dimension (which includes acquisition and assimilation capabilities), and 2) the applying or exploiting dimension (which includes transfer and exploitation capabilities). For simplicity, the extent of the acquisition and assimilation or, in other words, the exploring activities will be referred to as "ACAP_AA." Likewise, the extent of the transformation and application or, in other words, the exploiting activities will be referred to as "ACAP_TA."

Market Orientation may enhance a firm's ACAP for two reasons. First, previous research confirms that a firm's past experience in technology search, which is a result of competitive environmental scanning (Fahey 1999) and interactions with customers (Nonaka and Takeuchi 1995), affects the development of a firm's knowledge acquisition capabilities because it can also significantly determine how firms acquire and assimilate new knowledge, as well as the locus of their future technological search (Jansen, Van Den Bosch, and Volberda 2006). Therefore, firms with a strong customer and competitor orientation can effectively manage and develop their ACAP_AA.

Second, a firm's focus in inter-functional coordination, which facilitates both cross-functional interface and connectedness, will enhance ACAP_AA and ACAP_TA accordingly (Jansen, Van Den Bosch, and Volberda 2006). Connectedness, stimulated by social integration mechanism, builds understanding about new external knowledge (Daft & Lengel, 1986) and makes the employees aware of the types of data that constitute a firm's ACAP_AA (Zahra and George 2002). These mechanisms also facilitate the sharing and eventual exploitation of knowledge, thus enhancing a firm's ACAP_TA (Jansen, Van Den Bosch, and Volberda 2006).

Consistent with previous ACAP and market orientation literature, I hypothesized a positive effect of market orientation on both ACAP_AA and ACAP_TA.

H3a: A positive relationship exists between market orientation and ACAP_AA.

H3b: A positive relationship exists between market orientation and ACAP_TA.

Different Effects of 2 Dimensions of ACAP on Firm's Innovativeness

To study the process of knowledge absorption focusing on the different aspects of acquisition and assimilation versus transformation and the exploitation (Zahra and George 2002) or the utilization (Lane, Koka, and Pathak 2006) of the acquired knowledge, the new product development process is relevant because it represents an activity where both the exploration and utilization of knowledge are realized and it is a knowledge-intensive activity in which the exploitation and the transfer of the acquired knowledge could be analyzed (Abecassis-Moedas and Mahmoud-Jouini 2008).

One of the key constructs in new product innovation literature which is frequently mentioned as a key source of competitive advantage and subsequent superior business performance is a firm's innovativeness (Hult, Hurley, and Knight 2004; Garcia and Calantone 2002; Ozsomer, Calantone, and Di Benedetto 1997). In general, a firm's innovativeness comprises aspects that enable a firm to spot changing needs in the market, accumulate relevant knowledge and technology, leverage or upgrade resources, transform the organizational structure, and eventually develop and adopt innovations in terms of organizational behaviours, processes, products, strategic directions, and/or markets (Damanpour 1991; Garcia and Calantone 2002; Hult, Hurley, and Knight 2004; Hurley and Hult 1998; McNally, Cavusgil, and Calantone 2010; Wang and Ahmed 2004). A firm's ACAP was long found to be an important

factor for organizational learning and innovativeness (Cohen and Levinthal 1990). Previous studies consider that a firm's ability to develop skills that facilitate the exploration/assimilation of knowledge and information and their subsequent transform/deployment in other situations can help inject new ideas into the organization, increases capacity to understand new ideas and strengthens creativity and the ability to spot new opportunities (e.g. Cepeda-Carrion et al. 2012; Powell 1998). However, these two dimensions of ACAP are fundamentally different that require very different strategies and structures—while the learning/exploration dimension requires change, flexibility and creativity, the application/exploitation dimension requires order, control and stability (Cepeda-Carrion et al. 2012; Newey and Zahra 2009; Zahra and George 2002). This implies that if the firm becomes more tied to exploring or creating new knowledge, this may result in the under-utilization of relevant knowledge or the utilization of irrelevant knowledge due to a lack of formal procedures/routines to control transformation/exploitation processes, which leads to a degradation of innovation (Cepeda-Carrion et al. 2012; Lyndon 1989) and a subsequent decrease in organizational innovativeness. Therefore, the relationship between these two dimensions of ACAP and firm's innovativeness as described in the literature can be stated with the following hypotheses:

H4a: As a firm's ACAP_AA increases, its innovativeness increases.

H4b: As a firm's ACAP_TA increases, its innovativeness decreases.

Moderating Effect of Technological Orientation

Technological orientation is defined as the extent to which a firm focuses their activities on latest or sophisticated technology and can use this technological knowledge to build a new technical solution or develop new product that meets new needs of customers (Gatignon and Xuereb

1997). Unlike market-oriented firm that emphasizes “customer-pull” philosophy, technology-oriented firm deploys “technology-push” philosophy by committing in R&D resource investment and new innovative technology acquisition, as well as promoting openness to new ideas (Zhou, Yim, and Tse 2005). In a strong technology-oriented firm, employees are encouraged to search for and use latest technological knowledge in its new products, thus flexibility and creativity become the organizational norms and values that guide its priority, activities, and capability (Hurley and Hult 1998; Ali 1994; Zhou, Yim, and Tse 2005). As a result, I expected that these norms and values in a technology-oriented firm will strengthen a positive relationship between ACAP_AA and firm innovativeness. Likewise, since these creativity and flexibility norms and values in a technology-oriented firm create a conflict with the application/exploitation dimension of ACAP that requires order, control, and stability (Cepeda-Carrion et al. 2012; Newey and Zahra 2009; Zahra and George 2002), I posit that technological orientation will also strengthen a negative relationship between ACAP_TA and firm innovativeness. Thus, I hypothesized that:

H5a: The positive effect of ACAP_AA on firm innovativeness will increase as a firm’s technological orientation increases.

H5b: The negative effect of ACAP_TA on firm innovativeness will increase as a firm’s technological orientation increases.

Two Dimensions of ACAP and New Product Quality

As evidenced by past research that ACAP can influence new product quality (Verona 1999); nevertheless, research studies investigating the different empirical effects of each dimension of ACAP (e.g., acquisition/assimilation versus transformation/ application) on a perceived quality of new innovative product are quite limited. Developing a common understanding and achieving

consistency among decisions made throughout the new product development process are considered critical for the development of a new product quality (Clark and Fujimoto 1991; Garvin 1988; Menon, Jaworski, and Kohli 1997; Sethi 2000). Because individuals from various functional areas often have different ideas about the product (Dougherty 1992; Garvin 1988), especially a new product, without effective information integration, transformation, or application, these individuals generally pull the project in different directions and thus adversely affect the quality of new product development (Sethi 2000).

Since the exploitation dimension of a firm's ACAP will focus on applying existing knowledge to improve efficiency including a product quality, I expect that an increase in firm's application or exploitation dimension of its ACAP will increase the perceived new product quality since the firm can transform and apply its product knowledge or technology to develop new product quality. On the contrary, the perceived quality of new innovative products may decrease if the firm's learning or exploration dimension of its ACAP increases since the exclusive increase in exploring capability may cause the firm to suffer from the fact that it may never gain the returns of its knowledge (Levinthal and March 1993). Thus, it is hypothesized that:

H6a: As ACAP_AA increases, perceived new product quality decreases.

H6b: As ACAP_TA increases, perceived new product quality increases.

Moderating Effect of Quality Orientation

Quality orientation represents the extent to which a firm focuses on quality, creates a commitment to quality improvement among its employees, and practices total quality management (Sethi, 2000). A strong quality-oriented firm focuses on minimizing variation in

products, increasing speed to the market, reducing associated costs, and enhancing efficiency (Benner and Tushman 2003; Sethi and Sethi 2009). Furthermore, the simple and rational desire for greater profits leads to the creation of a culture and incentives that encourage decision makers to strive constantly to find ways of reducing costs without affecting the potency of the output (Dickson 1992). Consequently, employees are encouraged to deploy existing capabilities and knowledge to improve existing products of the firm since such products are more predictable and involve higher certainty (Sethi and Sethi 2009). Thus, it is expected that a relationship between ACAP_TA and new product quality will be stronger in a quality-oriented firm. On a contrary, a quality-oriented firm tends to avoid novel products because of its uncertainty and expensive exploratory processes which imply more R&D investment, new capabilities sourcing, and latest technological knowledge acquisition (Sethi and Sethi 2009). As a result, the acquisition and assimilation of new knowledge is likely to be compromised in a quality-oriented firm. Thus, it is expected that a quality orientation will strengthen a negative relationship between ACAP_AA and new product quality. Therefore:

H7a: The negative effect of ACAP_AA on new product quality will increase as a firm's quality orientation increases.

H7b: The positive effect of ACAP_TA on new product quality will increase as a firm's quality orientation increases.

Firm Innovativeness and New Product Performance

Innovative firms are mainly characterized by their openness to new ideas, products, and processes, including their willingness to change and adapt to emerging environment, e.g., revolution of technologies or changes in market trends (Acur, Kandemir, and Boer 2012; Calantone, Cavusgil, and Zhao 2002; Hurley and Hult 1998; Zaltman, Duncan, and Holbek

1973). In addition, a firm's innovativeness represents the rate of adoption or generation of product and/or service innovations (Deshpande, Farley, and Webster 1993). Research studies have shown strong relationship between firm innovativeness and new product performance (Han, Kim, and Srivastava 1998). As firms typically face resource and institutional constraints on their behaviors, they must act in a way that fits their strengths and weaknesses as well as their resource capabilities, e.g., financial and human capital (Dickson 1992). According to these constraints, innovative firms are willing to devote related new product development efforts and resources to new market potential, thereby broadening their horizontal scope (i.e., they are more diversified with more lines of outputs) and enhancing their opportunities to find and exploit a first mover advantage (Acur, Kandemir, and Boer 2012; Wernerfelt 1984; Wernerfelt 2005). Therefore, the following hypothesis is proposed:

H8: A positive relationship exists between firm innovativeness and new product performance.

The Effect of New Product Quality on New Product Performance

New product quality has been considered a crucial element for a firm to obtain a competitive advantage and also found to have a major influence on the market success and profitability of a new product (Aaker and Jacobson 1994; Clark and Fujimoto 1991; Garvin 1988; Jacobson and Aaker 1987; Molina-Castillo, Munuera-Aleman, and Calantone 2011; Phillips, Chang, and Buzzell 1983; Sethi 2000). In particular, customer's perception of new product advantage and superiority depends on its quality, cost-benefit ratio, and function relative to competitor (Montoya-Weiss and Calantone 1994). In addition, recent research empirically shows that new

product quality has direct and indirect effects on both short-term and long-term new product performance (Molina-Castillo, Munuera-Aleman, and Calantone 2011). Thus:

H9: A positive relationship exists between new product quality and new product performance.

The Effect of New Product Performance on Firm Performance

Successful new products are engines of company's growth since a new product line, as proposed by several frameworks including the product-life cycle and the growth-share matrix, could generate future profitability and prevent the obsolescence of the firm's product line (Cooper 1984; Chaney, Devinney and Winer 1991; Pauwel et al. 2004). Past research indicate that new product development is one of the key factors that results in superior firm performance (Gatignon and Xuereb 1997; Slater and Narver 1994). Under the increasingly intense competition, rapidly changing market environments, higher rates of technical obsolescence, and shorter product life cycles (Griffin 1997), new products serve to accommodate the uncertainties a firm faces in its entrepreneurial environment (Langerak, Hultink, and Robben 2004). Recent empirical studies found that new product performance have a strong positive effect on firm performance, especially on both market and financial performance (Griffin and Page 1996; Hultink et al. 1998; Langerak, Hultink, and Robben 2004; Montoya-Weiss and Calantone 1994).

For a more robust result, although previous research shows that there is a strong correlation between objective and subjective performance measures (e.g., Dawes 1999; Jaworski & Kohli 1993), I follow Dawes (1999)'s recommendation by hypothesizing the effect of new product performance on both subjective and objective performance of the firm.

H10a: A positive relationship exists between new product performance and a firm's subjective performance.

H10b: A positive relationship exists between new product performance and a firm's objective performance.

The Effect of Quality Offsets on Subjective and Objective Firm Performance

Warranties and guarantees are considered common types of “quality offsets” offered by sellers under several economic rationales. First, under the assumption of information asymmetry between buyers and sellers, quality offsets are offered to reduce buyers' information gap and lower their perceived risk by signaling a product superior quality through warranties and guarantees (Spence 1977). Customer reliance on signals for assessing new product quality is well documented in theoretical and empirical research. Signaling theory suggests that when there is a lack of information or information asymmetry, sending signals to the uninformed party or agent can facilitate the functioning of a perfectly competitive market (Spence 1977). Unlike developing a superior brand which will take more time and effort, new products often rely on other quality offsets schemes, i.e., warranties or guarantees as a more immediate available means of signaling quality to potential customers (Price and Dawar 2002). Second, quality offsets can work as a price mechanism tied to actual quality; i.e., after actual quality increases for a while, sellers will eventually reduce quality offsets (e.g., shorten warranty duration and so on) since they can predict that the buyers' perceived quality will increase accordingly. On a contrary, if the actual quality decreases, sellers will then increase quality offsets since they realize that the buyers' perceived quality will subsequently decrease. As a result, sellers may suffer from losing sales. Third, quality offsets provide insurance on the quality of the selling firms' products and

increase economic values of the product by adding a risk-sharing mechanism between buyers and sellers (Heal 1976, 1977). Under the assumption that buyers are risk-averse, quality offsets offered by sellers in forms of warranties and guarantees will increase buyers' confidence of product quality and encourage their purchasing decision. Hence, it is hypothesized that:

H11a: A positive relationship exists between quality offsets and perceived new product quality.

H11b: A positive relationship exists between quality offsets and a firm's subjective performance.

On a contrary, despite a high correlation between objective and subjective performance measures as previously mentioned, I expect to see different effects of quality offsets on subjective and objective performance. Quality offsets in forms of warranty or guarantees may serve two roles in the eyes of investors: a signal of product quality and a contingent liability that a firm needs to honor in the future. The latter might have a negative impact on objective performance, especially on cost-based performance measures e.g., profit, ROA, ROI, and ROE. Thus, I hypothesized:

H11c: A negative relationship exists between quality offsets and a firm's objective performance.

All hypotheses are summarized in table 2.1 as shown below.

Table 2.1: Essay 2 summary of hypotheses

Hypothesis	Hypothesized Effect
Hypothesis 1	The relationship between the firm's strategic exploration to exploitation ratio and a firm's emphasis on market orientation is inverted V-shape.
Hypothesis 2	Increased competitive intensity is positively associated with a more emphasis on the market orientation of a firm.
Hypothesis 3a	A positive relationship exists between market orientation and ACAP_AA.
Hypothesis 3b	A positive relationship exists between market orientation and ACAP_TA.
Hypothesis 4a	As a firm's ACAP_AA increases, its innovativeness increases
Hypothesis 4b	As a firm's ACAP_TA increases, its innovativeness decreases.
Hypothesis 5a	The positive effect of ACAP_AA on firm innovativeness will increase as a firm's technological orientation increases.
Hypothesis 5b	The negative effect of ACAP_TA on firm innovativeness will increase as a firm's technological orientation increases.
Hypothesis 6a	ACAP_AA increases, perceived new product quality decreases.
Hypothesis 6b	As ACAP_TA increases, perceived new product quality increases.
Hypothesis 7a	The negative effect of ACAP_AA on new product quality will increase as a firm's quality orientation increases.
Hypothesis 7b	The positive effect of ACAP_TA on new product quality will increase as a firm's quality orientation increases.
Hypothesis 8	A positive relationship exists between firm innovativeness and new product performance.
Hypothesis 9	A positive relationship exists between new product quality and new product performance.
Hypothesis 10a	A positive relationship exists between new product performance and a firm's subjective performance.
Hypothesis 10b	A positive relationship exists between new product performance and a firm's objective performance.
Hypothesis 11a	A positive relationship exists between quality offsets and perceived new product quality.
Hypothesis 11b	A positive relationship exists between quality offsets and a firm's subjective performance.
Hypothesis 11c	A negative relationship exists between quality offsets and a firm's objective performance.

Methodology

Sample and Data Collection

To test the conceptual model (See Figure 2.1), I collected data by conducting a web-based survey with R&D, new product development, and engineering managers who work for manufacturing firms publicly traded in the U.S. and international stock exchange. Consistent with previous literature in new product development and innovation (e.g. Calantone and Di Benedetto 2007; Droge, Calantone, and Harmancioglu 2008), this study relied on R&D and new product related executives to assess the subjective elements of the study since they were experienced and were the most knowledgeable sources of information in the area of new product development. Also, to assure the appropriateness and quality of the respondents, I screened the potential participants based on whether they were knowledgeable of the processes and strategy in new product development. Participants who fit all of the screening criteria were allowed to proceed to the survey. This approach is also consistent with the selection of key informants knowledgeable about organizational matters by virtue of their position (John and Weitz, 1988). Following Calantone and Di Benedetto's (2007) approach in assessing new product quality and performance, I requested respondents to identify one of their company's most recent new product launches that could be considered to be "characteristic" of their firm during the past two years.

The online survey was administered by a professional research firm. A random sample of 3,658 qualified respondents was selected from the research firm's proprietary online panel of potential respondents. All respondents were informed about the confidentiality of their responses. To increase a response rate, the respondents received compensation from the marketing research company for participating in the survey. Of the 3,658 contacts in the sample

frame, 462 responses were received, yielding a response rate of 12.6%. I excluded 169 responses as they did not satisfy the respondent quality criteria or due to large amount of missing data on key variables. The sample for hypothesis testing purposes therefore comprised 293 usable questionnaires. These respondents had worked with their respective firms for an average of 15.9 years. Following Armstrong and Overton's (1977) procedure to assess nonresponse bias, I found no significant differences between early and late respondents on the scales or the performance indicators. For robustness, I obtained the sampling frame from multiple industries: chemicals and allied products; industrial and commercial machinery and computer equipment; electronic, electrical equipment & components, transportation equipment; measuring/analyzing /controlling instruments, fabricated metal products, paper and allied products, and others. Firm information was collected in the survey and verified independently by the research firm. To avoid common method bias, objective firm performance outcomes including other firm characteristics (e.g., firm age, firm size or number of employees, SIC, and etc.) were obtained from the secondary source—WRDS, annual reports, and company web sites.

Measures

I selected the measures on the basis of their extent of use in previous research, reported validity and reliability, and comprehensibility to managers and executives.

Strategic EE Ratio. Strategic EE ratio is defined as a strategic ratio of explorative innovation strategy to exploitative innovation strategy. I adopted eight-item scale, developed by He and Wong (2004), to measure how firms emphasize attention and resources between innovation activities with explorative (4 items) versus exploitative (4 items) objectives. The explorative innovation strategy construct determines how important it is for a firm to carry out

innovation projects to enter new product-market domains, while the exploitative innovation construct considers whether it is important for a firm to improve existing product-market efficiency, e.g., introduce new generation of products versus improve existing product quality; open up new markets versus reduce production cost (He and Wong 2004). The anchor points for item rating were 1 = “Not Important,” and 7 = “Very Important.” Then, I created a strategic EE ratio measure by 1) summing each set of four items measuring explorative and exploitative innovation strategy, and 2) dividing the difference of the sum of two measures by the sum of them. The resulting measure was calculated as follows:

$$\text{Strategic EE Ratio} = \frac{\sum \text{Exploration} - \sum \text{Exploitation}}{\sum \text{Exploration} + \sum \text{Exploitation}}$$

Consequently, the strategic EE ratio is a single item construct.

Competitive Intensity. Competitive intensity is defined as the degree of competition that a firm faces. I used three well-validated items based on the works of Grewal and Tansuhaj (2001) and Jaworski and Kohli (1993) to assess the extent of competition in general, promotional wars, and price competition.

Market Orientation. The operationalization of this construct was adopted from previous studies (e.g., Calantone and Di Benedetto 2007; Narver and Slater 1990; Song and Parry 1992, 1994, 1996, 1997a, b; Parry and Song 1994). The 14-item scale captures 1) the extent to which sales and marketing department interact with customers and other functional business units when generating competitive intelligence, and 2) the evaluation of the speed with which the firm could respond to competitive changes or to satisfy changes in customer’s needs and wants (Calantone and Di Benedetto 2007).

Absorptive Capacity. As previously mentioned in Essay 1, ACAP refers to a firm’s ability to utilize knowledge through the organizational routines and strategic processes of

exploratory learning—knowledge acquisition and assimilation—and exploitative learning—knowledge transformation and application (Zahra and George 2002). Drawing on the work of Lichtenthaler (2009), I adapted 12 items to capture two dimensions of ACAP: 1) knowledge acquisition and assimilation, and 2) knowledge transformation and application.

Firm Innovativeness. Innovative firms, especially the successful ones, consistently search for and analyze innovation opportunities, which could be found either within or outside a firm or industry, e.g., industry and market changes, demographic changes, changes in perception, and so on (Drucker 1998). In this study, firm Innovativeness is conceptualized from two perspectives—the first views it as the rate of adoption or generation of new, timely, and creative products and/or services by the firms, while the second views it as the firms' openness to new ideas, products, and processes, including their willingness to change and adapt to emerging technologies and market trends (Acur, Kandemir, and Boer 2012; Calantone, Cavusgil, and Zhao 2002; Deshpande, Farley, and Webster 1993; Hurley and Hult 1998; Zaltman, Duncan, and Holbek 1973). Thus, I used four items based upon the work of Calantone, Cavusgil, and Zhao (2002) to tap these two perspectives of firm innovativeness.

New Product Performance. New product performance has been defined in the literature by several widely used categories of measures, for instance, financial performance—profit, sales, payback period, and costs, and market performance—competitiveness, fitness for purpose by the customers, and speed to market (Droge, Calantone, and Harmancioglu 2008; Montoya-Weiss and Calantone 1994). Both dimensions are determined in this study using seven items. In particular, on the basis of Droge, Calantone, and Harmancioglu's (2008) research, I used 4 items to assess the extent to which the new product (as specified by the respondents to represent a characteristic of their firms during the past two years) had achieved sales, profit

margin, return on asset (ROA), and return on investment (ROI), relative to the objective set for a launch of the new product. The anchor points for item rating were 1 = “Low, and 7 = “High.” Also, I used additional two items based on previous research of Ali, Krapfel, and LaBahn (1995), Calantone, Chan, and Cui (2006), and Chandy and Tellis (2000) to tap fitness and customer acceptance relative to competing products in the market. The anchor points for item rating were 1 = “Poorly Fitted, and 7 = “Highly Fitted” for the measure of fitness for purpose by the customer, and 1 = “Not Superior,” and 7 = “Very Superior” for the measure of customer acceptance relating to competitive products. Finally, I captured time to market using McNally, Akdeniz, and Calantone’s (2011) speed to market measure. The anchor points for this last item rating were 1 = “Far below Expectation, and 7 = “Far above Expectation.”

New Product Quality. New product quality is defined as the extent to which a new product is perceived to be superior to other competing products in its functionality and performance of the product itself and the post-purchase service (Calantone and Knight 2000; Molina-Castillo, Munuera-Alemán, and Calantone 2011; Sethi 2000), including low cost of quality (to sellers) in terms of defects, returns, and warranties (Adam and Foster 2000; Molina-Castillo, Munuera-Alemán, and Calantone 2011). I measured a quality of new product using a seven-item scale adapted from Molina-Castillo, Munuera-Alemán, and Calantone (2011) to tap both performance of the new product and the assessment of its low costs of defects, returns, and warranties to the firm. Similar to the way I measured new product performance, the respondents need to specify a new product which represents a characteristic of their firms during the past two years.

Quality Offsets. Quality offsets refer to product warranties and guarantees offered by sellers under several economic rationales—1) offsets work as a signal of superior product

quality, 2) offsets work as a price mechanism tied to actual product quality, and 3) offsets provide insurance on product quality. I constructed a new two-item scale based on the conceptual definition of quality offsets and asked the respondents to assess the overall level of their product warranties or guarantees (1 = “Very Poor,” 7 = “Excellent”), and how they rate it relative to their major competitors (1 = “Much Worse than Competitors,” 7 = “Much Better than Competitors”).

Technological Orientation. I adapted the three-item scale of technological orientation from the works of Gatignon and Xuereb (1997) and Zhou, Yim, and Tse (2005). The items capture the extent to which a firm has a strong focus on sophisticated new product technologies, and the application of the state of the art technologies in producing innovative products, and the acquisition of latest technological innovation knowledge (Gatignon and Xuereb 1997). The anchor points for item rating were 1 = “Not at All, and 7 = “A Great Extent.”

Quality Orientation. I adopted Sethi’s (2000) quality orientation measure. This three-item scale taps the extent to which a firm places a great deal of emphasis on quality, establishes a commitment to quality among employees, and practices total quality management program (Sethi 2000). The anchor points for item rating were 1 = “Strongly Disagree,” and 7 = “Strongly Agree.”

Firm performance. Performance is measured using two different approaches reflected in the previous literature—subjective and objective measures. The subjective measures ask firms for their assessment of revenue-based performance (i.e., sales and market share), and cost-based performance (i.e., overall profitability, ROA, ROI, and ROE) during the past two years, rated on a 7-point scale (Jaworski and Kohli 1993). The anchor points for item rating were 1 = “Very Poor,” and 7 = “Excellent.” For objective measures, sales revenue and net income during the

past two years were obtained from Compustat database. In this study, I measured firm's revenue with the average of logarithm of annual sales over the past two years to prevent skewness.

Control variables. To evaluate the robustness of our proposed model, I included three control variables that influence performance outcomes: R&D intensity, firm age, and firm size. I chose to control for R&D intensity since it has been widely accepted in innovation literature that it increases innovation activities and thus crucial to firm's innovative capability and performance (Rubera and Kirca 2012). So, consistent with previous literature (Cohen and Levinthal 1990), I measured R&D intensity as the average of R&D expenditures to total sales during the past two years. Following Gentry and Shen's (2011) approach and suggestion, since 10.9% of observations have missing values in R&D expenses, I replaced the missing data with zero. According to SEC Regulation 5-03.2, firms are not required to break out R&D expenses from sales and general administrative (SG&A) expenses if they are less than 10% of SG&A, thus it is assumed that these firms (with missing R&D data reported in Compustat or annual reports) had very low investment in R&D, or in other words, less than 10% of their SG&A (Gentry and Shen 2011). Similar to Gentry and Shen's (2011) work, I also ran a separate analysis using only observations that had R&D expenses reported and achieved the same results.

Most empirical studies of firm performance include firm size as a control variable since large firms are likely to possess more resources and market power, thereby increasing their performance (Chandy and Tellis 1998). Thus, I used a number of employees as a control variable for the firm size effects. Also, it is likely that a firm with longer experience in business will be able to build or acquire more complementary resources (Teece 1986) and thus enhancing performance. I therefore include firm age, defined as a number of operating years since establishment, as another control variable that can affect firm performance.

Analysis and Results

Assessing the Reliability and Validity of Measures

I undertook partial least squares, a variance-based structural equation modeling technique (PLS-SEM) approach, with SmartPLS 2.0.M3 software to examine measurement properties and hypotheses in this study. I use PLS-SEM to accommodate complex relationships as contained in the proposed model (Chin 1998; See Figure 2.1). PLS-SEM is appropriate since a research objective of this study is to identify and predict key driver constructs in an exploratory manner. Moreover, PLS-SEM technique has a number of advantages in terms of the estimation of interaction effects; it is distribution free thus accommodating a presence of interaction and curvilinear effects in the model; and it has no identification issues with small sample sizes (Chin 1998; Chin, Marcolin, and Newsted 2003; Hair et al. 2013). I check whether a sample size is adequate by conducting a power analysis together with a 10 times rule as suggested by Barclay, Higgins, and Thompson (1995). A significant level (α) of 0.05 (one-tailed) and a desired statistical power ($1-\beta$) of 0.80 would require a minimum sample size of 62 or 128 for detecting R^2 value of at least 0.25 or 0.10 accordingly when the maximum number of independent variables in the measurement and structural model of this study is six, (Hair et al. 2013, p.21). This figure is within the bound of the sample size ($N=293$) obtained in this study.

Following the approach that Fornell and Larcker (1981) developed for a PLS-SEM context, I assessed the adequacy of measurement model through an examination of reliability, convergent validity, and discriminant validity. To assess the reliability of the measures using composite reliability (CR) and average variance extracted (AVE), CR were all above 0.7, which meets Nunally and Bernstein's (1994) guideline, and AVE in constructs were all over 0.5

minimum threshold value suggested by Bagozzi and Yi (1988), which is indicative of acceptable levels of reliability. In addition, all factor loadings were all above the 0.5 guideline (Peterson 2000; Bagozzi and Yi 2012), indicating convergent validity. Details of factor loadings, CR, and AVE are shown in table 2.2.

Table 2.2: Essay 2 Validity Composition

Scales	Variables	Factor Loadings
Competitive Intensity (Com_Int) AVE = .65 CR = .85	Com_Int1	.72
	Com_Int2	.84
	Com_Int3	.84
Market Orientation (MO) AVE = .55 CR = .91	MO1	.69
	MO2	.77
	MO3	.75
	MO4	.75
	MO5	.79
	MO6	.80
	MO7	.70
	MO8	.69
	MO9 ^a	
	MO10 ^a	
	MO11 ^a	
	MO12 ^a	
	MO13 ^a	
	MO14 ^a	
Absorptive Capacity: Acquisition & Assimilation (AcapAA) AVE = .66 CR = .91	AcapAA1	.84
	AcapAA2	.88
	AcapAA3	.83
	AcapAA4	.71
	AcapAA5	.79
	AcapAA6 ^a	
Absorptive Capacity: Transformation & Application (AcapTA) AVE = .72 CR = .94	AcapTA1	.85
	AcapTA2	.89
	AcapTA3	.89
	AcapTA4	.81
	AcapTA5	.90
	AcapTA6	.74

Table 2.2 (cont'd)

Scales	Variables	Factor Loadings
Firm Innovativeness (F_inno) AVE = .77 CR = .93	F_Inno1 F_Inno2 F_Inno3 F_Inno4	.90 .87 .85 .88
New Product Performance (NPP) AVE = .56 CR = .90	NPP1 NPP2 NPP3 NPP4 NPP5 NPP6 NPP7	.79 .81 .86 .85 .68 .66 .55
New Product Quality (NPQ) AVE = .62 CR = .87	NPQ1 NPQ2 NPQ3 NPQ4 NPQ5 ^a NPQ6 ^a NPQ7 ^a	.76 .78 .86 .76
Quality Offsets (Q_Offset) AVE = .83 CR = .91	Q_Offset1 Q_Offset2	.92 .90
Technological Orientation (T_Or) AVE = .78 CR = .92	T_Or1 T_Or2 T_Or3	.91 .91 .83
Quality Orientation (Q_Or) AVE = .87 CR = .95	Q_Or1 Q_Or2 Q_Or3	.94 .94 .92
Strategic EE Ratio (EE_SR) AVE = N.A. CR = N.A.	EE_SR1	N.A. (single-item measure)
Subjective Firm Performance (Subj_Perf) AVE = .77 CR = .95	Subj_Perf1 Subj_Perf2 Subj_Perf3 Subj_Perf4 Subj_Perf5 Subj_Perf6	.77 .80 .93 .93 .93 .88
Objective Firm Performance (Obj_Perf) AVE = .83 CR = .90	Obj_Perf1 Obj_Perf2	.93 .89

^aItems were dropped from the scale after measurement purification.

To examine discriminant validity, I tested whether interconstruct correlations significantly depart from 1.0 (Bagozzi et al. 1991), and found that all correlations were significantly smaller than 1.0. In addition, as recommended by Fornell and Larcker (1981), I tested whether the square root of AVE are larger than the correlations among constructs. As shown in table 2.3, the square root of AVE or diagonal values are significantly higher than the construct correlations or off-diagonal values, thereby adequately confirming discriminant validity. Table 2.3 provides descriptive statistics of each construct and a correlation matrix with the square root of AVE on the diagonal. In sum, the results collectively support the reliability, convergent validity, and discriminant validity of all constructs.

Research involving cross-sectional survey data is vulnerable to common method variance. The data collected in this study are no exception, although I took some precaution when developing the questionnaire and also incorporated objective data from the secondary source to minimize the threat of common method variance. So, I performed a test for common method variance effects, using Lindell and Whitney's (2001) marker variable assessment technique. A finding shows that for all significant effects of the antecedents and their consequences on the dependent variable, the corresponding bivariate correlation coefficients remain statistically significant at $p < 0.05$ when partialling out an unrelated "marker variable" (Lindell and Brandt 2000; Lindell and Whitney 2001). Thus, I conclude that the effects due to common method bias are negligible. The above analysis and the deployment of secondary data from Compustat, annual reports, and company web sites for firm performance outcomes and control variables suggests that the risk of common method bias is minimal.

Table 2.3: Essay 2 Correlation Matrix and Descriptive Statistics of Measures

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. AcapAA	0.81													
2. AcapTA	0.77	0.85												
3. Com_Int	0.23	0.22	0.80											
4. EE_SR	0.09	0.14	-0.10	N.A.										
5. EE_SR_SQR	-0.23	-0.23	-0.09	-0.20	N.A.									
6. F_Inno	0.69	0.80	0.18	0.16	-0.21	0.88								
7. MO	0.64	0.68	0.36	0.05	-0.26	0.63	0.74							
8. NPP	0.43	0.45	0.23	0.05	-0.19	0.42	0.43	0.75						
9. NPQ	0.38	0.43	0.22	0.03	-0.09	0.35	0.39	0.62	0.79					
10. Obj_Perf	0.28	0.17	0.15	-0.01	0.04	0.10	0.14	0.14	0.16	0.91				
11. Q_Offset	0.39	0.39	0.19	-0.09	-0.12	0.42	0.40	0.32	0.35	0.00	0.91			
12. Q_Or	0.52	0.50	0.16	-0.07	-0.16	0.50	0.46	0.40	0.50	0.20	0.37	0.93		
13. Subj_Perf	0.52	0.48	0.03	0.14	-0.16	0.51	0.49	0.41	0.37	0.06	0.41	0.45	0.88	
14. T_Or	0.68	0.78	0.23	0.13	-0.22	0.81	0.59	0.46	0.40	0.12	0.41	0.52	0.47	0.89
Mean	5.33	5.40	5.13	-0.01	0.01	5.03	5.03	4.91	5.55	1,454	5.44	6.13	5.18	5.12
SD	1.03	1.07	1.11	0.11	0.03	1.32	1.05	0.90	1.01	2,131	0.96	1.00	1.08	1.24

Note: The diagonal elements are square root of the AVE.

N.A. = not applicable.

Structural Model

As suggested by previous research, I use PLS-SEM path modeling to estimate both main and interaction effects in the model (Chin, Marcolin, and Newsted 2003; Hair et al. 2013). Although PLS-SEM does not provide summary statistic to measure the overall model fit, I can use the variance explained and the sign and significant level of path coefficients to assess nomological validity (Hair et al. 2013; Smith and Barclay 1997). Overall, I find that the predictors offer good explanation for the focal constructs: R^2 for ACAP_AA = .41; R^2 for ACAP_TA = .47; R^2 for innovativeness = .74; R^2 for new product quality = .32; R^2 for new product performance = .44; R^2 for subjective performance = .27; and R^2 for objective performance = .60.

To test the effects and ascertain the statistical significance of the parameter estimates, I used bootstrapping procedure with 500 resamples (Hair et al. 2013). Following Chin, Marcolin, and Newsted's (2003) recommendation, I employ a nested model approach to test the hypotheses by estimating a model with direct effects only and then add the interaction effects (see table 2.4 model 1 and model 2 respectively).

In modeling a quadratic term to test a curvilinear effect of strategic EE ratio on market orientation, I first mean-centered the single indicator for strategic EE ratio to reduce multicollinearity concerns (Jaccard and Wan 1996; Ping 1995). Then I squared the item to create a square term of strategic EE ratio. As shown in table 2.4, I find support for H1 that strategic EE ratio has a curvilinear relationship with market orientation. In particular, while the quadratic effect is negative and significant ($\beta = -.22$, $p < .01$), the linear effect is not significant, indicating an inverted V-shape effect. The positive effect of competitive intensity ($\beta = .35$, $p < .01$) on market orientation is also significant, thus H2 is supported.

The positive and significant effects of market orientation ($\beta = .64, p < .01$; $\beta = .68, p < .01$) on ACAP_AA and ACAP_TA support H3a and H3b. Hypothesis 4a, in which I posit a positive relationship between ACAP_AA and firm innovativeness, is supported by the data ($\beta = .09, p < .05$); however, H6a is not ($p > .05$). The results indicate that ACAP_AA significantly affects firm innovativeness but has no effect on new product quality.

Contrary to my expectation, I found that ACAP_TA ($\beta = .39, p < .01$; $\beta = .21, p < .01$) was positively related to both firm innovativeness and new product quality. Although H6b is supported, H4b is not since the sign is in the opposite direction, indicating that ACAP_TA has positive effects on firm innovativeness as well as new product quality.

The results in table 2.4 also show the positive and significant effects of 1) firm innovativeness ($\beta = .23, p < .01$) and new product quality ($\beta = .54, p < .01$) on new product performance; and 2) new product performance ($\beta = .31, p < .01$; $\beta = .11, p < .01$) on both subjective and objective firm performance, thereby supporting H8, H9, H10a, and H10b.

Consider the effect of quality offsets on new product quality and firm performance, I found support for H11a, b, and c. That is, quality offset has positive and significant effects ($\beta = .14, p < .01$; $\beta = .32, p < .01$) on new product quality and subjective firm performance, but has negative effect ($\beta = -.06, p < .05$) on objective firm performance. Among control variables, firm age ($\beta = .13, p < .05$; $\beta = .09, p < .05$) is positively related to both subjective and objective performance, while firm size ($\beta = .73, p < .01$) is positively related to objective but not subjective performance. I found no significant effect of R&D intensity on both subjective and objective performance.

Finally, I tested the moderating effects of 1) technological orientation on a relationship between both ACAP and firm innovativeness, and 2) quality orientation on a relationship

between both ACAP and new product quality. Since I found no significant direct effect between ACAP_AA and new product quality, I removed this link from the test of moderating effects in model 2. In sum, I only find support for H7b that quality orientation enhances the effectiveness of ACAP_TA in developing new product quality ($\beta = .15^*$, $p < .05$), but not for H5a and H7a, indicating that interaction effects of technological orientation on ACAP_AA- and ACAP_TA-firm innovativeness relationships are not significant ($p > .05$).

Mediating effect of Market Orientation

To understand the exact nature of the mediating role of market orientation, I run post-hoc test to examine direct relationships between 1) strategic EE ratio (and its quadratic term) and 2) competitive intensity, and both dimensions of ACAP. Recall that a quadratic term of strategic EE ratio and competitive intensity are significantly related to market orientation, and market orientation also significantly affects both ACAP, I further examine whether there are direct relationships between these constructs (Baron and Kenny, 1986). The results show that the effects of strategic EE ratio (quadratic term) and competitive intensity on both ACAP_AA and ACAP_TA are not significant ($p > .05$), suggesting full mediation.

Table 2.4: Essay 2 Structural Results

Alternative Models	Model 1 (Baseline Model)		Model 2 (Test Moderating Effects)	
	Market Orientation		Market Orientation	
R^2	0.19		0.19	
Com_Int -> MO	0.35**		0.35**	
EE_SR -> MO	0.04		0.04	
EE_SR_SQR -> MO	-0.22**		-0.22**	
	ACAP_AA	ACAP_TA	ACAP_AA	ACAP_TA
R^2	0.41	0.47	0.41	0.47
MO -> AcapAA	0.64**		0.64**	
MO -> AcapTA		0.68**		0.68**
	Firm Innovativeness	New Product Quality	Firm Innovativeness	New Product Quality
R^2	0.66	0.23	0.74	0.32
AcapAA -> F_Inno	0.18**		0.09*	
AcapTA -> F_Inno	0.67**		0.39**	
AcapAA -> NPQ		0.08		- ^a
AcapTA -> NPQ		0.28**		0.21**
Q_Offset -> NPQ		0.21**		0.14**
Moderators				
T_Or -> F_Inno			0.46**	
Q_Or -> NPQ				0.42**
Interaction Effects^a				
AcapAA * T_Or -> F_Inno			-0.01	
AcapTA * T_Or -> F_Inno			0.05	
AcapTA * Q_Or -> NPQ				0.15*

Table 2.4 (cont'd)

Alternative Models	Model 1 (Baseline Model)		Model 2 (Test Moderating Effects)	
	New Product Performance		New Product Performance	
R^2	0.44		0.44	
F_Inno -> NPP	0.23**		0.23**	
NPQ -> NPP	0.54**		0.54**	
	Subjective Firm Performance	Objective Firm Performance	Subjective Firm Performance	Objective Firm Performance
R^2	0.27	0.60	0.27	0.60
NPP -> Subj_Perf	0.31**		0.31**	
NPP -> Obj_Perf		0.11**		0.11**
Q_Offset -> Subj_Perf	0.32**		0.32**	
Q_Offset -> Obj_Perf		-0.06*		-0.06*
Control Variables				
Size -> Subj_Perf	-0.07		-0.07	
Size -> Obj_Perf		0.73**		0.73**
Age -> Subj_Perf	0.13*		0.13*	
Age -> Obj_Perf		0.09*		0.09*
R&d_Int -> Subj_Perf	-0.02		-0.02	
R&d_Int -> Obj_Perf		-0.01		-0.01

^a Since the direct effect of ACAP_AA on new product quality is not significant ($\beta = .08$, $p > .05$), I dropped this link from model 2 when testing the moderating effects.

* $p < .05$ (one-tailed test for hypotheses, and two-tailed test for control variables).

** $p < .01$ (one-tailed test for hypotheses, and two-tailed test for control variables).

Discussion

Theoretical Contributions and Managerial Implications

My goal in this study is to advance both ACAP and innovation literature by untangling relationships among a balance in exploration and exploitation strategies, market orientation, ACAP dimensions, firm innovativeness, new product quality, new product performance and firm performance. Mixed finding in the extant literature on a debate between innovativeness- and quality improvement-performance links prompt the need for a better understanding of the underlying mechanisms that account for the way quality improvement and innovation efforts achieve performance objectives. The results support that a balance in exploration and exploitation strategy will effectively facilitate an implementation of market orientation within a firm, and thus enhancing both exploring and exploiting dimensions of ACAP. As a result, strong ACAP will enhance innovativeness and new product quality, leading a firm to improve new product performance and increase overall firm performance. Thus, the findings are in line with previous ambidexterity studies (e.g., Gupta, Smith, and Shally 2006; He and Wong 2004; O'Reilly and Tushman 2004). Although the exploration and exploitation, market orientation, and ACAP are important factors in enhancing product innovation outcomes, as is widely reported in management and marketing literature, the results provide the new insight and empirical evidence that ACAP is the route that makes the exploration and exploitation as well as market orientation more valuable resources in a firm's product innovation and quality improvement processes.

This study broadens and deepens our understanding of the mediating role of market orientation in a strategy-ACAP relationship. Past research on a firm's ACAP has focused on the effects of a firm's strategic focus and market orientation on ACAP and found mixed results. The findings extend current knowledge by empirically support a curvilinear effect of strategic EE

ratio and market orientation, and suggest an indirect relationship between a balance in exploration and exploitation and ACAP through market orientation. The curvilinear relationship suggests that the relative imbalance focus between explorative and exploitative innovation strategies, either exploration is greater than exploitation or vice versa, will distort a firm's emphasis on market orientation. Also, it supports that the highest level of a firm's market orientation will occur at a balanced (threshold) level of the firm's exploration and exploitation. A use of strategic EE ratio formula instead of an absolute difference or a simple ratio provides insight into how both the difference and the level of exploration and exploitation affect market orientation, especially among those in an imbalance group, i.e., strategic EE ratio is less or more than zero. The result suggests that, given the same difference between explorative and exploitative strategic focus, a firm with a higher level of exploration and exploitation can achieve a higher level of market orientation. This study indicates that examining only a difference or a level of exploration and exploitation separately might lead to an incorrect interpretation of the effects of a firm's balance or imbalance of strategic EE focus.

In addition, I also run a post-hoc test to examine a mean difference of market orientation among those in a balance group, i.e., strategic EE ratio is zero, or in other words, exploration and exploitation levels are the same ($N = 57$). The sample in a balance EE group was split into two subgroups based on the mean of either summed exploration or exploitation scores, which are equal in this group. The sample above the mean were defined as high EE ($N = 33$), and those below the mean were defined as low EE ($N = 24$). The mean difference test was then performed to examine whether there were any differences in market orientation level between high EE and low EE sample within a balance EE group. I found a significant difference ($p = .03$) in the mean level of market orientation between high EE group (mean = 5.49, sd = 1.22) and low EE group

(mean = 4.82, sd = 0.92). That is, among firms with balanced strategic EE ratio, firms with higher exploration and exploitation levels achieve a higher level of market orientation than those with lower exploration and exploitation levels.

Also, the findings shed light on the importance of quality offsets on new product quality and firm performance. In particular, the results support positive effects of quality offsets on new product quality and subjective firm performance, and negative effect on objective performance. This insight leads to important questions for research studies in the future: When are quality offsets useful for a firm's competitiveness? How could executives manage quality offsets to achieve highest returns?

In addition, I found no support for the negative effect of ACAP_AA on new product quality, indicating that an increase in a firm's ability to acquire and assimilate knowledge does not decrease perceived new product quality. Instead, I found a positive and significant effect of ACAP_TA on firm innovativeness. This unexpected sign might be a result of multicollinearity due to a high correlation between manifest variables (Blalock 1963; Cohen et al. 2003).

However, the VIF (Variance Inflation Factor) values for both models in table 2.4 are far below the cutoff of 5.0 (Hair et al. 2013), indicating that there is no multicollinearity problem. This positive relationship between a firm's ability to transform and apply knowledge and firm innovativeness, though contrary to my expectation, is in line with previous research and suggests that the exploiting capability helps firm convert knowledge into new products, thereby enhancing its innovativeness (Kogut and Zander 1996; Zahra and George 2002).

The findings for the interaction effects of quality and technological orientation provide mixed results. I found a support for a positive moderating effect of quality orientation on

ACAP_TA and new product quality link, suggesting that a quality-oriented firm will be more efficient in transforming and applying their technological knowledge to improve new product quality. However, the empirical tests do not reveal a moderating effect of technological orientation on a relationship between both dimensions of ACAP and firm innovativeness. A plausible explanation for the lack of interaction effect of technological orientation is that the ability to explore or exploit technology, in terms of organizational resources and skills, is of equal importance to high and low technological-oriented firms. In other words, this might imply that there is no synergy between the two.

Among practitioners, the argument that both innovation and quality enhance product innovation and firm performance has gained wide acceptance. The findings support this argument and also provide insights in several ways. For top executives, this study raises the important role of a firm's ACAP in market orientation-performance relationship and digs deeper into how a balance in explorative and exploitative strategies can facilitate a firm's emphasis on market orientation. The study calls on managers to consider that though a balance of EE strategy is important, managers need to pay attention to continuously increase both exploration and exploitation levels. Both the levels and the balance of resource allocation and attention focusing on explorative and exploitative strategies influence a firm's market orientation. The findings suggest that lower levels of both exploration and exploitation could incur more risk associated with a firm's innovation processes. For instance, small amount of resource allocation and attention might allow a firm to have only one or two new product development or quality improvement projects, or explore a possibility of offering a narrow product line or entering into a single market segment. A firm's limited resource and attention allocation on explorative and exploitative strategy will also make it more vulnerable to environmental hostility. On the

contrary, a larger volume of resource and attention allocating on both explorative and exploitative strategic focuses allows a firm to be more diversified, and thus enhancing its customer and competitor focuses and encouraging intra-firm coordination, which in turn will make it become more flexible and less vulnerable to environmental threats. The results also suggest that it is market orientation that enables the translation of explorative and exploitative innovation strategies into a firm's ability to acquire, assimilate, transform, and apply technology in order to develop new innovative product and improve quality. This means that managers who focus on increasing only innovation or quality outcomes but neglect the importance of market orientation and ACAP integration processes may not achieve their intended objectives.

Limitations and Future Research Directions

I recognize conceptual and methodological limitations in this study that warrant caution in interpreting the results. First, the data is cross-sectional; thus, I am unable to establish unidirectional relations between constructs. Although rationale for causal direction of my hypotheses is provided and most findings in this study are consistent with the theoretical predictions, caution is warranted in drawing causal conclusions between constructs. Also, further longitudinal research should empirically establish the causal claim of the model.

Second, this model highlights a mediating role of market orientation in a strategic EE ratio-ACAP relationship and does not intend to represent all possible antecedents and consequences of market orientation and ACAP. Thus, I underscore the importance of proximate consequences of market orientation and, thus, potential drivers of ACAP. Although the finding is novel in marketing and organizational studies, further research should also explore the effects of

other mediating factors, such as supportive organizational culture or reward and feedback mechanisms, on a market orientation-ACAP relationship.

Third, the key informants were limited to managers who primarily work in the U.S. Thus, extensions of my study to other international business settings would help a move towards more generalized findings. Finally, to maintain conceptual clarity and parsimony of the proposed model, I focus on product innovation only. However, a study in process innovation context, especially among service firms, may provide a broader and more comprehensive view of ACAP-innovation performance relationship.

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