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TWO ESSAYS ON MARKETING CAPABILITIES

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ABSTRACT

A critical decision for any firm involves allocating investment to different types of marketing activities. One argument is that firms should invest resources in both explorative and exploitative activities to develop ambidexterity. Considering the extensive theoretical and practical implications of ambidexterity, several research gaps exist in this area provide opportunities for both theoretical and practical contributions. In this dissertation, I identify and explore three important research opportunities.

First, based on one argument regarding ambidexterity, firms should pursue exploration and exploitation in a balanced manner. This is even though there is little evidence confirming that being 'out of balance' actually hurts performance. Recent research also suggests that the sum of exploration and exploitation might be more important than balance for performance advantage although evidence is inconclusive. The second research opportunity pertains specifically to the concept of 'imbalance'. That is, if an imbalance in exploration relative to exploitation (or vice versa) has adverse effects, we have little knowledge as to how it can be mitigated. In other words, we know little about the organizational and environmental factors that might increase or reduce any imbalance between exploration and exploitation. Third, recent findings suggest that some firms could be less ambidextrous than others because they lack investment in exploration. To the best of my knowledge however, there is little understanding of the factors that lead firms to have more or less exploration than others.

My dissertation addresses the above research opportunities by studying ambidexterity in the context of two important marketing capabilities: customer management (CM) and new product development (NPD).

In Essay 1, I address the first research opportunity by studying how performance is affected by: 1) the sum of exploration and exploitation (annotated as Sum_{E+E} in this dissertation) for the firm's CM capability; 2) the Sum_{E+E} for NPD capability; and 3) the imbalance between exploration and exploitation *within* each capability. My findings from a cross-industry sample of U.S. manufacturers show that a higher Sum_{E+E} for CM and also NPD improves customer relationship performance and new product performance, respectively. I also show that although an imbalance within CM capability has no impact on customer relationship performance, new product performance suffers if NPD is unbalanced towards exploration. The strong and consistent performance effects of the Sum_{E+E} for both capabilities- relative to effects of imbalance within them- provide support for the argument that Sum_{E+E} is more important for performance advantage.

I also address the second research opportunity in Essay 1. I do so by arguing that a firm's entrepreneurial orientation (EO) – combined with environmental dynamism – affects imbalance within CM and NPD capabilities. My findings show that although the Sum_{E+E} for both CM and NPD capabilities is positively impacted by a higher EO, the imbalances within these capabilities are differentially affected by EO under different environmental conditions.

The findings of Essay 1 inform marketing strategy by providing managers with an understanding of how the Sum_{E+E} for marketing capabilities and imbalance within them can influence marketing performance outcomes. In addition, by performing a moderated mediation framework, I show that high EO in stable environments can lead to negative performance results through an imbalance towards exploration within NPD. This offers new empirical evidence on the relationships between environmental factors, organizational characteristics, capabilities and performance outcomes.

In Essay 2, I draw on institutional theory and upper echelons theory to conceptualize and examine how product exploration and performance are influenced by institutional pressures and the composition of the top management team (TMT). This addresses the third research opportunity identified above. My findings show that when mimetic and coercive pressures on the firm are inconsistent (i.e. there is high institutional complexity), firms with a more heterogeneous TMT have higher levels of product exploration and in turn, performance. The results of Essay 2 offer new insights on the relationships between institutional factors, TMT composition, NPD capability and performance. They also help explain past contradictions regarding the effects of both institutional pressures and TMT heterogeneity on firm performance.

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STATEMENT OF ORIGINALITY

I, Hamed Mehrabi, hereby declare that the material contained in this dissertation is original work performed primarily by me, under the supervision of my dissertation committee. This includes the development of ideas and research models, data collection, data analysis and writing of the dissertation. This applies to Chapter 1 through Chapter 4 of the dissertation. During the process of conducting this research, my committee members were involved in reading my work, commenting on it, and helping me improve it. My supervisor, Dr. Nicole Coviello, provided oversight for all aspects of my research and focused on helping me refine my ideas and writing. Dr. Chatura Ranaweera provided guidance for data collection and analysis, while also providing advice on other aspects of my work. Dr. Sofy Carayannopoulos provided theoretical guidance, particularly for Essay 2 (Chapter 3).

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Chapter 1

GENERAL INTRODUCTION

1.1. Research Opportunities

Ambidexterity is the organizational capability that combines exploration and exploitation, two potentially opposing activities (Jansen, Tempelaar, Van den Bosch, and Volberda, 2009; Patel, Messersmith, and Lepak, 2012; Teece, 2014). Numerous studies have been conducted on organizational ambidexterity to understand it and its antecedents and outcomes (e.g. Carmeli and Halevi, 2009; He and Wong, 2004; Jansen, Simsek, and Cao, 2012; Jansen et al., 2009; Lubatkin, Simsek, Ling, and Veiga, 2006). Given its extensive theoretical and practical implications, leading scholars have called for more research on this concept (Birkinshaw and Gupta, 2013; O'Reilly and Tushman, 2013). In this dissertation, I identify and investigate three research opportunities specific to ambidexterity in the context of marketing capabilities.

First, since March (1991) published his arguments on exploration and exploitation, firms have been advised to develop a balanced combination of these two strategies (e.g. Benner and Tushman, 2003; He and Wong, 2004). Although early studies provide some support for this argument (e.g. He and Wong, 2004), more recent research suggests that 'imbalance' is not necessarily bad (e.g. Birkinshaw and Gupta, 2013; Junni, Sarala, Taras, and Tarba, 2013; O'Reilly and Tushman, 2013). As later explained in Chapter 2 (Section 2.2), similar (mixed) findings can be found in the marketing literature. Another perspective on ambidexterity suggests the sum of exploration and exploitation may be more important than their balance for performance advantage (e.g. Junni et al., 2013). For my research, the first research opportunity that I identify is that we lack knowledge as to how the sum of exploration and exploitation and their balance in marketing capabilities affect marketing performance metrics.

Second, if any imbalance within marketing capabilities has adverse effects on performance, we need to understand their impact. However, there is little research on how

organizational factors— combined with environmental factors— affect organizational ambidexterity (Birkinshaw and Gupta, 2013; O'Reilly and Tushman, 2013). The paucity of research in this area is surprising given the previously noted importance of ambidexterity in contemporary marketing. This provides the second research opportunity I identify in my dissertation.

Third, recent studies suggest that some firms might be less ambidextrous than others due to a lack of investment in exploration. As explained in Chapter 3 (Sections 3.2 and 3.3), Reeves and Harnoss (2015) find the decline in the level of exploration results in lower profitability. Accordingly, the third research opportunity that I identify is that there is little understanding of the factors that prevent firms from pursuing exploration. Therefore, the third research opportunity moves away from the issues of exploration and exploitation sum and balance to focus on exploration. The theoretical and practical implications of addressing these three research opportunities are provided in the next section and explained in more detail later in Chapter 2 and Chapter 3.

1.2. This Dissertation

Against the backdrop of these research opportunities, I study two different marketing capabilities that are potentially ambidextrous because they combine exploration and exploitation. The first is customer management (CM). The second is new product development (NPD). The importance of studying these two capabilities is later explained in Chapter 2 (Section 2.3). CM is "the firm's ability to effectively deploy relational resources" and reflects "the firm's ability to build and maintain beneficial relationships with target customers" (Vorhies, Orr, and Bush, 2011, p. 739).

NPD involves the "organizational routines that purposefully reconfigure the organizational product portfolio" (Schilke, 2014).

CM and NPD have both exploration and exploitation dimensions. Customer exploration involves developing new markets or customer relationships while customer exploitation improves relationships with existing customers. Product exploration creates newness and diversity in the firm's products and technologies, while product exploitation improves the firm's existing products or production technologies (Atuahene-Gima, 2005; Voss and Voss, 2013). In this dissertation, I draw on ambidexterity research to define the balance within CM capability as the equal pursuit of customer exploration and customer exploitation by the firm. I define *balance* in NPD capability in the same way but based on product exploration and exploitation. I also use $\underline{\text{Sum}_{E+E}}$ to refer to the *sum* of exploration and exploitation within each capability.

By focusing on CM and NPD capabilities, Essay 1 addresses the first two research opportunities. Essay 2 focuses on the third research opportunity.

Essay 1: Linking ambidextrous marketing capabilities to performance: How and when entrepreneurial orientation makes a difference

In this essay, I link the Sum_{E+E} for each of CM and NPD capability and the exploration-exploitation balance within them, to two important marketing outcomes: 1) customer relationship performance, and 2) new product performance. I find strong support for the argument that the sum of exploration and exploitation in a capability is important for performance advantage. This is because the results show that: 1) the $\underline{\text{Sum}_{E+E}}$ for CM capability improves customer relationship performance; and 2) the $\underline{\text{Sum}_{E+E}}$ for NPD capability improves new product performance. In addition, my results show that an emphasis on exploration over exploitation within NPD can

negatively affect new product performance. However, in contrast to my expectations, I find no support for the negative effect of an emphasis on customer exploration over customer exploitation on customer relationship performance. As I explain in Chapter 2 (Sections 2.2 and 2.6), these findings provide new theoretical and empirical insight to how ambidexterity in marketing capabilities affect performance.

To address the second research opportunity in Essay 1, I conceptualize and examine how a firm's entrepreneurial orientation affects the Sum_{E+E} for CM and NPD capabilities and (im)balance within them under different environmental conditions. I explain in Chapter 2 (Sections 2.2 and 2.3) why it is important to study these two factors together. I find that EO is positively associated with the Sum_{E+E} for both capabilities. In addition, although a higher EO is associated with an imbalance towards exploration in CM capability in dynamic environments, this is not so for NPD capability. Instead, the imbalance towards exploration only occurs when EO is high and the environment is stable. I also show through a moderated mediation analysis that EO can negatively be associated with new product performance in stable environments, mediated by an imbalance towards exploration in NPD capability. As explained in Sections 2.2 and 2.6, these findings provide new theoretical insights on how organizational factors— together with environmental factors— impact the sum of exploration and exploitation and their balance in marketing capabilities and accordingly, marketing performance outcomes. They also provide new empirical evidence on the relationships between environmental factors, organizational characteristics, capabilities and performance outcomes.

Essay 2: Performing under (institutional) pressures: How top management team composition affects product exploration

As noted earlier, some firms invest more in exploration activities than others. In this essay, I provide some answers as to why this might occur. I study the exploration dimension of NPD capability (aka product exploration) and apply DiMaggio and Powell's (1983) arguments regarding institutional theory. In particular, I examine how mimetic and coercive pressures in the institutional environment affect product exploration. As I explain in Chapter 3 (Sections 3.2 and 3.3), it is both theoretically and practically important to study institutional pressures. Importantly, I take a new approach by studying the effect of mimetic and coercive institutional pressures when they are incompatible. This occurs when (e.g.) perceived competitor pressures differ in direction from those of suppliers and customers. I explain in Chapter 3 (Section 3.2) that this incompatibility creates a complex institutional environment.

To investigate how incompatible institutional pressures affect product exploration, I draw on upper echelons theory (Hambrick, 2007; Hambrick and Mason, 1984). This allows me to study how heterogeneity within the firm's top management team (TMT) influences the firm's response to the environment. As explained in Sections 3.2 and 3.3, TMT heterogeneity might be beneficial for product exploration in complex institutional environments. I find that coercive pressure directly affects product exploration but mimetic pressure does not. Furthermore, when mimetic and coercive pressures are incompatible, firms with higher TMT heterogeneity have higher levels of product exploration. Based on a moderated mediation analysis, this, in turn, is associated with higher performance. I explain in Chapter 3 that these results offer new evidence on the effect of institutional pressures and TMT heterogeneity on firm strategies and performance.

1.3. How are the two essays linked?

Both essays draw on organizational ambidexterity research to link CM and NPD capabilities to performance and both investigate their antecedents. In Essay 1, I study exploration relative to exploitation and examine how a focus on one over the other (i.e. imbalance within CM and NPD capabilities) affects marketing performance outcomes. In addition, I examine the effect of the sum of exploration and exploitation for these two capabilities on marketing performance. Finally, I conceptualize and examine how exploration and exploitation sum and balance within these marketing capabilities are affected by EO— combined with environmental dynamism. In Essay 2, I look at a different research opportunity that is again drawn from organizational ambidexterity research. That is, given the widespread findings that combining exploration and exploitation (i.e. ambidexterity) is important for firm performance, I argue based on recent findings that some firms may be less ambidextrous because they lack investment in exploration. As a result, regardless of the extent of exploration relative to exploitation (or vice versa) within capabilities, we need to understand why exploration occurs to a greater extent in some firms and not others. I look at this research opportunity from an institutional complexity perspective and the response of firms' decision makers to that complexity by drawing on institutional theory and upper echelons theory. Therefore, the two essays are related because they both address issues pertinent to organizational ambidexterity. At the same time, they address different issues, examine different variables and rely on different theoretical perspectives.

1.4. Why is this research important for marketing strategy?

Understanding the role of marketing in explaining business performance has been a principal area of inquiry in the marketing discipline (Morgan, 2012). Many studies are conducted to

understand how marketing resources lead some firms to outperform others and how they are influenced by other factors (e.g. Atuahene-Gima, 2005; Feng, Morgan, and Rego, 2016; Kemper, Engelen, and Brettel, 2011; Reinartz, Thomas, and Kumar, 2005; Vorhies and Morgan, 2005). However, Morgan (2012, p. 102) points out that marketing scholars "have often not done a great job of relating our enhanced understanding and growing empirical insight with the theories developed to explain firm performance in strategic management". He goes on to reason this occurs even though these theories have the potential to help marketing scholars and managers better understand the role of marketing in the firm through integrated frameworks. This dissertation is one step towards that end. In particular, I integrate theories of strategic management and entrepreneurship with our insights and understanding of marketing capabilities to explain how marketing capabilities explain performance differences across firms and how they are affected by organizational and environmental factors.

Table 1.1 exhibits the theoretical lenses and specific variables for the two studies, including independent, dependent, moderating, mediating and control variables.

1.5. Overview of methodology

Both studies draw on two rounds of data collected from a sample of 141 U.S. manufacturing firms. Data were collected using an online survey hosted by the market research firm Research Now.

In early 2015, members of the Research Now respondent pool in the U.S. received an invitation to participate, resulting in 917 potential respondents. Of these, 229 (25%) were deemed to be qualified. From them, I received 141 (62%) usable responses. Research Now

Table 1.1. Theoretical lenses and constructs

	Essay 1	Essay 2
Theoretical foundations	• Organizational ambidexterity • Entrepreneurial orientation	• Organizational ambidexterity • Institutional theory • Upper echelon theory
IV (s)	• Entrepreneurial orientation	• Mimetic pressure • Coercive pressure • TMT heterogeneity
Moderator (s)	• Environmental dynamism	• Coercive pressure • TMT heterogeneity
Mediator (s)	• Customer management capability • New product development capability	• Product exploration
DV (s)	• Customer relationship performance • New product performance	• Firm performance
Controls	• Firm age • Firm size • Competitive intensity • B2B • B2C • Public	• Firm age • Firm size • Competitive intensity • B2B • B2C • Public • Environmental dynamism • TMT size

incentivized the respondents. To ensure reliability of the survey data, I conducted a second round of data collection in early 2016 by contacting the same respondents and inviting them to complete a reduced version of the questionnaire. I tested the data against the first round data. The high correlations between Round 1 and Round 2 data provide support for the reliability of the data. Reliability and validity are also assessed using established methods (e.g. confirmatory factor analysis, Cronbach's alpha and convergent and discriminant validity). Data distribution for both the items and variables was checked by assessing skewness, kurtosis and the normal histograms. No issues were identified. For data analysis, hierarchical regression and the bootstrapping method are employed. Table 1.2 provides a description of the sample firms.

Table 1.2. Sample description

		Number of firms	Percentage
Industry	Automotive	20	14%
	Electronics	18	13%
	Food and Beverage	14	10%
	Chemicals	13	9%
	Computer	11	8%
	Other	65	46%
Size	<50	27	19%
	50-500	65	46%
	501-1000	14	10%
	1001-2500	12	9%
	>2500	23	16%
Primary market	B2B	68	48%
	B2C	46	33%
	Both	27	19%
Public/private	Public	42	30%
	Private	99	70%
Position of respondent	Chief executive, president, general manager or equivalent	70	50%
	Senior marketing manager, marketing VP, marketing director or equivalent	54	38%
	Other	17	12%

Of note, the paradigm that guides my research is the positivist approach. There are several reasons for this. First, I follow Hunt (2010) to argue that strategic marketing can be studied through the positivist lens. This is because heterogeneity in resources and capabilities can explain performance differences across firms. In addition, environmental factors and organizational factors can shape the behaviour of the firm in terms of the strategic actions it takes and the capabilities it develops. Therefore, by studying the factors that potentially affect the behaviour of the firm in terms of the capabilities it develops using quantitative methods, we can understand the underlying reasons for capabilities and performance differences across firms. Second, the purpose of this research is to establish relationships among variables. This requires a quantitative approach that collects data from many companies. Finally, my positivist approach is

consistent with other studies in marketing and strategic management that examine organizational ambidexterity and capabilities (e.g. Atuahene-Gima, 2005; Fernhaber and Patel, 2012; Jansen et al., 2012; Lubatkin et al., 2006; Vorhies et al., 2011).

1.6. The structure of this dissertation

The remainder of this dissertation is structured as follows. Chapter 2 presents Essay 1. This chapter includes the theoretical foundation, research hypotheses, methodology (data collection and measures), results (reliability, validity, common method variance and hypothesis testing) and a discussion of theoretical and managerial implications for my first essay. Likewise, Chapter 3 presents Essay 2. My concluding remarks are provided in Chapter 4.

1.7. GLOSSARY

In this section, I provide the definition of the main terms used in this dissertation. It should be noted that the terminology in the field of ambidexterity is emerging and inconsistent.

Balance within CM Capability: This occurs when the firm pursues customer exploration and customer exploitation equally.

Balance within NPD Capability: This occurs when the firm pursues product exploration and product exploitation equally.

Coercive Pressure: This is a type of institutional pressure that regulates behaviour by setting expectations and sanctioning noncompliance (Heugens and Lander, 2009). It is a result of both formal and informal pressures exerted on firms by: 1) others upon which they are dependent; and

2) cultural expectations in the society within which they function (DiMaggio and Powell, 1983; Souitaris et al., 2012).

Customer Exploitation: The firm's ability to improve relationships with existing customers (Atuahene-Gima, 2005; Voss and Voss, 2013).

Customer Exploration: The firm's ability to develop new markets or customer relationships (Atuahene-Gima, 2005; Voss and Voss, 2013).

Customer Management (CM) Capability: The firm's ability to effectively deploy relational resources in order to build and maintain beneficial relationships with target customers (Vorhies, Orr, and Bush, 2011).

Customer Relationship (CR) Performance: The performance of the firm in terms of customer satisfaction and customer retention (Jayachandran et al. 2005; Ramaswami et al. 2009).

Environmental Dynamism: The level of dynamism in the firm's environment in terms of market uncertainty and technological turbulence. Market uncertainty refers to the rate of change in customer needs and preferences, and the uncertainty surrounding them. Technological turbulence refers to the changes and complexity in the firm's technological environment (De Luca and Atuahene-Gima 2007; Jaworski and Kohli 1993).

Entrepreneurial Orientation: A strategic orientation that is most often characterized by proactiveness, innovativeness and risk-taking (Covin and Slevin, 1989; Miller, 1983).

$\text{Sum}_{\text{E+E}}$ within CM Capability: This refers to the sum of customer exploration and customer exploitation.

$\text{Sum}_{\text{E+E}}$ within NPD Capability: This refers to the sum of product exploration and product exploitation.

Mimetic Pressure: This is a type of institutional pressure that stems from practices perceived to be popular or successful. These pressures stimulate the copying and further adoption of those practices within the same industry (Heugens and Lander, 2009).

New Product Development (NPD) Capability: The organizational routines that purposefully reconfigure the organizational product portfolio (Schilke, 2014).

New Product (NP) Performance: The performance of the firm in terms of the speed of new product development, the quality of products and product value to customers (Moorman and Rust 1999; Zhou et al. 2005).

Organizational Ambidexterity: The organizational capability that combines exploration and exploitation (Jansen et al., 2009; Patel et al., 2012; Teece, 2014).

Product Exploitation: The firm's ability to improve the firm's existing products or production technologies (Atuahene-Gima, 2005; Voss and Voss, 2013).

Product Exploration: The firm's ability to create newness and diversity in the firm's products and technologies (Atuahene-Gima, 2005; Voss and Voss, 2013).

TMT Heterogeneity: This refers to diversity in the functional, educational, industry and organization background of the TMT members (Alexiev et al., 2010; Carpenter, 2002; Hmieleski and Ensley, 2007).

Chapter 2

LINKING AMBIDEXTROUS MARKETING CAPABILITIES TO PERFORMANCE: HOW AND WHEN ENTREPRENEURIAL ORIENTATION MAKES A DIFFERENCE

2.1. Abstract

A critical decision for any firm involves allocating investment to marketing activities. One argument is that firms should pursue exploration and exploitation activities in a balanced manner. Although there is little evidence confirming that being 'out of balance' actually hurts performance, recent research suggests that the sum of exploration and exploitation (i.e. Sum_{E+E}) is more important than their balance for performance advantage. Is this so? And even if an imbalance between exploration and exploitation has adverse effects, might there be conditions where it can be mitigated? Drawing on organizational ambidexterity research, I begin to address these questions by studying exploration and exploitation sum and balance in two important marketing capabilities: customer management (CM) and new product development (NPD). I also study how Sum_{E+E} and balance in these capabilities are affected by a firm's entrepreneurial orientation in combination with environmental dynamism. Based on data from a cross-industry sample of U.S. manufacturers, I find that higher Sum_{E+E} for CM and NPD capabilities improve customer relationship and new product performance, respectively. Furthermore, the Sum_{E+E} within these capabilities is positively impacted by a higher entrepreneurial orientation (EO). Results for balance vary. Although an imbalance in CM capability (where the firm emphasizes exploration over exploitation or vice versa) has no impact on customer relationship performance, new product performance suffers if NPD is unbalanced towards exploration. This occurs if the firm has a high EO in stable environments. Implications for theory and practice are discussed.

Keywords marketing capabilities, new product development, customer management, entrepreneurial orientation, ambidexterity

2.2. Introduction

Since March (1991) published his arguments on exploration and exploitation, calls have been made for firms to develop a balanced combination of these two strategies (e.g. Benner and Tushman, 2003; He and Wong, 2004). In marketing, Reinartz et al. (2005) show that firms can enhance customer profitability by balancing their spending between customer acquisition (an explorative marketing activity) and customer retention (an exploitative marketing activity). However, other research suggests that 'imbalance' is not necessarily bad (e.g. Birkinshaw and Gupta, 2013; Junni et al., 2013; O'Reilly and Tushman, 2013). As Josephson, Johnson, and Mariadoss (2015) show, emphasizing exploitation (advertising expenditure) over exploration (R&D expenditure) increases the firm's risk but also its return on assets. Yet another view suggests the sum of exploration and exploitation may be more important than balance (e.g. Junni et al., 2013). The debate regarding the 'sum vs. balance' of exploration and exploitation remains however, largely outside the marketing literature in spite of strong interest in the concept of ambidexterity in this field (e.g. Arnold, Fang, and Palmatier, 2011; Atuahene-Gima, 2005; Josephson et al., 2015; Vorhies et al., 2011).

In this research, I study two different marketing capabilities that are potentially ambidextrous because they combine exploration and exploitation. My interest is in customer management (CM) and new product development (NPD) capabilities. I am guided by two research questions. First, I draw on ambidexterity research (Day, 2014; Kozlenkova, Samaha, and Palmatier, 2014; O'Reilly and Tushman, 2013) to ask: *How is performance affected by: 1) the sum of exploration and exploitation in a firm's CM and NPD capabilities; and 2) any (im)balance between exploration and exploitation within each?* I study the effect of these capabilities on: 1) customer relationship; and 2) new product performance. These are two

important outcomes for marketing actions (Katsikeas, Morgan, Leonidou, and Hult, 2016; Moorman and Rust, 1999; Verhoef and Leeflang, 2009) but there is little evidence of how they are affected by either the exploration-exploitation sum or imbalance in the firm's CM and NPD capabilities.

Second, if performance is affected by an exploration-exploitation imbalance in CM or NPD capabilities, we need to understand the factors that lead to this imbalance. In this research, I study the effect of entrepreneurial orientation (EO) because it is associated with both exploitative and explorative activities (Kollmann and Stöckmann, 2014). Also, because firms with higher EO are proactive and risk-taking (Covin and Slevin, 1989; Miller, 1983), their marketing capabilities may emphasize exploration over exploitation (Dess et al., 2003). This creates an imbalance that might have negative performance consequences and it indicates the potential influence of EO. I also study how EO affects imbalance when it interacts with environmental dynamism. This is because first, firms adapt how they combine exploration and exploitation in response to environmental change (O'Reilly and Tushman, 2013), and second, firms characterized by higher levels of EO are more receptive to change (Pérez-Luño, Wiklund, and Cabrera, 2011). Therefore, my second research question asks: *How does a firm's entrepreneurial orientation affect: 1) the sum of exploration and exploitation within CM and NPD capabilities; and 2) any (im)balance within them under different environmental conditions?*

I test the research hypotheses using data collected from 141 U.S.-based manufacturing firms from different industries. To ensure reliability of the survey data, I conducted a second round of data collection one year after the initial survey and tested the data against the first round data. The firms in the sample are single business unit firms or autonomous business units within

larger firms. They are also more than six years old and have at least 20 employees. I test my model using hierarchical regression analysis as well as the bootstrapping method.

I offer three main contributions. First, I link two ambidextrous marketing capabilities to customer relationship and new product outcomes and show their differential effects on these performance measures. The strong and consistent performance effects of the sum of exploration and exploitation versus that of balance substantiate recent arguments that the sum of exploration and exploitation is more important than a balance between them. They also show that imbalance is not always detrimental. Although an emphasis on exploration over exploitation in NPD negatively affects new product performance, an imbalance in CM has no effect on customer relationship performance.

Second, I conceptualize and show how EO influences the exploration-exploitation sum and imbalance in a firm's CM and NPD capabilities, under conditions of environmental dynamism. Two results are of note: 1) entrepreneurially-oriented firms emphasize exploration over exploitation in CM under dynamic environments; but 2), they do so for NPD in more stable environments. This provides new insights on ambidexterity because little research exists on how organizational factors together with environmental factors might influence ambidextrous capabilities (Benner and Tushman, 2015; O'Reilly and Tushman, 2013).

Third, I demonstrate how the relationship between EO and marketing performance is positively mediated by ambidextrous CM and NPD capabilities. I also show that higher levels of EO under stable environments can be detrimental to new product performance, because the firm emphasizes exploration in NPD. This provides new evidence as to how EO might have both positive and negative impacts on performance. This finding helps reconcile past mixed findings regarding the effect of EO on performance (Rauch, Wiklund, Lumpkin, and Frese, 2009).

In the next section, I present the theory and hypotheses. I frame my research with organizational ambidexterity literature (Birkinshaw and Gupta, 2013; March, 1991; Tushman and O'Reilly, 1996). I then describe the methodology, measures and analytic approaches. This leads to my results and implications for theory and practice, followed by limitations and suggestions for future research.

2.3. Theory and hypotheses

Day's (1994) arguments regarding the capabilities of market-driven organizations stimulated much research on the performance impact of various marketing capabilities. Examples include Ramaswami, Srivastava, and Bhargava (2009), Wilden and Gudergan (2015), and Feng et al. (2016). Here, I focus on CM and NPD because the product-market interface is where firms compete and spend significant resources (Ireland, Hitt, and Sirmon, 2003) and it has important implications for gaining performance advantage (Barney, 2014). In addition, these two capabilities are particularly important in marketing practice (Morgan, 2012; Srivastava, Shervani, and Fahey, 1999) and should be addressed together (Bohlmann, Spanjol, Qualls, and Rosa, 2013). CM is "the firm's ability to effectively deploy relational resources" and reflects "the firm's ability to build and maintain beneficial relationships with target customers" (Vorhies et al., 2011, p. 739). NPD involves the "organizational routines that purposefully reconfigure the organizational product portfolio" (Schilke, 2014).

My interest is in CM and NPD 'ambidexterity'. In part, this decision is influenced by Day's (2011) argument that the familiar capabilities of the marketing mix are susceptible to an exploitative mindset (i.e. they overlook exploration). However, CM and NPD have exploration and exploitation dimensions that reflect distinct learning approaches (March, 1991; Voss and

Voss, 2008). Customer exploration involves developing new markets or customer relationships while customer exploitation improves relationships with existing customers. Product exploration creates newness and diversity in the firm's products and technologies, while product exploitation improves the firm's existing products or production technologies (Atuahene-Gima, 2005; Voss and Voss, 2013). I draw on ambidexterity research to define the exploration-exploitation *balance* within CM capability as the equal pursuit of customer exploration and customer exploitation by the firm. The concept of *balance* for NPD capability is the same, but in the context of product exploration and product exploitation. The *sum* of exploration and exploitation is annotated as Sum_{E+E} for each capability.

In this research, I investigate how the Sum_{E+E} for CM and NPD capabilities and im(balance) within them affect customer relationship (CR) and new product (NP) performance. These measures are critical outcomes for marketing actions (Moorman and Rust, 1999; Verhoef and Leeflang, 2009). We lack however, an understanding of how CR and NP are influenced by ambidextrous marketing capabilities. For example, although Ramaswami et al. (2009) find partial support for the relationship between NPD and NP performance, as well as for CM and CR performance, their research does not assess ambidexterity.

For insight on ambidexterity, I turn to the strategic management literature and find two general arguments. One takes the position that firms achieve ambidexterity and perform better by pursuing exploration and exploitation equally (e.g. He and Wong, 2004; Uotila, Maula, Keil, and Zahra, 2009). This is the 'balanced' line of thought. Others explain that exploration and exploitation within a function are orthogonal and can be highly developed either simultaneously or sequentially (Birkinshaw and Gupta, 2013; O'Reilly and Tushman, 2013). This is the 'sum' argument. Thus, firms that combine exploration efforts with exploitation efforts at higher levels

should report performance results different from those combining them at moderate levels. This argument is consistent with a meta-analysis by Junni et al. (2013), showing that: 1) balancing exploration and exploitation activities may not be sufficient for achieving performance advantage, and 2) the sum of exploration and exploitation may be more important than their balance for gaining performance advantage. I draw on this debate to inform the marketing literature by studying Sum_{E+E} in both CM and NPD capabilities, and the exploration-exploitation (im)balance within each.

What however, influences the sum and (im)balance of exploration and exploitation? I suggest that EO is a useful lens to apply when investigating firm-level influences. This is because Kollmann and Stöckmann (2014) find that EO is associated with both explorative and exploitative innovation activities. EO is most often characterized by the three dimensions offered by Miller (1983): proactiveness, innovativeness, and risk-taking. Therefore, entrepreneurially-oriented firms might have an inclination towards exploration (Dess et al. 2003), and so we need to understand if and how EO leads to an imbalance in CM and NPD capabilities that might diminish marketing performance.

The importance of EO's potential influence on marketing ambidexterity can also be found in the arguments of Benner and Tushman (2015) as well as O'Reilly and Tushman (2013). They maintain that the challenge of becoming ambidextrous lies in organizational culture. From a marketing perspective, Zhou, Yim, and Tse (2005) show that of a set of strategic orientations (including market orientation), EO has the strongest impact on three important outcomes: technology-based innovation, market-based innovation and organizational learning.

Finally, if the organizational characteristic of EO might influence ambidexterity in CM and NPD capabilities, what environmental factors should be considered? Organizational

ambidexterity is rooted in resource-based theory (Day, 2014; Kozlenkova et al., 2014) and reflects the firm's ability to respond to changes in the environment (O'Reilly and Tushman, 2013; Teece, 2014). Given that firms characterized by EO are proactive and risk-taking, they are in a better position than others to take advantage of dynamic environments (Pérez-Luño et al., 2011). Therefore, the interaction between EO and environmental dynamism might influence the balance of exploration and exploitation within CM and NPD. I build my arguments by developing a set of four hypotheses that link: 1) Sum_{E+E} for CM capability and NPD capability; and 2) any exploration-exploitation imbalance within each to CR and NP performance. Then, I provide three hypotheses on how EO and environmental characteristics impact CM and NPD capabilities. The conceptual framework is seen in Figure 2.1.

2.3.1 Linking Sum_{E+E} within CM and NPD capabilities to performance

A high Sum_{E+E} for CM capability suggests the firm can combine customer exploration with customer exploitation at levels higher than those of other firms. Customer exploration increases CR performance because firms identify and serve high value customers in new markets (Arnold et al., 2011). A similar argument applies for customer exploitation because if the firm has systems to better understand and serve its customers, it also identifies and prioritizes those with high value. The firm is also able to focus on meeting customer's long-term needs which in turn, improves CR performance (Hillebrand, Nijholt, and Nijssen, 2011; Jayachandran, Sharma, Kaufman, and Raman, 2005; Ramaswami et al., 2009).

A higher Sum_{E+E} for NPD capability suggests that the firm can combine product exploration and product exploitation at higher levels. This should lead to better NP performance because a firm that can improve existing products and explore new ones, can develop products

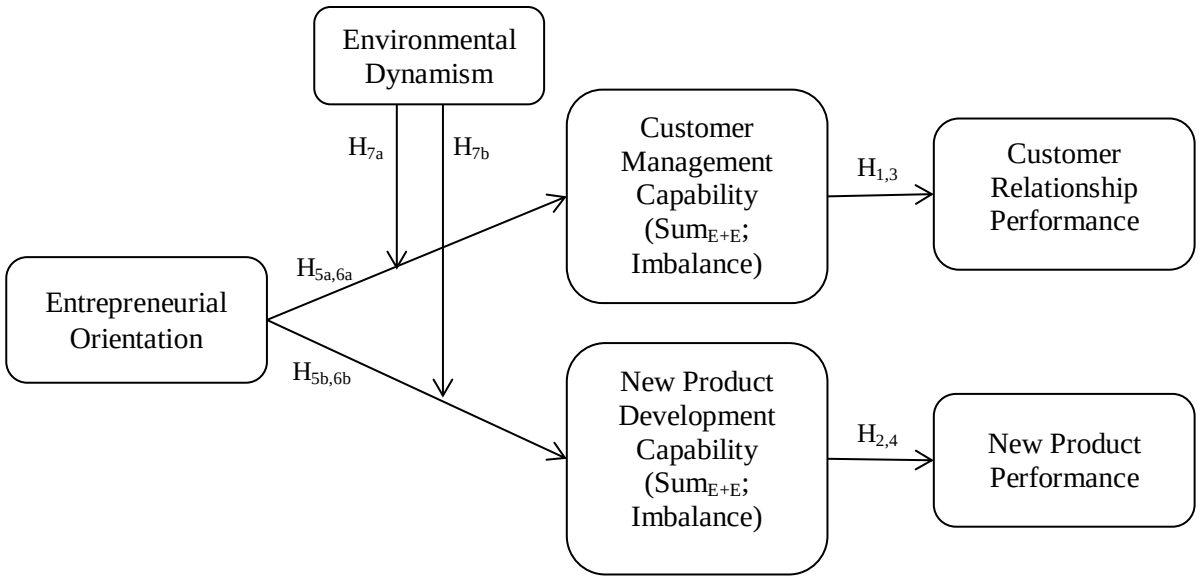

Figure 2.1. Research model

valued by customers (Ngo and O'Cass, 2012). If the firm does not pursue NPD exploration, it is locked into established innovation areas and loses the opportunity to develop promising new products (Rubera, Chandrasekaran, and Ordanini, 2016; Szymanski, Kroff, and Troy, 2007). Similarly, if there is a low ability to improve existing products, the firm loses the knowledge efficiency that comes with exploiting successful products. This may, for example, reduce the speed of product development (Lubatkin et al., 2006). Therefore, firms with a higher Sum_{E+E} for NPD capability should have higher NP performance. Accordingly, I hypothesize that:

H_1: The Sum_{E+E} within CM capability is positively related to CR performance.

H_2: The Sum_{E+E} within NPD capability is positively related to NP performance.

2.3.2 Linking exploration-exploitation (im)balance within CM and NPD to performance

Not all firms are able to achieve a high Sum_{E+E} within CM and NPD. This is because many organizations are resource-limited (Arnold et al., 2011; Benner and Tushman, 2015; March, 1991) and exploration and exploitation are potentially incompatible activities that compete for scarce resources (Junni et al., 2013; Teece, 2014). Therefore, it is important to understand how (im)balance within CM and NPD capabilities affects CR and NP performance, regardless of the Sum_{E+E} within these capabilities. Because the likelihood of imbalance is greater than balance (Reeves and Harnoss 2015), the hypotheses that follow are framed in terms of 'imbalance'. I begin with an imbalance in CM capability. This occurs if, within CM, emphasis is placed on exploration relative to exploitation (or vice versa). Of note, most firms pursue both exploration and exploitation to some extent. Accordingly, by exploration- or exploitation-focused imbalance, we mean the firm gives emphasis to one or the other while pursuing both.

A firm with exploitation-focused CM capability will have higher CR performance in terms of customer satisfaction and retention because the firm invests in processes to support closer relationships with existing customers, learn about them and serve them better (Reimann, Schilke, and Thomas, 2010). The opposite is true for firms with exploration-focused CM capability because the dominant focus on acquiring new customers and/or entering new markets prevents it from attending to existing customers. This lowers CR performance (Hillebrand et al., 2011; Jayachandran et al., 2005). This leads me to hypothesize:

H_3: Exploration-focused CM capability is negatively related to CR performance. [1]

[1] An exploration-focused imbalance is the opposite of an exploitation-focused imbalance. Therefore, this hypothesis means that exploitation-focused CM capability is positively related to CR performance.

In the same way that an exploration-focused imbalance in CM will lead to decreased CR performance, NP performance should suffer if NPD is exploration-focused. Although such an imbalance might contribute to radical innovation (Atuahene-Gima, 2005), extend the product range, or help the firm enter new areas of technology, the benefits of risky and costly NPD can be diminished by competitors within a short period of time (Mizik and Jacobson, 2003; Vorhies et al., 2011). This means that the value that exploration-focused NPD capability might create can quickly disappear. A firm's emphasis on product exploration might also reduce its speed of new product development because exploration takes more time than exploitation (Kyriakopoulos and Moorman, 2004; Levinthal and March, 1993). Product exploration is also risky and requires more time to generate meaningful results (Atuahene-Gima, 2005; Danneels, 2008; Fernhaber and Patel, 2012). Therefore, although both product exploration and exploitation are necessary for NP performance (see H2), if the firm emphasizes product exploration, the risk of adversely impacting product performance is higher. These points lead me to the following hypothesis:

H_4: Exploration-focused NPD capability is negatively related to NP performance.

2.3.3 Linking EO and environmental dynamism to CM and NPD

I now develop hypotheses on how the Sum_{E+E} for CM and NPD capabilities and the imbalance within these capabilities are influenced by: 1) an internal factor (EO); and 2) an external factor (environmental dynamism).

In terms of CM, entrepreneurially-oriented firms develop new markets more than other firms (Covin and Miles, 1999; Dess et al., 2003). The innovativeness of such firms results in novel products (Kollmann and Stöckmann, 2014) that can be sold to both current and new

customers. This is facilitated by a proactiveness that leads entrepreneurially-oriented firms to try and understand the demands of new markets. Furthermore, even though pioneering actions might jeopardize profitability, the risk-taking nature of firms with greater EO leads them towards experimental learning and exploration (Dess et al., 2003). At the same time, EO also enables the firm to engage in exploitation by researching the market and adjusting products to address extant customer needs (Kollmann and Stöckmann, 2014). Together, the above arguments suggest that firms characterized by EO are likely to have higher Sum_{E+E} for CM capability. However, given entrepreneurially-oriented firms are strongly inclined towards exploration (Dess et al., 2003), the combination of exploration and exploitation is likely to be unbalanced and in that direction. Similar arguments apply to NPD. Firms with higher EO are more likely to pursue exploration in an effort to maintain technological leadership (Kollmann and Stöckmann, 2014; Zahra, Sapienza, and Davidsson, 2006; Zhou et al., 2005). In addition, their proactiveness helps them learn about the new customer needs and preferences earlier than their competitors that can lead to new products ahead of competitors. Drawing on the above, I hypothesize that:

H_5: EO is positively associated with the Sum_{E+E} within: a) CM capability and b) NPD capability.

H_6: EO is positively associated with: a) exploration-focused CM capability and b) exploration-focused NPD capability.

H_6 argues that entrepreneurial firms are more likely to have CM and NPD capabilities dominated by exploration. I now suggest that this effect is reinforced in dynamic environments because the uncertainty they create provides even more opportunity for firms with higher EO to

enter new markets and obtain new customers. Thus, customer exploration is encouraged. A dynamic environment also encourages firms to engage in more product exploration than they might consider under stable conditions (Kreiser, Marino, Davis, Tang, and Lee, 2010). Such a decision reflects the entrepreneurially-oriented firm's proclivity toward innovations that could return high payback (Kollmann and Stöckmann, 2014). In contrast, stable environments discourage firms from product exploration (Zahra and Bogner, 2000) – even if they are characterized by EO– because competitors can easily imitate the actions of the pioneering firm (Song, Droge, Hanvanich, and Calantone, 2005). Accordingly, the following hypotheses are offered:

> H_7: *The positive effect of EO on: a) exploration-focused CM capability; and b) exploration-focused NPD capability is stronger when environmental dynamism is high.*

2.4. Methodology

2.4.1 Data collection

The empirical context for this study is U.S.-based manufacturing firms. Data were collected using an online survey hosted by the market research firm Research Now. I conducted two rounds of data collection. In the first round, I collected data for all variables of interest. The second round allowed me to assess the reliability of my data and was conducted one year later (details in the results section).

In Round 1, members of the Research Now national respondent pool received an invitation to participate, resulting in 917 potential respondents. Of these, 229 (25%) were deemed to be qualified, of which I received 141 (62%) usable responses. The qualification

criteria are explained later in this section. Research Now incentivized the respondents. Nonresponse bias was addressed by comparing early and late respondents on all study variables. No significant difference was found. The final sample includes firms from different industries (e.g. automotive, electronics, food, beverage, chemicals, computers). This ensures variation in the environmental conditions of the firms under study. To qualify for the study, firms had at least 20 employees, and 65% of the sample had less than 500 employees. The median firm age and size are 37 years and 250 employees respectively. Nearly half the firms serve business markets (48%) while 33% focus on B2C markets and 19% serve both B2C and B2B. 70% of the sample firms are privately held.

This study employs the key informant approach to data collection. Respondents are senior managers knowledgeable about the strategic actions within their firm (e.g. senior marketing managers, general managers). The experience of respondents with their firms and their industries averages 14.02 and 21.07 years respectively. I obtained age and size data for 58 firms in the sample. Correlations between the secondary data and the survey data were 0.89 and 0.98 for age and size respectively. This cross-validation ensures the accuracy of the survey data. Respondents also self-reported their knowledge by answering: "How knowledgeable were you on the issues covered in this survey?" with a seven-point scale (1 = "not at all knowledgeable" and 7 = "highly knowledgeable"). The mean score on this item was 6.06.

To ensure that exploration and exploitation occur within the same business unit (Vorhies et al., 2011), I sampled single business unit firms or autonomous business units within larger firms. Joint ventures and firms that obtain resources, ideas, and technology from a larger organization are excluded. I also excluded firms six years or younger, following Zahra, Ireland, and Hitt (2000). This is because such firms are prone to the liability of newness (Partanen,

Chetty, and Rajala, 2014; Peng and Luo, 2000) and their perceptions of the environment might be different from those of older firms. Firms with 20 employees or less are also excluded because they may have different reactions to the environment due to their smallness (Davidsson (1989). Also, a lack of network ties and resources (Sheng, Zhou, and Li, 2011) may prevent them from developing diverse capabilities. Finally, I exclude service firms because the nature of their NPD is fundamentally different from that of manufacturers.

2.4.2 Measures

This research relies on multi-item measures of managerial perceptions. All scales are either adopted or adapted from prior literature. The Appendix provides the measurement items. Unless otherwise noted, all measures employ seven-point Likert scales (1 = Strongly Disagree, 7 = Strongly Agree). The score for each variable is obtained by averaging the items. Of note, respondents were asked to consider two time frames in their answers: 1) the last five years for independent and moderator variables, and 2) the last two years for the intervening and outcome variables. This reduces the likelihood that the latter types of variable occurred at the same time as the former, an issue typically associated with cross-sectional data. This approach was used because for research in marketing, entrepreneurship and strategic management studying capabilities and performance, two typical time frames used to measure the variables are five years (e.g., Covin and Wales 2012; Drechsler et al. 2012; Fang et al. 2011; Gibson and Birkinshaw 2004) and two years (e.g. Voss and Voss 2008; Zhou et al. 2005). In addition, providing respondents with temporal reference points is appropriate when assessing firm-level variables (Patel et al. 2012). The survey was pre-tested with a panel of four academic experts and

four industry experts to ensure face validity. Minor changes in wording were made based on pre-test feedback.

Main variables. The primary dependent variables are customer relationship (CR) performance and new product (NP) performance. I measure CR performance with two items adapted from Jayachandran et al. (2005) and Ramaswami et al. (2009) that capture customer satisfaction and customer retention. NP performance is measured with three items adapted from Moorman and Rust (1999) and Zhou et al. (2005). These items assess the speed of new product development, the quality of products, and product value to customers.

The Sum_{E+E} and balance data for CM and NPD capabilities are derived from the dimensions of exploration and exploitation (Birkinshaw and Gupta, 2013). Therefore, I assess: 1) customer exploration, 2) customer exploitation, 3) product exploration, and 4) product exploitation. I measure customer exploration with three items from Lubatkin et al. (2006). These items capture the extent to which the firm has approached new markets or customer groups in managing their customer portfolio. Customer exploitation is measured using five items adapted from Ramaswami et al. (2009) and Vorhies et al. (2011) that focus on the extent to which the firm serves the needs of existing customers. Product exploration and exploitation are measured with three and five items, respectively, adapted from He and Wong (2004) and Schilke (2014). The items for product exploration assess the extent of newness and diversity in technologies and products, while those for product exploitation measure the extent to which the firm has improved existing products or production technologies.

To determine the Sum_{E+E} of each marketing capability, I use the sum of exploration and exploitation (e.g. Fernhaber and Patel, 2012; Jansen et al., 2009; Lubatkin et al., 2006). To make the resulting scales consistent with other seven-point scales, I divide them by two. To measure

balance, I employ the 'relative exploratory' approach from Uotila et al. (2009). As an example, to obtain the score for exploration-focused CM capability, I divide customer exploration by the sum of customer exploration and exploitation. The advantage of using this approach to construct the balance measure rather than using the absolute difference between exploration and exploitation (e.g. He and Wong, 2004) is that it shows whether the firm emphasizes exploration over exploitation, or vice versa.

EO is measured with a seven-item scale adapted from Covin and Slevin (1989) and Lumpkin and Dess (2001). Following other research (Kollmann and Stöckmann, 2014; Lumpkin and Dess, 2001), I removed Covin and Slevin's ambiguous 'tendency to be ahead of other competitors in introducing novel ideas or products' item. I measure EO using a seven-point semantic differential scale. Following Rauch et al (2009), each dimension of EO is the mean score of its underlying items, and EO is the mean score of its three dimensions.

Finally, environmental dynamism is measured using the average of two measures: 1) market uncertainty; and 2) technological turbulence. For both measures, I adapt items from De Luca and Atuahene-Gima (2007) and Jaworski and Kohli (1993). The four market uncertainty items assess the rate of change in customer needs and preferences, and the uncertainty surrounding them. The four technological turbulence items assess changes and complexity in the firm's technological environment.

Control variables. I control for several factors that may impact the capability and performance measures in my study. These include firm age, firm size, competitive intensity, primary market (i.e. B2B, B2C, both) and whether the firm is public or private. Firm age influences a firm's competitive advantage and the behaviour that underpins its capabilities (Schilke, 2014; Zahra et al., 2000). Therefore, older firms may respond differently to their

environment compared to their younger counterparts. Size can also be influential because larger firms may commit more resources for building or combining capabilities (Schilke, 2014) while smaller firms are more nimble in making changes to capabilities (Bohlmann et al., 2013; Verwaal and Donkers, 2002). Competitive intensity may pressure firms to develop specific capabilities in order to stay in competition (Barreto, 2010). It is measured using four items adapted from Jaworski and Kohli (1993) and Jayachandran et al. (2005). A firm's primary market may also impact the way it approaches CM and NPD (Yli-Renko, Autio, and Sapienza, 2001). Finally, public and private firms may have different reactions to their environment because they have different types of stakeholders.

2.5. Results

2.5.1 Reliability and validity

I examined scale validity by assessing inter-item correlations and reliability estimates, and conducting both exploratory and confirmatory factor analysis. This led to three items being deleted (see Appendix). The reliability coefficients of all variables exceed 0.70. Confirmatory factor analysis (CFA) was used to further validate the measures and to establish convergent and discriminant validity. Considering the high number of indicators, I ran two CFA models on theoretically-related constructs.

The first CFA includes the CM, NPD and performance variables. This model's results suggest good fit (chi-square = 178.92, degrees of freedom = 132, p = 0.00, CFI = 0.97, GFI = 0.89, TLI = 0.96 and RMSEA = 0.05). The second CFA model includes the independent and multi-item control variables (i.e. environmental dynamism, EO as a second-order construct and competitive intensity). The model has an acceptable fit (chi-square = 193.58, degrees of freedom

= 122, p = 0.00, CFI = 0.94, GFI = 0.87, TLI = 0.93 and RMSEA = 0.07). All factor loadings are significant at $p < 0.001$. Composite reliabilities range from 0.76 to 0.90, and the average variance extracted (AVE) measures range from 0.51 to 0.74. These results provide evidence for convergent validity.

I assessed discriminant validity by performing chi-square difference tests between restricted and unrestricted models for each pair of constructs in the two CFA models (Anderson and Gerbing, 1988). For all pairwise comparisons, the unrestricted model is significantly better than the restricted model ($p < 0.05$) with the exception of the CR performance and NP performance comparison in which the unrestricted model was only marginally better ($p = 0.08$). Therefore, I loaded the items of these two constructs onto a single construct. The chi-square difference test showed that the original model has a significantly lower chi-square. These results provide support for discriminant validity.

To further assess the reliability of my data, I contacted the same respondents one year after the initial survey. They were invited to complete a survey that included all the performance items and a reduced version of the CM and NPD measures (see Yli-Renko et al. (2001) for a similar approach). I received 79 responses, representing a response rate of 56%. Respondents were instructed to provide answers in the same timeframe that was used in the initial survey. The correlation between CR performance in the first and second rounds is 0.61 ($p < 0.001$); the correlation for NP performance is 0.52 ($p < 0.001$); and the correlations for customer exploration, customer exploitation, product exploration, and product exploitation range from 0.40 to 0.62, all significant at $p < 0.001$. These results from Round 2 provide further support for the reliability of my data.

2.5.2 Common method variance (CMV)

Given that the data for independent and outcome variables are obtained from a single informant within each firm, I pay particular attention to the possibility of CMV. First, the consistency of responses between the two rounds of data collected with a one-year lag indicates that CMV is not likely to drive the results. This is because respondents are not able to recall their previous responses with such temporal separation (Podsakoff, MacKenzie, Lee, and Podsakoff, 2003). Second, I used different scale anchors (i.e. semantic differential scales and Likert scales) following Podsakoff et al. (2003) and Rindfleisch, Malter, Ganesan, and Moorman (2008). Third, a marker variable (MV) was used, following Lindell and Whitney (2001). An MV is a theoretically unrelated variable in the questionnaire which should not have a significant correlation with at least one of the study's variables. If any correlation between the MV and the study's variable is observed, that correlation will be used to adjust the correlations among the study's constructs and their significance (e.g. Sheng et al., 2011; Verhoef and Leeflang, 2009). The MV in my research is an item measuring economic confidence: "How much confidence do you have in your national economy today?" This item is not theoretically related to the variables in this study and has previously been used as an MV in the marketing literature (Josiassen, 2011; Verhoef and Leeflang, 2009). The correlations between the MV and the key variables ranged from -0.10 to 0.08 with an average size of 0.03. None were significant ($p < 0.05$). One methodological advantage of an MV is that it can be used as a filtering question that separates the flow of questions from predictors to outcome variables (Podsakoff et al., 2003). Because this temporal separation reduces the likelihood that the respondents' answers to the subsequent questions are motivated by their prior responses, the potential for common method variance is reduced.

There are other considerations that reduce the effect of CMV in this study. These include: 1) my use of knowledgeable respondents, 2) guaranteeing respondents complete anonymity, and 3) having interaction terms. Siemsen, Roth, and Oliveira (2010) investigate the influence of CMV on interaction effects and conclude that "there is no reason that common method bias would create an artificial interaction effect" (p. 470). Table 2.1 presents the correlations and descriptive statistics for key variables.

2.5.3 Hypothesis testing

I used hierarchical regression analysis to test the hypotheses. I regressed EO on environmental dynamism to obtain residuals free from the influence of this environmental factor. Then, I performed the analysis using residuals as the indicator of EO (Luo, Rindfleisch, and Tse, 2007; Menguc, Auh, and Yannopoulos, 2014; Zhou and Li, 2012). My detailed results are presented for the Sum_{E+E} in CM and NPD followed by balance within each of these marketing capabilities. Table 2.2 provides a summary of the hypotheses and results.

As shown in Table 2.3, the Sum_{E+E} for CM capability is positively related to CR performance ($b = 0.38$, $p < 0.01$). This provides support for H_1. The Sum_{E+E} for NPD capability is significantly associated with NP performance ($b = 0.39$, $p < 0.001$), providing support for H_2. In terms of (im)balance, exploration-focused CM capability has no effect on CR performance. Therefore, I cannot find support for H_3. However, exploration-focused NPD has a significant negative effect on NP performance ($b = -2.68$, $p < 0.05$). This provides support for H_4. We now turn to the antecedents of exploration-exploitation sum and imbalance within each of CM and NPD. Table 2.4 shows that EO is positively related to the Sum_{E+E} within CM ($b = 0.24$, $p < 0.001$) and NPD ($b = 0.37$, $p < 0.001$). This provides support for H_5.

Table 2.1. Correlations and descriptive statistics

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Firm age (log)	1.00													
2. Firm size (log)	0.31**	1.00												
3. Competitive intensity	0.06	0.08	1.00											
4. B2B	0.05	-0.09	0.01	1.00										
5. B2C	-0.09	-0.08	-0.06	-0.67**	1.00									
6. Public	0.19*	0.51**	-0.10	-0.07	-0.06	1.00								
7. Environmental dynamism	-0.07	0.12	0.30**	-0.09	0.03	-0.08	1.00							
8. EO	-0.05	0.15	-0.01	-0.01	-0.13	0.06	0.11	1.00						
9. Sum_{E+E} within CM capability	0.12	0.03	0.16	0.14	-0.21*	-0.06	0.08	0.30**	1.00					
10. Sum_{E+E} within NPD capability	-0.03	0.22**	0.05	0.02	-0.22**	0.07	0.18*	0.54**	0.54**	1.00				
11. Exploration-focused CM capability	-0.06	-0.15	0.00	0.02	-0.02	-0.04	0.01	0.02	0.34**	-0.10	1.00			
12. Exploration-focused NPD capability	0.04	0.22**	-0.05	-0.03	-0.01	0.07	0.15	0.21*	0.06	0.28**	-0.11	1.00		
13. CR performance	-0.06	-0.02	0.17*	0.01	-0.13	-0.13	0.04	0.22**	0.40**	0.30**	0.03	-0.11	1.00	
14. NP performance	-0.06	-0.02	0.13	-0.01	-0.04	-0.16	0.20*	0.34**	0.35**	0.41**	-0.03	-0.07	0.69**	1.00
Mean	1.59	2.52	5.41	0.48	0.33	0.30	4.23	4.53	5.46	5.27	0.48	0.49	5.16	5.05
Standard deviation	0.31	0.89	1.05	0.50	0.47	0.46	1.13	1.17	0.92	0.89	0.06	0.07	1.08	1.02

*$p < 0.05$; **$p < 0.01$; all significance tests are two-tailed.

Table 2.2. Summary of hypotheses and results

Hypothesis			Effect	T-value	Supported
H_1: Sum_{E+E} within CM capability (+)	→	CR perf	0.38	3.30^{**}	Yes
H_2: Sum_{E+E} within NPD capability (+)	→	NP perf	0.39	3.48^{***}	Yes
H_3: Exploration-focused CM capability (-)	→	CR perf	-1.92	-1.18	No
H_4: Exploration-focused NPD capability (-)	→	NP perf	-2.68	-2.18^{*}	Yes
H_{5a}: EO (+)	→	Sum_{E+E} within CM capability	0.24	3.67^{***}	Yes
H_{5b}: EO (+)	→	Sum_{E+E} within NPD capability	0.37	6.61^{***}	Yes
H_{6a}: EO (+)	→	Exploration-focused CM capability	0.00	0.40	No
H_{6b}: EO (+)	→	Exploration-focused NPD capability	0.01	1.99^{*}	Yes
H_{7a}: EO × environmental dynamism (+)	→	Exploration-focused CM capability	0.01	3.08^{**}	Yes
H_{7b}: EO × environmental dynamism (+)	→	Exploration-focused NPD capability	-0.01	-3.86^{***}	Contrary to expectations

$^{\dagger}p < 0.10$, $^{*}p < 0.05$; $^{**}p < 0.01$; $^{***}p < 0.001$; unstandardized estimates are reported; all significance tests are two-tailed.

The results for balance are less consistent. H_{6a} is not supported because the effect of EO on exploration-focused CM capability is not significant (b = 0.00, n.s.). However, EO is positively associated with exploration-focused NPD capability (b = 0.01, $p < 0.05$). This provides support for H_{6b}. Consistent with H_{7a} (Figure 2.2a), the effect of the interaction between EO and environmental dynamism on exploration-focused CM capability is positive and significant (b = 0.01, $p < 0.05$). However, in contrast with my expectations, the positive effect of EO on exploration-focused NPD capability is diminished (see Figure 2.2b) when environmental

Table 2.3. Performance consequences of CM and NPD capabilities

	CR Performance			NP Performance		
Control variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Firm age	-0.24 (-0.77)	-0.31 (-1.06)	-0.35 (-1.19)	-0.18 (-0.61)	-0.11 (-0.41)	-0.13 (-0.49)
Firm size	0.04 (0.29)	0.00 (0.02)	0.04 (0.30)	0.07 (0.62)	-0.02 (-0.19)	0.01 (0.11)
Competitive intensity	0.15† (1.71)	0.10 (1.26)	0.08 (1.03)	0.10 (1.17)	0.07 (0.94)	0.06 (0.73)
B2B	-0.31 (-1.26)	-0.26 (-1.12)	-0.27 (-1.17)	-0.16 (-0.70)	-0.03 (-0.13)	-0.03 (-0.15)
B2C	-0.52† (-1.97)	-0.29 (-1.12)	-0.28 (-1.09)	-0.22 (-0.87)	0.11 (0.45)	0.12 (0.51)
Public	-0.32 (-1.39)	-0.25 (-1.15)	-0.26 (-1.22)	-0.41† (-1.87)	-0.34† (-1.68)	-0.35† (-1.77)
Predictors						
Sum_{E+E} within CM capability		0.38** (3.30)	0.43** (3.32)		0.18† (1.69)	0.21† (1.77)
Sum_{E+E} within NPD capability		0.12 (1.02)	0.13 (0.99)		0.39*** (3.48)	0.41** (3.36)
Exploration-focused CM capability			-1.92 (-1.18)			-1.41 (-0.93)
Exploration-focused NPD capability			-2.77* (-2.09)			-2.68* (-2.18)
R^2 (Adjusted R^2)	0.07 (0.03)	0.21 (0.16)	0.24 (0.18)	0.05 (0.01)	0.23 (0.18)	0.26 (0.21)
ΔR^2	-	0.14***	0.03	-	0.18***	0.03

$^{\dagger}p < 0.10$, $^{*}p < 0.05$; $^{**}p < 0.01$; $^{***}p < 0.001$; unstandardized estimates are reported; t-values in parentheses; all significance tests are two-tailed.

dynamism is high (b = -0.01, p < 0.001). Because this contradicts H_{7b}, I ran Hayes' Process moderation model (Hayes, 2013) to examine the effect of EO on exploration-focused NPD at different levels of environmental dynamism. My analysis shows that firms with higher EO are more exploration-focused in NPD but only at lower levels of environmental dynamism (b = 0.03, P < 0.001). Of note, when investigating the effect of CM and NPD capabilities on CR and NP

Table 2.4. Antecedents of CM and NPD capabilities

	Sum_{E+E} within CM capability		Sum_{E+E} within NPD capability		Exploration-focused CM capability			Exploration-focused NPD capability		
Control variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10
Firm age	0.30 (1.16)	0.41 (1.62)	-0.31 (-1.28)	-0.13 (-0.6)	0.00 (-0.23)	0.00 (-0.15)	0.00 (-0.28)	-0.01 (-0.27)	0.00 (0.11)	0.00 (0.26)
Firm size	0.01 (0.08)	-0.05 (-0.48)	0.24* (2.41)	0.14 (1.57)	-0.01† (-1.63)	-0.01† (-1.69)	-0.01 (-1.79)	0.02** (2.67)	0.02* (2.14)	0.02* (2.30)
Competitive intensity	0.12 (1.61)	0.12† (1.67)	0.01 (0.15)	0.00 (0.02)	0.00 (0.19)	0.00 (0.12)	0.00 (0.17)	-0.01 (-0.97)	-0.01 (-1.28)	-0.01 (-1.40)
B2B	-0.03 (-0.14)	0.06 (0.27)	-0.34† (-1.69)	-0.20 (-1.13)	0.00 (-0.22)	0.00 (-0.16)	0.01 (0.41)	0.00 (-0.19)	0.00 (0.12)	-0.01 (-0.58)
B2C	-0.42† (-1.87)	-0.28 (-1.28)	-0.64** (-3.04)	-0.43* (-2.31)	-0.01 (-0.40)	0.00 (-0.32)	0.00 (0.04)	0.00 (-0.15)	0.00 (0.21)	0.00 (-0.26)
Public	-0.16 (-0.80)	-0.13 (-0.68)	-0.12 (-0.64)	-0.06 (-0.36)	0.01 (0.43)	0.01 (0.47)	0.01 (0.79)	-0.01 (-0.81)	-0.01 (-0.58)	-0.01 (-0.99)
Predictors										
EO		0.24*** (3.67)		0.37*** (6.61)		0.00 (0.40)	0.00 (0.59)		0.01* (1.99)	0.01† (1.86)
Environmental dynamism		0.04 (0.63)		0.12* (2.06)		0.00 (0.31)	0.00 (-0.08)		0.01† (1.70)	0.01* (2.27)
EO × environmental dynamism							0.01** (3.08)			-0.01*** (-3.86)
R^2 (Adjusted R^2)	0.08 (0.04)	0.17 (0.12)	0.12 (0.08)	0.36 (0.32)	0.02 (-0.02)	0.03 (-0.03)	0.09 (0.03)	0.06 (0.02)	0.11 (0.05)	0.20 (0.14)
ΔR^2	-	0.09***	-	0.23***	-	0.00	0.07**	-	0.05*	0.09***

$^{\dagger}p < 0.10$, $^{*}p < 0.05$; $^{**}p < 0.01$; $^{***}p < 0.001$; unstandardized estimates are reported; t-values in parentheses; all significance tests are two-tailed.

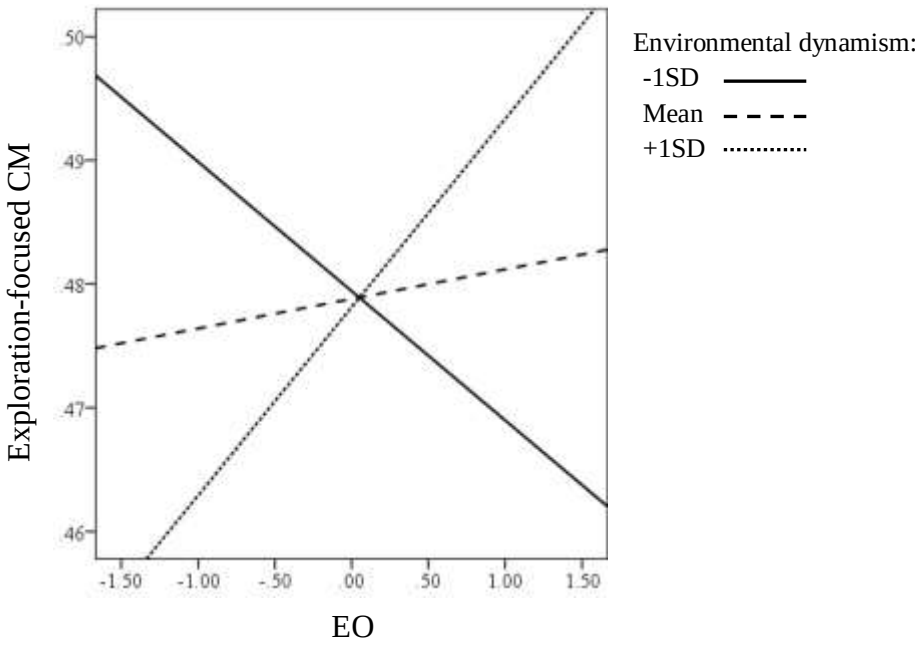

Figure 2.2a. Impact of EO × environmental dynamism on exploration-focused CM capability

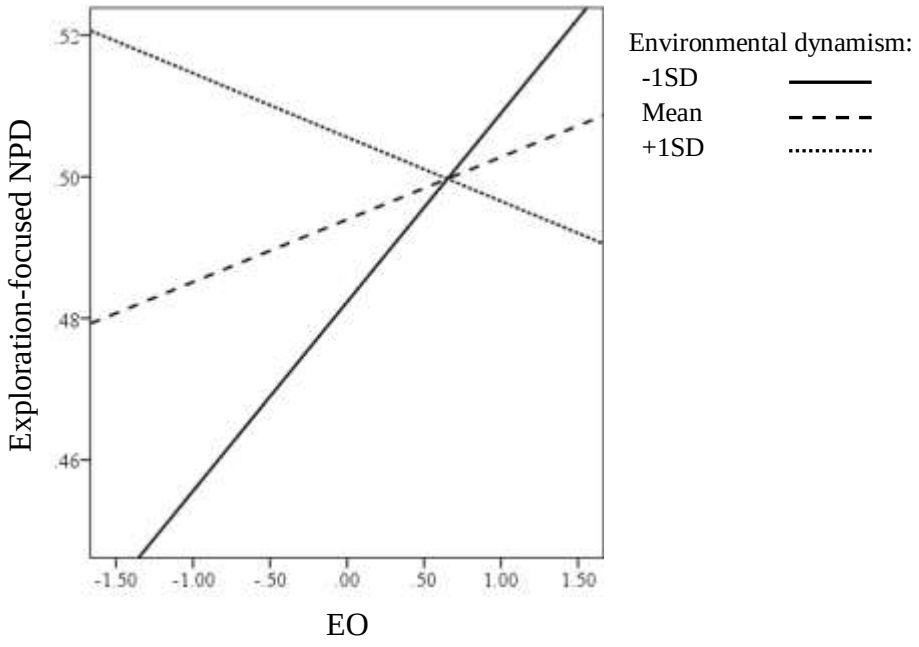

Figure 2.2b. Impact of EO × environmental dynamism on exploration-focused NPD capability

performance, my models explain 0.24 and 0.26 of the variance in these outcomes. The antecedents of CM and NPD capabilities in my models also explain 0.09 to 0.36 of variance in these capabilities. These effect sizes are considered moderate to large in social science and are consistent with other studies on capabilities and performance (e.g. Atuahene-Gima 2005; Lubatkin et al. 2006; Schilke 2014; Vorhies and Morgan 2005).

I also found significant effects for several control variables. In particular, competitive intensity has a marginal positive effect on CR performance ($b = 0.15$, $p < 0.1$). This is expected because firms try to keep their customers more satisfied when there is increased competition. In addition, CR performance is lower for firms that pursue only B2C markets ($b = -0.52$, $p = 0.05$). This is again not surprising given B2B firms and firms serving both markets are likely to have stronger customer relationships because B2B firms tend to deal with fewer customers who generally have larger purchases. Turning to NP performance, the only effect is from public firms who are marginally lower on this metric ($b = -0.41$, $p < 0.1$). In other relationships, the Sum_{E+E} for CM capability is marginally lower in B2C firms ($b = -0.42$, $p < 0.1$). This perhaps explains the lower CR performance in this type of organization given my results show that CR performance benefits from a higher Sum_{E+E} within CM. B2C firms have lower Sum_{E+E} within NPD ($b = -0.64$, $p < 0.01$) as do B2B firms ($b = -0.34$, $p < 0.1$). This latter result suggests that firms pursuing both B2C and B2B markets may have a higher Sum_{E+E} for NPD than firms pursuing only one. In addition, larger firms have higher Sum_{E+E} within NPD ($b = 0.24$, $p < 0.05$) than smaller firms. Larger firms are also and are less exploration-focused in CM ($b = -0.01$, $p < 0.1$) and more exploration-focused in NPD ($b = 0.02$, $p < 0.01$) than smaller firms.

2.5.4 Additional analysis

Because of my findings to this point, I tested for any invested U-shaped relationship between imbalance and performance. The highest effect occurs when the firm has balanced exploration and exploitation within each capability. The results show no support for an inverted U-shaped relationship. I also tested the relationships between EO, environmental dynamism, CM and NPD capabilities and performance in a moderated mediation framework. Preacher, Rucker, and Hayes (2007) recommend use of the bootstrapping method over normal-theory methods when testing indirect effects because it makes no assumptions about the shape of the sampling distribution. I performed this test using Hayes' Process moderated mediation model with 10000 bootstraps (Hayes, 2013). The findings (Table 2.5) show that: 1) EO has a positive effect on CR performance through the Sum_{E+E} for CM capability, 2) the Sum_{E+E} for NPD capability positively mediates the relationship between EO and NP performance, and 3) EO is negatively related to NP performance through exploration-focused NPD capability when environmental dynamism is low.

2.6. Discussion

This research conceptualizes and investigates: 1) the relationship between a firm's ambidextrous marketing capabilities and performance; and 2) how these capabilities are influenced by entrepreneurial orientation and environmental dynamism.

My findings offer several contributions. For CM, a higher sum of customer exploration and customer exploitation improves CR performance but an imbalance has no impact. Given that most of the firms in the sample combine exploration and exploitation activities, this result shows that firms combining customer exploitation with customer exploration will not lose CR

Table 2.5. Conditional indirect effect of EO on performance

	Moderator	**Conditional indirect effect**					
	Environmental dynamism	CR performance			NP performance		
Mediators		Effect (SE)	LLCI95	ULCI95	Effect	LLCI95	ULCI95
Sum_{E+E} within CM capability	-1.13 (-1SD)	0.08 (0.05)	0.01	0.20	0.04 (0.03)	0.00	0.14
	0 (Mean)	0.10 (0.05)	0.04	0.22	0.05 (0.04)	0.00	0.15
	1.13 (+1SD)	0.13 (0.07)	0.02	0.29	0.06 (0.05)	0.00	0.19
Sum_{E+E} within NPD capability	-1.13 (-1SD)	0.02 (0.06)	-0.07	0.16	0.11 (0.06)	0.03	0.25
	0 (Mean)	0.02 (0.05)	-0.07	0.15	0.11 (0.05)	0.02	0.22
	1.13 (+1SD)	0.02 (0.06)	-0.07	0.16	0.11 (0.06)	0.02	0.25
Exploration-focused CM capability	-1.13 (-1SD)	0.02 (0.02)	-0.01	0.11	0.02 (0.02)	-0.01	0.09
	0 (Mean)	-0.01 (0.01)	-0.05	0.01	0.00 (0.01)	-0.05	0.01
	1.13 (+1SD)	-0.03 (0.03)	-0.13	0.01	-0.03 (0.03)	-0.11	0.01
Exploration-focused NPD capability	-1.13 (-1SD)	-0.07 (0.04)	-0.18	0.00	-0.07 (0.04)	-0.17	-0.01
	0 (Mean)	-0.02 (0.02)	-0.11	0.00	-0.02 (0.02)	-0.10	0.00
	1.13 (+1SD)	0.02 (0.03)	-0.02	0.11	0.02 (0.03)	-0.02	0.09

Unstandardized estimates are reported; control variables: firm age, firm size, competitive intensity, B2B, B2C, public; LLCI (ULCI): lower level (upper level) bias-corrected 95% confidence intervals (number of bootstraps = 10000); bootstrapping standard errors in parentheses.

performance even if they emphasize exploration over exploitation. This may be because these firms are able to find attractive new markets that value the firm's offerings and are kept satisfied through the firm's customer exploitation activities. For NPD capability, a higher Sum_{E+E} improves NP performance but an imbalance towards exploration is deleterious. Given the consistent and positive performance of Sum_{E+E} for both CM and NPD, my results offer support for recent arguments that the sum of exploration and exploitation in a capability rather than balance is more important to performance advantage (Birkinshaw and Gupta, 2013; Junni et al., 2013; O'Reilly and Tushman, 2013). In the context of two core marketing capabilities, I also offer new evidence that an imbalance between exploration and exploitation can differentially affect performance (Josephson et al., 2015; Junni et al., 2013).

As a second contribution, my findings demonstrate the insight that comes from examining ambidexterity in a way that integrates organizational and environmental influences. This supports recent arguments on the importance of cultural factors in enhancing ambidexterity (Benner and Tushman, 2015; O'Reilly and Tushman, 2013). My findings show that when a firm has a higher EO, the Sum_{E+E} for both types of capabilities is enhanced. In terms of (im)balance, a higher EO strengthens an NPD- but not CM- imbalance towards exploration. In contrast, EO is positively associated with exploration-focused CM capability under conditions of environmental dynamism, while its effect on exploration-focused NPD is diminished. The unexpected effect of EO on exploration-focused NPD in dynamic environments may be explained by Schilke's (2014) finding that the effect of product exploration on performance decreases in dynamic environments. In other words, entrepreneurially-oriented firms may intentionally reduce their emphasis on product exploration over product exploitation under conditions of environmental dynamism. Of note, the small effects of EO on exploration-focused imbalances should not be

considered negligible because: 1) I have reported unstandardized estimates and the small effects are due to the difference in scales, and 2) the results show that a unit change in exploration-focused NPD capability can have a substantial effect on performance.

Third and related to the above, I show how the Sum_{E+E} and imbalance within CM and NPD mediate the relationship between EO and both CR and NP performance under different environmental conditions. This highlights arguments in resource-based theory that merely having resources (such as capabilities) does not lead to performance advantage. The combination of exploration and exploitation within capabilities is one way that firms can increase the value of their resources and protect against imitation (Gruber, Heinemann, Brettel, and Hungeling, 2010; Kozlenkova et al., 2014). In particular, in an era of temporary competitive advantage, combining exploration and exploitation activities in the market and product domains is an essential asset (Day, 2014). I found that without EO, a firm's CR and NP performance is consistently diminished because of a lower Sum_{E+E} for each of CM and NPD. These results are in line with other research in marketing regarding the important role of EO in marketing strategy (e.g. Matsuno, Mentzer, and Özsomer, 2002; Zhou et al., 2005). However, because I study EO in a different context, I add to the knowledge that there are a variety of mechanisms through which EO can enhance performance. As seen here, entrepreneurially-oriented firms have marketing capabilities that increase customer satisfaction and retention, metrics critical to many firms.

Finally, I offer insight into past mixed findings regarding the impact of EO (Rauch et al., 2009) by suggesting that if studies do not consider contingencies such as those explored here, they may not find a positive relationship between EO and performance. For instance, Wiklund and Shepherd (2005) do not find that 'environmental dynamism' moderates the EO-performance relationship. However, my examination shows that when the firm is entrepreneurially-oriented in

a dynamic environment, there are inconsistent effects on the exploration-exploitation imbalance within CM and NPD. Furthermore, although EO is positively associated with both customer relationship and new product performance through CM and NPD's Sum_{E+E}, it is negatively associated with NP performance when environmental dynamism is low. This is because EO increases the emphasis on product exploration. Together, these results shed some light on the upsides and downsides of an entrepreneurial orientation.

2.7. Managerial implications

My research has useful implications for managers. Firms should increase exploration and exploitation activities to enhance their CM and NPD capabilities. However, because an exploration-focused imbalance in NPD negatively affects NP performance, firms faced with limited resources could emphasize product exploitation relative to exploration, at least in the short term. Such a strategy does not necessarily require a high (or perhaps risky) investment. My findings are different for CM capability because imbalance had no performance impact. Thus, firms might make trade-offs between exploratory or exploitative activities in customer management without reducing CR performance. For example, firms that emphasize efforts to find new customers and markets can identify those who value their market offer. Similarly, those that focus on existing customers can offer products that are valued by those customers by learning about their needs, wants and preferences (Ernst, Hoyer, Krafft, and Krieger, 2011; Reimann et al., 2010). Both approaches enhance the likelihood of customer satisfaction and retention.

My findings also reinforce Day's (2011) arguments that to create competitive advantage, firms need to engage in adaptive experimentation (e.g. by being innovative and risk-taking) and

vigilant market learning (e.g. by being proactive). Therefore, managers should invest in EO-related initiatives to enhance the Sum_{E+E} for their different marketing capabilities and in turn, improve performance. At the same time, managers in firms with a high level of EO may consider reducing it when the environment becomes stable because the cost of that orientation will not pay off in terms of marketing outcomes.

2.8. Limitations and suggestions for future research

Certain limitations are relevant to my study; limitations that also create opportunities for future investigation. First, I employed different time frames for my independent and dependent variables to help address concerns associated with using cross-sectional data to test relationships. Future research could employ longitudinal data to enrich these results. Second, I focused on two marketing capabilities. Others (e.g. brand management, channel management) also warrant investigation given their important role in the organization (Morgan, 2012). Third, I tested the effect of environmental dynamism in this study and controlled for competitive intensity. Future research should investigate other factors that might impact the Sum_{E+E} and balance within marketing capabilities that are potentially ambidextrous. For example, it would be appropriate to study the EO-capabilities-performance relationship in different contexts given the potential influence of (e.g.) regulatory environments or cultural norms on entrepreneurial and marketing behaviour.

2.9. Appendix: Measurement items

Items	Factor Loading	α	CR	AVE
Market uncertainty		0.82	0.85	0.59
Customer needs and product preferences changed quite rapidly	0.68			
Customer product demands and preferences were highly uncertain	0.93			
It was difficult to predict changes in customer needs and preferences	0.77			
Market competitive conditions were highly unpredictable	0.67			
Technological turbulence		0.88	0.89	0.68
It was very difficult to forecast technology developments in our industry	0.55			
The technology environment was highly uncertain	0.90			
Technological developments were highly unpredictable	0.93			
Technologically, our industry was a very complex environment	0.87			
Entrepreneurial orientation		0.79	0.89	0.74
Innovativeness				
In general, the top managers of our firm have favored . . . A strong emphasis on the marketing of tried-and-true products 1 2 3 4 5 6 7 A strong emphasis on R&D, technological leadership, and innovations	0.47			
Proactiveness	0.88	0.72	0.76	0.51
In dealing with its competitors, our firm . . . Has typically responded to actions which competitors initiate 1 2 3 4 5 6 7 Has typically initiated actions to which competitors then respond	0.72			
In dealing with its competitors, our firm . . . Has seldom been the first business to introduce new products, administrative techniques, operating technologies, etc. 1 2 3 4 5 6 7 Has often been the first business to introduce new products, administrative techniques, operating technologies, etc.	0.64			
In general, the top managers of our firm have had . . . A strong tendency to "follow the leader" in introducing new products or ideas 1 2 3 4 5 6 7 A strong tendency to be ahead of other competitors in introducing novel ideas or products	0.77			
Risk-taking	0.94	0.83	0.83	0.63
In general, the top managers of our firm have had . . . A strong inclination for low-risk projects (with normal and certain rates of return) 1 2 3 4 5 6 7 A strong inclination for high-risk projects (with chances of very high returns)	0.68			
In general, the top managers of our firm have believed that …	0.85			

Owing to the nature of the environment, it is best to explore it gradually via cautious, incremental behavior 1 2 3 4 5 6 7 Owing to the nature of the environment, bold, wide-ranging acts are necessary to achieve the firm's objectives				
When confronted with decision-making situations involving uncertainty, our firm … Has typically adopted a cautious, "wait-and-see" posture in order to minimize the probability of making costly decisions 1 2 3 4 5 6 7 Has typically adopted a bold, aggressive posture in order to maximize the probability of exploiting potential opportunities	0.83			
Customer exploration		0.79	0.81	0.68
Our firm has used new ways to satisfy customer needs [a]				
Our firm has acquired new customer segments	0.90			
Our firm has entered new markets	0.75			
Customer exploitation		0.87	0.85	0.59
Our firm had systems to better understand and serve its customers [a]				
Our firm has routinely established a "dialogue" with target customers	0.72			
Our firm has focused on meeting customers' long term needs to ensure repeat business	0.84			
Our firm has worked systematically to maintain loyalty among attractive customers	0.81			
Our firm has routinely enhanced the quality of relationships with attractive customers	0.69			
Product exploration		0.78	0.81	0.60
Our firm has introduced new generations of products	0.78			
Our firm has extended its product range	0.93			
Our firm has entered new technology fields	0.57			
Product exploitation		0.87	0.90	0.63
Our firm has improved existing product quality	0.85			
Our firm has reduced production costs	0.75			
Our firm has improved production flexibility	0.88			
Our firm has improved yield	0.88			
Our firm has reduced material consumption	0.59			
Customer relationship performance *(Relative to stated objectives in the last 2 years: 1 = Worse, 4 = As planned, 7 = Better)*		0.84	0.85	0.73
Customer satisfaction	0.86			
Customer retention	0.85			
New product performance *(Relative to stated objectives in the last 2 years: 1 = Worse, 4 = As planned, 7 = Better)*		0.80	0.78	0.55
Speed of new product development	0.70			
Product quality	0.81			

Value of products to customers (quality/price)	0.71			
Competitive intensity		0.77	0.76	0.52
Competition in our industry was intense	0.80			
Anything that one competitor offered to the market, others readily matched	0.72			
Price competition was a major characteristic of our industry	0.64			
In our industry, one heard of a new competitive move almost every day [a]				

All multi-item scales are measured using seven-point Likert scale (1 = Strongly Disagree, 7 = Strongly Agree) unless otherwise noted.

[a] Removed from analysis.

CR = Composite reliability; AVE = Average variance extracted; All factor loadings are significant at $p < 0.001$.

Chapter 3

PERFORMING UNDER (INSTITUTIONAL) PRESSURES: HOW TOP MANAGEMENT TEAM COMPOSITION AFFECTS PRODUCT EXPLORATION

3.1. Abstract

Product exploration is an essential component of a firm's ambidextrous NPD capability. However, recent research shows that many firms are less ambidextrous than others because they have lower levels of product exploration. In this study, I draw on institutional theory and upper echelons theory to conceptualize and examine influences on product exploration in NPD. I study: 1) how product exploration is influenced by institutional pressures and the composition of the top management team (TMT); and 2) how product exploration mediates the effect of these factors on firm performance. My findings from a cross-industry sample of U.S. manufacturers show that when mimetic and coercive pressures on the firm are inconsistent, those with a more heterogeneous TMT have higher levels of product exploration and in turn, performance. These and other results offer new insights on how certain contextual influences on product exploration interact with firm-specific factors. They also help explain past contradictions regarding the effects of institutional pressures as well as TMT heterogeneity on firm performance.

Keywords: new product development capability, product exploration, organizational ambidexterity, institutional pressures, institutional complexity, top management team

3.2. Introduction

Ambidexterity is the organizational capability that combines two potentially opposing activities: 1) exploration; and 2) exploitation (Jansen et al., 2009; Patel et al., 2012; Teece, 2014). As recently observed by Reeves and Harnoss (2015), S&P 500 firms characterized as ambidextrous outperform their peers. These results are consistent with the meta-analysis by Junni et al. (2013) that shows the positive effect of ambidexterity on performance. Although an ambidextrous firm is able to pursue both exploration and exploitation, recent research- both theoretical and empirical- suggests that some firms are less ambidextrous because they lack investment in exploration (Danneels and Sethi, 2011; Reeves and Harnoss, 2015). Why however, do some firms have a higher level of product exploration than others? Some research suggests the answer lies in organizational characteristics. Examples include top management team advice seeking (Alexiev, Jansen, Van den Bosch, and Volberda, 2010) and future oriented market scanning (Danneels and Sethi, 2011).

These studies provide important insights but the impact of the firm's external institutional context is less understood (Benner and Tushman, 2015; Greenwood, Raynard, Kodeih, Micelotta, and Lounsbury, 2011; O'Reilly and Tushman, 2013). The importance of understanding external influences is reinforced by a recent report from McKinsey & Company indicating that customer and competitive demands– both forms of institutional pressure– are among the top three factors influencing how firms prioritize the development of their capabilities (Benson-Armer, Otto, and Webster, 2015). Important to my research is that these pressures may align or diverge. If they are incompatible, a complex environment is created for the firm. As such, it is both theoretically and practically relevant to investigate the relationship between a firm's capabilities and the institutional forces it must work within.

In this research, I study product exploration, an essential dimension of new product development (NPD) ambidexterity. Product exploration is a potential source of performance

advantage for most organizations (Atuahene-Gima, 2005; Schilke, 2014). I am guided by three research questions. First, I ask: *How do institutional pressures affect product exploration?* I apply DiMaggio and Powell's (1983) arguments regarding institutional theory to study if product exploration is a result of efforts to copy competitors (mimetic isomorphism) or if it is impacted by political or power influences from suppliers and customers (coercive isomorphism).

Second, I ask: *How do incompatible mimetic and coercive institutional pressures affect product exploration?* That is, when their inconsistency creates a complex institutional environment by pulling or pushing the firm in different directions. As an example, the firm's main suppliers and customers may believe that it should offer innovative products yet the firm's main competitors have not taken this approach. This creates a complex situation for the firm in terms of determining its NPD strategy. Important here is that strategy and the development of capabilities rely on the firm's top management team (TMT). Thus, I follow Birkinshaw and Gupta (2013) as well as Smith and Tushman (2005) to argue that TMT composition influences the firm's efforts regarding product exploration in order to become ambidextrous. More specifically, upper echelons theory (Hambrick, 2007; Hambrick and Mason, 1984) helps me conceptualize how product exploration is influenced when incompatible mimetic and coercive pressures interact with TMT heterogeneity. I reason that because a heterogeneous TMT possesses diverse information, viewpoints and cognitive frames, and has access to varied network ties, it might be more beneficial in multifaceted situations (Cannella, Park, and Lee, 2008; Hmieleski and Ensley, 2007), such as institutional complexity.

Finally, my third research question is: *How is firm performance affected by the relationship between institutional pressures, TMT heterogeneity and product exploration?* Addressing this question allows us to understand the conditions under which TMT

composition is more influential in terms of increasing product exploration and performance. If institutional pressures together with TMT heterogeneity explain differences in product exploration, they should lead to performance differences across firms.

My main contributions are as follows. First, I offer new empirical insight on the effect of institutional pressures on product exploration. This informs the NPD and ambidexterity literatures where institutional pressures are understudied (Birkinshaw and Gupta, 2013). Second, I present a conceptualization of institutional complexity based on the (in)compatibility of mimetic and coercive pressures. This allows us to study NPD when mimetic pressure is high and coercive pressure is low, or vice versa. From this base, my third contribution is that I show how TMT heterogeneity affects product exploration under institutional complexity. This offers new insight into the controversy in the upper echelons literature that debates the effects of TMT heterogeneity (Boone and Hendriks, 2009; Certo, Lester, Dalton, and Dalton, 2006). Fourth, I demonstrate how product exploration mediates the TMT-performance relationship, again under conditions of institutional complexity. This offers what I consider to be a necessary integrative perspective when examining NPD because it highlights the performance influence of both internal and external factors.

In the next section, I provide the theory and my hypotheses. The method and results are then presented. The paper concludes with implications for research and practice.

3.3. Theory and hypotheses

The literature on organizational ambidexterity generally draws on March's (1991) argument that firms should explore new possibilities and exploit old certainties. It also uses Tushman and O'Reilly's (1996) work on "how companies could manage both evolutionary and revolutionary change processes" (Birkinshaw and Gupta, 2013, p. 288). In recent years, numerous studies have been conducted on organizational ambidexterity, examining its

outcomes (e.g., Cao, Gedajlovic, and Zhang, 2009; He and Wong, 2004; Jansen et al., 2012), antecedents (e.g., Carmeli and Halevi, 2009; Jansen et al., 2009), or both (e.g., Gibson and Birkinshaw, 2004; Lubatkin et al., 2006).

Although research on ambidexterity continues, Reeves and Harnoss (2015) show that U.S. firms struggle to maintain exploration as they grow, leading them to become less ambidextrous. They observe an average 7% reduction in the level of exploration across S&P 500 firms in the last 10 years; a pattern consistent with other arguments that innovation exploitation— rather than exploration— is widespread in almost every industry because it is less costly and risky, and its benefits are more immediate (Atuahene-Gima, 2005; Danneels, 2008; Fernhaber and Patel, 2012). If a firm's ability to become ambidextrous is due to a lack of investment in product exploration, we need to understand the factors that affect the extent of product exploration within firms (Danneels and Sethi, 2011).

Following from the above, my research focuses on product exploration because the ability to develop new products has important implications for performance advantage (Atuahene-Gima, 2005; Schilke, 2014), and exploration is a core dimension of ambidexterity. From a theoretical perspective, NPD is a process that is adapted in response to the environment (Schilke, 2014). This is relevant given my interest in institutional influences and the role of the firm's decision-makers in determining NPD strategy. I follow Schilke (2014, p. 183) to consider NPD as the "organizational routines that purposefully reconfigure the organizational product portfolio". Product exploration refers to the extent of diversity and newness in the firm's products and technologies (Atuahene-Gima, 2005; Voss and Voss, 2013).

Although the performance advantage of product exploration is documented in past literature, more research is needed to uncover what influences this capability (Atuahene-Gima, 2005; Birkinshaw and Gupta, 2013; Danneels and Sethi, 2011). My interest here is the

understudied effect of institutional pressures (Benner and Tushman, 2015; Greenwood et al., 2011; O'Reilly and Tushman, 2013). These pressures are mimetic, coercive, or normative (DiMaggio and Powell, 1983). In this study, I focus on mimetic and coercive pressures.[2]

Mimetic isomorphism or change occurs when firms model themselves after the competition (Mizruchi and Fein, 1999). Coercive isomorphism stems from political influences and the problem of legitimacy; it "regulates behavior by setting rules, monitoring compliance, and sanctioning behavior" (Heugens and Lander, 2009, p. 63). I believe there is a need to understand the influence of these specific pressures on product exploration for two reasons. First, the uncertainties surrounding capability building predispose a capability such as product exploration to institutional isomorphism (Hsieh, Tsai, and Chen, 2015; Hsieh and Vermeulen, 2013). Second, institutional pressures may also be incompatible (where one is high and the other is low), placing the firm under tension. It then becomes important to study product exploration under this form of institutional complexity because even if incompatible, both pressures can still affect the firm (Greenwood et al., 2011; Pache and Santos, 2010; Raaijmakers, Vermeulen, Meeus, and Zietsma, 2015; Raffaelli and Glynn, 2014).

Firm behaviour and subsequent outcomes also depend on TMT composition and processes. This argument from upper echelons theory (Hambrick, 2007; Hambrick and Mason, 1984) is consistent with others in the organizational ambidexterity literature that the firm's ability to pursue exploration and exploitation lies in the firm's TMT (Andriopoulos and Lewis, 2009; Birkinshaw and Gupta, 2013; Cao, Simsek, and Zhang, 2010). I also recognize that organizational legitimacy is a burden on managers (Rojas, 2010). As a result, a firm might, through the decisions of its TMT, mimic a competitor or be coerced by a supplier

[2] Normative pressure is associated with expectations of behaviours from (e.g.) industry associations and within the organization. As a result, factors within the organization (e.g., TMT's social capital) may be a source of it (DiMaggio and Powell, 1983; Mizruchi and Fein, 1999; Souitaris, Zerbinati, and Liu, 2012). Given I study how TMT heterogeneity influences product exploration, I exclude normative pressure in the model to avoid redundancies in my arguments.

or customer firm to follow certain strategies. In the context of NPD, it is the TMT that primarily influences how the firm reacts to such external pressures (Smith and Tushman, 2005). Accordingly, it is important to understand how TMT characteristics interact with incompatible institutional pressures to affect product exploration. My particular interest is in TMT heterogeneity.

TMT heterogeneity refers to diversity in the functional, educational, industry, and organization background of TMT members (Alexiev et al., 2010; Carpenter, 2002; Hmieleski and Ensley, 2007). Although numerous benefits have been attributed to TMT heterogeneity, such as diversity of network ties and breadth of information, it is also argued to be a source of conflict and a hindrance to timely decision-making (Cao et al., 2010; Hambrick, Humphrey, and Gupta, 2015; Hmieleski and Ensley, 2007). Cannella et al. (2008) therefore suggest different mechanisms and contextual factors underlie the TMT's effect on firm performance.

I argue that a heterogeneous TMT is more effective than a homogeneous one for enhancing the level of product exploration under institutional complexity. This is because the TMT's strategic response to the environment is influenced by the backgrounds and experience of its team members (Peng and Luo, 2000). That is, the members of a heterogeneous TMT have access to diverse sources of information and are able to generate various strategic alternatives (Carpenter, 2002; Hmieleski and Ensley, 2007). This helps the firm to overcome tensions and handle uncertainty in a complex institutional environment (Smith and Lewis, 2011). As a result, I reason the firm is open to developing strategies involving product exploration.

In the remainder of this section, I develop my hypotheses. The research model is presented in Figure 3.1.

3.3.1 Do mimetic and coercive pressures affect product exploration?

Firms within an industry face similar (e.g.) technological or regulatory conditions and are thus likely to imitate their successful competitors (Raffaelli and Glynn, 2014). In other words, mimetic pressures stem from practices that are perceived to be popular or successful. These pressures stimulate the copying and further adoption of those practices within the same industry (Heugens and Lander, 2009), and a firm may imitate widespread behaviour to mitigate risk and maintain their position by neutralizing the actions of competitors (Abrahamson, 1991; Lieberman and Asaba, 2006). This occurs for costly and risky practices with uncertain outcomes (Hsieh and Vermeulen, 2013; Lieberman and Asaba, 2006). Consistent with this logic, if a firm's competitors are successfully exploring new products, the firm is likely to increase its level of product exploration with an imitative response. This leads me to suggest that:

> *H_{1a}: Mimetic pressure is positively related to the level of product exploration by the firm.*

Coercive pressure influences the firm based on a different logic. It regulate behaviour by setting expectations and sanctioning noncompliance (Heugens and Lander, 2009). Coercive isomorphism is a result of both formal and informal pressures exerted on firms by: 1) others upon which they are dependent; and 2) cultural expectations in the society within which they function (DiMaggio and Powell, 1983; Souitaris et al., 2012). In a marketing context, the firm's main customers and suppliers provide coercive pressure (e.g., Wathne and Heide, 2004). That is, firms may be controlled and monitored by these stakeholders and forced to realign their behaviour when they do not perform to expectations (Gilliland, Bello, and Gundlach, 2010; Teo, Wei, and Benbasat, 2003). For instance, customers are the source

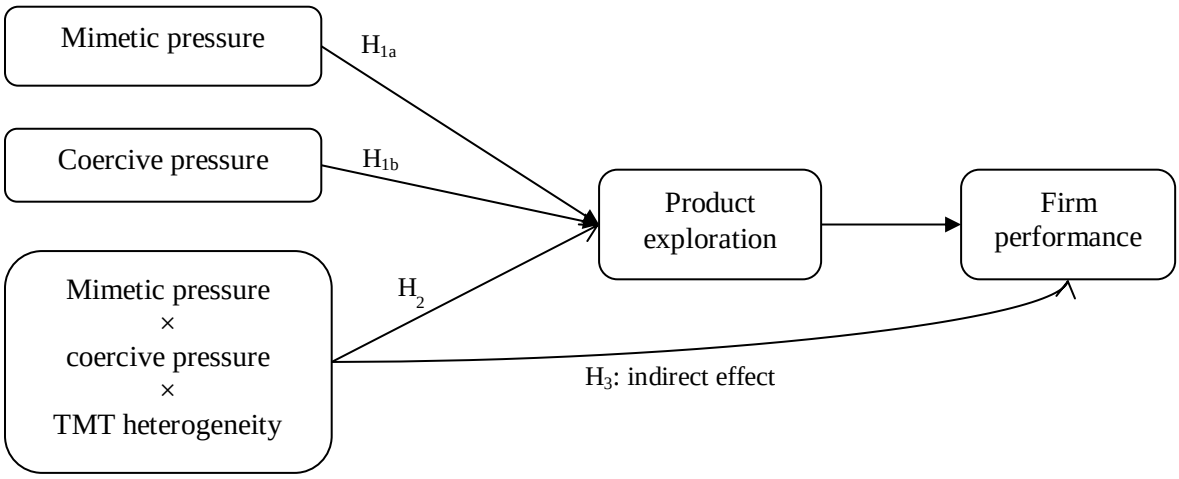

Figure 3.1. Research model

of revenue for firms, and can sanction firms by not purchasing products that do not perform to expectations. Coercive pressures may also constrain a firm's activities (McFarland, Bloodgood, and Payan, 2008). Thus, if a firm's customers and/or suppliers do not support product exploration, the firm is less likely to engage in this activity because information from suppliers and customers is needed for exploration (Jeong, Pae, and Zhou, 2006). Turning this around, if suppliers and/or customers do in fact, support product exploration, they may exert coercive pressure accordingly. In this situation, suppliers and customers are more likely to provide NPD-related information, leading to more effective cooperation and coordination with the firm (Hansen, 2002; Mohr, Fisher, and Nevin, 1996; Paulraj, Lado, and Chen, 2008). This in turn benefits product exploration. Therefore, I hypothesize that:

H_{1b}: Coercive pressure is positively related to the firm's level of product exploration.

3.3.2 How does incompatibility between pressures affect product exploration?

What happens when the institutional environment for the firm is complex, e.g. when coercive pressure is high but mimetic pressure is low (or vice versa)? This complexity places the firm under tension (Greenwood et al., 2011), and pulls it in different directions. As an example, assume suppliers and/or customers support exploration. The firm feels coercive pressure because it depends on these relationships for resources (Raaijmakers et al., 2015). At the same time, if competitors have struggled with exploration or taken a different strategy, mimetic pressure may feel low. In this type of complex institutional environment, it is difficult for managers to track cause-effect relationships and consider the full range of possibilities (Lieberman and Asaba, 2006).

To understand how incompatible institutional pressures influence product exploration, I turn to diversity in the firm's TMT. My rationale for studying TMT composition is that top managers make decisions based on their cognitive frames; frames formed by their values and backgrounds (Talke, Salomo, and Kock, 2011). Thus, a heterogeneous TMT brings different perspectives to decision-making and is more capable of generating strategic alternatives (Carpenter, 2002). This enables the resolution of complex problems (Cannella et al., 2008; Talke et al., 2011).

Consequently, I argue that a heterogeneous TMT is beneficial. This is in part, because diversity in the TMT will enhance the variety in network ties and accordingly, the diversity of information (Land, Engelen, and Brettel, 2012; Talke et al., 2011) and the firm's responsiveness (Gu, Hung, and Tse, 2008). A heterogeneous TMT with diverse viewpoints and cognitive frames should also lead to more comprehensive strategic decisions in complex institutional environments (Cannella et al., 2008; Hmieleski and Ensley, 2007). This mitigates the risk of perhaps naïvely following the competition or acquiescing to suppliers

and customers. In addition, TMT members with diverse backgrounds have a greater ability to take into account both competition and alignment with suppliers and customers, given their ability to generate alternative strategies and solve complex problems (Cannella et al., 2008; Hmieleski and Ensley, 2007). Therefore, instead of resisting pressures or delaying decision-making to buffer uncertainty caused by institutional complexity (Oliver, 1991; Raaijmakers et al., 2015), a heterogeneous TMT is more likely to develop strategies that involve product exploration. This leads to my next hypothesis:

> *H_2: When mimetic and coercive pressures are incompatible (i.e. one is high and the other is low), firms with higher TMT heterogeneity have a higher level of product exploration.*

3.3.3 How is performance affected by the relationship between institutional pressures, TMT heterogeneity and product exploration?

Certo et al.'s (2006) meta-analysis shows TMT heterogeneity has a modest effect on firm performance but generally, findings regarding the TMT's impact have been inconclusive (Boone and Hendriks, 2009; Cannella et al., 2008). This suggests that other mechanisms and contextual factors underlie the TMT's effect on performance (Cannella et al., 2008). The same arguments apply to the effect of institutional pressures. Although we know that firm behaviour is affected by such pressures, the mechanisms and contextual factors that lead them to influence performance are yet to be understood (McFarland et al., 2008). Here, I argue that TMT heterogeneity and institutional pressures are associated with performance through product exploration. That is, when mimetic and coercive pressures are incompatible, firms with a more heterogeneous TMT perform better. This is because they have higher levels of

product exploration, and product exploration results in better firm performance (Cao et al., 2009; Schilke, 2014). Therefore, I hypothesize that:

> *H_3: When mimetic and coercive pressures are incompatible, firms with higher TMT heterogeneity outperform other firms, mediated by higher levels of product exploration.*

3.4. Methodology

3.4.1 Data collection

The data for this research are obtained from U.S. manufacturing firms. Consistent with most research of this type, data were collected using the survey method. Here, I employed two rounds of data collection using online surveys hosted by the market research firm Research Now. The first round collected data for all variables of interest. The second round (one year later) was conducted to help assess the reliability of my data.

In Round 1, an invitation was sent to the members of the Research Now national respondent pool. This resulted in 917 potential respondents incentivized by Research Now. Of these, 229 (25%) qualified for this study and I received 141 (62%) usable responses. I assessed nonresponse bias by comparing early and late respondents on all variables. No significant difference was found ($p < 0.05$).

To qualify for the study, firms were single business units or autonomous business units within larger firms to ensure that exploration and exploitation are pursued within the same business unit (Vorhies et al., 2011). For the same reason, I excluded joint ventures and firms that obtain resources, ideas, and technology from a larger organization. Because young firms are prone to liability of newness (Peng and Luo, 2000) and may perceive the environment differently than older firms, I followed Zahra et al. (2000) to exclude firms six

years or younger. I also excluded firms with 20 employees or less, as per Davidsson (1989), because their reactions to the environment may be different from those of their larger counterparts. Very small firms may be unable to pursue diverse strategies due to a lack of network ties and resources (Sheng et al., 2011) and they may not operate with a TMT (Boone and Hendriks, 2009). Finally, service firms were excluded because the nature of NPD and the relationships of these firms with their suppliers might be fundamentally different from manufacturing firms.

The final sample includes different industries (e.g. automotive, electronics, food, beverage, chemicals, computers). This ensures variation in the environmental conditions of the firms under study. The median firm age is 37 years and median size is 250 employees (65 percent of the firms have less than 500 employees). Nearly half the firms serve business markets (48%) while 33 percent focus on consumer markets and 19 percent serve both.

My respondents were senior managers knowledgeable about the strategic actions within their firm (e.g., senior marketing managers, general managers). Their experience with their current firm and industry averaged 14.02 and 21.07 years respectively. Data regarding firm age and size was obtained for 58 of the sample firms using public and archival sources. The correlations between the secondary data and the survey data were 0.89 and 0.98 for age and size respectively. This cross-validation ensures the accuracy of the survey data. Respondents also self-reported their knowledge by answering: "How knowledgeable were you on the issues covered in this survey?" with a seven-point scale (1 = "not at all knowledgeable" and 7 = "highly knowledgeable"). The mean score on this item was 6.06.

3.4.2 Measures

All scales are either adopted or adapted from prior literature. The measurement items (see Appendix) use seven-point Likert scales (1 = strongly disagree, 7 = strongly agree) unless

otherwise noted. In Round 1 of data collection, respondents were asked to consider two time frames: 1) the last five years for independent and moderator variables; and 2) the last two years for product exploration and firm performance. This reduces the likelihood that the outcome variables occurred at the same time as the independent and moderator variables. This approach was used because for research in marketing, entrepreneurship and strategic management studying capabilities and performance, two time frames typically used to measure variables are five years (e.g., Covin and Wales 2012; Drechsler et al. 2012; Fang et al. 2011; Gibson and Birkinshaw 2004) and two years (e.g. Voss and Voss 2008; Zhou et al. 2005). Also, providing a temporal reference points is appropriate when assessing firm-level variables (Patel et al. 2012). I pre-tested the survey with a panel of four academic experts and four industry experts to ensure face validity. This led to minor changes in wording.

The primary dependent variable is *firm performance*. Consistent with other research on NPD and product exploration (e.g., Gruber et al., 2010; Lubatkin et al., 2006; e.g., Schilke, 2014), I use subjective performance measures. I adapted four items from De Luca and Atuahene-Gima (2007) and Verhoef and Leeflang (2009) to assess firm performance relative to a set of stated objectives (1 = worse, 4 = as planned, 7 = better). I cross-checked this performance measure by asking two additional questions adopted from Jaworski and Kohli (1993). These assess: 1) the overall performance of the firm (1 = poor, 4 = average, 7 = excellent), and 2) the overall performance of the firm relative to major competitors (1 = much worse than major competitors, 4 = same as major competitors, 7 = much better than major competitors). Cronbach's alpha for these two items is 0.80. The correlation between the scale capturing performance relative to objectives and the general performance measure is 0.76 ($p < 0.001$). I used their average for the overall performance of the firm.

Product exploration is measured with three items adapted from He and Wong (2004) and Schilke (2014). These assess the extent of newness and diversity in technologies and

products. *TMT heterogeneity* is measured with a four-item seven-point Likert type scale adapted from Heyden, Van Doorn, Reimer, Van Den Bosch, and Volberda (2013), Alexiev et al. (2010), and Talke et al. (2011). I asked an additional question to measure the overall background diversity in the TMT. The correlation between this item and the four-item scale is 0.51 ($p < 0.001$). I use the average of the four-item scale and overall scale to measure TMT heterogeneity.

The scales for *mimetic and coercive pressures* are adapted from prior literature. Mimetic pressure is usually measured along two dimensions: 1) the adoption of a practice by a firm's competitors, and 2) the perceived success of those firms after adopting the practice (Liang, Saraf, Hu, and Xue, 2007; Mizruchi and Fein, 1999; Raffaelli and Glynn, 2014; Teo et al., 2003). I used the exploration literature (e.g., Lubatkin et al., 2006) to adapt available measures to capture mimetic pressure. That is, Lubatkin et al. (2006) measure product exploration by asking if the company has created innovative products. The institutional theory literature measures the perceived success of competitors by asking if competitor firms have benefited from adopting a practice, how favourably they are perceived by their suppliers and customers, and the extent to which they have become competitive after adopting that practice (Liu, Ke, Wei, Gu, and Chen, 2010). Therefore, I adapted these measures for the context of product exploration to measure the perceived success of competitor firms after they have created innovative products. Coercive pressure assesses the extent to which the firm perceives its main suppliers and customers believe that a practice should be adopted by the firm (Liu et al., 2010; Teo et al., 2003). As with mimetic pressure, the measurement items for coercive pressure are adapted using the exploration literature. That is, the institutional theory literature measures coercive pressure by asking whether the firm's suppliers and customer believe it should engage in a practice. Accordingly, we asked respondents how much their suppliers and customers believe that the firm should create innovative products.

Several *control variables* are included in the analysis. *Firm age* may influence a firm's behaviour in building capabilities (Schilke, 2014; Zahra et al., 2000) and the response of older firms to their institutional environment may be different from that of their younger counterparts. Likewise, *firm size* may affect the extent of resources that firms commit for building capabilities such as product exploration (Schilke, 2014).

I also included *environmental dynamism*, which is assessed using the dimensions of market uncertainty and technological turbulence (Lavie, Stettner, and Tushman, 2010). Each dimension is measured with four items adapted from De Luca and Atuahene-Gima (2007) and Jaworski and Kohli (1993). The items for market uncertainty assess the rate of change in customer needs and preferences and the uncertainty surrounding them. Those for technological turbulence assess the changes and complexity in the firm's technological environment. In addition, *competitive intensity* may result in firms developing specific product development capabilities (Chandler and Hwang, 2015). For instance, if competitors involve in price wars, the firm may develop products that enable it to match its prices. It is measured with four items adapted from Jaworski and Kohli (1993). *TMT size* may also have an effect on firm capabilities and performance (Certo et al., 2006). It is measured using the number of TMT members (Marcel, 2009). Finally, a firm's *primary market* may influence the way it approaches NPD, as does the firm's status as *public or private*. To normalize the distribution of firm age, firm size, and TMT size, I use the logarithm of these measures.

3.5. Results

3.5.1 Reliability and validity

The scales for mimetic and coercive pressures are formative, as is TMT heterogeneity. Accordingly, I assessed their validity following the recommendations of Diamantopoulos and Winklhofer (2001). First, I specified the domain of these constructs using the literature and

examined their face validity through interviews with academic and industry experts. Second, I assessed multicollinearity by examining variance inflation factors (VIF). The highest VIF was 2.94, far below the recommended threshold of 10. Therefore, multicollinearity is not a concern in these constructs. Finally, I assessed external validity by examining their relationships to other constructs in a nomological network. TMT heterogeneity is expected to increase with an increase in the number of TMT members. The correlation between these two variables is significant ($r = 0.40$, $p = 0.000$) and consistent with other studies (e.g., Boone and Hendriks, 2009; Hmieleski and Ensley, 2007; Qian, Cao, and Takeuchi, 2013). On the other hand, mimetic and coercive pressures should be associated with environmental dynamism (Scherer, Palazzo, and Seidl, 2013; Smith and Lewis, 2011). The correlations between the two pressures and environmental dynamism are both significant ($r = 0.32$, $p = 0.000$; $r = 0.31$, $P = 0.000$). Therefore, these results provide support for the validity of these constructs.

I assessed my reflective scales using reliability estimates and by performing both exploratory and confirmatory factor analysis (CFA). This led to one item being deleted (see Appendix). The reliability coefficients of all variables are above 0.77. I performed CFA to further validate the measures and to establish convergent and discriminant validity. The model has an acceptable fit, with chi-square = 195.22, degrees of freedom = 118, $p = 0.00$, CFI = 0.94, GFI = 0.88, TLI = 0.93, and RMSEA = 0.07. All factor loadings are significant at $p < 0.001$. Composite reliabilities range from 0.79 to 0.90 and the average variance extracted (AVE) measures range from 0.51 to 0.69. These results provide evidence for convergent validity. I assessed discriminant validity by performing chi-square difference tests between restricted and unrestricted models for each pair of constructs in the CFA model (Anderson and Gerbing, 1988). For all pairwise comparisons, the unrestricted model is significantly better than the restricted model ($p < 0.01$).

As noted earlier, I contacted the same respondents one year after the initial survey to further assess the reliability of my data. They were invited to complete a survey that included the performance and product exploration items (see Yli-Renko et al. (2001) for a similar approach). I received 79 responses, representing a response rate of 56%. Respondents were instructed to provide answers in the same time frame that was used in the initial survey. The correlation between overall performance in the first and second rounds is 0.74 ($p = 0.000$); and the correlation for product exploration is 0.53 ($p = 0.000$).

Finally, I obtained sales growth data for 20 of the 58 sample firms that were previously examined with archival data. The correlation between the subjective and objective sales growth data is 0.65 ($p = 0.004$). This compares well with other research doing similar analysis. For instance, Schilke (2014) finds a correlation of 0.32 ($p \leq 0.01$) and Robson, Katsikeas, and Bello (2008) find a correlation of 0.67 ($p < 0.01$) between objective sales growth data and subjective performance data. Overall, the Round 2 results provide further support for the reliability of my data.

3.5.2 Common method variance (CMV)

I employed several methods to assess CMV given the data for independent and outcome variables are obtained from a single respondent within each firm. First, respondents assessed the same variables one year after the initial survey. The consistency of responses indicates that CMV is not likely to drive the results. This is because with temporal separation, respondents are not able to recall their previous responses (Podsakoff et al., 2003). Second, I used a marker variable (MV), following the recommendation by Lindell and Whitney (2001), and consistent with other research (e.g., Schilke and Cook, 2015; Sheng et al., 2011; Verhoef and Leeflang, 2009). An MV should be theoretically unrelated with at least one of the study's variables. Any observed correlation between the MV and that variable will be used to adjust

the correlations among the study's constructs. In this research, I use an item measuring economic confidence as MV: "How much confidence do you have in your national economy today?" This item is not theoretically related to the variables in this study and has previously been used as an MV in prior literature (e.g., Verhoef and Leeflang, 2009). The correlations between the MV and my key variables ranged from -0.10 to 0.08 with an average size of 0.06. None were significant ($p < 0.05$). As a methodological advantage, the MV can also serve as a filtering question that separates the flow of questions from predictors to outcome variables (Podsakoff et al., 2003). This temporal separation reduces the likelihood that respondents answered questions based on their prior responses.

Other considerations that reduce the effect of CMV include: 1) the correlation between objective and subjective sales growth data, 2) using knowledgeable respondents, 3) guaranteeing respondents complete anonymity, and 4) having interaction terms. Siemsen et al. (2010) investigate the influence of CMV on interaction effects and conclude: "there is no reason that common method bias would create an artificial interaction effect" (p. 470). Based on this, they note that in establishing interactions effects: "researchers should not be criticized for CMV." This suggests that CMV is not a major concern in my data. Table 3.1 presents the correlations and descriptive statistics for the study variables.

3.5.3 Hypothesis testing

Hierarchical regression analysis was used to test my hypotheses. To test for mediation, the bootstrapping method was employed. To mitigate endogeneity concerns, I used a two-stage least squares regression approach, consistent with other research (e.g., Luo et al., 2007; Menguc et al., 2014; Zhou and Li, 2012). Because institutional factors may influence the extent of heterogeneity within a firm's TMT (Menz, 2012), I regressed TMT heterogeneity on mimetic and coercive pressures to obtain residuals free from the influence of these

institutional factors. I then tested the main effects and interaction effects using residuals as the indicator of TMT heterogeneity. Table 3.2 summarizes the regression results. I first entered the control variables (model 1). This was followed by the main effects (model 2), two-way interactions (model 3) and three-way interaction (model 4).

The relationship between mimetic pressure and the firm's level of product exploration is not significant (b = 0.13, p = 0.153). Therefore, H_{1a} is not supported. However, the results provide partial support for H_{1b} because there is a weak positive relationship between coercive pressure and the firm's level of product exploration (b = 0.15, p = 0.093). In support of H_2, when mimetic and coercive pressures are incompatible (i.e. one is high and the other is low), firms with higher TMT heterogeneity have higher levels of product exploration. As seen in Figure 3.2, this effect disappears when both pressures are high or low (b = -0.34, p = 0.000).

To understand the slopes and significance levels of each condition in Figure 3.2, I ran Hayes' Process moderation model (Hayes, 2013). Here, I report beta coefficients, standard errors (SEs), p-value and confidence intervals (CIs). Results show that with a low coercive pressure, the effect of mimetic pressure on product exploration is negative when TMT heterogeneity is low (b = -0.52, SE = 0.27, p = 0.054, CI: -1.04-0.01), but it is positive when TMT heterogeneity is high (b = 0.50, SE = 0.23, p = 0.029, CI: 0.05-0.95). In other words, as the pressures become more incompatible, a heterogeneous TMT becomes more beneficial and a less heterogeneous TMT becomes detrimental to product exploration. On the other hand, with a high coercive pressure, the effect of mimetic pressure on the level of product exploration is positive when TMT heterogeneity is low (b = 0.55, SE = 0.14, p = 0.000, CI: 0.28-0.83). The coefficient becomes non-significant when TMT heterogeneity is high (b = -0.11, SE = 0.12, p = 0.355, CI: -0.35-0.13).

Table 3.1. Correlations and descriptive statistics

	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Firm age (log)	1.00												
2. Firm size (log)	0.31**	1.00											
3. B2B	0.05	-0.09	1.00										
4. B2C	-0.09	-0.08	-0.67**	1.00									
5. Public	0.19*	0.51**	-0.07	-0.06	1.00								
6. Environmental dynamism	-0.07	0.12	-0.09	0.03	-0.08	1.00							
7. Competitive intensity	0.06	0.08	0.01	-0.06	-0.10	0.30**	1.00	0.05					
8. TMT size (log)	0.11	0.51**	-0.07	-0.11	0.28**	0.12	0.05	1.00					
9. TMT heterogeneity	0.01	0.06	-0.08	-0.04	-0.02	0.02	0.01	0.40**	1.00				
10. Mimetic pressure	-0.03	0.24**	-0.12	0.05	0.19*	0.32**	0.17*	0.19*	0.06	1.00			
11. Coercive pressure	0.06	0.22**	-0.07	-0.01	0.15	0.31**	0.31**	0.13	0.11	0.29**	1.00		
12. Product exploration	0.00	0.28**	0.01	-0.18*	0.09	0.20*	0.02	0.29**	0.36**	0.22**	0.22**	1.00	
13. Firm performance	0.06	0.10	-0.05	-0.08	-0.03	-0.04	0.02	0.23**	0.27**	-0.02	0.07	0.27**	1.00
Mean	1.59	2.52	0.48	0.33	0.30	4.23	5.41	0.96	5.10	4.75	5.08	5.22	4.95
Standard deviation	0.31	0.89	0.50	0.47	0.46	1.13	1.05	0.43	1.11	1.04	1.11	1.16	1.01

*$p < 0.05$; **$p < 0.01$; all significance tests are two-tailed.

Table 3.2. Impact of institutional pressures TMT and heterogeneity on product exploration

	Dependent variable: product exploration			
Control variables	model 1	model 2	model 3	model 4
Firm age	-0.29 (-0.92)	-0.29 (-0.96)	-0.40 (-1.36)	-0.18 (-0.63)
Firm size	0.29* (2.08)	0.33* (2.42)	0.33* (2.45)	0.27* (2.11)
B2B	-0.23 (-0.91)	-0.12 (-0.48)	-0.16 (-0.65)	-0.16 (-0.71)
B2C	-0.58* (-2.12)	-0.51* (-2.00)	-0.58* (-2.24)	-0.52* (-2.12)
Public	-0.18 (-0.75)	-0.18 (-0.78)	-0.20 (-0.88)	-0.20 (-0.91)
Environmental dynamism	0.16† (1.87)	0.12 (1.36)	0.12 (1.39)	0.14† (1.70)
Competitive intensity	-0.08 (-0.83)	-0.12 (-1.31)	-0.12 (-1.32)	-0.08 (-0.89)
TMT size	0.41 (1.63)	-0.02 (-0.08)	0.02 (0.06)	-0.16 (-0.64)
Independent variables				
Mimetic pressure		0.13 (1.44)	0.14 (1.31)	0.11 (1.12)
Coercive pressure		0.15† (1.69)	0.15 (1.57)	0.21* (2.35)
TMT heterogeneity		0.33*** (3.74)	0.33*** (3.63)	0.48*** (5.24)
Mimetic pressure × coercive pressure			0.04 (0.47)	0.09 (1.10)
TMT heterogeneity × mimetic pressure			-0.18* (-2.44)	0.08 (0.86)
TMT heterogeneity × coercive pressure			-0.02 (-0.21)	-0.10 (-1.28)
Mimetic pressure × coercive pressure × TMT heterogeneity				-0.34*** (-4.28)
R^2	0.17	0.28	0.32	0.41
Adjusted R^2	0.12	0.22	0.24	0.37
ΔR^2	-	0.11	0.04	0.09
F change	3.43***	6.59***	2.32†	18.35***

$^{\dagger}p < 0.10$, $^{*}p < 0.05$; $^{**}p < 0.01$; $^{***}p < 0.001$. Unstandardized estimates and t-values (in parentheses) are reported; all significance tests are two-tailed.

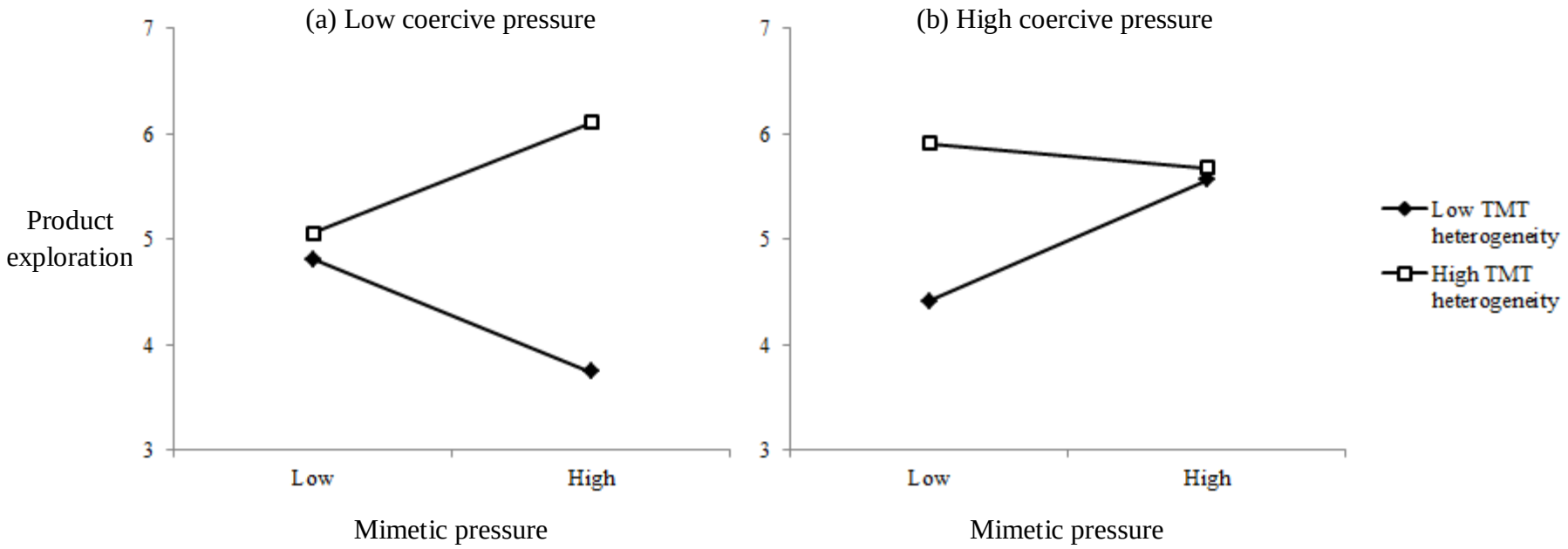

Figure 3.2. Impact of mimetic pressure × coercive pressure × TMT heterogeneity on product exploration

To test how a firm's product exploration mediates the effect of the interaction between mimetic pressure, coercive pressure, and TMT heterogeneity on firm performance, I performed a path model analysis using Amos 23. Preacher et al. (2007) and Aguinis, Edwards, and Bradley (2016) recommend use of the bootstrapping method over normal-theory methods for testing indirect effects because it makes no assumptions about the shape of the sampling distribution. I ran a moderated mediation model using Hayes' Process. The analysis (see Table 3.3) shows that with a low coercive pressure, the effect of mimetic pressure on performance mediated by product exploration is positive only when TMT heterogeneity is high (b = 0.11, SE = 0.07, CI = 0.01-0.29). In other words, as the pressures become more incompatible, firms with a more heterogeneous TMT have better performance. With high coercive pressure, the effect of mimetic pressure on performance through product exploration is positive when TMT heterogeneity is low (b = 0.12, SE = 0.06, CI = 0.03-0.26). Thus, as the pressures become more compatible, a less heterogeneous TMT becomes more beneficial for performance. Finally, when both pressures are high, TMT heterogeneity has no benefit (b = -0.02, SE = 0.03, CI = -0.09-0.02). These results provide support for H_3.

Of note, not all the supported effects have the same size. Here, I briefly discuss the effect sizes in this study. In testing the effect of TMT heterogeneity and institutional pressures on product exploration, when I enter the control variables (see model 1 in table 3.2), they explain 0.17 of the variance in product exploration which is significant (p = 0.001). This is mainly attributed to serving B2C markets (b = -0.58) followed by firm size (b = 0.29) and environmental dynamism (b = 0.16). This means that B2C firms have lower levels of product exploration than B2B firms and those firms that pursue both types of markets. This is perhaps not surprising given B2B products are usually more technology-intensive. In addition, firms with more dynamic environments have higher levels of product exploration, even though the size of this effect is relatively small. When I enter institutional pressures and

Table 3.3. Conditional indirect effect of mimetic pressure on firm performance *

	Moderators		**Conditional indirect effect**		
Mediator	Coercive pressure	TMT heterogeneity	effect	LLCI95	ULCI95
Product exploration	-1.11 (-1SD)	-1.11 (-1SD)	-0.11 (0.08)	-0.33	0.00
	-1.11 (-1SD)	1.11 (+1SD)	0.11 (0.07)	0.01	0.29
	1.11 (+1SD)	-1.11 (-1SD)	0.12 (0.06)	0.03	0.26
	1.11 (+1SD)	1.11 (+1SD)	-0.02 (0.03)	-0.09	0.02

* Unstandardized estimates are reported; control variables: firm age, firm size, B2B, B2C, public, environmental dynamism, competitive intensity, TMT size; LLCI (ULCI): lower level (upper level) bias-corrected 95 percent confidence intervals (number of bootstraps = 10000); bootstrapping standard errors in parentheses.

TMT heterogeneity, there is an r-square change of 0.11 that is attributed to two factors: TMT heterogeneity and coercive pressure. The effect of TMT heterogeneity (b = 0.33) is almost double that of coercive pressure (b = 0.15). Finally, the inclusion of the three-way interaction after two-way interactions enhances the explanatory power of the model significantly with an r-square change of 0.09 (p = 0.000). The effect sizes can be seen more clearly by interpreting the slopes in Figure 3.2. For instance, when mimetic pressure is high but coercive pressure is low, firms with higher TMT heterogeneity have a score of 6.11 (out of 7) while those with a low TMT heterogeneity have a score of 3.74 (a difference of 2.37). This is even though this difference becomes non-significant when these pressures are compatible, particularly when they are both high.

3.6. Discussion

Leading scholars have called for more research on factors that influence organizational ambidexterity (Birkinshaw and Gupta, 2013; O'Reilly and Tushman, 2013). Others point to the importance of studying exploration as the overlooked component of ambidexterity (Danneels and Sethi, 2011; Reeves and Harnoss, 2015). In response to these calls, I investigate the effect of the interaction between incompatible institutional pressures and TMT

heterogeneity on product exploration, and examine how these relationships are associated with firm performance.

I find that coercive pressure is directly related to product exploration. Mimetic pressure is not. However, mimetic pressure does affect product exploration when it interacts with coercive pressure and TMT heterogeneity. In particular, my findings show that when mimetic and coercive pressures are incompatible (i.e. one is high and the other is low), firms with higher TMT heterogeneity have higher levels of product exploration. This, in turn, is associated with better firm performance. Conversely, I find that lower TMT heterogeneity is more beneficial for product exploration and performance when both pressures are high (i.e. low institutional complexity).

My findings provide several contributions. First, they provide one explanation for Reeves and Harnoss' (2015) recent finding that many U.S. firms have become less ambidextrous in the last 10 years because of a decrease in the level of exploration, resulting in lower profitability. I therefore add to the ambidexterity and NPD literatures by showing that a firm's level of product exploration is affected by the interaction of external factors (institutional pressures) with internal factors (TMT heterogeneity). In addition, although I support the notion that ambidexterity is achieved through managerial capability (Birkinshaw and Gupta, 2013, p. 293), I show that the TMT's effect on product exploration depends substantially on pressure from competitors, customers and suppliers.

My second contribution is to institutional theory. Although that literature has long suggested that the firm's adoption of practices and subsequent performance are influenced by the institutional environment, the mechanism through which institutional pressures might impact firm performance is not clear (McFarland et al., 2008). In particular, the 'structure versus agency debate' has been a central argument among institutional theorists in terms of attributing firm behaviour and resultant performance to social forces vs. organizational

factors (Heugens and Lander, 2009). My findings offer new insight to this literature by showing that in the context of product exploration, the effect of institutional pressures is a function of how they interact with firm-specific factors. In particular, although my results show that mimetic pressure does not affect product exploration directly, it is a source of influence depending on its consistency with coercive pressure.

Third, I offer a conceptualization of institutional complexity based on the (in)compatibility of mimetic and coercive pressures (Greenwood et al., 2011; Pache and Santos, 2010; Raaijmakers et al., 2015; Raffaelli and Glynn, 2014). Considering the empirical findings on institutional complexity as a whole are limited (Kodeih and Greenwood, 2014), a related contribution comes from my results showing that more and less complex institutional environments require a different TMT composition. This supports Greenwood et al.'s (2011) argument that incompatible institutional pressures require leaders who are able to understand multiple expectations.

Fourth, there are mixed findings in the TMT literature regarding the positive and negative performance effects of TMT heterogeneity (Boone and Hendriks, 2009; Cannella et al., 2008; Certo et al., 2006). By demonstrating that TMT heterogeneity is advantageous under institutional complexity (in my context of product exploration), I offer new empirical insight into the benefits of diversity within the firm's TMT. This finding also supports arguments that the impact of TMT heterogeneity is contingent on other factors, particularly those external to the firm (Bromiley and Rau, 2016; Hmieleski and Ensley, 2007; Nielsen, 2010). In addition, the finding that lower TMT heterogeneity is more beneficial under low institutional complexity) provides some support for the argument that TMT heterogeneity may hinder timely decision-making (Cao et al., 2010; Hambrick et al., 2015).

Finally, institutional theory has been mainly used for showing the source of similarity across firms but we need to understand how institutional factors lead to organizational

differences in terms of (e.g.) resources and capabilities and in turn, performance (Chandler and Hwang, 2015; Greenwood, Hinings, and Whetten, 2014; Souitaris et al., 2012). Here, my results suggest that differential firm performance is in part, a result of the relationships between institutional complexity, TMT composition and firm-specific product exploration.

3.7. Managerial implications

My findings have important practical implications. They show that one reason for a lower level of product exploration and thereby, ambidexterity, could be an increase in the complexity of the institutional environment coupled with firm-specific factors that restrict the firm from responding appropriately. To address this, firms might better manage external pressures by changing the composition of their TMT. This means that firms should be cognizant of at least two things: 1) the extent and nature of pressure from competitors versus customers and suppliers; and 2) the conditions under which a diverse TMT is beneficial. Regarding these conditions, one is when the firm's major competitors are successfully offering innovative products but its main suppliers and customers do not support product exploration. The other is when the firm's suppliers and customers demand innovation through exploration but competitor firms have either not offered innovative products or they have not been successful in doing so.

In both of these conditions or scenarios, the firm experiences a type of tension. For instance, if we consider the first scenario, any decision to follow competitor actions regarding NPD may lead to products that are not valued by customers. Furthermore, if suppliers do not believe the firm should engage in product exploration, they may not provide adequate support. Conversely, following suppliers and customers may put the firm behind the competition and contribute to a loss in profitability (Srinivasan, Lilien, and Rangaswamy, 2002). My results suggest that this scenario requires a heterogeneous management team that

can handle complexity and tension; a team that can respond to (rather than resist) incompatible institutional pressures by providing diverse viewpoints and distinctive strategic alternatives.

3.8. Limitations and suggestions for future research

This study has certain limitations that warrant future investigation. First, to reduce concerns over causal processes, I employ different time frames for independent and dependent variables. However, future research could enrich my results by using a longitudinal design. Second, I find that the level of product exploration is not directly influenced by mimetic pressure. This may be a result of firms choosing to imitate the competitors' actual innovation (Ethiraj and Zhu, 2008) rather than their innovation strategy *per se*. Future research could examine this possibility by considering different imitative responses by firms in the context of exploration. For instance, competitors may create an innovative product. In response, instead of pursuing product exploration to develop innovative products, the company may copy the competitor's new offer. Third, I focus solely on the NPD context. Other contexts (e.g., network management) also warrant investigation in the context of institutional pressures and TMT influences. For example, is the firm's ability to effectively explore relationships with suppliers, customers and competitors affected in the same way by institutional complexity and TMT composition? Finally, other forms of institutional complexity warrant investigation. In particular, Greenwood et al. (2011) discusses two facets of institutional complexity: one that is based on the number of institutional logics and one based on the incompatibility between them. I studied an instance of the latter. Future research could examine the former by including the influence of (e.g.) the regulatory environment.

3.9. Appendix. Measurement items

Items	Factor Loading	α	CR	AVE
Market uncertainty		0.82	0.80	0.51
Customer needs and product preferences changed quite rapidly	0.66			
Customer product demands and preferences were highly uncertain	0.82			
It was difficult to predict changes in customer needs and preferences	0.68			
Market competitive conditions were highly unpredictable	0.69			
Technological turbulence		0.88	0.90	0.69
It was very difficult to forecast technology developments in our industry	0.89			
The technology environment was highly uncertain	0.90			
Technological developments were highly unpredictable	0.88			
Technologically, our industry was a very complex environment	0.62			
Competitive intensity		0.77	0.79	0.56
Competition in our industry was intense	0.86			
Anything that one competitor offered to the market, others readily matched	0.76			
Price competition was a major characteristic of our industry	0.61			
In our industry, one heard of a new competitive move almost every day [a]	-			
Firm performance		0.89	0.88	0.65
Sales growth	0.81			
Return on investment	0.83			
Profit level	0.80			
Market share	0.78			
Product exploration		0.78	0.81	0.60
Our firm has introduced new generations of products	0.80			
Our firm has extended its product range	0.91			
Our firm has entered new technology fields	0.57			

Items	Factor Loading	α	CR	AVE
TMT heterogeneity (formative measure)				
Educational background	-*	-	-	-
Functional background	-	-	-	-
Industry background	-	-	-	-
Years of experience with the firm	-	-	-	-
Mimetic pressure (formative measure)				
Our main competitors have created products that are innovative	-	-	-	-
Our main competitors who have created innovative products:				
• Have benefited greatly	-	-	-	-
• Are favorably perceived by their suppliers	-	-	-	-
• Are favorably perceived by their customers	-	-	-	-
• Are more competitive	-	-	-	-
Coercive pressure (formative measure)				
Our main suppliers believed that we should create products that are innovative	-	-	-	-
Our main customers believed that we should create products that are innovative	-	-	-	-

[a] Removed from analysis; CR = Composite reliability; AVE = Average variance extracted

* The formative measures are assessed using a different approach in the 'reliability and validity' section.

Chapter 4

CONCLUSION

Organizational ambidexterity is the firm's ability to combine exploration and exploitation activities (Jansen et al., 2009; Patel et al., 2012; Teece, 2014). This has such extensive theoretical and managerial implications that leading scholars have called for more research on the phenomenon despite the abundance of research that exists (Birkinshaw and Gupta, 2013; O'Reilly and Tushman, 2013). In this dissertation, I identify three important research opportunities pertinent to ambidexterity in the context of two core marketing capabilities: CM and NPD capabilities. These are: 1) how the Sum_{E+E} for CM and NPD capabilities and imbalance within them affect customer relationship and new product performance, 2) how the Sum_{E+E} and imbalance within these capabilities are affected by EO— combined with environmental dynamism and 3) why some firms are higher on the level of product exploration than others. I address these research opportunities in two essays. Essay 1 addresses the first two and Essay 2 investigates the third.

Essay 1 shows that when the sum of exploration and exploitation is high in the firm's CM capability, customer relationship performance improves. The same relationship occurs for NPD and new product performance. However, when NPD is imbalanced by an exploration-focus, NP performance suffers. An imbalance within CM capability has no effect on CR performance. Going further, I also show that the sum of exploration and exploitation in each capability is enhanced by higher EO. A higher EO is also associated with an exploration-focused imbalance within CM and NPD capabilities. Notable however is that although this occurs for CM capability in dynamic environments, it only occurs for NPD capability in more stable environments. By combining research opportunities 1 and 2 in one essay, I was able to use a moderated mediation analysis to show that: 1) EO is negatively associated with NP performance, as 2) mediated by an exploration-focused imbalance within NPD capability, when 3) the environment is stable.

While essay one examines the opportunities pertinent to the Sum_{E+E} and imbalance within CM and NPD, Essay 2 focuses on product exploration alone to investigate why some firms pursue more exploration than others. My results show that this can occur when the firm is under institutional complexity (i.e. when mimetic pressure is high and coercive pressure is low, or vice versa) and if TMT heterogeneity is low. I show in a moderated mediation analysis that this, in turn, is associated with lower firm performance. In contrast, when both mimetic and coercive pressures are high, a less heterogeneous TMT is more beneficial for performance.

Theoretical Implications

This dissertation advances research in marketing strategy by integrating theories of strategic management (e.g. organizational ambidexterity, institutional theory and upper echelons theory) and entrepreneurship with marketing. The conceptualizations and findings from my two essays provide numerous theoretical contributions. First, they link two ambidextrous marketing capabilities to two key marketing performance outcomes and show that an imbalance in these capabilities is not always bad. They also offer new evidence as to when an imbalance is detrimental to performance. This demonstrates that an imbalance between exploration and exploitation within different capabilities can differentially affect performance metrics (Josephson et al., 2015; Junni et al., 2013). As seen here, an exploration-focused imbalance within NPD capability is detrimental to performance but a similar imbalance within CM capability is not.

Second, the results provide new insight on how the interaction of organizational and environmental factors affect exploration-exploitation imbalance within CM and NPD capabilities. In particular, they show that an entrepreneurial orientation differentially affects imbalance under conditions of environmental dynamism. A higher EO is associated with an

exploration-focused imbalance in NPD capability when the environment is stable. This finding is important because my results show that an imbalance within NPD capability has adverse performance effects. This means that EO can be associated with lower performance when the environment is stable. Confirming this possibility with a moderated mediation analysis forms my third contribution. That is, I show that in stable environments, EO is associated with lower NP performance when mediated by an exploration-focused imbalance in NPD. In addition to these negative associations, I show EO's positive effect on customer relationship and new product performance, through the sum of exploration and exploitation in CM and NPD capabilities, respectively. This adds to the knowledge regarding the important role of EO in marketing strategy and arguments that there are a variety of mechanisms through which EO can enhance performance (e.g. Matsuno et al., 2002; Zhou et al., 2005). Fourth, this sheds some light on past mixed findings regarding the impact of EO (Rauch et al., 2009) by demonstrating the positive and negative effects of EO on performance.

Fifth, I provide new theoretical and empirical evidence for why some firms have higher levels of product exploration than others. This provides an explanation for Reeves and Harnoss' (2015) observation that the level of exploration by U.S. firms has declined, resulting in lower profitability. Sixth, by showing that the interaction between institutional complexity and TMT heterogeneity explains performance differences across firms, I shed light on the debate over how social forces versus organizational factors affect performance (Heugens and Lander, 2009). Finally, the results provide new insight on the positive and negative effect of heterogeneity within the firm's TMT (Boone and Hendriks, 2009; Cannella et al., 2008; Certo et al., 2006). This adds to the knowledge that although having a heterogeneous TMT can be beneficial, its

value may be contingent on other factors (Bromiley and Rau, 2016; Hmieleski and Ensley, 2007; Nielsen, 2010).

Managerial Implications

The findings provide several managerial implications. First, managers can improve CR and NP performance outcomes by enhancing the the sum of exploration and exploitation in both CM and NPD capabilities. That is, they should invest in both the exploration and exploitation dimensions of these marketing capabilities. Second, when it comes to balancing exploration and exploitation, managers should note that an imbalance within CM capability does not hurt CR performance. However, if exploration is emphasized over exploitation within NPD, NP performance can be adversely affected. Third, although higher levels of EO are positively associated with both CR and NP performance, higher EO can also hurt NP performance when the environment is more stable. Thus, managers may need to adjust the level of EO under different environmental conditions. Finally, it is important that managers acknowledge when incompatible pressures from competitors versus suppliers and customers create tension for strategic decisions. In this situation, managers may need to increase the level of heterogeneity in their TMT. This enables access to diverse information, viewpoints and cognitive frames which is beneficial in multifaceted situations, such as institutional complexity.

Research Limitations and Implications

In sections 2.8 and 3.8, I explained the limitations of each study and suggested some opportunities for future research. Here, I add to those by explaining some of the limitations that I

faced during the completion of this dissertation and what I learned from those limitations and my other experiences.

During the process of my research, it became very clear to me that research on organizational ambidexterity and capabilities is important considering the huge investment companies make to build capabilities. Through the process of conducting this research and communicating it to other scholars, I also observed that because this field of research is contemporary, it involves many emerging terms and arguments. This suggests that more research is needed to develop: 1) a more comprehensive understanding of the core terms; 2) a better picture of the numerous pertinent variables in this field of study.

My future research will involve further understanding of these relationships. As one example of the research I intend to pursue, I will study how marketing's presence in the TMT influences the firm's ambidextrous marketing capabilities. This is important because several studies have examined the effect of the presence of chief marketing officer (CMO) on firm performance but findings are inconclusive (Boyd, Chandy, and Cunha, 2010; Nath and Mahajan, 2008). By understanding how CMO influences marketing capabilities, we might provide an explanation for the inconclusive findings generated to date. This idea is based on my theoretical arguments and findings that the composition of TMT has a major effect on how a firm builds its marketing capabilities and performs.

I believe that marketing strategy will benefit from this type of research because several threads of contemporary research are potentially related to how firms become ambidextrous in their marketing capabilities. As one example, co-creating ideas and products with customers may have implications in terms of the combination of exploration and exploitation within the firm's NPD capability. This is because although some studies point out that co-creation is a potential

barrier to exploration, others show that explorative innovations can be created through co-creation with customer (e.g. Coviello and Joseph, 2012).

During the process of this dissertation, I also learned more about the challenges of conducting research and the limitations they create. An example is access to secondary data. Secondary data enable researchers to address concerns over reliability and validity. In addition, they enable researchers to establish causality rather than correlations. These data are not however, typically available for private companies. Although not all my variables benefit from secondary data (e.g. EO, capabilities), one of the limitations of studying private companies is that I was unable to secure secondary data for (e.g.) performance. To overcome this issue, I assessed the reliability of data by collecting a second round of data and comparing that with my first-round data. In addition, I obtained secondary data for some of the firms in my sample and compare that with primary data.

I also observed that conducting good research is a long process. My research officially started in the fall of 2013 and ended in the fall of 2016. This process involved developing the theoretical arguments and research models, developing and pretesting the research instrument, choosing my panel provider, negotiating the process with Research Now, two rounds of data collection, analyzing the data several times, writing the papers and rewriting them after receiving feedback from my dissertation committee and friendly reviewers, and so on. Each of these steps had their own learning processes. For instance, I drew on three different literatures to be able to inform marketing, enrich the others, and provide new theoretical and managerial insights. I did the same for instrument development. Because my model involved variables that were drawn from different literatures (e.g. mimetic and coercive pressures), I adapted existing measures to be able to measure the variables in my model.

I also learned that finding a market research company that can provide an appropriate panel of respondents is challenging. It involves long negotiations with the panel providers and one of the hurdles a researcher may face by working with panel providers is data quality. When I started working with my service provider, I learned that their process for assessing the quality of data is somewhat different from mine, as an academic researcher. Therefore, to ensure I obtained the quality of data I needed, I had to specify additional criteria to the data collection process and carefully manage the relationship with the service provider. Finally, I learned about the importance of friendly reviews in the process of conducting and publishing research. These reviews can be immensely helpful for improving a paper before submitting it to the target journal.

APPENDIX: SURVEY INSTRUMENT

Study on 'The Impact of Organizational Capabilities'

Principal Investigators:

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Nicole Coviello - Betty and Peter Sims Professor of Entrepreneurship, Professor of Marketing, Wilfrid Laurier University, Waterloo, Canada

We invite you to participate in a research study that examines organizational capabilities, what influences them, and how they impact performance. The survey also includes questions about your firm, the environmental conditions in which your firm operates, and your firm's competitors. Your participation will help shed insight on performance drivers, and you will also help a student complete their PhD research. In terms of the survey, there are no right or wrong answers to the questions, and only your opinion is required. There are no known risks associated with the questions. Individual data will not be analyzed. Data will only be reported at an aggregate level, with absolutely no reference to company names or any identifying features. The data will be saved on a password-protected computer. Please also note that the survey is hosted online by a professional organization. This organization has appropriate security systems in place to ensure the confidentiality and privacy of the data, although this cannot be fully guaranteed. In addition, if the system offers to make the participant's IP address available to the researchers, this information will be declined. The data will be kept securely and solely with the principal investigators. The questionnaire will take about 20-25 minutes to complete. We will send a summary report of our findings to all who respond to this survey after the completion of the entire project. Your participation in this study is voluntary; if you decide to participate, you may withdraw at any time. While we appreciate your complete and careful participation, you may decline to answer any individual question. The results from the study will be published as a doctoral dissertation, presented in academic conferences and published in academic journals. If you have questions at any time about the study or the procedures (or you experience adverse effects as a result of participating in this study) you may contact the researcher Hamed Mehrabi at mehr1500@mylaurier.ca or at 519-884-0710 (ext. 2846). This project has been reviewed and approved by the University Research Ethics Board (REB). If you feel you have not been treated according to the descriptions in this form, or your rights as a participant in research have been violated during the course of this project, you may contact Dr. Robert Basso, Chair, University Research Ethics Board, Wilfrid Laurier University, (519) 884-1970 (ext. 4994) or rbasso@wlu.ca. The REB approval number is 4112.

Consent

I have read and fully understand the above information and agree to participate in the study:

- ❍ Yes
- ❍ No

Welcome and thank you for participating in this survey. I appreciate your help with my PhD research. We begin with some simple questions. These are followed by other sections on topics such as your firm and competitors. Please feel free to comment in the boxes provided.

Is your firm*[3]:

- ❍ an independently owned organization?
- ❍ an autonomous division (or strategic business unit) of another firm?
- ❍ part of a larger organization (e.g. your firm gets resources, ideas, technology from it)?
- ❍ a joint venture?
- ❍ other (please specify): _____

Display This Question:
If Is your firm: an autonomous division (or strategic business unit) of another firm? Is Selected

Is your firm the largest division/business unit of the parent company in terms of sales revenue?

- ❍ Yes
- ❍ No

[3] * indicates screening questions

Display This Question:
If Is your firm: an autonomous division (or strategic business unit) of another firm? Is Selected

For the rest of the questions in this survey, please focus on your division as 'your firm'. For instance, when we ask about the number of employees your firm has, please consider the number of employees your division/business unit has.

What is your current position in this firm*?

- ❍ Chief executive, President, General manager or equivalent
- ❍ Senior Marketing Manager, Marketing VP, Marketing Director or equivalent
- ❍ Chief Operating Officer
- ❍ Other (please specify): _____

Display This Question:
If Is your firm: an independently owned organization? Is Selected

Does your firm have:

- ❍ a single strategic business unit?
- ❍ multiple strategic business units?

Display This Question:
If Does your firm have: multiple strategic business units? Is Selected

For the rest of the questions in this survey, please focus on the business unit you are most familiar with as 'your firm'. For instance, when we ask about the number of employees your firm has, please consider the number of employees that business unit has.

Is your firm*:

- ❍ primarily a manufacturing firm?
- ❍ primarily a service firm?

In what year was your firm founded*?

Approximately how many employees does your firm have*?

What is your firm's primary industry by sales volume?

- ❍ Automotive
- ❍ Chemicals
- ❍ Computer hardware
- ❍ Computer software
- ❍ Electronics
- ❍ Pharmaceuticals
- ❍ Food
- ❍ Beverage
- ❍ Other industrial or business products (please specify): _____
- ❍ Other consumer products (please specify): _____
- ❍ Other (please specify): _____

The next section asks about the environment your firm operates in. Please focus on your primary market in the last 5 years. Using the scale, please indicate your level of agreement with the following statements.

In the last 5 years:

	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
Customer needs and product preferences changed quite rapidly	❍	❍	❍	❍	❍	❍	❍
Customer product demands and preferences were highly uncertain	❍	❍	❍	❍	❍	❍	❍
It was difficult to predict changes in customer needs and preferences	❍	❍	❍	❍	❍	❍	❍
Market competitive conditions were highly unpredictable	❍	❍	❍	❍	❍	❍	❍
It was very difficult to forecast technology developments in our industry	❍	❍	❍	❍	❍	❍	❍
The technology environment was highly uncertain	❍	❍	❍	❍	❍	❍	❍
Technological developments were highly unpredictable	❍	❍	❍	❍	❍	❍	❍
Technologically, our industry was a very complex environment	❍	❍	❍	❍	❍	❍	❍

The next section asks for your perceptions about your firm's main competitors in the last 5 years.

In the last 5 years, our main competitors have:

	Yes	No	I Don't Know
Created products that are innovative	❍	❍	❍

Our main competitors who have created innovative products in the last 5 years:

	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree	I Don't Know
Have benefited greatly	❍	❍	❍	❍	❍	❍	❍	❍
Are favorably perceived by their suppliers	❍	❍	❍	❍	❍	❍	❍	❍
Are favorably perceived by their customers	❍	❍	❍	❍	❍	❍	❍	❍
Are more competitive	❍	❍	❍	❍	❍	❍	❍	❍

Please describe the competition in your industry in the last 5 years by indicating your level of agreement with the following statements:

	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
Competition in our industry was intense	❍	❍	❍	❍	❍	❍	❍
Anything that one competitor offered to the market, others readily matched	❍	❍	❍	❍	❍	❍	❍
Price competition was a major characteristic of our industry	❍	❍	❍	❍	❍	❍	❍
In our industry, one heard of a new competitive move almost every day	❍	❍	❍	❍	❍	❍	❍

In the next section, we want you to focus on your firm's main suppliers and customers. In the last 5 years:

	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
Our main suppliers believed that we should create products that are innovative	❍	❍	❍	❍	❍	❍	❍
Our main customers believed that we should create products that are innovative	❍	❍	❍	❍	❍	❍	❍

Now, please consider your firm's top management team.

In the last 5 years, the members of our firm's top management team:

	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
Have had a variety of educational backgrounds (e.g. bachelor's degree, master's degree, PhD)	❍	❍	❍	❍	❍	❍	❍
Have varied widely in their functional background (e.g. finance, marketing, R&D)	❍	❍	❍	❍	❍	❍	❍
Have had a variety of industry backgrounds (e.g. technology, automotive, pharmaceutical)	❍	❍	❍	❍	❍	❍	❍
Have varied widely in their years of experience with the firm	❍	❍	❍	❍	❍	❍	❍

In the last 5 years, our top management team has been quite diverse in terms of their background.

- ❍ Strongly Disagree
- ❍ Disagree
- ❍ Somewhat Disagree
- ❍ Neither Agree nor Disagree
- ❍ Somewhat Agree
- ❍ Agree
- ❍ Strongly Agree

Approximately how many members does your firm's top management team have today?

Please complete this next set of questions by selecting a number on each continuum. Your opinion should continue to focus on the last 5 years.

In general, the top managers of our firm have favored . . .

A strong emphasis on the marketing of tried-and-true products 1 2 3 4 5 6 7 A strong emphasis on R&D, technological leadership, and innovations

In dealing with its competitors, our firm . . .

Has typically responded to actions which competitors initiate 1 2 3 4 5 6 7 Has typically initiated actions to which competitors then respond

In dealing with its competitors, our firm . . .

Has seldom been the first business to introduce new products, administrative techniques, operating technologies, etc. 1 2 3 4 5 6 7 Has often been the first business to introduce new products, administrative techniques, operating technologies, etc.

In general, the top managers of our firm have had . . .

A strong tendency to “follow the leader” in introducing new products or ideas 1 2 3 4 5 6 7 A strong tendency to be ahead of other competitors in introducing novel ideas or products

In general, the top managers of our firm have had . . .

A strong inclination for low-risk projects (with normal and certain rates of return) 1 2 3 4 5 6 7 A strong inclination for high-risk projects (with chances of very high returns)

In general, the top managers of our firm have believed that …

Owing to the nature of the environment, it is best to explore it gradually via cautious, incremental behavior 1 2 3 4 5 6 7 Owing to the nature of the environment, bold, wide-ranging acts are necessary to achieve the firm's objectives

When confronted with decision-making situations involving uncertainty, our firm …

Has typically adopted a cautious, "wait-and-see" posture in order to minimize the probability of making costly decisions 1 2 3 4 5 6 7 Has typically adopted a bold, aggressive posture in order to maximize the probability of exploiting potential opportunities

In the last 5 years, has your firm served:

- ❍ Primarily business and/or government markets?
- ❍ Primarily consumer markets?
- ❍ Both of the above equally?

Is your firm publicly traded?

- ❍ Yes
- ❍ No

The next set of questions asks about other activities in your firm.

In the last 2 years:

	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
Our firm has used new ways to satisfy customer needs	❍	❍	❍	❍	❍	❍	❍
Our firm has acquired new customer segments	❍	❍	❍	❍	❍	❍	❍
Our firm has entered new markets	❍	❍	❍	❍	❍	❍	❍

In the last 2 years:

	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
Our firm had systems to better understand and serve its customers	❍	❍	❍	❍	❍	❍	❍
Our firm has routinely established a "dialogue" with target customers	❍	❍	❍	❍	❍	❍	❍
Our firm has focused on meeting customers' long term needs to ensure repeat business	❍	❍	❍	❍	❍	❍	❍
Our firm has worked systematically to maintain loyalty among attractive customers	❍	❍	❍	❍	❍	❍	❍
Our firm has routinely enhanced the quality of relationships with attractive customers	❍	❍	❍	❍	❍	❍	❍

In the last 2 years:

	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
Our firm has introduced new generations of products	❍	❍	❍	❍	❍	❍	❍
Our firm has extended its product range	❍	❍	❍	❍	❍	❍	❍
Our firm has entered new technology fields	❍	❍	❍	❍	❍	❍	❍

In the last 2 years:

	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
Our firm has improved existing product quality	❍	❍	❍	❍	❍	❍	❍
Our firm has reduced production costs	❍	❍	❍	❍	❍	❍	❍
Our firm has improved production flexibility	❍	❍	❍	❍	❍	❍	❍
Our firm has improved yield	❍	❍	❍	❍	❍	❍	❍
Our firm has reduced material consumption	❍	❍	❍	❍	❍	❍	❍

How much confidence do you have in your national economy today?

- ❍ Very Low 1
- ❍ 2
- ❍ 3
- ❍ Moderate 4
- ❍ 5
- ❍ 6
- ❍ Very High 7

This next set of questions asks about your firm's performance in the last 2 years.

To the best of your knowledge, in the last 2 years, how has your firm performed relative to stated objectives on:

	Worse 1	2	3	As planned 4	5	6	Better 7
Customer satisfaction	❍	❍	❍	❍	❍	❍	❍
Customer retention	❍	❍	❍	❍	❍	❍	❍
Speed of new product development	❍	❍	❍	❍	❍	❍	❍
Product quality	❍	❍	❍	❍	❍	❍	❍
Value of products to customers (quality/price)	❍	❍	❍	❍	❍	❍	❍

To the best of your knowledge, in the last 2 years, how has your firm performed relative to stated objectives on:

	Worse 1	2	3	As planned 4	5	6	Better 7
Sales growth	❍	❍	❍	❍	❍	❍	❍
Return on investment	❍	❍	❍	❍	❍	❍	❍
Profit level	❍	❍	❍	❍	❍	❍	❍
Market share	❍	❍	❍	❍	❍	❍	❍

How do you evaluate the overall performance of your firm in the last 2 years?

- ❍ Poor 1
- ❍ 2
- ❍ 3
- ❍ Average 4
- ❍ 5
- ❍ 6
- ❍ Excellent 7

How do you evaluate the overall performance of your firm relative to major competitors in the last 2 years?

- ❍ Much worse than major competitors 1
- ❍ 2
- ❍ 3
- ❍ Same as major competitors 4
- ❍ 5
- ❍ 6
- ❍ Much better than major competitors 7

We now turn to our last section:

Approximately how many years have you worked in this firm?

Approximately how many years have you worked in this industry?

How knowledgeable were you on the issues covered in this survey?

- ❍ Not at all knowledgeable 1
- ❍ 2
- ❍ 3
- ❍ Moderately knowledgeable 4
- ❍ 5
- ❍ 6
- ❍ Highly knowledgeable 7

Finally, we would like to ask you to tell us the name of your company. While your response to this question is optional, we would truly appreciate this information because it will enable us to integrate publicly available information about firms to our analysis. We guarantee absolute confidentiality of the identity of individual firms surveyed and assure that we will use the name of the firm only for the aforementioned reason. This Information will be invaluable for the successful completion of this PhD research. My company name is:

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