THREE STUDIES ON INTERFIRM RELATIONSHIPS UNDER SUPPLIER ENCROACHMENT AND ONLINE CHANNEL PROLIFERATION

WANG MENG

PhD

The Hong Kong Polytechnic University

2022

The Hong Kong Polytechnic University
Department of Management and Marketing

Three Studies on Interfirm Relationships Under Supplier Encroachment and Online Channel Proliferation

Wang Meng

A thesis submitted in partial fulfillment of the requirements for
the degree of Doctor of Philosophy
June 2022

CERTIFICATE OF ORIGINALITY

I hereby declare that this thesis is my own work and that, to the best of my knowledge and belief, it reproduces no material previously published or written, nor material that has been accepted for the award of any other degree or diploma, except where due acknowledgment has been made in the text.

Signature: _____

Name of Student: Wang Meng

Three Studies on Interfirm Relationships under Supplier Encroachment and Online Channel Proliferation

Abstract

Interfirm relationship management is one of the cornerstones of a firm's marketing strategy. However, productive upstream and downstream business to business (B2B) relationships do not naturally emerge on their own. Rather, they result from effective marketing strategies, in conjunction with considerations from partner characteristics and environmental conditions. Hence, understanding how to manage different dyadic relationships (e.g., supplier-distributor relationship; manufacturer-retailer relationship) from both the upstream and downstream perspectives is critical. My dissertation enriches the interfirm relationship management literature with empirical investigation on a distributor's capability development under supplier encroachment and supply risks (Chapter1 and Chapter 2). Moreover, by examining the manufacturer-retailer power dependence through product assortment across online and offline channels, this dissertation contributes to omnichannel management literature with nuanced discussion on power shifts between dyadic (Chapter 3).

Suppliers in business-to-business (B2B) markets often directly approach end customers in addition to using third-party distribution channels. This phenomenon, known as supplier encroachment, poses an increasing challenge to the distributor's profitability in the supply chain. However, little research has adopted the distributor's perspective to examine how it can overcome this challenge. **The first study** addresses this gap by adopting the dynamic capability and network embeddedness theory to postulate the critical role of the distributors' customer-driving capability in tackling encroachment. Using survey data from 125 distributor firms in the semiconductor industry, I show that distributors' customer-driving capability significantly improves firm performance and that the impact strengthens when supplier encroachment is high. Moreover, I delineate the positive impacts of supplier relationship exploration, distributor relational embeddedness, and customer service excellence on

distributors' customer-driving capability. Interestingly, supplier encroachment weakens the effects of supplier relationship exploration and customer service excellence but strengthens that of distributor relational embeddedness, indicating the importance of leveraging peer relationships under high supplier encroachment.

Facing the divergent supply pressures and risks from upstream suppliers, distributors need to explore the potential for obtaining supplier relationships beyond those they currently maintain. However, how different types of relationship exploration affect distributors' capability development, and thus their firm performance, remains unclear. Based on the resource features that distributors obtain, **in the second study**, I differentiated two forms of relationship exploration – substitute relationship exploration (SRE) and complementary relationship exploration (CRE). Drawing on the information economics perspective, I hypothesized and examined the effects of SRE and CRE on a distributor's detection capability in relationship governance with upstream suppliers and innovation capability in services to downstream customers. Using 176 distributors' replies, I find that CRE increases both detection and innovation capability, whereas SRE negatively affects detection capability and positively influences innovation capability. Finally, the effects of detection and innovation capability on distributor performance are contingent on external market uncertainty. Our study enriches the channel management literature and provides managerial implications for practitioners in the relationship exploration decision process.

In the third study, I examined how the manufacturer's product assortment across online and offline channel may affect the total brand category sales performance. Reflecting dramatic changes in distribution landscapes brought by online shopping, brand manufacturers seek to use omnichannel models to reach end-customers. However, how to manage online and offline product assortment differentiation (OOPD) to increase product sales remains a challenge: Greater OOPD might attract diverse consumer segments and cater to distinct

buying behaviors and preferences, leading to expanded market coverage, but it also could increase the likelihood of multichannel misalignment at vertical (between the manufacturer and channel partners) and horizontal (across channels) levels, resulting in diminished sales. By considering both countervailing effects, the author predicts an inverted U-shaped effect on a brand manufacturer's sales performance, and by drawing on power dependence theory, I further argue that this relationship is attenuated by the manufacturer's brand positioning, innovativeness, and channel directness. A comprehensive panel data set of online and offline sales data in the home appliance industry in China offers support for the hypotheses. In highlighting the performance trade-offs associated with product assortment differentiation, this study offers some critical managerial and policy implications in omnichannel management.

Keywords

B2B marketing; Customer-driving capability; Supplier encroachment; Dynamic capability; Network embeddedness theory; Channel management; Relationship exploration; Omnichannel management, online–offline, power dependence.

Publications arising from the thesis:

Wang, Meng, Danyang Zhao, and Flora F. Gu (2020), "Distributors' customer-driving capability under supplier encroachment," *Industrial Marketing Management*, 94: 52-65.

ACKNOWLEDGEMENTS

First and foremost, I would like to express my sincere gratitude to my supervisor, Dr. Flora Fang Gu for her unreserved support and guiding of my Ph.D studies. Being her research student is the BEST thing that ever happened in my life. I sincerely appreciate her insightful feedbacks and encouragement through different stages of this dissertation. Despite her tight agenda, she was always responsive to my requests and problems. She always encouraged me to learn new methods and pushed me to try my best on implementing impactful studies. When we were working on research, Dr. Gu was a visionary mentor also paying a lot attention to details. Her critical thinking, pursuit of excellence, and perseverance towards research have made her my role model in many aspects. In addition, she was very considerate and caring passionately and deeply about my career when my graduation came to a close. Suffice it to say, I am so lucky from the very beginning of my academic life to have her as my Ph.D. supervisor. I believe it will be better to express my appreciation to her through my diligent efforts in the research and teaching.

I also greatly appreciate all the support and guidance I received from Dr. Danny Tan Wang and Dr. Fanni Fine Leung. I really thank them for their time, effort, and patience in nurturing me. Their persistence, work ethics, and commitment in pursuing meaningful and critical research have inspired me in many ways.

I would like to express my gratitude to Dr. Moon Kuen Mak and Dr. Qi Peng for their generous support on data collection. Special thanks to Dr. Mak for his inspiration on the supplier-distributor relationships with ample practical cases. Thanks to my peers, including Danyang Zhao, Angela Gao, and Jocelyn Cao for their kind support and care. I can always count on them whenever I needed any help.

My special thanks also go to close friends of mine, including but not limited to Dr. Menglong Liu, Dr. Kai Wang, Dr.Quan Zhou, Dr.Yaozhong Liao, Mr. Hengnan Dai, Mr. Weibin Tang, and Miss. Li Liang for all their love, sweet understanding and tremendous support during my Ph.D period.

Last but not least, I would like to express my indebtedness to my husband Dr. Qi HU, for his encouragement, inspiration, and consideration over the years. Without his help, support and love, my Ph.D. journey would not be possible.

Table of Contents

Lists of Tables

Lists of Figures

Chapter 1. Introduction

Over the past decades, business-to-business (B2B) relationship marketing has emerged as one of the dominant areas in business strategy circles (Palmatier, Dant, Grewal and Evans 2006; Srinivasan and Moorman 2005). Interfirm relationship marketing has attracted considerable business practical as well as academic attention because of their significance to exchange parties' performance (Anderson and Coughlan 2002; Ghosh and John 2012; Wathne, Heide, Mooi, and Kumar 2018). However, productive relationships between transactions dyads (e.g. the supplier-distributor dyad; the manufacturer-retailer dyad) do not simply emerge on their own. Rather, they result from different marketing strategies, capabilities and power dependence between exchange parties (e.g., Heide and John 1988; Palmatier, Huston, Dant and Grewal 2013; Zhou and Li 2010). Hence, understanding the interfirm relationship dynamics across different relationship dyads under different contingent is quite critical to create productive relationships and better firm performance.

Given that distributors are the middlemen in a supplier-distributor dyad and perform marketing tasks for the supplier, they are usually driven by the supplier instead of customers, who are closer to the market. This supplier-driven nature of their role, on the one hand, foreshadows the distributor's trampled situation under supplier's objectives, on the other hand, demands that distributors think outside the box to explore and develop the surviving approaches under supplier and industry pressures. For example, suppliers actively manage relationships with not only their distributors but also the distributors' customers through various marketing activities (Dahlquist and Griffith, 2014; Homburg, Wilczek, and Hahn, 2014). Supplier's encroachment to the market creates mounting challenges, threatening distributors profitability and survivability in the value chain (Homburg et al. 2014). Some prior research has point out the distributor's vulnerability under supplier encroachment (Li, Gilbert, & Lai, 2015; Sa Vinhas & Heide, 2015). Yet to the best of our knowledge, there is

few empirical studies that focuses on how distributors can develop their capabilities to respond to the challenge or improve firm performance, and thus this critical question is largely unanswered. In my dissertation, the first study addresses this gap by adopting dynamic capability and network embeddedness theory to postulate the critical role of distributor's customer-driving capability under supplier encroachment. Moreover, I examined and found the positive effects of supplier relationship exploration, distributor relationship embeddedness and customer service excellence on distributor's customer driving capability. In doing so, unlike prior research, which focused on supplier's perspective to examine the effectiveness of market encroachment, our study is among the first to adopt a distributor's perspective to discuss the dark side of supplier encroachment and how distributors can respond to it by developing customer-driving capability.

Extending my interests in distributors role and living environment in the supply chain, I continued to investigate the distributor's survivability to conceptualize two types of relationship exploration from distributor's perspective in my second study. Distributor's relationship exploration, or their research for alternative suppliers, is a ubiquitous phenomenon in channel and interfirm relationship management due to its critical role to against the supply risks (Leonidou *et al*., 2019; Tse *et al*., 2019). However, an analogy to marriage with sociological perspective has cautioned against relationship exploration, demonstrating its threats to relational governance with incumbent partners (Anderson and Weitz, 1992; Gustafsson *et al*., 2005; Shahzad *et al*., 2018; Zhao *et al*., 2011). Given the mixed effects of distributor's relationship exploration, how distributors can explore alternative suppliers without hurting the relationship with the incumbent suppliers remains unknown. I believe that a key step toward understanding the effects and mechanisms of relationship exploration is to properly differentiate its forms based on the resources it could bring to the distributor. Based on the resource features that distributors obtain, I differentiated

two forms of relationship exploration – substitute relationship exploration (SRE) and complementary relationship exploration (CRE). Drawing on the information economics perspective, I posit that SRE and CRE differentially affect a distributor's detection capability in relationship governance with upstream suppliers and innovation capability in services to downstream customers. Using 176 distributors' replies, I find that CRE increases both detection and innovation capability, whereas SRE negatively affects the detection capability but positively influences the innovation capability. Results further show that the effects of detection and innovation capability on distributor performance are contingent on external market uncertainty. Our study enriches the channel management literature and provides managerial implications

Finally, with the booming of online shopping, many manufacturers have adopted omnichannel distribution strategy, in an aim to manage online and offline channels in a synergetic manner to reach end customers (Verhoef, Kannan and Inman 2015). The progression from single, to multi, then to omnichannel marketing has made shopping easier for customers, but channel management more challenging for brand manufacturers. For example, a manufacturer needs to decide what parts of the product line to be offered in online or offline channels to "balance distribution coverage against conflict with channel partners" (Ailawadi 2021: p. 121). In managing such omnichannel marketing systems, manufacturers arguably should increase the differentiation in the product assortments they offer (Palmatier et al. 2020; Villas-Boas 1998). Such online and offline product assortment differentiation (OOPD) represents the degree to which different products are offered across online and offline channels in a product category owned by a brand manufacturer. It can help the manufacturer expand its market coverage, tailor its products and services to the specific needs of diverse customer segments, and increase revenues from different sources (Ailawadi and Farris 2020). However, it fosters channel members' misalignments with the vertical

manufacturers and horizontal peers. By considering both countervailing effects, the authors predict an inverted U-shaped effect on a brand manufacturer's sales performance, and by drawing on power dependence theory, they further argue that this relationship is attenuated by the manufacturer's brand positioning, innovativeness, and channel directness. A comprehensive panel data set of online and offline sales data in the home appliance industry in China offers support for the hypotheses. In highlighting the performance trade-offs associated with product assortment differentiation, this study offers some critical managerial and policy implications in omnichannel management.

Chapter 2. Distributors' Customer-driving Capability under Supplier Encroachment

2.1. Introduction

Suppliers in business-to-business (B2B) markets actively manage relationships with not only their distributors but also the distributors' customers through various marketing activities (Dahlquist and Griffith, 2014; Homburg, Wilczek, and Hahn, 2014). The marketing activities directed toward the distributors' customers reflect the suppliers' increasing efforts to manage downstream customers without the mediation of distributors – a phenomenon widely referred to as supplier encroachment (Arya, Mittendorf, and Sappington, 2007; Huang, Guan, and Chen, 2018). The simultaneous adoption of direct and indirect distribution channels offers substantial benefits to the supplier, such as direct access to customer information, effective control of distributor opportunism, and the ability to rapidly respond to market dynamism (Sa Vinhas and Anderson, 2005; Sa Vinhas & Heide, 2015). However, from the distributor's perspective, supplier encroachment creates mounting challenges, because business customers can order products and services directly from suppliers, thereby threatening the distributor's profitability in the value chain (Homburg et al., 2014).

While there has been considerable interest in the issue of supplier-distributor dynamics against the backdrop of supplier encroachment, the multichannel management literature has mostly adopted the supplier's perspective to investigate how one can design the channel structure and effectively govern interorganizational relationships when both direct and indirect channels are available (Fürst, Leimbach, and Prigge, 2017; Kabadayi, Eyuboglu, and Thomas, 2007; Sa Vinhas and Anderson, 2005). Some researchers have pointed out the distributor's vulnerability under supplier encroachment (Li, Gilbert, and Lai, 2015; Sa Vinhas and Heide, 2015). Yet, to the best of our knowledge, there is few empirical study that focuses

on how distributors can develop their capabilities to respond to the challenge or improve firm performance, and thus the critical question is largely unanswered.

Distributors facing the challenge of supplier encroachment must build a distinctive capability to sustain market advantage (Ghauri et al., 2016). Kohli and Jaworski (1990) defined market orientation as the organizational-wide generation of market intelligence pertaining to current and future customer needs, and the dissemination and responsiveness to this intelligence. Subsequent studies suggested two approaches to becoming marketing oriented—market-driven and market-driving (Jaworski, Kohli, and Sahay, 2000). While *market-driven* refers to understanding and reacting to the preferences and behaviors of players within a given market structure in a responsive manner, *market-driving* implies influencing the structure of the market or behaviors of market players to enhance competitive position in a proactive manner. Prior research in marketing has emphasized the importance of a market-driving orientation to a firm's long-term market advantage and superior profitability (Brege and Kindström, 2020; Chen, Li, and Evans, 2012; Jaworski et al., 2000; Kohli and Jaworski, 1990). According to Ghauri et al. (2016), market-driving behavior encompasses three dimensions: customer driving, channel driving, and wider society driving. Given the limited room for distributors to influence the whole channel or society, I focus on customer-driving in our context of enquiry.

From the dynamic capability perspective, prior literature of market orientation has generally agreed that the ability to proactively drive the market or influence customers' latent needs is consistent with the essence of dynamic capability and is key to developing a firm's market advantage and performance (Blocker et al., 2011; Ghauri et al., 2016; Narver, Slater, and MacLachlan, 2004). Drawing on this literature, I define customer-driving capability as the distributor's ability to sense opportunities and reshape resources to proactively understand, influence, and develop customers' latent and future needs in order to create new

markets. Successful brands such as Apple, Starbucks, and IKEA are known to drive rather than be driven by the market they enter (Kumar, Scheer, and Kotler, 2000). It is noteworthy that a firm's ability to develop customers' future needs is based on its understanding and satisfaction of customers' existing needs. Yet, a firm with customer-driving capability significantly goes beyond it to explore and specify needs that even customers themselves are not aware of. Our interviews with two high-positioned managers of electronics firms revealed:

> "About ten years ago, our company only focused on doing what customers asked for. We can no longer just do the same, as the technologies have been changing too fast. We have to be more active in 'pushing' our customers. For example, downstream customers may not know the latest technological trend in the industry. We need to take the initiative to tell them the possibilities of cutting cost or improving product performance based on the new technologies." (Ms. W, Marketing Director, IC Electronics)

> "Sensing and fulfilling customer needs are the basis in our industry. We frequently update customers with the latest information in our industry and get ourselves updated on their needs and concerns. We also propose solutions such as different combinations of products and services for our customers to create new business opportunities." (Ms. C, Regional Supply Manager, FT Electronics)

As illustrated by the two informants, firms actively create new customer needs by informing customers about technological advancements, and proposing solutions to solve customer problems. I posit that a distributor's customer-driving capability plays a critical role in the face of supplier encroachment, and aim to empirically examine its antecedents and performance impact under varying levels of supplier encroachment.

In doing so, this study contributes to the marketing channels literature in three ways. First, unlike the prior research, which focused on a supplier's ability to encroach on the market in multichannel management, our study is among the first to adopt a distributor's perspective to discuss the dark side of supplier encroachment and how distributors can respond to it by developing customer-driving capability. Second, I examine the performance impact of distributors' customer-driving capability under the pressure of supplier

encroachment. Responding to the call for dynamic capability research in proactive market-driving (Wilden, Devinney, and Dowling, 2016), I posit that, as a middleman, the distributor's ability to drive or "make" downstream customer need is key to sustaining its market advantage and enhancing firm performance. Third, I integrate the dynamic capability and network embeddedness theory in a new context by explaining how distributors can develop relationships with different network actors, including upstream suppliers, peer distributors, and downstream customers in order to diversify, excavate, and secure resources for customer-driving capability development. Specifically, I suggest that supplier relationship exploration, distributor relational embeddedness, and customer service excellence serve as conduits for developing customer-driving capability, thus providing practical implications to managers in distribution firms.

2.2. Conceptual Framework and Hypothesis Development

2.2.1. Supplier Encroachment

In addition to selling through intermediary distributors, suppliers sell products directly to downstream customers using supplier-owned sales forces, a phenomenon known as supplier encroachment (Arya et al., 2007; Huang et al., 2018). Suppliers with high encroachment can obtain direct access to valuable market information (Sa Vinhas and Anderson, 2005), explore customers' product preferences, and ultimately stimulate changes in the market structure and shape the behaviors of the players in the value chain (Webster, 2000). Supplier encroachment can also benefit customers with competitive price offerings and advanced product research and development (Sa Vinhas and Anderson, 2005). Given the increased number of direct transactions between suppliers and customers, distributors face unprecedented challenges to acquire and retain customers (Dahlquist and Griffith, 2014; Ernst, Hoyer, and Rübsaamen, 2010). From the distributor's view, direct market access by suppliers, who have advantages in terms of price flexibility, technology strength, and

resource management (Rehme et al., 2016), places substantial pressure on their survival and profitability.

Most of the previous research on supplier encroachment takes the view of suppliers (e. g., Arya et al., 2007; Homburg et al., 2014; Huang et al., 2018). One literature stream on channel management has focused on how suppliers can maximize their benefits through encroachment. For example, Homburg et al. (2014) delineated strategies for B2B suppliers to approach their customers' customers. Sa Vinhas and Heide (2015) examined the role of the suppliers' concurrent channel usage in reducing distributors' opportunism and how suppliers can manage competition between channels. Another stream of the literature has focused on the optimal pricing strategy for suppliers when they plan to directly approach customers. For example, a nonlinear pricing strategy should be considered when the problem of information asymmetry exists due to supplier encroachment (Li et al., 2015; Huang et al., 2018). However, to the best of our knowledge, no prior research has taken a distributor's perspective to understand how they can effectively respond to the challenge of supplier encroachment.

2.2.2. Distributors' Customer-driving Capability and Firm Performance

From the dynamic capability perspective, a firm's ability to create new value requires it to sense opportunities and threats, seize the opportunities, and maintain competitiveness by integrating, protecting, and even reconfiguring tangible and intangible resources to match and create market changes (Eisenhardt and Martin, 2000; Teece, 2007). The literature of dynamic capability suggests a link between a firm's dynamic capability and its ability to influence markets. The dynamic capability enables firms to respond to and carry out changes in the market (Teece, Peteraf, and Leih, 2016). In the marketing literature, prior researchers also use the dynamic capability perspective to explain how market orientation and marketing capability affect firm performance (e.g., Bruni and Verona, 2009; Danneels, 2008; Morgan, Vorhies, and Mason, 2009; Song et al., 2005; Winter, 2003).

Prior research on marketing capability has primarily adopted a customer focus to examine constructs such as market-focused learning, customer linking, and customer needs fulfillment (Mu et al., 2018; Song et al., 2005; Vorhies and Morgan, 2005; Weerawardena, 2003). While some studies have emphasized the strategic value of customer-driving capability to firms, they have been mostly conceptual in nature, limited to case studies and theoretical reviews (e.g., Elg et al., 2012; Schindehutte, Morris, and Kocak, 2008; see Table 1). In a recent study, Wilden et al. (2016) called for further studies to shift from a passive market-driven perspective toward the investigation of proactive market-driving. Thus, an empirical examination of customer-driving capability and its antecedents and outcomes is much needed.

Table 1. Selected Studies Related to Customer-driving Capability

Key studies*	Research objectives	Theory	Empirical	Key findings
Jaworski, Kohli, and Sahay, 2000	To introduce two approaches to market orientation: market-driven and market-driving approach.	Market orientation	No	This study reshapes and defines market-driven and market-driving. It also provides three approaches to driving the market structure and two ways for firms to shape market players' behaviors.
Kumar, Scheer, and Kotler, 2000	To compare market-driven and market-driving.	Market orientation	No	This study offers several recommendations to help established firms overcome obstacles and become more market-driving.
Narver, Slater, and MacLachlan, 2004	To distinguish between responsive and proactive market orientations and new product success.	Market orientation	No	This study extends the measurement of market orientation by measuring both responsive market orientation and proactive market orientation. The findings also imply that proactive market orientation is indispensable for firms to sustain new-product success.
Schindehutte, Morris, and Kocak, 2008	To explore how entrepreneurship-market-driving interface influence sustainable competitive advantage.	Market orientation	No	This study argues that market-driving is distinct from a firm's market orientation, and instead is the essence of entrepreneurial action in the Schumpeterian "creative destruction" sense.
Blocker et al., 2011	To explore the notion of proactive customer orientation and examine how this capability offers an opportunity for competitive advantage.	Market orientation	Yes	This study confirms that proactive customer orientation is the most consistent driven of customer value creation.
Elg et al., 2012	To explore how firm achieves supportive supplier relationship in global supplier network to enhance its market- driving strategy.	Social network	No	This study identifies critical factors within the actor, resource and activity dimensions that influence the suppliers' support for a firm's market-driving strategy.
Ghauri et al., 2016	To investigate how firm becomes market-driving in foreign markets and what capabilities lead to market-driving behavior.	Dynamic capability	Yes	This study finds that capabilities in configuration, networking, knowledge transfer and internal branding can lead to market-driving behavior.
Stathakopoulosa et al., 2019	To investigate the role of personnel attributes in implementing a market-driving strategy.	Market orientation	No	This study demonstrates that specific characteristics of the top management and certain traits of middle-level employees are of central importance to the market-driving concept.
Nenonen, Storbacka, and Windahl, 2019	To comprehensively categorize the capabilities needed for market-shaping and synthesize them into a conceptual framework that describes the process and its outcomes.	Dynamic capability	No	This study finds that market-shaping is beneficial not only for the shaping firm but also for other stakeholders. It also proposes eight triggering capabilities and four facilitating capabilities.
Brege and Kindström, 2020	To provide specific strategies for firms to develop proactivity in the market.	Market orientation	No	This study proposes a working definition of proactivity in a market strategic context and conceptualizes three generic proactive market strategies.
Our study	To explore whether customer-driving capability helps a distributor survive through the destructive competition brought by supplier encroachment, and the antecedents of customer-driving capability.	Dynamic capability	Yes	This study confirms the vital role of distributor's customer-driving capability in facilitating firm performance under supplier encroachment condition, and identifies three antecedents of customer-driving capabilities: supplier relationship exploration, distributor relational embeddedness and customer service excellence.

I posit that customer-driving capability positively influences a distributor's firm performance for three reasons. First, customer-driving capability is a type of dynamic capability, and it enables a distributor to provide value propositions that focus more on the future and new market than the existing market (Kumar et al., 2000) and hence survive market dynamism, in which customer needs are difficult to predict and satisfy. Second, customer-driving capability needs distributors to accurately understand customers' current needs, which can help them to continuously probe and uncover customer's future needs, likely even before customers realize that they have such a need. It can enhance the value that distributors deliver to customers and thus develop the distributor's market advantage and firm performance (Blocker et al., 2011; Brege and Kindström, 2020). Finally, a distributor who possesses customer-driving capability can reconfigure resource linkages and create a unique proactivity profile, such as customized product solutions and services, to create new markets, increase the market size, and enhance firm performance (Blocker et al., 2011; Ghauri et al., 2016). For example, a distributor with customer-driving capability can synergize resources and offer specific products and services to a given customer to address its latent needs.

Given that distributors are the middlemen in a distribution channel and perform marketing tasks for the supplier, they are usually driven by the supplier instead of customers, who are closer to the market. This supplier-driven nature of their role, on the one hand, foreshadows the distributor's predicament amid the trend of supplier encroachment and, on the other hand, demands that distributors think outside the box to engage in customer-driving activities.

I argue that not only does customer-driving capability increase distributors' performance, but this effect also grows under supplier encroachment. As suppliers encroach on customers, customers have more choices on the purchasing channels and will develop higher and more sophisticated expectations regarding the products or services they receive

(Dahlquist and Griffith, 2014; Ernst et al., 2010). Business customers expect service or product providers not only to satisfy their expressed needs but also to sufficiently understand and address their latent needs as part of transactional exchanges (Blocker et al., 2011; Flint, Woodruff, and Gardial, 2002). With the increasing competition from suppliers' direct sales, the ability to drive customer needs becomes more valuable because it is in line with heightened customer expectations. For example, with increasing supplier encroachment, customers can obtain offerings with competitive prices and value. It is advisable for distributors, who are left with little profit margin, to avoid price wars with suppliers and to focus on latent markets. In this case, customer-driving capability enables distributors to avoid competition with the supplier on the existing market by focusing on latent markets and future customer needs instead, thus creating new markets and setting up new market advantages. Finally, the stronger the supplier encroachment, the less value customers will perceive from the distributor's regular order fulfillment; thus, the capability of distributors to drive customers' latent needs and deliver unique value to customers becomes more important for distributor firm performance. Distributors armed with customer-driving capability can help customers to identify their needs and address them in advance, thereby improving the irreplaceability of the distributor from customers' viewpoints and enhancing distributor performance.

H_{1a}: The distributor's customer-driving capability positively influences its firm performance.

H_{1b}: Supplier encroachment strengthens the positive relationship between the distributor's customer-driving capability and its firm performance.

2.2.3 Antecedents of the Distributors' Customer-driving Capability

As previously discussed, a distributor's customer-driving capability is critical for driving firm performance. An ensuing question is how distributors can build up their

customer-driving capability. Moreover, since supplier encroachment represents a competitive condition for the distributor, can any of the drivers of customer-driving capability become more or less effective?

Distributors are embedded in the network with other market players, including upstream suppliers, peer distributors, and downstream customers (Dong, Zeng, and Su, 2019; Wang, Gu, and Dong, 2013). The heterogeneous information and resources that distributors draw from different entities in the network can promote their customer-driving capability. Therefore, I draw on the dynamic capability and network embeddedness perspective to investigate how distributors can diversify, excavate, and secure their resources with other market players in the network to facilitate customer-driving capability (Elg et al., 2012). In our study, I consider *supplier relationship exploration*, which is defined as a distributor's effort to seek alternative suppliers for more business opportunities (Tse, Wang, and Zhang, 2019), as an approach to diversify and enrich distributors' resource base. *Distributor relational embeddedness* refers to the extent to which a distributor develops close and reciprocal relationships with other distributors in the industry (Uzzi, 1997; Wang et al., 2013). For downstream customers, I consider *customer service excellence*, referring to an organizational emphasis on delivering accurate and timely services to customers through sales reps (Wirtz and Zeithaml, 2018). By embracing customer service excellence, sales reps from the distributor firm can help to secure vital and scarce resources (Gu, Wang, and Wang, 2019) and facilitate information exchange and business transactions through interpersonal communications and informal social mechanisms (Huang et al., 2016).

2.2.3.1. Supplier Relationship Exploration

Unlike monotonous supply, which causes threats to the distributor in terms of channel stability, resource accessibility, and supply price (Tomlin, 2006), supplier relationship exploration provides several benefits to facilitate the development of customer-driving

capability. First, through communication with different suppliers, distributors can enlarge and diversify their reservoir of information and obtain a better understanding of industry and market characteristics (Tse et al., 2019). With greater information accessibility, distributors can comprehend the industry forefront to drive customers' latent needs, which are difficult for customers to articulate (Blocker et al., 2011). For example, distributors with more knowledge about the product market from different suppliers can educate their customers about the latest technological trends in the industry. Second, as supplier relationship exploration allows distributors to explore alternative resources available on the market, it places competitive pressure on the incumbent supplier to offer better prices and products (Babich, Burnetas, and Ritchken, 2007; Wuyts et al., 2004). It not only can secure the stability of supply but also can optimize the resources to be utilized for latent customer need exploration and satisfaction. Third, the diversified resources from different suppliers enable distributors to drive different customer needs in a more precise fashion (Choi and Hartley, 1996). For example, resources from suppliers with a spectrum of expertise across product categories can deepen and widen a distributor's knowledge in different fields, which enables it to drive customers' latent needs from different aspects and expand its customer-driving capability. Thus, supplier relationship exploration enables distributors to diversify information, optimize their offerings, and drive different segments of customer needs, thus facilitating the development of customer-driving capability.

However, when supplier encroachment is high, I posit that the positive effect of supplier relationship exploration on a distributor's customer-driving capability decreases. As suppliers deepen their encroachment via direct sales channels to reach end customers, the distributor gains reduced benefits from supplier relationship exploration. First, while distributors can collect more information from an enlarged pool of suppliers and use the insights gained to influence customer needs (Prajogo and Olhager, 2012; Tse et al., 2019),

suppliers that directly contact customers can transfer knowledge to customers in a timely and customized way. Therefore, the information benefit arising from supplier relationship exploration is less effective in shaping the customer-driving capability. Second, when suppliers directly contact customers, they do not have to share profits with intermediary distributors, which is a main motive for their encroachment (Hendershott and Zhang, 2006). In so doing, they can offer customers products and solutions with higher price value (Arya et al., 2007; Homburg et al., 2014). Although supplier relationship exploration can help the distributor to obtain better price value (Koufteros, Vickery, and Dröge, 2012), the bargaining power of the distributor among different suppliers gradually decreases as supplier encroachment deepens, thus reducing the benefit of supplier relationship exploration. Finally, as supplier encroachment grows, suppliers directly invest in end customers in order to gain information about customer needs and market changes (Homburg et al., 2014). With direct access to customer information and resources, suppliers can drive customers' latent needs independently and effectively, bypassing the distributor (Huang et al., 2018). Thus, the diversified supplier resources become less valuable for distributors to drive different customers' needs when supplier encroachment is high (Yoon, 2016). Overall, supplier encroachment weakens the value of supplier relationship exploration in providing information to guide customers, optimizing offerings, and exploring different customers' latent needs, thus attenuating the positive effect of supplier relationship exploration on the customer-driving capability.

H_{2a}: Supplier relationship exploration has a positive effect on the distributor's customer-driving capability.

H_{2b}: Supplier encroachment weakens the effect of supplier relationship exploration on the distributor's customer-driving capability.

2.2.3.2. Distributor Relational Embeddedness

From the view of network embeddedness theory, a distributor is embedded in a business network consisting of suppliers, peer distributors, and customers (Granovetter, 1985; Uzzi, 1997). These network members share information regarding industry, technology, and market changes (Brass et al., 2004; Wang et al., 2013). Distributor relational embeddedness helps the distributor to develop customer-driving capability in two ways. First, distributors in the network communicate with each other to share valuable market information (Zeng et al., 2015). For example, peer distributors can share updated information about supply sources, market conditions, development trends in the industry, and insights into customers' latent needs (Gu et al., 2010). With superior information, the distributor can adjust its products and services to guide its customers proactively (Ghauri et al., 2016; Swaminathan and Moorman, 2009). Second, a distributor with high relational embeddedness shares close and reciprocal relationships with peer distributors, which makes it easy to gain trust and social support from others in the business network (Wang et al., 2013). These relational benefits are intangible resources for the distributor, facilitating its attempts to drive customers' demands and behaviors. Given the enhanced access to information and relational benefits accrued from the peer distributor network, I posit that distributor relational embeddedness facilitates the development of customer-driving capability.

I further contend that, when supplier encroachment increases, distributor relational embeddedness plays a more important role in fostering the distributor's customer-driving capability. When supplier encroachment is high, suppliers compete with distributors for market resources and information. Distributors are forced to seek valuable information and resources from other market players. In this case, the synergized value of resources gained from distributor relational embeddedness will play a stronger role in addressing industry trends and customers' needs (Wang et al., 2013). They help the distributor to drive customer needs to a greater extent. Moreover, a central feature of the distribution channel is that the

distributors are closer to the market than the suppliers and thus access more valuable downstream information (Desiraju and Moorthy, 1997; Gu et al., 2010; Wuyts et al., 2004). Forced to turn to peer distributors for more information when supplier encroachment is high, the distributor can excavate more valuable resources to drive customers' needs in a more accurate manner. Therefore, I argue that supplier encroachment will amplify the value of distributor relational embeddedness in promoting distributors' customer-driving capability.

H_{3a}: Distributor relational embeddedness has a positive effect on the distributor's customer-driving capability.

H_{3b}: Supplier encroachment strengthens the effect of distributor relational embeddedness on the distributor's customer-driving capability.

2.2.3.3. Customer Service Excellence

Distributors, which traditionally have limited room for innovation in the B2B value chain, often play similar roles as logistic and order fulfillment intermediaries. However, as suggested by Huang et al. (2016), developing interpersonal ties between exchange firms is vital to accessing and securing key and scarce resources. Sales reps, who act as the boundary spanners between firms, demonstrate effectiveness in communicating with customers and building close relationships through value-added service provision and intensive personal communication (Gu et al., 2019; Huang et al., 2016). Distributors can gain valuable customer information from service provision processes, helping them to understand customers' requirements. For example, drawing on intensive interpersonal interactions, sales reps can help distributors to obtain valuable and scarce information, which is not available in the market (Zhou et al., 2020). This result enables the distributor to dig into customers' real needs and guide them properly. Moreover, distributors that can provide excellent service to customers are more attractive to suppliers (Wuyts et al., 2004). Suppliers and other stakeholders are more motivated to work with them, enriching the tangible and intangible

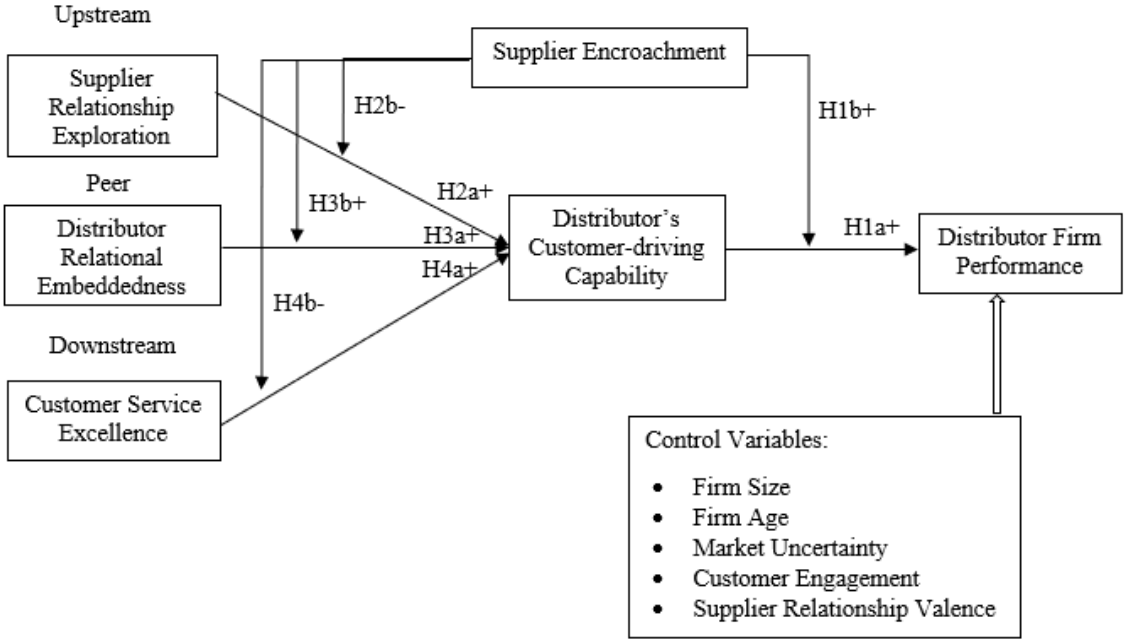
resources available to these distributors for customer-driving capability development. Overall, excellent customer service helps distributors to obtain an accurate understanding of customers and access valuable resources, thus exerting positive influences on customer-driving capability.

However, as supplier encroachment increases, the benefits obtained through customer service excellence will be weakened. Suppliers can obtain critical information about the market conditions and the end customers' requirements by approaching them directly. The resources gained by the distributor through customer service excellence thereby lose their uniqueness. Moreover, customers can obtain competitive offerings from suppliers' direct sales, such as services of the same quality but at lower prices. With increasing competitive service provisions from suppliers, more customers might cooperate directly with suppliers (Lau, Tang, and Yam, 2010), offering the distributor fewer opportunities to obtain resources and value from end customers through customer service excellence. The greater the supplier encroachment, the lower the likelihood that the distributor will be able to gain valuable and rare information and resources through services to drive the market. Thus, the effect of customer service excellence on the development of the market-driving capability is weakened when supplier encroachment is high.

H_{4a}: Customer service excellence has a positive effect on the distributor's customer-driving capability.

H_{4b}: Supplier encroachment weakens the effect of customer service excellence on the distributor's customer-driving capability.

Figure 1. Conceptual Framework (Chapter 2)



2.3. Methods

2.3.1. Sample and Data Collection

I tested our framework using data collected from distributors in the semiconductor industry across China with the help of China Electronics and Distribution Alliance (CEDA). I obtained authorization from CEDA to access its member list of distributors in China. The context is appropriate for our study for two reasons. First, supplier encroachment is a globally relevant phenomenon in the semiconductor industry with increasing threats to distributors (Texas Instruments, 2019). Since China commands nearly half of overall semiconductor market value (Deloitte, 2019), distributors face the challenge of supplier encroachment; hence, the topic is relevant to our context. Second, the semiconductor industry shares some common characteristics with industries such as automotive, consumer electronics, and software that are globally connected and technology intensive and involve complex channel structures (Deloitte, 2018). Given the changing marketplace, I believe that supplier

encroachment is a widely relevant phenomenon that marketing scholars and practitioners across countries and industries seek to understand and provide solutions for distributors. Our sample provides a proper context for theory testing and should not limit the generality of our findings.

I adopted the key-informant approach and solicited the participation of one person from each distributor firm in a high position who is knowledgeable about the firm's marketing strategy and relationships with upstream suppliers, peer distributors, and downstream customers. I invited 500 potential informants to participate in our research via email. I explained the academic purpose of our study and ensured the confidentiality of the data provided with a cover letter. After three email reminders at one-week intervals, I obtained 125 completed responses, representing a response rate of 25%. I compared the early respondents who replied after the initial email notification with the late respondents who replied after three email reminders were sent, and no significant differences in terms of industry experience and company tenure were found.

Our respondents held the titles of partner/CEO/general manager (14.2%), purchasing director (16.7%), sales manager (20.8%), product manager (33.3%), and others (15%). On average, our respondents had 11.7 years of industry experience and 6.5 years of company tenure. On average, their distribution relationship with key suppliers was 8.9 years, and their relationship with key customers spanned 7.0 years. These statistics show that our respondents are highly experienced and familiar with their suppliers and customers.

2.3.2. Measures

I identified the potential measurement scales for the key constructs from the previous literature and adapted them to our research context. I developed an English version questionnaire and then translated it into Chinese. Two independent bilingual translators then translated the Chinese-based questionnaire back into English to ensure the conceptual

equivalence. I conducted in-depth interviews with CEOs and senior purchasing managers from distributor firms to evaluate the questionnaire's relevance and clarity. I revised several items based on their feedback. The items used in the questionnaire are measured on 7-point Likert scales (1 = strongly disagree and 7 = strongly agree), unless otherwise specified.

I carefully constructed the four-item measurement scale for *customer-driving capability* based on the previous literature including customer-driving behavior from Ghauri et al. (2016), future customer needs focus from Nenonen et al. (2019), and proactive customer orientation capability from Blocker et al. (2011). External validity of these items was verified through in-depth interviews with senior managers.[1] The first item measures the distributor's ability to explore new customers in new markets, a key characteristic of customer-driving capability (Blocker et al., 2011). The second and third item stress the distributor's ability to explore and satisfy customers' latent needs, such as launching new products and services, and probing customers' real needs that they might be unaware (Ghauri et al., 2016). These items have been used in previous studies to gauge the extent to which distributors can proactively drive customers (Ghauri et al., 2016; Jaworski et al., 2000; Nenonen et al., 2019). The last item measures the distributor's ability to keep close contact with customers to fulfill their current needs and explore their latent needs (Blocker et al., 2011; Brege and Kindström, 2020). These items are also consistent with our interviewees' comments.

> "If we cannot offer customers what they asked for, we have no opportunity for future orders. We get to know our customers better through fulfilling their existing needs, which also helps us make more reasonable recommendations for them. Sometimes customers do not know the latest trend in the industry or express their needs clearly, so we will explore together to find their real needs. We call this 'demand creation' in our industry." (Mr. F, Product manager, CE International Equipment)

> "Every time when we successfully complete a customer order, we know their needs better. When we satisfy their existing needs, they trust us more. They will tell us more

[1]We thank a reviewer for recommending improvement of the external validity of the study. Eight in-depth interviews were conducted, each taking 40-60 minutes. We report the informant profile and their narratives in Appendix A & B.

about their problems, worries, and plans, so that we know what they really need and brainstorm a better solution for them." (Mr. L, Regional director, AR Electronics)

The items for *supplier encroachment* were derived from the work of Homburg et al. (2014) to reflect the extent to which the supplier has direct access to the distributors' customers through marketing activities. Sample items include "Our supplier has its own customer management system" and "Our supplier often holds information-sharing activities directly targeted at downstream customers."

The items for upstream *supplier relationship exploration* were adopted from Tse et al. (2019) to describe how much the distributors would like to diversify their supplier base with different alternative suppliers. The measure of *distributor relational embeddedness* was based on Wang et al. (2013) to capture the extent of support that distributors can gain from collaborative peer relationships. I adapted the measures of *customer service excellence* from Cronin and Taylor (1992) as well as from Ray, Muhanna, and Barney (2005) to reflect the extent to which the sales reps create and deliver high quality service to customers. For the dependent variables, I adapted three items from Zhou, Yim, and Tse (2005) to measure the distributor's firm performance.

Following the previous literature (Feng, Morgan, and Rego, 2017; Gu et al., 2010), I included *firm size*, measured by the natural log of the number of staff members at the distributor firm, as a control variable because of its potential impact on the effectiveness of the customer-driving capability. I also included *firm age*, measured by the number of years since the distributor firm was founded, to control for possible economies of scale and scope. Moreover, I also included *market uncertainty*, measured by the scale items from Jaworski and Kohli (1993). The previous literature on the dynamic capability suggests that market uncertainty can have an impact on the availability of resources and capability development (Teece et al., 2016) and hence affects a broad range of marketing capability-performance links. Finally, I included *supplier relationship valence* (Kumar, Scheer, and Steenkamp,

1995) and *customer engagement* (Ernst et al., 2010) to control for their potential effects on customer-driving capability development and firm performance. The descriptive statistics and the interconstruct correlations among all of the variables are provided in Table 2.

2.3.3. Measurement Model

I summarized the constructs, measurement items, and model statistics in Table 3. I submitted all of the constructs to conduct confirmatory factor analysis. I subjected each item's loading to its priori factor and allowed all factors to correlate with each other. Finally, the fit indices of the measurement model were satisfactory ($\chi^2_{(394)} = 507.782$, $p < 0.001$, comparative fit index (CFI) = 0.952, incremental fit index (IFI) = 0.955, and root mean square error of approximation (RMSEA) = 0.048).

Table 2. Descriptive Statistics and Correlations (Chapter 2)

	1	2	3	4	5	6	7	8	9	10	11
1. Firm performance	**0.503**	0.406**	0.155	0.241**	0.339**	0.489**	0.151	-0.280**	0.040	0.362**	0.211*
2. Customer-driving capability	0.413**	**0.653**	0.215*	0.333**	0.523**	0.468**	-0.011	-0.257**	0.135	0.510**	0.327**
3. Supplier encroachment	0.161	0.221*	**0.681**	0.246**	0.405**	0.139	-0.034	-0.185*	-0.056	0.314**	0.287**
4. Supplier relationship exploration	0.247**	0.340**	0.252**	**0.581**	0.318**	0.233**	-0.062	-0.269**	0.220*	0.086	0.014
5. Distributor relational embeddedness	0.346**	0.531**	0.412**	0.325**	**0.734**	0.388**	-0.263**	-0.310**	0.061	0.357**	0.211*
6. Customer service excellence	0.496**	0.475**	0.145	0.239**	0.395**	**0.782**	-0.052	-0.312**	-0.003	0.512**	0.145
7. Firm size	0.157	-0.006	-0.029	-0.057	-0.259**	-0.048	**N/A**	0.359**	-0.052	0.073	0.066
8. Firm age	-0.276**	-0.253**	-0.181*	-0.265**	-0.307**	-0.309**	0.366**	**N/A**	-0.052	-0.143	0.032
9. Market uncertainty	0.045	0.141	-0.051	0.226*	0.066	0.002	-0.048	-0.048	**0.587**	0.032	0.024
10. Customer engagement	0.369**	0.518**	0.321**	0.091	0.364**	0.520**	0.079	-0.139	0.037	**0.676**	0.246**
11. Supplier relationship valence	0.217*	0.334**	0.293**	0.019	0.217*	0.150	0.072	0.037	0.029	0.252**	**N/A**
12. Supplier performance ambiguity (MV)	-0.256**	-0.086	-0.071	0.036	0.048	-0.120	-0.261**	0.005	0.016	-0.104	-0.246**
Means	5.016	5.974	5.497	5.388	5.557	5.485	5.379	17.533	4.258	5.549	6.172
Standard deviations	0.999	0.936	1.217	1.190	1.099	1.077	1.693	12.351	1.143	1.056	1.095

Note: N=125. **: $p < 0.01$, *: $p < 0.05$

The diagonals of the matrix are the Average Variance Extracted (AVE) values for the latent variables shown in the bold type; the zero-order construct correlations are below the diagonal; the adjusted correlations for the potential common method variance (Lindell and Whitney, 2001) are above the diagonal

Table 3. Construct Measurement Scales and Properties (Chapter 2)

Multi-item construct measures	Std. Loading
Customer-driving Capability CR= 0.750 AVE= 0.503	
(Self-constructed based on Blocker et al., 2011; Ghauri et al., 2016; Nenonen et al., 2019)	
1. We are capable of exploring new customers in new markets.	0.912***
2. We regularly launch new products and services that are intended to explore the latent needs of our existing and new customers.	0.833***
3. We continuously explore our customers' new needs, of which they might be unaware.	0.777***
4. We always keep close contact with our customers to fulfill their existing needs and explore their latent needs.	0.696***
Supplier Encroachment CR= 0.893 AVE= 0.653	
(Self-constructed based on Homburg, Wilczek and Hahn, 2014)	
1. Our supplier often holds customer events without our participation.	0.968***
2. Our supplier verifies the information received from distributors with downstream customers directly.	0.869***
3. Our supplier often holds information sharing activities directly targeted at downstream customers.	0.786***
4. Our supplier has its own customer management system.	0.642***
Supplier Relationship Exploration CR= 0.806, AVE= 0.581	
(adapted from Tse, Wang, and Zhang, 2019)	
1. We always consider potential new suppliers to secure better product lines, delivery conditions, or prices, even when we are happy with the current suppliers.	0.775***
2. We continually adjust our resources to build up relationships with diverse potential suppliers.	0.758***
3. We are continually on the lookout for relationship building with various potential suppliers.	0.754***
Distributor Relational Embeddedness CR= 0.917 AVE= 0.734	
(adapted from Wang, Gu, and Dong, 2013)	
1. We share close social relations with other peer distributors in our distribution network.	0.934***
2. The other peer distributors in our distribution network are quite willing to give favors or provide help to us.	0.882***
3. Relationships between us and other peer distributors in our distribution network can be generally described as "mutually beneficial".	0.807***
4. We expect to be working with other peer distributors in our distribution network far into the future.	0.796***
Customer Service Excellence CR= 0.915 AVE= 0.782	
(adapted from Cronin and Taylor, 1992; Ray, Muhanna, and Barney, 2005)	
1. Our service reps provide customer service accurately the first time.	0.906***
2. Our service reps strive to understand and meet customers' specific needs.	0.880***
3. Our service reps make sure that our promises to customers are delivered properly and timely.	0.866***
Firm Performance CR= 0.784 AVE= 0.600	

(adapted from Zhou, Yim, and Tse, 2005)		
Compared with your major competitors, your firm's performance in the following aspects is: 1=much lower than your major competitors and 7=much higher than your major competitors		
1. Sales growth in the past two years		0.756***
2. Return on investment		0.746***
3. Value to customers		0.616***
Control variables:		
Firm Size: The natural log of the number of employees the firm has.		
Firm Age: Number of years since the establishment of the firm.		
Market Uncertainty	CR=0.808	
AVE=0.587		
(adapted from Jaworski and Kohli, 1993)		
1. The downstream customer preferences change frequently.		0.878***
2. The downstream customer needs are unstable.		0.710***
3. Our sales are unpredictable.		0.696***
Customer Engagement	CR=0.892	
AVE=0.676		
(adapted from Ernst, Hoyer and Rübsaamen, 2010)		
1. Our customers will participate in the prototype testing of products.		0.882***
2. Our customers inspire and help us in the new product development.		0.861***
3. Our customers provide us with key information about market changes and latent needs analysis.		0.808***
4. Our customers will participate in the market testing of products.		0.728***
Supplier Relationship Valence		
(adapted from Kumar, Scheer, and Steenkamp, 1995)		
The relationship between your firm and your supplier can be described as competitive (1), or cooperative (7)		
Model fit: $\chi^2(394) = 507.782$ CFI= 0.952 IFI= 0.955 RMSEA= 0.048		

Note: ***: p<0.001

The standard loadings for all of the factors were significant ($p < 0.001$), demonstrating the convergent validity. Moreover, all of the composite reliability (CR) values were greater than the 0.70 cutoff, and the average variances extracted (AVE) were greater than 0.5, indicating convergent validity and reliability (Fornell and Larcker, 1981). To assess the discriminant validity, I calculated the shared variance between each pair of constructs; they were less than the AVE for each individual construct. For example, the highest shared variance between distributor relational embeddedness and customer-driving capability is 0.531 less than the AVE of customer-driving capability (0.653).

2.3.4. Common Method Bias

As our data are collected from the self-reports of distributors, I took several steps to minimize and exclude the potential for common method bias. First, in the development of the scale items in the questionnaire, I adopted the established subjective scales containing reasonable reliability and validity (Atuahene-Gima and Murray, 2007). Second, as several hypotheses in our study focus on moderating effects, the concern of common method bias is alleviated. This is because it is unlikely that the respondents would consciously suspect the complicated relationships in our framework. Third, I used Harmon's one factor method on all items. Eight factors were extracted, accounting for 77.77% of the total variance, while the first factor explained 12.07%, failing to reveal a substantial amount of common method variance (Podsakoff and Organ, 1986). Fourth, I applied Lindell and Whitney's (2001) marker variance (MV) approach to statistically assess the potential bias. I identified a marker variable (supplier performance ambiguity), which is theoretically uncorrelated with at least one core construct in our framework, as a proxy for common method variance, and I adjusted all of the construct correlations with the lowest positive correlation (r = 0.005) between the MV and all the variables. After the partial correlational adjustment, all of the significant correlations remained significant (see Table 2). Overall, based on the above procedural and statistical evidence, I believe that common method bias is not a serious concern in our study.

2.4. Analysis and Results

2.4.1. Main Effects

Because our model contains both direct effects as well as interactions, I follow previous literature (e.g., Homburg, Müller, and Klarmann, 2011; Sheng et al., 2011; Zhou et al., 2020) by using a combination of structural equation modeling (SEM) and regression analysis. I performed SEM to test our hypothesized main effects because it explicitly accounts for the reliability of measurement and can simultaneously test a complete model with all main effects (Weiner, Ullman, and Bentler, 2003). I controlled for the potential

effects of firm size, firm age, market uncertainty, supplier relationship valence, and customer engagement when testing the main effects. The overall model fit statistics showed a satisfactory fit of our model to the data ($\chi 2(268) = 355.532$, CFI = 0.955, IFI = 0.956, RMSEA = 0.051).

I hypothesize that the customer-driving capability enhances the distributor's firm performance (H1a). The results from our tests show that the customer-driving capability registers a highly significant and positive effect on firm performance ($\beta = 0.450$, $p < 0.001$), thereby supporting H1a. I also hypothesize that supplier relationship exploration (H2a), distributor relational embeddedness (H3a), and customer service excellence (H4a) enhance the distributor's customer-driving capability. The results provide strong support for supplier relationship exploration ($\beta = 0.193$, $p < 0.05$), distributor relational embeddedness ($\beta = 0.261$, $p < 0.05$), and customer service excellence ($\beta = 0.289$, $p < 0.05$), indicating that they all significantly and positively influence the distributor's customer-driving capability, which is in support of H2a, H3a, and H4a. Furthermore, there might be direct effects of the three antecedents on firm performance. Therefore, I tested an alternative model by linking the antecedents with firm performance. The alternative model also fits our data well ($\chi 2$ (265) = 353.434, CFI = 0.954, IFI = 0.956, RMSEA = 0.051). As Table 4 shows, adding these direct links between antecedents and firm performance does not hurt model fit. This additional evidence suggests that our results are stable and robust.

2.4.2. Moderation Effects

I applied moderated regression analysis to test the hypotheses involving moderation, as it is considered effective to detect moderator effects in survey-based research (e.g., Homburg et al., 2011; Sheng et al., 2011; Zhou et al., 2020). The results of all of the moderating effects are presented in Table 5. Supplier encroachment significantly strengthens the positive effect of customer-driving capability on firm performance ($\beta = 0.149$, $p < 0.05$),

supporting H1b. Regarding the moderated antecedents, the results show that the effect of supplier relationship exploration on customer-driving capability is significantly weakened by supplier encroachment ($\beta = -0.138$, $p < 0.05$), in support of H2b. Additionally, supplier encroachment strengthens the positive effect of distributor relational embeddedness ($\beta = 0.177$, $p < 0.01$), in support of H3b. Finally, the positive effect of customer service excellence on customer-driving capability is significantly weakened when supplier encroachment is high ($\beta = -0.191$, $p < 0.05$), consistent with H4b. The highest VIF in our model is 1.803, which is substantially less than the critical threshold of 10.0, indicating that multicollinearity is not an issue.

I conducted simple slope tests and plotted the relationships in Figure 2. In these tests, I split the supplier encroachment variable into two groups: low (one standard deviation below the mean) and high (one standard deviation above the mean). I then examined our hypothesized effects at both levels. As Figure 2a shows, the effect of customer-driving capability on firm performance is insignificant when supplier encroachment is low ($b = 0.279$, $p > 0.1$) but significant when it is high ($b = 0.428$, $p < 0.05$), suggesting the enhanced performance impact of customer-driving capability under supplier encroachment. Moreover, as Figure 2b shows, supplier relationship exploration is strongly related to customer-driving capability when supplier encroachment is low ($b = 0.602$, $p < 0.001$) but not when it is high ($b = -0.022$, $p > 0.10$). Conversely, Figure 2c shows that the effect of distributor relational embeddedness on customer-driving capability is not significant when supplier encroachment is low ($b = -0.313$, $p > 0.10$) but is significant when supplier encroachment is high ($b = 0.487$, $p < 0.001$). Finally, as Figure 2d shows, I find that customer service excellence is positively and significantly related to customer-driving capability when supplier encroachment is low ($b = 0.794$, $p < 0.05$) but not when it is high ($b = -0.069$, $p > 0.1$). These slope analysis results collectively support our moderation hypotheses, in that when supplier encroachment is high,

the impact of customer-driving capability increases, and the effectiveness of distributor relational embeddedness in fostering this capability increases as well; however, the effectiveness of supplier relationship exploration and customer service excellence declines

Table 4. Hypothesis Testing of Main Effects (Chapter 2)

Structural Paths	**Standardized Path Loading**	
	Hypothesized Model	**Alternative Model**
Main effects:		
Customer-driving capability---> Firm performance	0.450***	0.267*
Supplier relationship exploration-->Customer-driving capability	0.193*	0.204*
Distributor relational embeddedness-->Customer-driving capability	0.261*	0.259*
Customer service excellence-->Customer-driving capability	0.289*	0.229*
Supplier relationship exploration-->Firm performance		0.068
Distributor relational embeddedness-->Firm performance		0.028
Customer service excellence-->Firm performance		0.367*
Control variables:		
Firm size-->Firm performance	0.279*	0.297*
Firm age-->Firm performance	-0.323*	-0.237 +
Market uncertainty-->Firm performance	-0.083	-0.042
Customer engagement-->Firm performance	0.120	-0.025
Supplier relationship valence-->Firm performance	0.052.	0.079
Firm size-->Customer-driving capability	0.123	0.115
Firm age-->Customer-driving capability	-0.039	-0.049
Market uncertainty-->Customer-driving capability	0.125	0.103
Customer engagement-->Customer-driving capability	0.091	0.126
Supplier relationship valence-->Customer-driving capability	0.211*	0.211*
Model Fit:	$\chi^2(268) = 355.532$ CFI=0.955, IFI=0.956, RMSEA=0.051	$\chi^2(265) = 353.434$ CFI=0.954, IFI=0.956, RMSEA=0.051

Notes: +: p<0.10; *: p<0.05; **: p<0.01; ***: p<0.001

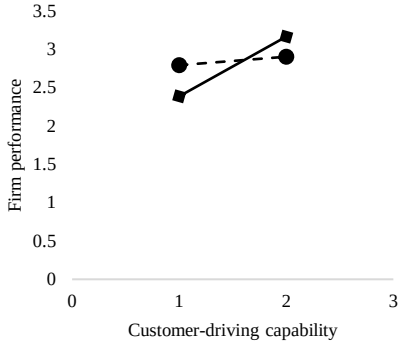
Table 5. Regression Results of the Moderating Role of Supplier Encroachment

		Dependent Variables		Highest VIF
		Firm performance	Customer-driving capability	
Control variables:				
Firm size		0.134**	0.042	1.364
Firm age		-0.023***	-0.008	1.418
Market uncertainty		0.008	0.083	1.171
Customer engagement		0.171+	0.330***	1.750
Supplier relationship valence		0.141+	0.145*	1.203
Main effects and interactions:				
Supplier encroachment (SE)		-0.036	-0.106	1.541
Customer-driving capability (CDC)	H1a	0.222*		1.575
SE x CDC	H1b	0.167*		1.119
Supplier relationship exploration (SRE)	H2a		0.149*	1.419
SE x SRE	H2b		-0.138*	1.133
Distributor relational embeddedness (DRE)	H3a		0.268***	1.803
SE x DRE	H3b		0.177**	1.605
Customer service excellence (CSE)	H4a		0.168*	1.703
SE x CSE	H4b		-0.191*	1.642
F		6.867***	12.281***	
F change		5.063**	8.786***	
R^2		0.321	0.568	
Adjusted R^2		0.275	0.522	

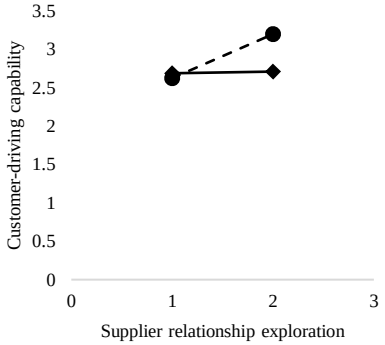
Notes: + p<0.10; * p<0.05; ** p<0.01; *** p<0.001

Figure 2. Interaction Effects (Chapter 2)

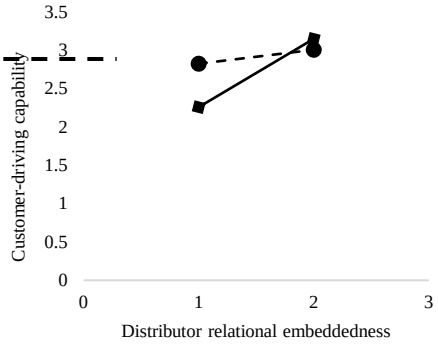
2a: Interaction effects between customer-driving capability and supplier encroachment on firm performance



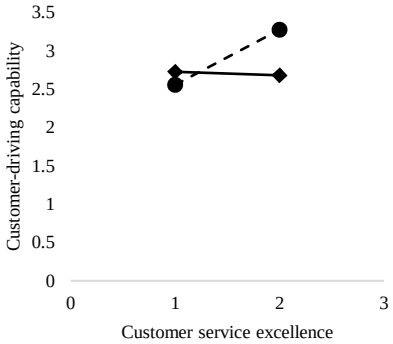
2b: Interaction effects between supplier relationship exploration and supplier encroachment on customer-driving capability



2c: Interaction effects between distributor relational embeddedness and supplier encroachment on customer-



2d: Interaction effects between customer service excellence and supplier encroachment on customer-driving capability



Low supplier encroachment
High supplier encroachment

2.4.3. Supplementary Analysis

Mediation analysis. I performed bootstrapping tests (Preacher and Hayes, 2008; Zhao, Lynch, and Chen, 2010) to determine the mediating role of customer-driving capability in affecting firm performance. The results revealed that the indirect effect of supplier relationship exploration on firm performance was significantly mediated by the customer-driving capability (a x b = 0.077), with a 95% confidence interval excluding zero (CI = 0.016 to 0.159). The direct effect of supplier relationship exploration on firm performance (c = 0.084, t = 1.157, p = 0.250, CI = -0.060 to 0.226) was not significant, suggesting full mediation (Zhao et al., 2010). Similarly, the indirect effect of distributor relational

embeddedness on firm performance through the customer-driving capability was significant (*a* x *b* = 0.112, CI = 0.016 to 0.224), but the direct effect of distributor relational embeddedness was not significant (*c* = 0.208, *t* = 2.394, *p* = 0.018, CI = 0.036 to 0.380), also suggesting full mediation. Finally, the indirect effect of customer service excellence on firm performance (*a* x *b* = 0.081) was significant, with a 95% confidence interval excluding zero (CI = 0.014 to 0.158), and the direct effect of customer service excellence on firm performance was significant (*c* = 0.322, *t* = 4.037, *p* = 0.001, CI = 0.164 to 0.480), showing the partial mediation of the customer-driving capability between customer service excellence and firm performance.

2.5. Discussion

Although the supplier's direct marketing activities have dramatically increased and pose mounting challenges to distributors' profits, empirical studies on how distributors can respond to the challenge have been rare. I propose that the distributor's customer-driving capability can enhance its performance under supplier encroachment. With survey data from 125 distributors, respectively, in the semiconductor industry, I find that the customer-driving capability can enhance the distributors' viability in the face of supplier encroachment. Moreover, I find that three antecedents systematically interact with supplier encroachment in developing the distributor's customer-driving capability. An additional set of eight in-depth interviews was conducted to strengthen our theoretical and practical understanding of the topic.

2.5.1. Theoretical Implications

This study offers implications for the following streams of literature. First, I contribute to the channel management literature by switching the perspective from the supplier to the distributor. Predominantly adopting the view of the supplier, the previous

research in the multichannel management field has mainly focused on channel structure design and pricing strategies (e.g., Huang et al., 2018; Sa Vinhas and Heide, 2015). However, a rapidly changing environment and increasing competition from upstream suppliers have challenged the viability of distributors. It is imperative to examine effective responding strategies for distributors to survive the competition. I respond to the call for more studies about intermediaries' behaviors in the channel literature (Gilliland and Kim, 2014; Kim and Gilliland, 2017) by investigating how a distributor can drive the latent and future market needs to sustain a market advantage under supplier encroachment. To the best of our knowledge, our study is among the first to conceptualize and empirically test a framework to advise distributors in the face of increasing market encroachment by suppliers.

Second, I empirically confirm that customer-driving capability can significantly enhance the distributor's performance, especially under high supplier encroachment. In so doing, I enrich the dynamic capability literature by adopting a proactive customer-driving view and empirically testing the antecedents and outcomes of the customer-driving capability (Wilden et al., 2016). I also resonate with Nenonen et al. (2019), who suggested that studies of customer-driving capability utilize context-specific heuristics. In our context of distributors, I show that the distributor's customer-driving capability enhances its performance by reconfiguring and reshaping its resources to drive customers' latent needs proactively. Our focus on distributors' customer-driving capability also responds to the call for "examining performance effects of different marketing capabilities" (Moorman and Day, 2016). Being one of the first to document the performance impact of the customer-driving capability, our study contrasts with previous studies that mostly adopted the customer-driven perspective, and I generate new insights in the area of marketing capabilities.

Third, the results contribute to the general understanding of how distributors can develop their customer-driving capability from a network perspective. I reveal a set of three

antecedents, i.e., supplier relationship exploration, distributor relational embeddedness, and customer service excellence, focusing on how distributors can diversify, excavate, and secure their resources through relationships with different market players in the network. Echoing the outside-in marketing strategy (Quach et al., 2020), our study revealed how distributors can work with external players to develop its own customer-driving capability, which will ultimately enhance the customer perceived value and firm performance. Furthermore, by testing the moderating effects of supplier encroachment on the effectiveness of the antecedents, I identify the activity profiles for the distributors' customer-driving capability development (Brege and Kindström, 2020). Among the set of approaches to develop the customer-driving capability, distributor relational embeddedness is most effective when supplier encroachment is high, emphasizing its unique contribution to the distributor's development of its capability and performance.

2.5.2. Managerial Implications

Reflecting the prevalence of supplier encroachment in semiconductors and beyond, Texas Instruments stated the following in its annual report (2019), "We market and sell our products through direct sales channels, including our brand sales force and our website, and through distributors. About 65 percent of our sales are fulfilled through our distributors, and they maintain inventory of our products." Our study provides several practical implications for distributors suffering from the competition brought by supplier encroachment. First, as a middleman with less power in the resource arrangement, a distributor should focus on its own proactive customer-driving capability rather than passively relying on the adjustments made by suppliers. A distributor with the capability of reconfiguring and reshaping the resources to make or create the market can enhance its irreplaceability in the value chain and increase its own sales performance, even in the presence of supplier encroachment. As a member of a networked value chain, a distributor faces pressure from multiple directions, such as

macroeconomic uncertainties, customer demands, supplier market changes, and competitive threats. Fostering a customer-driving capability helps distributors to buffer against risks, survive environmental dynamism, and improve performance.

Second, a distributor should adopt different approaches to enrich, diversify, and secure resources to cultivate its customer-driving capability when facing varying levels of supplier encroachment. When supplier encroachment is low, distributors can flexibly combine strategies, including supplier relationship exploration, distributor relational embeddedness, and customer service excellence, based on their resources and market characteristics to drive and influence customers. However, when supplier encroachment is high, the distributor should concentrate on distributor relational embeddedness to bond with peer distributors to enhance information sharing and reciprocity for the development of the customer-driving capability.

Third, our study suggests that, when facing competition from other market players in the value chain, a firm can take a proactive and value-generating perspective, rather than respond disruptively. In an environment of supplier encroachment, distributors can broaden the boundaries of their own firm and drive and influence the latent needs of potential markets. Distributors that are well connected to network members, including suppliers, peer distributors, and customers, are in the best position to deploy resources from multiple sources to sustain their market advantage.

2.5.3. Limitations and Future Studies

The findings of this study should be understood with the consideration of the limitations in the research design. First, although the semiconductor industry fits our research context and shares similar characteristics with many other industries, future studies can examine the effect of distributors' customer-driving capability on firm performance with data from multiple industries. Second, due to the resource constraint, data were collected from

distributor firms with one key informant. Further research can examine the framework with supplier-distributor-customer triadic-matched data or the multiple-informant approach to improve the rigor of the findings. Third, this study merely focuses on the customer-driving capability, but further studies can compare the relative performances of different types of market-driving capability with different levels of outcome variables (Katsikeas et al., 2016) to assess the organization's marketing excellence (Moorman and Day, 2016). Fourth, our study only examined three drivers of the market-driving capability based on the dynamic capability and network embeddedness perspectives. There may be other antecedents, such as resource mobilization, organization structure reconfiguration, and technology leadership, which could influence the development of customer-driving capability (Brege and Kindström, 2020). Fifth, the intermediary outcomes between customer-driving capability and firm performance, such as the customer loyalty, commitment and relationship quality, should be examined in future research. Finally, the effectiveness of customer-driving capability could be examined under different competitive forces. In our B2B supplier-distributor context, supplier encroachment is a most notable external force for distributors. However, different external factors, such as peer competition and supplier forward integration, could be further examined when varying the capacity of the customer-driving capability in enhancing the distributor's performance.

Chapter 3. Forms of Supplier Relationship Exploration and Distributor Performance

3.1. Introduction

Distributors' relationship exploration, or their search for alternative suppliers, is a prevalent phenomenon in channel management (Leonidou *et al*., 2019; Tse *et al*., 2019)[2]. However, from a sociological perspective, via an analogy to marriage and romantic relationships, researchers have cautioned against relationship exploration, claiming that it potentially threatens relational governance with incumbent partners (Anderson and Weitz, 1992; Gustafsson *et al*., 2005; Shahzad *et al*., 2018; Zhao *et al*., 2011). Leonidou *et al*. (2019) identified one of the major causes of relationship failure as "infidelity incidences in the relationship…due to a parallel creation of illegitimate partnership outside the relationship." Given mixed beliefs and business practices, I am motivated to conduct a finely-tuned investigation on the effects of relationship exploration.

Previous studies in channel management revealed the positive effects of a distributor's relationship exploration. Based on the information economics perspective, maintaining a broader supplier base is conducive to distributors' access to information and helps mitigate the risks brought by information asymmetry (Li, 2020; Wathne and Heide 2004). However, the extant literature has largely been silent on the dark side of relationship exploration and its underlying mechanisms. For example, will relationship exploration arouse the vigilance of incumbent suppliers? How can distributors explore alternative suppliers without hurting the

[2] For example, through our interviews with distributors in the semiconductor industry, Future Electronics, the fourth largest electronics distributor worldwide, continuously explores alternative suppliers to update its product offerings, maintain its supply stability, and satisfy customers' changing needs. Similarly, another electronic component distributor, Comtech, proactively searches for alternative suppliers to complement exiting product lines to energize the product and service performance.

relationship with the incumbent suppliers? Can distributors' capabilities be enhanced by exploring alternative suppliers? Are there boundary conditions that may vary the effects? Answers to these questions are important for clarifying the effectiveness of relationship exploration.

I believe that a key step toward understanding the effects and mechanisms of relationship exploration is to properly differentiate its forms based on the resources it could bring to the distributor. For example, distributors may seek alternatives to replace the existing suppliers to acquire better prices, product quality and service (Babich *et al*., 2007; Golmohammadi and Hassini, 2020). Alternatively, distributors may seek new suppliers to complement existing suppliers and expand their business scope so that they can explore unserved market segments with competitive offerings. Different purposes lead to relationship exploration behaviors that target distinctive resources and, thus, may influence distributors' capability development in different ways (Nath *et al*., 2010). However, empirical evidence is lacking in distinguishing these forms of relationship exploration.

To fill this void, based on the distinct objectives and resource implications of relationship exploration, I define and classify two types of distributor relationship exploration. One is *substitute relationship exploration* (SRE), referring to a distributor's exploration of alternative suppliers that provide products or services in the same category as their incumbent suppliers. As new and incumbent suppliers can substitute for each other in supplying similar products or services to a distributor, those suppliers' resources and knowledge have overlapping characteristics; therefore, they are competitors in the market in which they operate. The other type of relationship exploration is *complementary relationship exploration* (CRE), which I define as a distributor's exploration of new suppliers that provide products and services that are not offered by incumbent suppliers for unserved markets. In this regard, alternative suppliers and incumbent suppliers complement each other in

facilitating and enlarging the distributor's operations in different markets, which can diversify and enrich the distributor's information and resource base.

This study intends to provide three theoretical implications for the current channel management literature. First, compared to previous literature that characterizes the distributor's relationship exploration as a unitary construct, our study is among the first to categorize relationship exploration into SRE and CRE, thus enriching the relationship exploration literature in distribution channels. Prior research has mainly documented the positive effects of relationship exploration. For example, drawing on resource dependency theory, Zhang *et al*. (2021) found that relationship exploration can enhance relationship quality through dynamic capability development. By differentiating SRE and CRE, this study uncovers both the positive and negative effects of SRE and CRE in upstream relationship governance and downstream demand management, enriching the relationship exploration literature.

Second, I provide the first empirical study that investigates the distinct effects of SRE and CRE via routes of capability in relationship governance with upstream suppliers (i.e., detection capability) and of innovative service offerings to downstream customers (i.e., innovation capability)[3], which are two critical capabilities for distributors' survivability (Endres *et al*., 2020). Given the characteristics of SRE and CRE, alternative suppliers can provide different types of information and may distinctly influence the distributor's capability development. For example, potential suppliers brought about by SRE may provide similar information as the incumbent suppliers, whereas alternative suppliers brought about by CRE can help broaden and diversify the information base for the distributor, which facilitates its detection capability in governing incumbent suppliers. Moreover, SRE and CRE will

[3] As distributors do not have manufacturing essentials, a distributor's innovation capability refers to novel and innovative combinations of products and services to meet or drive downstream customers' needs (Wang *et al*., 2021)

influence the distributor's information pool by deepening existing market knowledge and diversifying the information sources, which is critical for the distributor's innovation capability (Klingebiel and Rammer, 2014; Wang *et al*., 2021). By revealing the effects of SRE and CRE on distributor capabilities, our study sheds light on how the distributor–the middleman in the distribution network–manages upstream supplier relationships and drives downstream customer needs through different types of relationship exploration, thus contributing to both academic conversations and managerial practices.

Third, our study also sheds light on the moderating role of external market uncertainty in the performance effects of SRE and CRE. Market uncertainty refers to a situation whereby a firm is unable to accurately forecast and evaluate market-related information, such as the sales volume and customer preference in the downstream market (Wathne and Heide, 2004). Information economics holds that market uncertainty is a critical factor that affects capability performance (Feng *et al*., 2017). Our results consistently show clear empirical evidence for an enhanced performance effect of innovation capability and a weakened effect of detection capability under market uncertainty. Thus, I provide implications for distributors about how to balance SRE and CRE to achieve higher firm performance.

3.2. Theory and hypothesis

3.2.1. Relationship exploration

Traditionally, suppliers have greater leverage in product distribution, product pricing and information sharing, making distributors passive receivers of suppliers' arrangement and resource allocation (Brito and Miguel, 2017; Kumar *et al*., 1995). From an information economics perspective, the dependence and information asymmetry caused by a single supply source limits distributors' ability to maintain supply stability, diversify risks, and uphold profitability (Babich *et al*., 2007; Endres *et al*., 2020; Yang *et al*., 2012). Therefore, to alleviate the single supply source predicament, distributors are motivated to seek alternative

suppliers to gain more information and broaden business opportunities while cooperating with their incumbent suppliers (Chod *et al*., 2019; Leonidou *et al*., 2019; Tse *et al*., 2019).

Distributors' relationship exploration refers to distributor-initiated activities that explore alternative supplier relationships that will add to or replace the existing suppliers–a common practice in marketing channels (Tse *et al*., 2019; Zhang *et al*., 2021). Through relationship exploration, distributors can proactively diversify and enlarge their access to resources and information (Soda and Furlotti, 2017; Tanskanen and Aminoff, 2015; Yang *et al*., 2012), facilitate knowledge acquisition and trigger novel associations in product and service provision (Cohen and Levinthal, 1990; Zhou and Li, 2012). However, some studies implied the existence of a dark side of relationship exploration. For example, managing multiple suppliers may harm the harmonious relationship between distributors and incumbent suppliers and entice noncooperative behaviors, such as information withholding, conservative support and unfair product distribution (Blessley *et al*., 2018).

One plausible reason for these inconsistent views is that the extant literature lacks sufficient differentiation between types of relationship exploration. In managerial practice, based on customers' needs and market changes, distributors can explore alternative suppliers that provide the same product categories as their incumbent suppliers to sustain supply chain stability (Anupindi and Akella, 1993; Burke *et al*., 2007). Alternatively, distributors explore suppliers that provide different product categories that can complement each other to enlarge their business scope (Zhang *et al*., 2021). Given the different objectives and resource implications of relationship exploration, proper differentiation is needed. In this study, I categorize relationship exploration into two distinct forms—SRE and CRE—to delineate both the benefits and costs arising from relationship exploration from relationship governance and innovation capability perspectives and assess their impacts on the distributor's performance.

3.2.2. SRE, CRE and detection capability

Detection capability refers to distributors' ability to evaluate their incumbent suppliers' performance and compliance with mutual agreement (Dahlquist and Griffith, 2014; Dutta *et al*.,1999), which is critical to explain the effects of SRE and CRE on distributor performance (Dutta *et al*., 1999). It is not costless for a distributor to detect whether the supplier is violating their agreement (Wathne and Heide, 2000). For example, a distributor may need to allocate resources and pay efforts to undertake on-site visits to access and verify the supplier's information and activities. In marketing channels, the distributor's information accessibility to the supplier's activities and performance relies on how much attention and effort it directs toward the supplier (Frazier *et al*., 2009).

I propose that a distributor's SRE will decrease its detection capability for two reasons. First, the purpose of SRE is to find alternative suppliers that may potentially replace an incumbent supplier by providing comparable quality, prices, or service, inevitably leading to reduced dependence on and efforts toward the incumbent supplier (Tse *et al*., 2019). The redistribution of resources reduces the incumbent relationship quality, which in turn impedes the supplier's willingness to share more information with the focal distributors. With limited access to valuable information from supplier side, the distributor's detection capability on the incumbent supplier will decrease (Dutta *et al*., 1999). Second, with SRE, the distributor has more choices in supplier selection. For example, it may gain a better price or better product quality from other suppliers (Babich *et al*., 2007). Enriched substituting choices and secured supply reliability reduce the distributor's ties to the incumbent relationship, so its governance efforts toward the incumbent supplier performance will likewise decrease. With diminished dependence on the incumbent supplier, the distributor will be less motivated to spend time and efforts on monitoring the incumbent supplier. In such cases, the distributor's SRE is negatively related to its detection capability on the incumbent supplier.

In contrast, I posit that a distributor's CRE can increase its detection capability regarding its incumbent supplier's performance. In the case of CRE, a distributor's aim is to broaden its business scope rather than replace incumbent suppliers. For example, an incumbent supplier provides product A and a new supplier provides product B to the distributor. These two suppliers are not competing but are complementary to each other (Soda and Furlotti, 2017). Therefore, the incumbent supplier's functions are still irreplaceable and unique to the distributor, and the distributor's efforts and resources directed toward the incumbent supplier will not be reduced. The distributor should still attach great importance to the dyadic relationship and try to promote their cooperation quality. Moreover, as the distributor gains diversified resources and information from different suppliers that may complement each other, the information asymmetry between the distributor and incumbent supplier is weakened (Babich *et al*., 2007). Thus, the focal distributor will be more effective in evaluating and monitoring the incumbent supplier's performance and its compliance with mutual agreements. In sum, we posit:

H1: (a) SRE reduces, while (b) CRE enhances the distributor's detection capability.

3.2.3. SRE, CRE and innovation capability

As distributors are not obligated to launch new products directly, their innovation capability is embodied in their capability to generate innovative solutions that solve customer problems and create customer value (Yoon and Lilien, 1988; Zhang *et al*., 2021). Prior research indicates that an enriched and diversified flow of information can facilitate knowledge acquisition (Ganesan *et al*., 2009) and trigger novel associations (Cohen and Levinthal, 1990). These resources are the foundations of a firm's innovation (Klingebiel and Rammer, 2014), which can enhance firm performance (West and Bogers, 2014; Zhang *et al*., 2021). For distributors, relationship exploration can help diversify and enhance their market-related knowledge by accessing information and resources from different suppliers outside their

existing relationships (Blocker *et al*., 2011). For example, through SRE with new competing suppliers in the same category, a distributor can provide more competitive offers for customers' consideration based on customers' specific needs. By matching services with customers' needs, the distributor can flexibly innovate diversified services and solutions, which enhances its competitiveness (Mangus *et al*., 2020; Uzzi, 1997). Through CRE with suppliers whose product and service offerings target unserved market segments, distributors are also able to learn fresh product and market knowledge to diversify their knowledge and service offerings. As such, both SRE and CRE enable a distributor to update its repertoire of knowledge of products and markets, which promotes its innovation capability in providing superior solutions and services to better satisfy customers' needs (Li *et al*., 2017). Taken together, I hypothesize:

H2: Both (a) SRE and (b) CRE enhance the distributor's innovation capability.

3.2.4. Detection capability, innovation capability and firm performance

I argue that a distributor's detection capability can positively affect its firm performance. A distributor with a high detection capability is better able to monitor its supplier's behaviors, thus leaving little room for supplier opportunism that may damage the distributor's performance (Lumineau and Oliveira, 2020). With a greater information advantage against the incumbent supplier, the distributor also has a higher ability to negotiate with the supplier and get things down more efficiently (Zhang *et al.*,2018). This enhanced control facilitates the distributor's performance. Furthermore, with higher detection capability, the distributor can monitor the supplier's performance in a timely manner and decide whether to increase its investment in the incumbent relationship. Accordingly, the distributor can adjust its resources to better adapt to changing situations to optimize its own performance.

In addition to our assertion regarding the positive performance effect of detection capability, I also suggest that distributors with higher innovation capability are able to

achieve higher firm performance. Abundant research shows that firms with innovation capability are likely to achieve greater market performance because of their unique value proposition, advanced technology, and forward-looking of customer needs (Laursen and Salter, 2006; Sheng *et al*., 2013). As illustrated above, a distributor's innovation capability is manifested in providing customers with innovative customer solutions and services that solve customers' problems in a more creative and valuable manner, which can help distributors gain higher customer satisfaction and loyalty (Endres *et al*., 2020). Moreover, with the ability to offer more innovative and customized solutions and services, distributors can even proactively drive customer demand, thus creating greater profits (Wang *et al*., 2021). Taken together, I hypothesize the following:

> **H_3**: **(a)** Detection capability and **(b)** innovation capability can positively affect the distributor's firm performance.

3.2.5. The moderating role of market uncertainty

Market uncertainty refers to a situation in which a firm is unable to accurately forecast and evaluate market-related information, such as sales volume and customer preference in the downstream market (Wathne and Heide, 2004). When market uncertainty is high, it may lead to a distributor's difficulties in acquiring or evaluating external market information, integrating market knowledge, and making distribution decisions (Tsai and Yang, 2013). I again take the view from the information economics perspective and consider how the performance impacts of detection capability and innovation capability can vary upon the differing levels of market uncertainty.

I posit that market uncertainty weakens the positive effect of detection capability on the distributor's firm performance. When market uncertainty is high, the distributor may find it difficult to predict customer demands and acquire downstream market-related information (Jaworski and Kohli, 1993; Tsai and Yang, 2013). The distributor, as a middleman in the

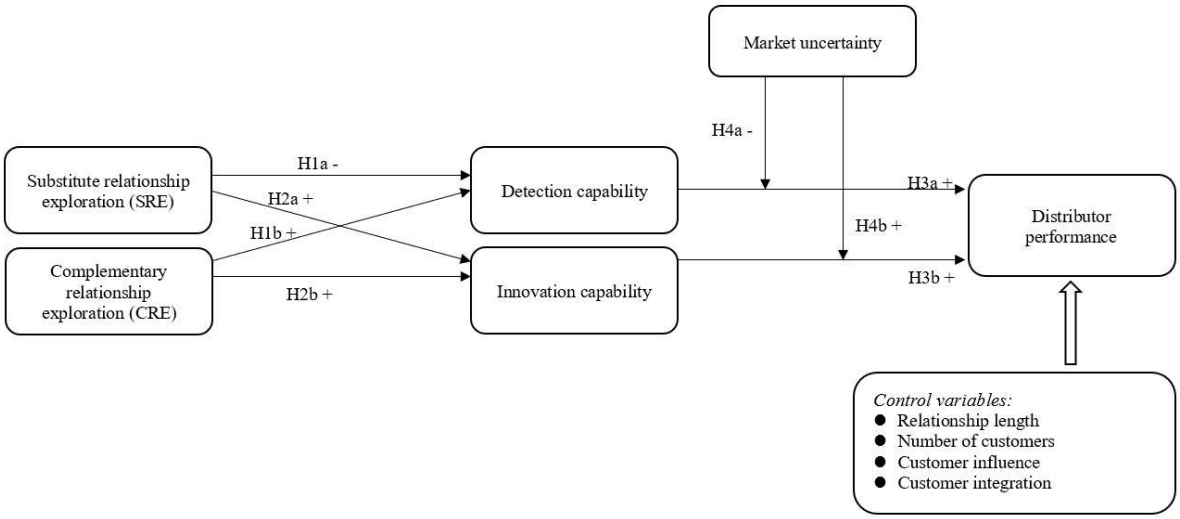
supply chain, may rely more on upstream suppliers to obtain consistent support and supply and drive customer needs, so as to neutralize external uncertainty and maintain firm performance (Wang *et al*., 2021; Wuyts *et al*., 2004). The distributor's dependence on the supplier is likely to increase. As a result, the distributor may be less able to leverage its detection capability to control or negotiate with the supplier to facilitate performance. Moreover, when market uncertainty is high, it becomes more difficult for distributors to allocate marketing resources and priorities due to the lack of information clarity. Although a high level of detection capability can help distributors evaluate supplier performance and adjust resource allocation (Dutta *et al*., 1999), a high level of market uncertainty impedes its resource allocation decisions that improve performance (Zhang *et al*., 2021). Overall, I believe that when market uncertainty is high, a distributor's detection capability related to the incumbent supplier becomes less effective in enhancing performance.

In contrast, I posit that when market uncertainty is high, a distributor's innovation capability will have a stronger effect on firm performance. Innovation capability enables the distributor to continuously launch new solutions or services to the market and even lead customer needs (Ferreira *et al*., 2020). Under high market uncertainty, the ability to understand customers' expressed and latent needs becomes more critical, and so is the ability to provide innovative service offerings to continuously meet and lead customer expectations. A distributor's innovation capability will help fulfill and drive customer demands and hence create profits. It will also enable the distributor to make timely changes to its products and services (Wang *et al*., 2021), making the new solutions more in line with customers' expectations. Therefore, a distributor's innovation capability will lead to stronger competitiveness and higher market performance when market uncertainty is high.

H_{4a}: When market uncertainty is high, the positive effect of detection capability on a distributor's firm performance will be weakened.

H_{4b}: When market uncertainty is high, the positive effect of innovation capability on a distributor's firm performance will be strengthened.

Figure 3. Conceptual Model (Chapter 3)



3.3. Methods

3.3.1. Sample and data collection

We adopted measures from the previous literature to design our questionnaire. I first developed an English version of the questionnaire and then translated it into Chinese. I enlisted two professional translators to translate the Chinese version back to English to ensure consistency. To increase the validity of our questionnaires, I conducted in-depth interviews with 8 senior managers with the help of the China Electronics and Distribution Alliance (CEDA). Based on their feedbacks on the questionnaire, I revised several items.

We randomly selected 500 distributor firms from a distributor directory provided by CEDA. I adopted the key informant approach and invited respondents with a high position and with extensive knowledge of their firms to participate in our research. The respondents held titles such as general managers, purchasing directors, sales managers, and product managers. I explained in a cover letter the academic purpose of our study and ensured the

confidentiality of the information. After sending three reminders at one-week intervals, I obtained 176 completed responses, which is a response rate of 35.2%. To test for nonresponse bias, I compared the early respondents (those who replied soon after the initial email notification) with the late respondents (those who replied after three email reminders were sent) and no significant differences in terms of industry experience, company tenure or geographic location were found.

3.3.2. Measures

We asked the respondents to recall their relationships with suppliers, peer distributors and customers and evaluate the market environment factors. The items used in the questionnaire were measured with 7-point Likert scales (1 = strongly disagree and 7 = strongly agree) unless otherwise specified.

As there were no established measurements for *SRE* and *CRE*, I obtained inspiration from Tse *et al*. (2019) and integrated it with narratives from 8 in-depth interviews with senior managers in the semiconductor industry to develop the two scales. *SRE* assesses a distributor's intention to seek alternative suppliers that can replace an incumbent supplier. I asked respondents to evaluate to what extent the potential suppliers they consider exchange with are: (1) competitors with incumbent suppliers, (2) substitutes for incumbent suppliers, and (3) provide products and services in the same category as incumbent suppliers. *CRE* evaluates a distributor's intention to expand its supplier pool by seeking suppliers that can complement its incumbent suppliers. Respondents were asked to rate the extent to which the potential suppliers they consider exchange with: (1) provide products and services that are not offered by incumbent suppliers, (2) can add to existing products and services, and (3) can complement incumbent suppliers' product and service offerings.

The measure of *detection capability* was adapted from Dutta *et al.* (1999), with three items assessing to what extent the distributor can accurately evaluate the performance of the

incumbent supplier. I adapted the measure of *innovation capability* by Subramaniam and Youndt (2005), with three items assessing the distributor's capability to generate innovations in its product and service offerings. I adapted the measure of *market uncertainty* by Jaworski and Kohli (1993) to assess the extent to which market and customer needs are unpredictable. Regarding the measure of *firm performance*, I adapted the three-item scale from Zhou *et al.* (2005).

We included four control variables that were proven to influence marketing channel management in the prior literature. First, I controlled the *relationship length* between the distributor and its focal supplier, as prior literature suggested that it may influence the formation of relational norms within the dyad; this may affect the distributor's performance (Jap and Ganesan, 2000). Moreover, I controlled three customer-related variables. A distributor's *number of customers* indicates its sources of revenue and thus affects its performance (Zhang *et al*. 2021). A distributor's *customer influence* (Smith and Barclay, 1997) and *customer integration* (Frohlich and Westbrook, 2001) reflect the degree of trust and interdependence between customers and the distributor, thus affecting the distributor's capabilities and performance (Palmatier *et al*., 2007). The descriptive statistics and the inter-construct correlations among each pair of variables are provided in Table 6.

3.3.3. Measurement model

We summarized the constructs, measurement items, Cronbach's alpha (α), composite reliability (CR), average variance extracted (AVE) values and model statistics in Table 7. I used all of the constructs to conduct confirmatory factor analysis. I subjected each item's loading to its a priori factor and allowed all factors to be correlated with each other. Finally, the fit indices of the measurement model were satisfactory (χ^2 (207) = 296.459, $p < .001$, comparative fit index (CFI) = .959, incremental fit index (IFI) = .960, and root mean square error of approximation (RMSEA) = .050.

The standard loadings for all of the factors were significant ($p < .001$), demonstrating convergent validity. Moreover, all of the CR values were greater than the .70 cutoff, and the AVE values were greater than .50, indicating convergent validity and reliability (Fornell and Larcker, 1981). I used two approaches to assess the discriminant validity of the measures. First, I calculated the shared variance between each pair of constructs. They were less than the AVE for each individual construct. For example, the highest shared variance between innovation capability and customer integration is .415, less than the AVE of innovation capability (.799). Second, I ran pairwise chi-squared difference tests for all multi-item scales to determine whether the restricted model (correlation fixed at 1.0) and the freely estimated model had significant differences. For example, for customer influence and customer integration, which shared the highest correlation among all pairs, the chi-squared difference test between the two models was significant ($\Delta\chi^2_{(1)} = 11.16$, $p < .001$). All the pairwise model comparisons resulted in significant differences, indicating good discriminant validity of the constructs.

Table 6. Descriptive Statistics and Correlations (Chapter 3)

	1	2	3	4	5	6	7	8	9	10
1. Firm performance	**.573**	.005	.009	.095	.227**	.081	.081	-.066	.323**	.242**
2. Substitute relationship exploration (SRE)	.006	**.568**	-.052	-.258**	.194**	.278**	-.071	-.152*	-.034	.001
3. Complementary relationship exploration (CRE)	.010	-.051	**.640**	.297**	.227**	.084	-.112	.075	-.015	.026
4. Detection capability	.096	-.257**	.298**	**.742**	-.068	-.095	.123	.123	-.090	-.155*
5. Innovation capability	.228**	.195**	.228**	-.067	**.799**	.192*	-.141	.058	.264**	.414**
6. Market uncertainty	.082	.279**	.085	-.094	.193*	**.562**	-.077	-.047	.084	.140
7. Relationship length	.082	-.070	-.111	.124	-.140	-.076	**N/A**	-.194**	.105	-.067
8. Number of customers	-.065	-.151*	.076	.124	.059	-.046	-.193*	**N/A**	.080	.011
9. Customer influence	.324**	-.033	-.014	-.089	.265**	.085	.106	.081	**.668**	.436**
10. Customer integration	.243**	.002	.027	-.154*	.415**	.141	-.066	.012	.437**	**.513**
11. Network centrality (MV)	.523**	.001	.162*	.138	.251**	.032	.070	.111	.377**	.328**
Means	4.995	4.149	5.361	5.276	5.517	4.241	2.069	5.069	5.323	4.587
Standard deviations	1.038	1.216	1.061	1.270	1.072	1.099	.830	4.385	1.001	1.303

Note: N=176. **: $p < .01$, *: $p < .05$
The diagonals of the matrix are the Average Variance Extracted (AVE) values for the latent variables shown in the bold type; the zero-order construct correlations are below the diagonal; the adjusted correlations for the potential common method variance (Lindell and Whitney, 2001) are above the diagonal.

Table 7. Construct Measurement Scales and Properties (Chapter 3)

Multi-item construct measures	**Std. loading**
Firm performance AVE = .573, CR = .794, α = .738	
(adapted from Zhou, Yim, and Tse, 2005)	
Compared with your major competitors in the last year, your firm's performance in the following aspects is: 1=much lower than your major competitors and 7=much higher than your major competitors	
1. Profitability	.537***
2. Inimitable competitive advantage.	.760***
3. Value to customers.	.924***
SRE AVE = .568, CR = .797, α = .796	
The potential suppliers that we consider exchange with	
1. are competitors to our incumbent supplier.	.807***
2. are substitute to our incumbent supplier.	.694***
3. provide products and services in the same category as our incumbent supplier.	.755***
CRE AVE = .640, CR = .839, α = .809	
The potential suppliers that we consider exchange with	
1. provide products and services that are not offered by our incumbent supplier.	.627***
2. can add to our existing products and services	.885***
3. can complement our incumbent supplier's product and service offerings.	.862***
Detection capability AVE = .742, CR = .896, α = .892	
(adapted from Dutta, Heide, and Bergen, 1999)	
1. We are able to evaluate the supplier's performance.	.878***
2. We are able to monitor the actual performance of the supplier.	.931***
3. We are able to learn whether the supplier's performance complies our mutual agreements.	.767***
Innovation capability AVE = .799, CR = .923, α = .918	
(adapted from Subramaniam and Youndt, 2005)	
How would you rate your firm's capability to generate the following types of innovations in the last one year: 1=much lower than your major competitors and 7=much higher than your major competitors.	
1. Innovations that reinforce your prevailing service offerings.	.895***
2. Innovations that reinforce your existing expertise in prevailing services.	.911***
3. Innovations that reinforce how you currently compete.	.875***
Market uncertainty AVE = .562, CR = .792, α = .785	
(adapted from Jaworski and Kohli, 1993)	
1. The downstream customer preferences change frequently.	.688***
2. The downstream customer needs are unstable.	.850***
3. Our sales are unpredictable.	.700***
Control variables	

Relationship length: Number of years since we transacted with our incumbent supplier.	N/A
Number of suppliers: Compared with main competitors, your number of customers is : 1= less, 7=more.	N/A
Customer influence AVE = .668, CR = .857, α = .849	
(adapted from Smith and Barclay, 1997)	
1. Our customers often accept our suggestions to them.	.900***
2. We can influence our customers' decisions.	.731***
3. Generally speaking, our customers are willing to accept our suggestions.	.812***
Customer integration AVE = .513, CR = .758, α = .747	
(adapted from Frohlich and Westbrook, 2001)	
To what extent do your firm integrate activities with your downstream customers: 1= lowest and 7=highest.	
1. Access to planning systems.	.803***
2. Use specific electronic data interchange interface.	.660***
3. Provide customized products or services.	.676***
Model fit: $\chi 2(207) = 296.459$ CFI= .959 IFI= .960 RMSEA= .050	

Note: ***: $p < .001$

3.3.4. Common method bias

As our data were collected from the self-reports of distributors, I took several steps to minimize and exclude potential concerns for common method bias. First, I applied Harmon's one factor method to all items. Eight factors accounting for 76.928% of the total variance were extracted, and the first factor explained 11.22%, failing to reveal a substantial amount of common method variance (Podsakoff and Organ, 1986). Second, I applied Lindell and Whitney's (2001) marker variance (MV) approach to statistically assess the potential bias. I identified a marker variable (i.e., network centrality), which is theoretically uncorrelated with at least one core construct in our framework, as a proxy for common method variance, and I adjusted all the construct correlations with the lowest positive correlation ($r = .001$) between the MV and all the variables. After the partial correlational adjustment, all the significant correlations remained significant (see Table 6). Overall, based on the above procedural and statistical evidence, I believe that common method bias is not a serious concern in our study.

3.4. Analysis and results

3.4.1. Main effects

Because our model contains both direct effects and interactions, I follow the previous literature (e.g., Gu *et al*., 2019; Zhou *et al*., 2020) by using a combination of structural equation modeling (SEM) and regression analysis. I performed SEM to test our hypothesized main effects because it explicitly accounts for the measurement reliability and can simultaneously test a complete model with all main effects (Weiner *et al*., 2003). I controlled for the potential effects of relationship length, number of customers, customer influence and customer integration when testing the main effects. The overall model fit statistics showed a satisfactory fit of our model to the data ($\chi^2_{(261)}$ = 367.119, CFI = .952, IFI = .953, and RMSEA = .048).

We hypothesize that SRE reduces detection capability (H1a) while CRE increases detection capability (H1b). As shown in Table 8, SRE is negatively related to detection capability (β = -.285, $p < .001$), and CRE is positively related to detection capability (β = .334, $p < .001$), supporting H1a and H1b. I also hypothesize that both SRE (H2a) and CRE (H2b) can enhance innovation capability. The results provide strong support for SRE (β = .353, $p < .001$) and CRE (β = .210, $p < .01$), indicating that they both significantly and positively influence innovation capability, in support of H2a and H2b. Our results are consistent with previous findings that detection capability (β = .093, $p < .05$) and innovation capability (β = .097, $p < .05$) can increase a distributor's firm performance, supporting H3a and H3b. I then use regression to test the main effect again. The results in Table 9 and Table 10 further verified our main effects.

3.4.2. Moderating effects

We applied moderated regression analysis to test the hypotheses involving moderation, as it is considered effective in detecting moderating effects in survey-based research (e.g., Sheng *et al*., 2011; Tse *et al*., 2019). I mean-centered each scale to minimize the potential threat of multicollinearity problems (Aiken and West, 1991). The highest VIF in our model is 1.436, which is substantially less than the critical threshold of 10.0, indicating that multicollinearity is not an issue.

Table 8. Hypothesis Testing of Main Effects (Chapter 3)

Structural Paths	**Std. Path Loading**
Main effects	
SRE → Detection capability	-.285***
CRE → Detection capability	.334***
SRE → Innovation capability	.353***
CRE → Innovation capability	.21**
Detection capability →Firm performance	.093*
Innovation capability → Firm performance	.097*
Control variables	
Length of relationship → Firm performance	.039
Number of customers → Firm performance	-.018
Customer influence → Firm performance	.051+
Customer integration → Firm performance	.154
Model Fit:	$\chi^2(261) = 367.119$ CFI=.952, IFI=.953, RMSEA=.048

Notes: +: $p < .10$; *: $p < .05$; **: $p < .01$; ***: $p < .001$

Table 9. Regression Results of Main Effects (Chapter 3)

Variables	Detection capability			Innovation capability		
	M1	**M2**	**M3**	**M4**	**M5**	**M6**
Market uncertainty	.011	-.092	-.024	.077	.109	.056
SRE	-.244**		**-.219****	.157*		**.172****
CRE		.379***	**.361*****		.201**	**.216*****
Control variables						
Relationship length	.202+	.273*	.246*	-.130	-.125	-.104
Number of customers	.035	.040+	.031	.014	.004	.011
Customer influence	-.089	-.072	-.079	.129	.130	.135+
Customer integration	-.114	-.113	-.119	.283***	.275***	.280***
F	3.656**	5.529***	6.121***	9.005***	9.526***	9.640***
F change	9.333**	19.833***	14.465***	6.325*	8.779**	8.555***
R	.339	.405	.451	.492	.503	.535
R^2	.115	.164	.203	.242	.253	.287
Adjusted R^2	.083	.134	.170	.215	.226	.257

Notes: + $p < .10$; * $p < .05$; ** $p < .01$; *** $p < .001$

Table 10. Regression Results of Moderating Effects (Chapter 3)

Variables	Firm performance	
	M1	**M2**
Market uncertainty (MU)	.032	.000
Detection capability (DC)	.126*	**.148***
Innovation capability (IC)	.131+	**.154***
Moderation terms		
DC x MU		**-.146***
IC x MU		**.158***
Control variables		
Relationship length	.054	.043
Number of customers	-.025	-.025
Customer influence	.272***	.281***
Customer integration	.076	.081
F	4.803***	5.084***
F change	3.751*	5.221**
R	.408	.465
R^2	.167	.216
Adjusted R^2	.132	.174

Notes: + $p < .10$; * $p < .05$; ** $p < .01$; *** $p < .001$

The results of all of the moderating effects are displayed in Table 10. Market uncertainty alleviates the positive effect of detection capability on firm performance (β = -.146, $p < .05$), supporting H4a. Additionally, market uncertainty strengthens the positive effect of innovation capability on firm performance (β = .158, $p < .05$), supporting H4b.

To further illustrate our results, I conducted a series of simple slope tests (Aiken and West, 1991) and plotted the moderating effects in Figures 4, Panel A-B using unstandardized parameter estimates. As shown in Figure 4, Panel A, the positive effect of detection capability on firm performance is significant when market uncertainty is low (b = .627; $p < .01$) but becomes nonsignificant when market uncertainty is high (b = -.186, $p > .1$), indicating the alleviating moderating role of market uncertainty in support of H4a. As shown in Figure 4, Panel B, the effect of innovation capability on firm performance is positive at a high level of market uncertainty (b = .579, $p < .01$) but negative and nonsignificant at a low

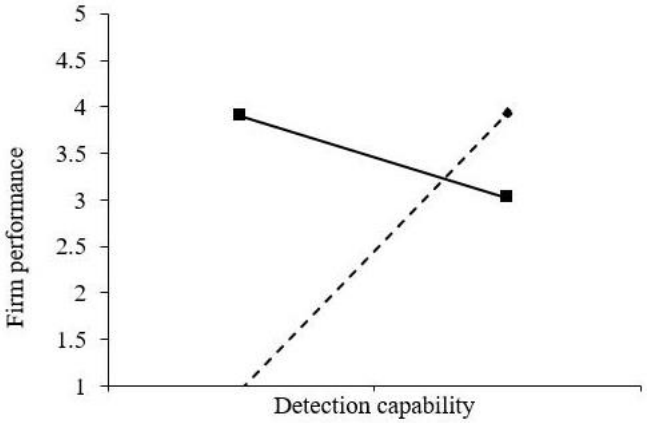
level (b = -.306, p > .1), indicating the strengthened moderating role of market uncertainty and supporting H4b.

3.4.3. Supplementary analysis

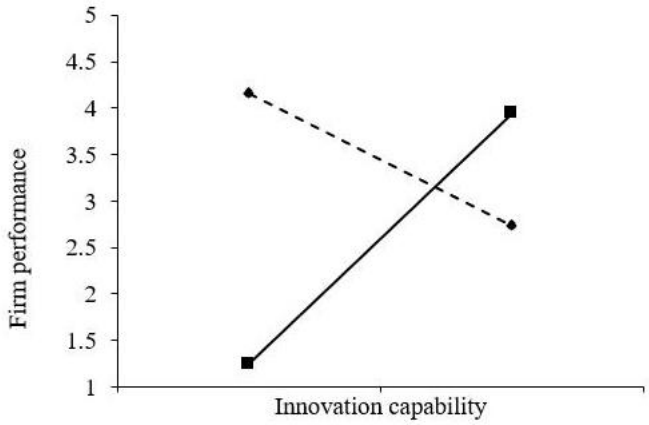
We conducted four supplementary analyses to further check the robustness of our results. First, I followed Richardson *et al*. (2009) and Homburg *et al*. (2011) to further control the potential effect of CMV in hypothesis testing. In the structural equation model, I specified a common method factor as being uncorrelated with other constructs, loaded it to all items and set all loadings to the same size, reflecting the assumption that CMV affects all items equally. As shown in Table 11, the results after I corrected for the potential influence of the common method factor remain consistent with those in Table 8, confirming the robustness of our findings.

Figure 4. Moderating Effects (Chapter 3)

A. The attenuating role of market uncertainty in the positive effect of detection capability on firm performance (H4a)



B. The strengthening role of market uncertainty in the positive effect of innovation capability on firm performance (H4b)



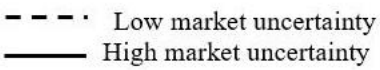


Table 11 Results of Structural Equation Modelling after Controlling CMV

Structural Paths	Std. Path Loading
Main effects	
SRE → Detection capability	-.273***
CRE → Detection capability	.285***
SRE → Innovation capability	.275***
CRE → Innovation capability	.239**
Detection capability →Firm performance	.093*
Innovation capability → Firm performance	.093*
Control variables	
Length of relationship → Firm performance	.035
Number of customers → Firm performance	-.018*
Customer influence → Firm performance	.05
Customer integration → Firm performance	.128*
Model Fit:	$\chi^2(259)$ =369.114 CFI=.950, IFI=.951, RMSEA=.049

Notes: +: $p< .10$; *: $p< .05$; **: $p< .01$; ***: $p< .001$

Second, I examined alternative model specifications to verify our findings. One potential concern of our model is reverse causality, which may be hypothesized as detection capability and innovation capability that may drive a distributor to engage in SRE or CRE. To address this concern, we tested an alternative structural equation model by linking detection capability and innovation capability with SRE and CRE (Brown *et al*., 2019). The results show that detection capability is negatively related to SRE ($\beta = -.237$, $p < .01$) and is positively related to CRE ($\beta = .281$, $p < .001$). Innovation capability can drive SRE and CRE ($\beta = .240$, $p < .01$; and $\beta = .195$, $p < .05$, respectively). However, the fit of this model is poorer ($\chi^2_{(290)} = 681.810$, CFI = .822, IFI = .825, and RMSEA = .088) than that of our hypothesized model. As the Akaike Information Criterion (AIC) index allows comparisons between nonhierarchical models (Kline, 1998), I then compared the AIC indices between

these two models. The AIC index of the hypothesized model (AIC = 599.119) is smaller than that of the alternative model (AIC = 855.81), indicating that our proposed model has a better fit than the alternative model.

Third, I exclude the potential effects of market uncertainty on SRE and CRE. I tested one alternative model by linking the effects of market uncertainty on SRE and CRE. The results show that market uncertainty can drive SRE (β = .414, $p < .001$) but does not have significant direct effects on CRE (β = .184, $p > .1$). The model fit of the alternative model is relatively poor ($\chi^2_{(288)}$ = 664.941, CFI = .829, IFI = .832, and RMSEA = .086), and the AIC index of the alternative model (AIC = 842.941) is larger than that of our proposed model, suggesting a better fit of our model.

Finally, I performed bootstrapping tests (Preacher and Hayes, 2008; Zhao *et al*., 2010) to examine the mediating role of detection and innovation capability in affecting firm performance. The results revealed that the indirect effect of SRE on firm performance was nonsignificantly mediated by detection capability (*a x b*= -.023), with a confidence interval including zero (CI= -.067 to .022), suggesting no mediation (Zhao *et al*., 2010). Similarly, the indirect effect of CRE on firm performance was nonsignificantly mediated by detection capability (*a x b* =.029), with a confidence interval including zero (CI= -.021 to .103). In contrast, our bootstrapping results show a significant indirect effect of SRE on firm performance through innovation capability (*a x b*= .038), with a confidence interval excluding zero (CI = .007 to .083). The direct effect of SRE on firm performance (c= -.034, t=-.527, p=.600 CI= -.161 to .093) was not significant, suggesting full mediation (Zhao *et al*., 2010). In a similar vein, the indirect effect of CRE on firm performance was significantly mediated by innovation capability (*a x b*= .053, CI= .008 to .117). Moreover, the direct effect of CRE on firm performance (c= -.044, t=-.586, p=.559 CI= -.190 to .103) indicates a full mediation effect of innovation capability.

3.5. Discussion

Although distributors' relationship exploration is a common practice in managing distributor-supplier relationships, how different types of relationship exploration affect a distributor's detection capability in relationship governance and its innovation capability remain unclear. In this study, based on survey data from 176 distributors in the semiconductor industry in China, I find that a distributor's SRE decreases detection capability in evaluating incumbent supplier performance while CRE increases it. Both SRE and CRE increase a distributor's innovation capability. Moreover, going beyond the dyadic view of relationship management with upstream suppliers and downstream customers, I investigate the roles of external marketing uncertainty in influencing the resulting effects of SRE and CRE on the distributor's firm performance.

3.5.1. Theoretical implication

This study contributes to the channel management literature in the following ways. First, this study contributes to the relationship exploration literature by categorizing relationship exploration into two types and differentiating their effects on detection and innovation capability. Most previous studies established the benefits of distributors' relationship exploration (e.g., Babich *et al*., 2007; Tang and Kouvelis, 2011; Yang *et al*., 2012) and provided suggestions on how to maximize its benefits from the distributor's perspective, such as the supplier selection mechanism (Burke *et al*., 2007; Chod *et al*., 2019; Sarkis and Talluri, 2002). However, some literature also implied the dark side of relationship exploration from the sociological perspective (Gundlach *et al*., 1995; Tse *et al*., 2019). Given the mixed findings, our study provides substantial empirical evidence to countervail the effects of relationship exploration by differentiating and examining the effects of SRE and CRE on detection and innovation capability.

Second, by classifying the distributor's relationship exploration into SRE and CRE, I provide a more nuanced analysis of the roles of different types of relationship exploration. Although business practice and conventional wisdom suggest that committing to a relationship (Anderson and Weitz, 1992; Shahzad *et al*., 2018) and relationship exploration with alternative suppliers will be beneficial (Zhang *et al*., 2021), few studies have simultaneously examined the potential costs and benefits of relationship exploration. Moreover, our study is among the first to examine the effects of SRE and CRE from a multi-dyadic perspective by exploring their effects on detection capability with upstream suppliers and innovation capability with downstream customers. In line with information economics, our findings reveal that SRE will decrease the detection capability of incumbent supplier performance due to the resultant information inefficiency from substituting suppliers, while CRE will increase the detection capability due to information diversity. Additionally, I find that although a distributor's SRE has a negative impact on incumbent supplier relationship governance, it increases the distributor's innovation capability, as does CRE. Therefore, I are among the first to provide nuanced empirical evidence on the roles of different types of relationship exploration, thus echoing the academic debate on whether distributors should engage in relationship exploration and extending relevant channels.

Third, this study goes beyond the dyadic relationship between the distributor and its incumbent suppliers and customers and further investigates how external marketing uncertainty varies the impacts of detection and innovation capability on the distributor's firm performance. Previous studies investigated how market uncertainty promotes distributors' relationship exploration (Anupindi and Akella, 1993; Tang and Kouvelis, 2011) but failed to explore how market uncertainty serves as a moderator to influence the processes of different relationship explorations (i.e., SRE and CRE) affecting distributor performance. By filling this void, our findings show that market uncertainty will weaken the effectiveness of

detection capability in driving firm performance because market uncertainty may change the dependence dynamism between supplier and distributor, which will affect the distributor's firm performance (Samaha *et al*., 2014). In contrast, as a critical capability to explore and drive customers' needs, especially when their demands are hard to predict, the positive effect of innovation capability on firm performance will be strengthened when market uncertainty is high (Zhang *et al*., 2021). Consistent with information economics, our findings enrich the literature on the roles of external market uncertainty in changing distributors' information dependence on upstream suppliers and downstream customers and thus varying the effects of detection and innovation capability.

3.5.2. Practical implications

Based on our findings, I provide several practical implications for distributors on relationship exploration. First, distributors should understand that both SRE and CRE can enhance their innovation capability and thus increase their firm's performance. In other words, relationship exploration can help distributors diversify and secure new resources and knowledge that are critical for innovation capability development. However, as our findings show, SRE will decrease while CRE will increase the detection capability for evaluating incumbent supplier performance. Therefore, CRE is beneficial for both supplier relationship governance and innovation capability, but the benefits of SRE in driving innovation capability come with the cost of increasing additional relationship governance costs. Distributors should carefully consider the tradeoff between the benefits and costs of SRE when exploring exchanges with new competing suppliers.

Second, our findings show that distributors should consider market conditions when deciding in which kind of relationship exploration they would like to engage. When market uncertainty is high, it is beneficial for distributors to implement SRE because it will help them alleviate the costs brought by SRE. When market uncertainty is low, it is beneficial for

distributors to explore complementary suppliers, as it can amplify the market enlargement effect brought by innovation capability. Therefore, our study encourages distributors to dynamically manage their relationship exploration based on external market conditions, which can enhance the benefits and alleviate the costs associated with supplier relationship management.

3.5.3. Limitations and future research

This study has the following limitations that call for future research. First, our data originated from the distributor's side, which may bias our findings. Although the results of the marker variable method and supplementary analysis showed that our framework did not result in common method bias, I still call for future research to collect data from matched dyadic perspectives to examine the effects of relationship exploration on dyadic relational tension. Second, our cross-sectional data may threaten the validity of the causality between variables. I used the reverse causality method to verify our results, but I still recommend that future research use longitudinal data to test the conceptual model. Third, I classified SRE and CRE based on whether a new supplier provides similar products and services as an incumbent supplier. I realize that there are other classification standards. For example, the new supplier's firm size, firm age, ownership structure, and previous experience in the industry and the match between its market capability and customer needs can also influence a distributor and incumbent suppliers. Future research can adapt new classification standards to investigate the impact of a distributor's relationship exploration.

Chapter 4 Product Assortment Differentiation for Brand Manufacturers in Omnichannel Management

4.1. Introduction

Noting growing customer heterogeneity and expanded channel possibilities, many manufacturers have adopted omnichannel distribution strategy, in an aim to manage online and offline channels in a synergetic manner to reach end customers (Verhoef, Kannan and Inman 2015). The progression from single, to multi, then to omnichannel marketing has made shopping easier for customers, but channel management more challenging for brand manufacturers. For example, a manufacturer needs to decide what parts of the product line to be offered in online or offline channels to "balance distribution coverage against conflict with channel partners" (Ailawadi 2021: p. 121). In managing such omnichannel marketing systems, manufacturers arguably should increase the differentiation in the product assortments they offer (Palmatier et al. 2020; Villas-Boas 1998). Such online and offline product assortment differentiation (OOPD) represents the degree to which different products are offered across online and offline channels in a product category owned by a brand manufacturer. It can help the manufacturer expand its market coverage, tailor its products and services to the specific needs of diverse customer segments, and increase revenues from different sources (Ailawadi and Farris 2020).

But omnichannel management[4] also is challenging and may lead to misaligned interests across channels, such that not all brand manufacturers achieve synergies in their OOPD (Fürst,

[4] We use the term omnichannel management in this paper, as this study focuses on the integration and management of assortments across channels as an explicit strategy which is an important element of omnichannel management (Cui et al. 2021; Verhoef, Kannan and Inman 2015). Moreover, we used the "omnichannel", "online and offline channel" and "multichannel" interchangeably to indicate the all types of online and offline selling channel of the manufacture in one brand-category.

Leimbach, and Prigge 2017; Sa Vinhas and Heide 2015). Adidas suffered substantial sales and profit shortfalls in 2020 due to its "failure to recognize and respond to consolidation in the retail industry," such that it came to depend too much on particular channel partners, which reduced its bargaining power and prevented it from adjusting its channel strategy in a timely manner (Adidas 2021). Although 95% of marketers acknowledge the importance of maintaining both online and offline channels to reach end-customers, only 14% of organizations believe they have successfully implemented them (Hadfield 2019). With this study, I therefore seek to identify whether and in which conditions OOPD can help manufacturers manage their product assortments in a way that enhances synergy and produces net sales benefits in a brand category.[5]

Prior research on product assortments in the omnichannel context mainly takes the retailer's perspective (Ailawadi 2021; for an overview, see Table 12) to examine different aspects of product assortments, such as product category types, assortment exclusivity, and assortment size, that they might leverage to optimize their assortments and compete more effectively (Brynjolfsson, Hu, and Rahman 2009; Dzyabura and Jagabathula 2018; Emrich, Paul, and Rudolph 2015; Mehra, Kumar, and Raju 2018). Although the product assortment in each channel is critical for determining whether retailers can compete effectively for resources and customers to maximize its own sales performance (Dukes, Geylani, and Srinivasan 2009), manufacturers instead need to design product assortments *across* online and offline channels to maximize overall sales in the product category (Ailawadi 2021). Without taking the manufacturers' perspective though, I cannot establish how OOPD might influence these total sales across channels.

[5] A brand category is a product category owned by a brand manufacturer. In our data set, Siemens cooker hoods and Siemens TVs are two example brand categories.

We anticipate that OOPD might engender both benefits and costs to brand manufacturers. On the one hand, through OOPD, manufacturers can leverage the different channels to attract diverse consumer segments with distinct buying behaviors and preferences, such that its market coverage should increase (Fürst, Leimbach, and Prigge 2017; Gu and Tayi 2017; Pauwels and Neslin 2015). On the other hand, OOPD might produce distinct sales priorities and goals across channels that do not necessarily align with manufacturers' overall marketing objectives (Dahlquist and Griffith 2014; Samaha, Palmatier, and Dant 2011). Misaligned, noncooperative behaviors can escalate to such a point that OOPD even backfires and diminishes manufacturers' sales performance. Therefore, a thorny problem for manufacturers is determining the extent to which they should differentiate product assortments across online and offline channels (Zhang et al. 2010). Is there an optimum level of OOPD? What mechanisms determine its effect on a brand manufacturer's sales outcome? Are there boundary conditions that moderate this effect?

In line with these questions, I specify three objectives for this research. First, I want to introduce and quantify OOPD, as the percentage of products offered exclusively in online or offline channels, relative to the total amount of nonduplicated products offered in both channels in a brand category. Considering the lack of research that takes the manufacturer's perspective (Ailawadi 2021), I provide a novel approach to omnichannel management. Second, I empirically examine *how* OOPD works by delineating an inverted U-shaped impact on brand category sales performance. Rather than assuming a linear relationship, I argue that a manufacturer's sales performance depends on its market coverage but also the extent to which it suffers multichannel misalignment at the vertical (between the manufacturer and its channel partners) and horizontal (across channels) levels. Third, I assess *when* OOPD works effectively by considering its boundary conditions. In line with power dependence theory, I suggest that brands with high

levels of price positioning or innovativeness have advantages over their channel partners (Homburg, Müller, and Klarmann 2011; Rubera and Kirca 2012), which can moderate the effect of OOPD. Manufacturers' channel directness, which reflects their ability to bypass independent channel partners to reach end-customers directly (Gielens and Steenkamp 2019; Käuferle and Reinartz 2015), also might affect the impact of OOPD on sales.

To achieve these research objectives, I compile a unique dataset of product and sales data related to home appliance brands sold on the four largest online platforms and more than 10,000 physical stores in China. The final dataset includes 7,709 products, representing four product categories, purchased over 36 months. The results gained from these massive data show that OOPD changes brand category sales in a nonlinear fashion; when it reaches a level of 58.8% (i.e., 58.8% of the products appear uniquely in either online or offline channels), OOPD drives manufacturers' performance optimally, across manufacturers with varying brand and channel-ownership characteristics. This performance impact of OOPD is flatter for powerful brands than for weaker brands, suggesting that OOPD is more critical for enabling less powerful brands to enhance their brand category sales, because it helps them expand the market more. Furthermore, if a manufacturer has its own online or offline channels to sell products, it becomes less dependent on independent channel partners, and the curvilinearity flattens, which offers another indicator of the reduced effectiveness of OOPD for driving brand category sales.

4.2 Literature Review

Our study relates closely to two main streams of literature. The first entails the impact of the interaction of online and offline channels in omnichannel management; the second pertains to managing channel conflicts, such as through differentiation, between manufacturers and channel partners.

In particular, extant literature on online and offline channels indicates that the use of dual channels improves total sales performance in the long run, because more channels provide access and engage more customers (Kumar, Mehra, and Kumar 2019; Wang and Goldfarb 2017), and different channels also are essential to meet customers' heterogeneous channel preferences (Ansari, Mela, and Neslin 2008; Avery et al. 2012). In turn, various practices aim to leverage the complementarity of online and offline channels, such as showrooming (Bell, Gallino, and Moreno 2018; Gensler, Neslin, and Verhoef 2017; Gu and Tayi 2017), web-rooming (Kleinlercher et al. 2020), and click-and-collect solutions (Gao and Su 2017; Gielens, Gijsbrechts, and Geyskens 2021). Bell, Gallino, and Moreno (2018) show that the introduction of showrooms by online-first retailers increases overall demand and operational efficiency. Even if some studies predict competition between online and offline channels (e.g., Mehra, Kumar, and Raju 2018), most research highlights the success of one or the other (see Table 12). Thus for example, Brynjolfsson, Hu, and Rahman (2009) acknowledge the competition that online stores face but also find that selling niche products can help them resist competition from offline stores. For offline retailers, Mehra, Kumar, and Raju (2018) suggest price matching as a short-term strategy and store brand exclusivity as a long-term strategy to deal with competition from online stores. Such insights cannot reveal whether or how a manufacturer might simultaneously employ online and offline channels and deal with their potential competition though.

Channel cannibalization, in the form of opportunistic behavior and channel conflicts, might arise from multichannel strategies too (Homburg, Vollmayr, and Hahn 2014; Sa Vinhas and Anderson 2005; Sa Vinhas and Heide 2015). For example, with an event study, Homburg, Vollmayr, and Hahn (2014) find that establishing a new channel can destroy firm value, due to sales entity cannibalization and free riding. For distributors, Sa Vinhas and Heide (2015) caution

that competition between distributor-owned and manufacturer-owned channels increases distributor opportunism in service delivery and sales generation. To address this potential "dark side," prior multichannel literature proposes various channel differentiation strategies. For example, Sa Vinhas and Anderson (2005) suggest that if suppliers make differentiated offers across independent and direct channels, the risk of destructive channel competition decreases. Fürst, Leimbach, and Prigge (2017) also find that organizations that implement segment and task differentiation in multichannel systems can reduce channel conflict.

Despite the key insights provided by these previous literature streams, Zhang et al. (2010) assert that I still lack understanding of differentiation strategies that contain "implementable details." Therefore, I explicitly conceptualize OOPD as the degree to which a manufacturer offers different products across online and offline channels and examine the effect on its brand category sales performance. Our definition of OOPD reflects the critical firm decisions associated with managing the product assortment, which consumers list as the third most important determinant (behind convenient locations and low prices) of their purchase decision (Briesch, Chintagunta, and Fox 2009; Kumar, Mehra, and Kumar 2019). Previous studies confirm the sales effects of product assortment features, such as reductions (Zhang and Krishna 2007), category assortment selection (Brynjolfsson, Hu, and Rahman 2009), and depth (Hamilton and Richards 2009), but I seek to go further by examining product assortment differentiation decisions across online and offline marketing channels, from a manufacturer's perspective (Ailawadi 2021).

Table 12. Studies of Product Assortment in Multichannel Literature

Study	Perspective	Research Context	Product Assortment Dimensions	Dependent Variables	Moderators	Methods	Findings
Brynjolfsson, Hu, and Rahman 2009	Retailer	Online–offline channel competition	Mainstream/niche product assortment	Internet channel demand	Mainstream vs. niche products	Analytical modeling and empirical test	• Internet retailers face significant competition from brick-and-mortar retailers when selling mainstream products but are virtually immune from competition when selling niche products.
Dzyabura and Jagabathula 2018	Retailer	Offline channel	Offline assortment	Profits of online and offline channels	—	Analytical modeling and empirical test	• Gains in expected revenue of up to 40% by accounting for the impact of offline assortment on online sales.
Emrich, Paul, and Rudolph 2015	Retailer	Multichannel	Full, asymmetric, and no assortment integration	Purchase intention	Assortment relations	Lab experiments	• Asymmetrical integration, such as larger assortments online than offline, is more beneficial when assortments are independent of each other. • Full integration (identical assortment) is better than no integration (different assortment) across assortment relations, but asymmetrical integration, the strategy most adopted by retailers, may have detrimental impacts for substitutive assortment relations, compared with no integration.
Gu and Tayi 2017	Multichannel sellers	Online–offline channel pseudo-showrooming	Online exclusive product placement	Firm's total profit	Style, design, product quality, consumer demand, and fit probability	Analytical modeling	• By offering one product through dual channels and another different but related product through the online channel, the firm induces consumer pseudo-showrooming and increases overall profits. • The firm garners the most benefit from inducing consumer pseudo-showrooming by selling the higher-quality or higher-demand product through the online channel exclusively.
Mehra, Kumar, and Raju 2018	Retailer	Offline channel	Exclusivity of product assortment	Brick-and-mortar store profit	Product category characteristics	Analytical modeling	• Price matching as a short-term strategy and exclusivity of product assortment as a long-term strategy are effective to counter showrooming. • Implementing exclusivity through store brands is better than exclusivity through known brands when the product category has few digital attributes.
This study	Manufacturer	Online and offline channels	Product assortment differentiation across online and offline channels	Brand category sales	Brand positioning; brand innovativeness; manufacturer channel directness	Empirical test with matched online and offline data across 36 months	• OOPD affects a brand manufacturer's category sales in an inverted U-shaped fashion. • The effect of OOPD is attenuated by the manufacturer's brand positioning, brand innovativeness, and channel directness.

4.3. Conceptual Framework and Hypotheses

Figure 5 summarizes our conceptual framework. I hypothesize and examine the effect of a manufacturer's OOPD on its total brand category sales across online and offline channels. In contrast with the predominant focus on retailers in extant omnichannel management literature (e.g., Dzyabura and Jagabathula 2018; Mehra, Kumar, and Raju 2018), I take the manufacturer's perspective. Because the sales impact of OOPD critically hinges on the power-based interactions of the manufacturer and its channel partners (Draganska, Klapper, and Villas-Boas 2010; Iyer and Villas-Boas 2003; Van der Maelen, Breugelmans, and Cleeren 2017), I draw on power dependency theory to predict boundary conditions of the OOPD effect.

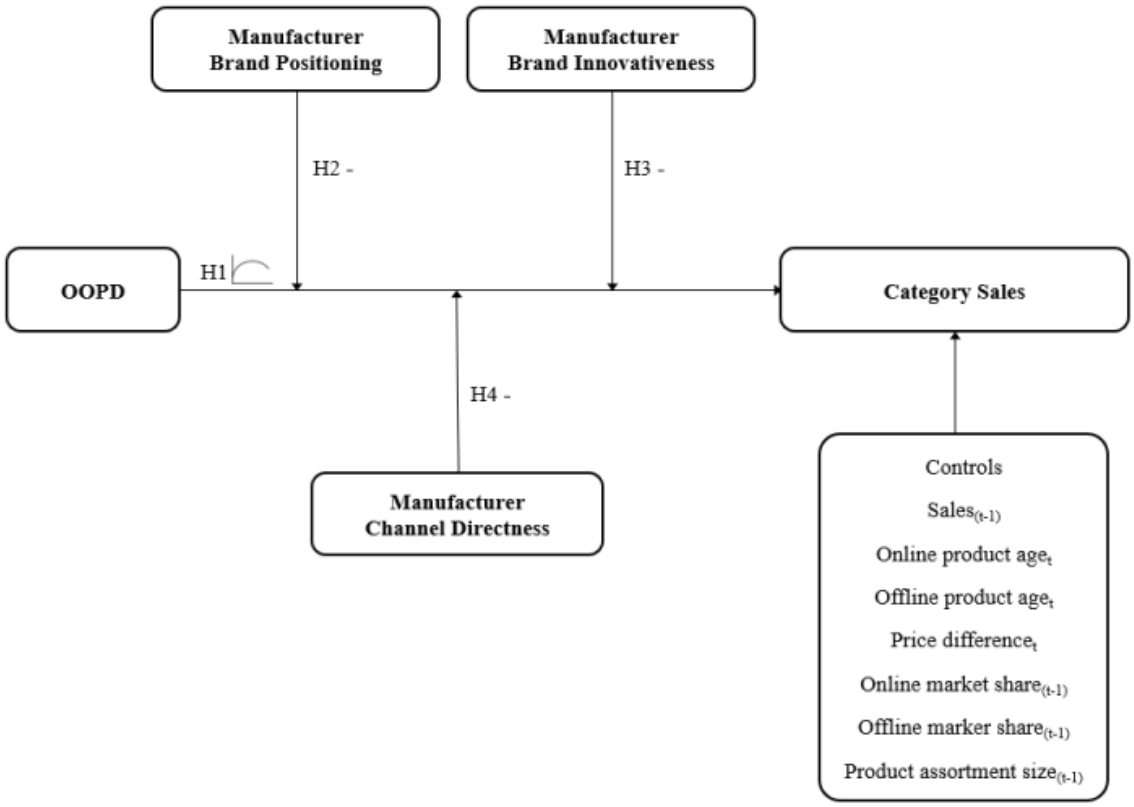
A critical factor for channel management is the relative power between manufacturers and channel partners (Ailawadi and Farris 2020; Iyer and Villas-Boas 2003). According to power dependence theory, power implies the ability of one party to bring about its desired outcomes by influencing the actions of others (El-Ansary and Stern 1972; Hunt and Nevin 1974). In marketing channels, power is based on dependence, such that "the power of A over B is equal to, and based upon, the dependence of B upon A" (Emerson 1962, p. 32-3). For example, if a manufacturer possesses unique, inimitable resources that its channel partners need to achieve their organizational goals, they are more dependent on the manufacturer, and the manufacturer has greater influence over their decisions (Carson and Ghosh 2019; Frazier et al. 2009). When one party unilaterally depends more on the other party, relationship trust and commitment decrease, and interfirm conflicts increase (Kumar, Scheer, and Steenkamp 1995). In their meta-analysis, Scheer, Miao and Palmatier (2014) determine that interdependence asymmetry favoring one partner is detrimental to dyadic cooperation, relationship quality, and performance outcomes.

In a manufacturer–channel partner relationship, power tends to rest with the manufacturer, because it has a greater capacity to determine the breadth of its product line or impose price and other buying conditions on channel partners (Ailawadi, Borin, and Farris 1995). However, other channel members might possess power advantages, due to their proximity to the market and unique resources (e.g., customer information, services) that make them valuable to the manufacturer (Aydin and Heese 2015; Reinartz, Wiegand, and Imschloss 2019). Powerful channel members might dictate wholesale prices (Geylani, Dukes and Srinivasan 2007), select product categories (Aydin and Heese 2015), or reduce assortment sizes (Dukes, Geylani and Srinivasan 2009), contrary to the manufacturer's preferences.

We consider the manufacturer's brand characteristics (Homburg, Müller, and Klarmann 2011; Rubera and Kirca 2012) and channel ownership structure (Käuferle and Reinartz 2015) to predict these power-based interactions. To capture the manufacturer's brand characteristics, I focus on *brand positioning*, which refers to the manufacturer's relative price level in the product category (Homburg, Müller, and Klarmann 2011), and *brand innovativeness*, which is the manufacturer's relative ability to launch new products compared with competitors in the same product category (Karhade and Dong 2021; Katila and Ahuja 2002). Both variables indicate the brand manufacturer's competitive position in the market and its power relative to channel partners in terms of allocating marketing resources across online and offline channels (Homburg, Müller, and Klarmann 2011; Rubera and Kirca 2012). Then I include *manufacturer channel directness*, or the manufacturer's use of self-owned channels, as an indicator of its capability to bypass independent channel partners to reach end-customers directly (Homburg, Vollmayr, and Hahn 2014; Kabadayi, Eyuboglu, and Thomas 2007; Käuferle and Reinartz 2015). Greater channel directness enables the manufacturer to access a variety of information, such as market

intelligence and customer feedback, without mediation by channel partners (Gielens and Steenkamp 2019). Such information in turn enhances the manufacturer's power and increases its ability to control and monitor channel partners' behaviors (Scheer, Miao, and Palmatier 2014).

Figure 5. Conceptual Framework (Chapter 4)



4.3.1. The Impact of OOPD on Brand Category Sales

We anticipate two countervailing effects of OOPD on brand category sales, reflecting market coverage and multichannel misalignment, or the extent to which online and offline channels exhibit misaligned or noncooperative behaviors that obstruct the achievement of the manufacturer's marketing objectives (Dahlquist and Griffith 2014; Samaha, Palmatier, and Dant

2011). I further predict that the two countervailing effects produce an inverted U-shaped relationship between OOPD and sales performance in a brand category.

Complementarity effect. A fundamental driver of a brand manufacturer's multichannel strategy is to expand its market access and generate revenues from various sources (Avery et al. 2012; Zhang et al. 2010). Customers express heterogeneous preferences in their channel patronage decisions (Inman, Shankar, and Ferraro 2004; Liu, Lobschat, and Verhoef 2018). For example, a goal-oriented customer might be more likely to shop online, because it facilitates information searches, but experience-oriented customers might prefer physical stores that allow them to touch and interact with the products (Pauwels and Neslin 2015). By leveraging OOPD, the manufacturer can offer different products and purchase options to meet the specific needs of diverse customer segments and thereby earn sales from these different market segments (Reinartz et al. 2019). For example, a manufacturer might push most of its lower-priced products through its online channel, to maximize its reach to mass markets and gain market share, while it also offers higher-priced, new, or more experiential products in physical stores so that customers can touch and feel the products to enhance their purchase intentions (Gu and Tayi 2017).

Misalignment effect. Because sales channels are close to the market and can access valuable information about customer needs, they possess unique forms of power (Van der Maelen, Breugelmans, and Cleeren 2017). When OOPD increases, two forms of misalignment behaviors also might increase. First, high levels of OOPD should induce vertical misalignment between the manufacturer and its online and offline channel partners. To achieve its marketing objectives, a brand manufacturer might purposefully allocate marketing budgets, sales assistance, and appealing products to certain profitable channels (e.g., online). Other channel members (e.g., offline partners) likely regard such preferential offerings and support as unfair, such that they

might respond with uncooperative attitudes and behaviors (Gu and Wang 2011; Kumar, Scheer, and Steenkamp 1995; Samaha, Palmatier, and Dant 2011). Manufacturers need their participation in joint marketing and sales activities (e.g., new product launches, promotion campaigns, cross-channel product referral, services), but perceived unfairness due to OOPD might demotivate channel partners' compliance with these marketing arrangements (Gu and Wang 2011; Jap 2001). For example, if a best-selling product only appears online, offline channel partners may perceive the arrangement as unfair and refuse to provide product inspection or after-sales service, which undermines both the manufacturer's marketing efforts and its sales.

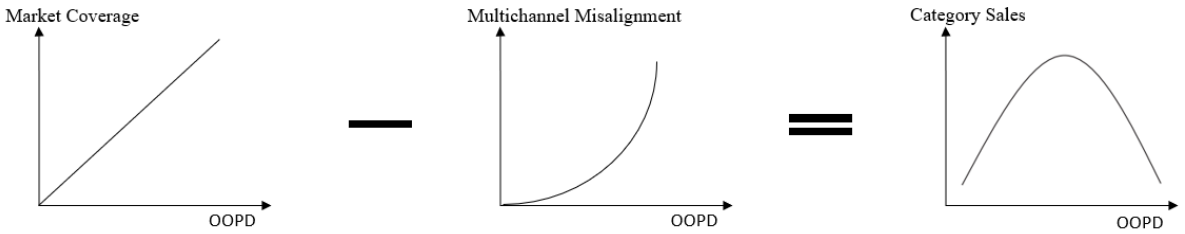
Second, when the manufacturer differentially allocates products, marketing support, and technical assistance across channels, customers can compare channels and seek out better offerings, prompting greater competition between channels for resources and customers (Zhao et al. 2017). Such competition disrupts relationship cohesion but increases horizontal misalignment across channels. Channel partners even might exhibit destructive behaviors to obstruct other parties' goal achievement, such as vicious price competition and withholding assistance (El Akermi, Mignonac, and Perrigot 2011; Sa Vinhas and Anderson 2005). As prior literature suggests, when online and offline channels misalign, they engage in price competition (Grewal et al. 2010) and refuse to share inventory information (Gallino and Moreno 2014) or provide services to customers (Gao and Su 2017). At the brand category level, these horizontal misalignment behaviors can prevent the brand manufacturer's sales.

Because channel partners, both online and offline, seek greater customer patronage, increasing levels of OOPD might cause the effect of misalignments at vertical and horizontal levels to rise exponentially. If I combine the complementary effect of expanding market coverage with the misalignment effect of destructive channel behaviors, I predict an inverted U-

shaped effect on brand category sales (Haans, Pieters, and He 2016). At low to moderate levels, the positive effects of OOPD for increasing market coverage outweigh the multichannel misalignment (Figure 6). However, as the level of OOPD rises, the extent of multichannel misalignment becomes aggravated, supersedes the benefits, and inhibits sales performance.

> **H_1:** The OOPD in a brand manufacturer's product category has an inverted U-shaped effect on the brand's category sales performance.

Figure 6. Predicted Inverted U-Shaped Effect



4.3.2. Moderating Effects

To theorize about potential moderating effects, I focus on curve changes in the inverted U-shape, as reflected by curvilinearity shifts in various boundary conditions (e.g., Haans, Pieters, and He 2016; Jourdan and Kivleniece 2017). Similar to Jourdan and Kivleniece (2017), I examine changes to both the linear beneficial effect and the nonlinear cost effect in different contingent conditions. If both weaken, it implies the curvilinearity of the inverted U-shape is attenuated (flatter); otherwise, it becomes stronger (steeper). I discuss the influence of the predicted moderators on both linear benefits and nonlinear costs.

As noted, power dependence between the manufacturer and its channel partners depends on the characteristics of the manufacturer's brand and channel ownership (Draganska, Klapper, and Villas-Boas 2010; Sa Vinhas and Anderson 2005; Van der Maelen, Breugelmans, and Cleeren 2017). A manufacturer's brand value, measured by its brand positioning and brand innovativeness, influences its interdependence with channel partners (Homburg, Müller, and Klarmann 2011; Rubera and Kirca 2012). The extent of manufacturer channel directness also indicates whether the manufacturer can generate sales through its own channels, such that its dependence on independent channels is lower (Dahlquist and Griffith 2014; Sa Vinhas and Anderson 2005). Varying interdependence between the manufacturer and its channel partners likely moderates the effect of OOPD on sales performance.

Manufacturer brand positioning is the manufacturer's relative price level in the product category (Homburg, Müller, and Klarmann 2011). A brand with higher price positioning likely delivers superior functional and symbolic value to end-customers (Guitart, Gonzalez, and Stremersch 2018; Homburg, Müller, and Klarmann 2011; Steenkamp, Van Heerde, and Geyskens 2010). A price premium, as an indicator of brand strength, can enhance the long-term economic value of the brand (Ailawadi, Lehmann, and Neslin 2003; Persson 2010). By carrying products marked by a premium brand, channel partners also benefit from potentially greater profitability (Kadiyali, Chintagunta, and Vilcassim 2000). That is, pricing power grants the brand manufacturer an advantageous position relative to its channel partners. In turn, both the benefit and cost effects associated with OOPD should be less pronounced when the manufacturer's price level is above the market average, such that the inverted U-shaped relationship between OOPD and brand category sales is attenuated (Figure 3).

In detail, if a manufacturer brand positions its prices higher than competitors in the same product category, it usually consolidates its marketing resources to focus on a narrower customer base (Dalgic and Leeuw 1994), such as quality- rather than price-sensitive customers (Bolton and Myers 2003). Because the resulting target segments tend to be more homogeneous, the advantage of OOPD for effectively addressing customer heterogeneity becomes less critical. In contrast, if a manufacturer adopts a price positioning that is below the market average, it appeals to a wider market with more heterogeneous consumption behaviors, and OOPD's effectiveness for enlarging market coverage becomes more relevant.

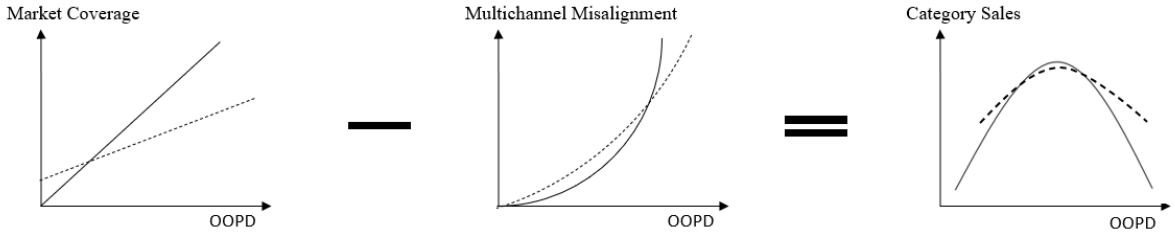
Moreover, customers of a brand with a higher price positioning likely place greater emphasis on superior product and service quality (Homburg, Müller, and Klarmann 2011; Steenkamp, Van Heerde, and Geyskens 2010), such that they also might seek sensory experiences, prompting the brand to strengthen its offline presence. Online channels might enhance convenience, but differentiating the product assortments does not increase this convenience or contribute to quality-conscious customers' experience. Because OOPD cannot enhance customers' perceptions of product and service quality, the benefits of expanding market coverage likely are weaker for brands with higher price positioning, leading to an attenuated positive effect of OOPD on market coverage (Figure 7).

Finally, a manufacturer with a high price positioning usually imposes strict rules, in terms of pricing and promotion, to ensure its consistent brand image across channels (Guitart, Gonzalez, and Stremersch 2018). Accordingly, it exercises greater power over channel policies, which can reduce the risk of destructive acts. Brands with high positioning possess high-quality products and a favorable brand image, which their channel partners can leverage for their own product promotion and other marketing activities (Homburg, Müller, and Klarmann 2011). They

thus are motivated to align with the manufacturer, to maximize their performance, as well as the manufacturer's (Dahlquist and Griffith 2014; Ghosh and John 2005). Because a higher price positioning thus is conducive for the manufacturer to set rules and incentive mechanisms, channel partners are left with less bargaining power to negotiate or compete for preferential marketing resources, making the misalignment effect of OOPD on sales less salient. Taken together, I hypothesize:

> **H_2:** Brand price positioning attenuates the inverted U-shaped relationship between OOPD and a brand category's sales performance.

Figure 7. Moderating Mechanisms of the Inverted U-Shape



Notes: Solid lines indicate expected effects at low levels of a moderator; dashed lines represent expected effects at high levels of a moderator.

Manufacturer brand innovativeness refers to the relative strength of a manufacturer brand to launch new products, compared with competitors in the same product category (Karhade and Dong 2021; Katila and Ahuja 2002). Brand innovativeness enable manufacturers to enter new-to-the-firm product markets, which is a primary source of brand growth and development (Rubera and Kirca 2017; Sharma, Saboo and Kumar 2018). Rubera and Kirca (2012) emphasized the positive impact of innovativeness on firm value, market position, and financial performance. Because new products create customer appeal and increase customer demand, they contribute to channel members' performance too (Sriram and Kadiyali 2009).

In turn, both the benefit and cost effects associated with OOPD should be less pronounced for an innovative brand manufacturer. It offers new products to expand its market, but not all consumers in this expanded market are appropriate targets for the new products (Robertson 1967). Early adopters and innovators share some similar characteristics, such that they are relatively homogeneous in their preference for products and channel patronage (Im, Bayus, and Mason 2003), and hence, the benefits of OOPD for meeting diverse customer needs become attenuated. Early adopters also tend to be omnichannel enthusiasts, with expertise in both online and offline information searching (Konuş, Verhoef, and Neslin 2008). By creating disparity in online and offline product assortments, the brand evokes inconsistency among these enthusiasts and target consumers, suggesting weaker sales effects. But if a brand struggles to introduce new products to the market, its product portfolio is relatively stable, and its target consumers represent a wider range, including majorities and laggards too (Robertson 1967). As such, OOPD's role in addressing customer heterogeneity and expanding the brand's market share is more salient.

According to power dependence theory, if a brand manufacturer exhibits high innovativeness, channel partners depend more on it for updated or novel products. This manufacturer then gains more bargaining power and can forcibly align the interests of its channel partners with its own (Heide 1994; Iyer and Villas-Boas 2003). Vertically, when channel partners' dependence on the manufacturer increases, they likely tolerate some unfairness due to OOPD (Samaha, Palmatier, and Dant 2011) and still align their behavior with the interests and requirements of the manufacturer. Horizontally, channels partners benefit from the manufacturer's new products, which enhance their own brand image and customer traffic (Glynn 2010; Van der Maelen et al. 2017), so they should be motivated to support sales and promotion

activities. The relationship cohesion among channel partners in turn is relatively higher, which curbs channel members' opportunistic tendencies and encourages them to coordinate their efforts to achieve the manufacturer's goals (El Akremi, Mignonac, and Perrigot 2011). As such, the potential misalignment effect of OOPD should be weakened, and I predict:

H_3: Brand innovativeness attenuates the inverted U-shaped relationship between OOPD and a brand category's sales performance.

Finally, *manufacturer channel directness* reflects whether the manufacturer has firm-owned online and/or offline distribution channels to reach end-customers directly (Käuferle and Reinartz 2015; Sa Vinhas and Anderson 2005). If a manufacturer has its own store, it relies less on channel partners for sales, indicating its higher power and lower channel dependence (Dahlquist and Griffith 2014; Gielens and Steenkamp 2019). In addition, direct channels help the manufacturer obtain market information and monitor channel partners' behavior more effectively, enhancing its ability to coordinate multiple channels (Sa Vinhas and Heide 2015).

Consistent with the effects of brand positioning and innovativeness, I argue that both market coverage and multichannel misalignment effects of OOPD on brand category sales weaken with greater manufacturer channel directness. When a manufacturer has its own stores, such as physical locations, a brand website, and mobile apps, it can access more customer segments (Gielens and Steenkamp 2019; Reinartz, Wiegand, and Imschloss 2019). It also can leverage its first-hand, critical market intelligence (e.g., insights from customer feedback) and procedural know-how (e.g., operation details for sales) to decide how to allocate resources to different channels. In this setting, OOPD provides limited value to the brand, in terms of generating additional sales. A manufacturer-owned channel can reach target segments directly, with more competitive offerings, due to lower transaction costs and reduced chances of double marginalization (Gielens and Steenkamp 2019; Kadiyali, Chintagunta, and Wilcassim 2000;

Wang, Zhao, and Gu 2021). Customers also accept offers in manufacturer-owned channels, regardless of their online or offline channel preference. Due to such market encroachment by the brand manufacturer, the complementarity effect of OOPD and its benefits for meeting heterogeneous customer needs and enlarging the market should decrease.

The manufacturer's enhanced advantage through its direct channels also may make channel partners less likely to engage in misaligning behavior, even as OOPD increases. The manufacturer has its own sources of valuable market information, which previously only passed through channel partners (Dahlquist and Griffith 2014). With reduced information asymmetry, the manufacturer can more effectively detect channel partners' misbehavior and curb their self-interest–seeking tendencies (Sa Vinhas and Heide 2015). Vertically, channel partners are more likely to comply with the manufacturer's preferences to avoid punishments for being misaligned (Hibbard, Kumar, and Stern 2001); horizontally, they are more motivated to build close ties with one another to limit the potential losses linked to the manufacturer's encroachment (Wang, Zhao, and Gu 2021). When channel partners comply cooperatively, the misalignment effect of OOPD weakens, so the inverted U-shape between OOPD and sales performance should be attenuated.

H_4: Manufacturer channel directness attenuates the inverted U-shaped relationship between OOPD and a brand category's sales performance.

4.4 Methods

4.4.1. Data Collection

To investigate how the level of OOPD affects brand category sales, I compiled a unique data set of monthly product and sales data related to 39 home appliance brands in China (Appendix C contains the complete brand list), from January 2016 to December 2018, such that I obtain 36 monthly observations for each brand category. Fueled by digitalization innovations, the home appliances industry in China is an omnichannel-based marketplace consisting of both

world-renowned brands and Chinese local brands competing to provide a wide range of products to consumers. Of a total market size of US$131 billion by revenue in 2019, online channel sales in the home appliance industry account for 41.17% (National Bureau of Statistics 2019), indicating a roughly balanced usage of online and offline channels. This pattern provides an ideal context for testing the effect of product assortment differentiation across online and offline marketing channels.

The data set was compiled from two sources. Online product and sales data came from brand-authorized e-shops on Tmall, JD, GOME, and Suning, which are the four largest business-to-consumer platforms in China.[6] The offline data were provided by a research company affiliated with China Household Electrical Appliances Association.[7] This database contains detailed product and sales information about more than 10,000 authorized physical shops throughout China, which account for more than 90% of total offline home appliance sales in the country. The two data sets thus provide comprehensive coverage of major home appliance brands in China. I focus on four product categories (television, gas stove, kitchen ventilator, disinfection cabinet) in this study because product and sales data across online and offline channels are most complete in these categories in the 36-month study window. After matching the two databases and excluding data with missing information, the final sample consists of monthly data about 7,709 products (identified by a unique product serial number) in these four categories, which represent 39 brands. For our study period from January 2016 to December 2018, the number of product-month observations for analysis reaches 277,524.

[6] In China's home appliance industry, the online sales market is highly concentrated. The market shares of these four largest online platforms account for 92.1% of total online sales in 2019 (CHEARI 2020).
[7] The China Household Electrical Appliances Association tracks and analyzes data to publish the China Household Appliance Industry Development Report every year.

In interviews with industry experts, I learned that different product categories owned by a manufacturing brand have high degrees of autonomy in developing their own channel strategies, consistent with prior literature (Van der Maelen, Breugelmans, and Cleeren 2017). Therefore, I sorted the product-level data, such as the product's serial number, price, sales quantity, and sales, according to the product category of each brand (i.e., brand category). The final unit of analysis thus refers to the brand category level, such that Samsung TV and LG TV are two different brand categories, as are Panasonic gas stove and Panasonic TV. As a result, our sample consists of 71 brand categories over 36 months (2,556 observations).

4.4.2. Measurements

OOPD. For brand category i, the number of products offered online in month t is represented by NON_{it}, and that of products offered offline is $NOFF_{it}$. To measure OOPD, I first generate a dummy variable *Duplicate* to identify products that appear in both online and offline channels in a particular month. Then I count the number of duplicated products within brand category i at month t as $Nall_{it}$. The operationalization of OOPD of brand-category i at time t is:

$$\text{OOPD}_{it} = \frac{NON_{it}+NOFF_{it}-2NALL_{it}}{NON_{it}+NOFF_{it}-NALL_{it}}.$$

The numerator is the number of products offered exclusively in either online or offline channels. The denominator is the total number of unduplicated products offered in both channels. A higher score indicates a higher OOPD level of a particular brand category. This operationalization controls for heterogeneity in the total number of product offerings of a given brand category.[8]

[8] We also included the number of products in a brand category to control for the potential influence of product assortment size in our estimation model.

Moderating variables. I created three moderating variables to reflect the power of the manufacturer relative to its channel partners. First, inspired by Homburg, Müller, and Klarmann (2011), I measure *brand positioning* (BP_{it}) as the brand's average price in a product category, standardized by the product category's average price across different brands. Therefore, this measure reflects the positioning of a brand category *i* in month *t*, which varies across brand categories and time. For example, the TCL gas stove exhibits greater variance (SD = .295) over 36 months than the Canbo gas stove (SD = .043). In the television category, LG, Samsung, Sharp, and Sony all scored higher than 1, indicating that they are positioned as premium brands in this category, even though they vary in the degree of the premium (e.g., from 1.929 to 3.379 for Sony TV, from 1.707 to 2.542 for Samsung TV) over the observed period.

Second, to measure *brand innovativeness*, I first manually identified new products according to their serial number when they first appear on the market. For the variable BI_{it}, I calculate the proportion of new products (number of new $products_{it}/NON_{it} + NOFF_{it} – Nall_{it}$) in brand category *i* over the proportion of new products in the entire product category in month *t*. Similar to brand positioning, the value of brand innovativeness varies across brand categories and time. For example, Skyworth TV reveals less variability (SD = .369) than KKTV (SD = 1.438) in terms of introducing new products over the 36 months. Changhong TV scored a maximum value of 12.28 in month 30, whereas some brand categories (e.g., KKTV, Supor disinfection cabinet, RongSheng kitchen ventilation) scored 0 in certain months (2, 3, and 10).

Third, to measure *channel directness*, I use a dummy variable (CD_{it} = 1 if a manufacturer makes sales in at least one of its own direct channels; 0 = otherwise). The dichotomous measure is consistent with previous literature on plural governance (Bradach and Eccles 1989; Heide 2003) that suggests that the presence (absence) of direct channels, rather than relative reliance on

different channels,[9] informs a focal firm's governance effectiveness. Theoretically, as long as a manufacturer has its own channel, it can reduce its reliance on channel partners and gain more power in channel management (Dahlquist and Griffith 2014; Gielens and Steenkamp 2019).

Control variables. I included several category- and brand-specific covariates to control for factors that may affect sales performance. I measured online and offline product price difference in a brand category *i* in month *t* to control for the effect on sales performance (Mehra, Kumar, and Raju, 2018). I also controlled for the average product age of a brand category in online and offline channels, because new products might exhibit unique sales performance (Jin, Shu, and Zhou 2019). I employed a one-month lagged market share of online and offline sales of a brand category to control for spillover effects on sales performance (Feng, Morgan, and Rego 2015). With category dummies, I controlled for the effect of heterogeneous categories. Finally, I included the number of products in a brand category to control for assortment size (Van der Maelen, Breugelmans and Cleeren 2017), which may influence sales performance.

4.4.3. Model-Free Analysis

We conducted model-free analyses to generate initial insights from the data. The OOPD of the 71 brand categories ranges from 0 to 1 in our data set, with the mean value of .756, and it varies across time, brands, and product categories. Across the 71 brand categories, Panasonic Television, Oulin Disinfection Cabinet, and TCL Disinfection Cabinet are the most differentiated, with average values of 1 for OOPD. In these brand categories, online and offline channels sell completely different products. Other highly differentiated brand categories include Setir Gas Stove (OOPD = .997) and Samsung Television (OOPD = .993). But brand categories

[9] Empirically, if we operationalize CD as the ratio of direct channel sales to the sum of brand category sales across different channels, the measure would overlap with that of our dependent variable.

such as Fardio Disinfection Cabinet (OOPD = .167) and PPTV (OOPD = .303) instead are among the least differentiated. These data suggest substantial variation in product assortment differentiation across online and offline channels.

We also observe differences across product categories with the same brand. For example, Midea, China's top home appliance brand, experienced time-varying levels of OOPD in different product categories over time. In general, its OOPD decreased over the observed period, particularly for kitchen ventilators (Appendix D). Moreover, I note substantial variations in OOPD across brands in the same product category. In the gas stove category for example, some brands operate at a high level of OOPD (close or equal to 1), but others maintain a relatively stable or low level (e.g., .4 to .6) (Appendix E).

4.4.4. Model Specification and Estimation Procedure

Examining hypotheses with panel data (i.e., 71 brand categories across 36 months) introduces some data analysis challenges, which can be detected by preliminary econometric tests. First, the Breusch-Pagan and Wooldridge test confirms that heteroskedasticity ($\chi^2(1) = 110.17$, $p < .001$) and serial correlation ($F_{(1, 70)} = 33.204$, $p < .001$) exist in our data. Second, the Breusch-Pagan Lagrange multiplier test reveals the presence of unobserved firm-specific heterogeneity ($p < .001$), which may jointly affect product assortment differentiation and category sales performance across channels. Finally, endogeneity is likely when the explanatory variables are evaluated simultaneously with the dependent variable, such that the OOPD level may be affected by the manufacturer's past sales performance. Also, manufacturers with different sales performance may have tendency for certain brand and channel strategies.

To address all these concerns, I estimate our empirical models using system generalized methods of moments (GMM) estimators (Arellano and Bond 1991; Arellano and Bover 1995;

Blundell and Bond 1998). This approach uses both levels and first-difference specifications and offers several advantages for our study. First, it accounts for serial correlation concerns by including one-period lagged dependent variables (Kennedy 2003; Wooldridge 2006). This specification is important because the current level of sales performance depends on past values. The explanatory power of the independent variables is then restricted to everything not explained by the lagged dependent variable. Second, by first differencing the variables and the instruments, system GMM eliminates the possible time-invariant unobserved effects. Third, system GMM overcomes the problem of endogeneity between the dependent variable and explanatory variables by using their lags as instruments. Following the previous literature (Feng, Morgan, and Rego 2015; Tuli, Bharadwaj, and Kohli 2010), I instrument each endogenous variable with its first two-period or earlier lagged values for the first-difference. These instruments are orthogonal to the error term and thus represent valid instruments (Arellano and Bover 1995; Blundell and Bond 1998).

We performed additional diagnostic tests and procedures to confirm the validity and robustness of using the system GMM estimations. First, the Wald χ^2 test is significant for all models, indicating that our proposed model specification fits the data well. Second, I used first- and second-order autoregressive (AR) statistics to test for serial correlation in the error term. The GMM estimator requires the presence of AR(1) (i.e., first-order serial correlation), but not AR(2) (i.e., second-order serial correlation) (Arellano and Bond 1991). Our results reject AR(1) but fail to reject AR(2), in further support of our model specifications. Third, I test for the validity of the instruments using Hansen's (1982) test of overidentifying restrictions, and the results fail to reject the null hypothesis that the model specification meets the moment condition, so the instruments appear valid (Table 14). Fourth, I adopted GMM with a "collapsed" instrument

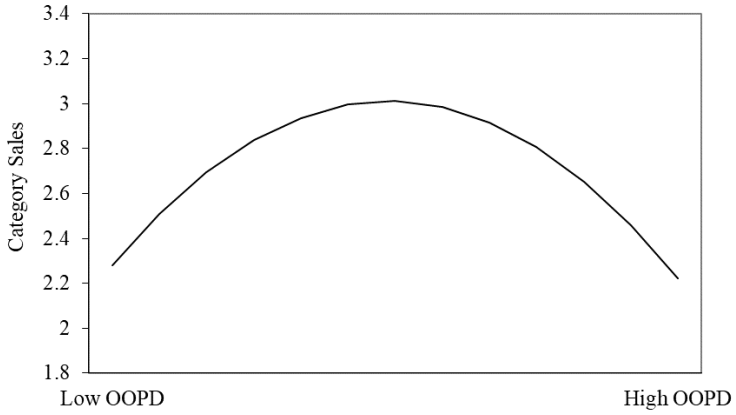
approach to lower the risk of instrument proliferation (Bansal et al. 2017). After the re-estimation, the results remain robust, and all Hansen overidentification tests are rejected at .10 levels, providing further support to our findings. Finally, I employed Windmeijer's (2005) two-step robust estimator to correct for panel-specific autocorrelation and heteroskedasticity. I adopted Stata's xtabond2 procedure to estimate the models (Roodman 2009).

4.5. RESULTS

4.5.1. Hypothesis Testing Results

We present the descriptive statistics of our key variables in Table 13 and the hypothesis testing results in Table 14. Model 1 includes control variables and main effects, and Models 2–4 add relevant interaction terms. With regard to H_1, predicting the inverted U-shaped effect, I find that the coefficient of the squared OOPD term is significantly negative (b = -2.111, p < .01, Model 1), which indicates an inverted U-shaped relationship. Then to validate that it exists within our data range, I test the slope coefficients at low and high ends of our data range (Haans, Pieters, and He 2016; Lind and Mehlum 2010). I identify a significantly positive slope at the low end (b = 2.483, p < .01) and a significantly negative slope at the high end of our data range (b = -1.739, p < .01). Finally, the turning point of the curve lies well within the data range (turning point = .588). Therefore, the inverted U-shaped relationship between OOPD and brand category sales performance exists in our observed data range (Figure 8), in support of H_1.

Figure 8: Main Effect of OOPD on Brand Category Sales Performance



Turning to the moderating effects, the hypothesized model includes six interaction terms, with both linear and quadratic terms of OOPD. If all of them enter the full model together, the potential for high correlations between interaction terms associated with the same quadratic term (e.g., $OOPD^2 \times BP$ versus $OOPD^2 \times BI$) may overinflate the standard error and render them insignificant. Therefore, I evaluate the interaction effects with a blockwise hierarchical approach (Handley and Angst 2015; McGrath 2001) and include the interactions of each moderator with linear and quadratic terms of OOPD in Models 2–4 separately.

Table 13. Descriptive Statistics and Correlations (Chapter 4)

	1	2	3	4	5	6	7	8	9	10	11
1. Sales	1.000										
2. OOPD	-.304**	1.000									
3. Brand positioning	.329**	-.155**	1.000								
4. Brand innovativeness	-.090**	.113**	-.110**	1.000							
5. Channel directness	.667**	-.338**	.266**	-.100**	1.000						
6. Online product age	.063**	-.306**	.071**	-.045*	.143**	1.000					
7. Offline product age	-.010	-.250**	.155**	-.078**	.163**	.753**	1.000				
8. Price difference	-.032	.156**	.121**	.025	-.182**	-.063**	-.033	1.000			
9. Online market share	.457**	-.118**	.246**	-.071**	.362**	.058**	.086**	-.164**	1.000		
10. Offline market share	.474**	-.094**	.564**	-.104**	.412**	.039	.125**	-.126**	.652**	1.000	
11. Product assortment size	.766**	.021	.242**	-.085**	.573**	.058**	.099**	-.058**	.388**	.377**	1.000
Mean	7.319	.756	1.000	.972	.650	11.205	13.435	2.587	.056	.056	1.731
SD	1.077	.193	.476	1.115	.477	5.912	8.146	.567	.075	.079	.493

** $p < .01$, * $p < .05$ (two-tailed).

Table 14. System GMM Estimation: The Moderated Effects of OOPD on Brand Category Sales

		$Sales_t$			
		Model 1	Model 2	Model 3	Model 4
Main Effects					
$OOPD_t$		2.483***	5.510**	2.521***	3.474**
$OOPD_t^2$	H1	-2.111***	-4.219**	-2.181***	-2.99***
BP_t		.084	1.671**	.079	.063
BI_t		.002	.004	.110	.004
CD_t		.074**	.087**	.071**	.905**
Interaction Effects					
$OOPD_t \times BP_t$			-4.953**		
$OOPD_t^2 \times BP_t$	H2		3.530**		
$OOPD_t \times BI_t$				-.423*	
$OOPD_t^2 \times BI_t$	H3			.332**	
$OOPD_t \times CD_t$					-3.117**
$OOPD_t^2 \times CD_t$	H4				2.495**
Controls					
$Sales_{(t-1)}$		.515***	.516***	.522***	.500***
Online product age_t		.013**	.012**	.012**	.012**
Offline product age_t		-.012***	-.012***	-.011***	-.011**
Price $difference_t$		-.002	.006	-.003	.005
Online $market\ share_{(t-1)}$		.545	.550	.517	.589
Offline $market\ share_{(t-1)}$		1.359***	1.629***	1.351***	1.513***
Product $assortment\ size_{(t-1)}$		.265***	.300***	.275***	.283***
Observations		2485	2485	2485	2485
Number of instruments		80	80	80	82
Wald χ^2		3622.63***	4889.09***	3914.55***	4007.11***
Hansen J statistic		70.7	69.69	70.38	70.10
AR(I) (z-score)		-4.78***	-4.85***	-4.87***	-4.76***
AR(II) (z-score)		-1.32	-1.38	-1.46	-1.28

*p <.10; ** p < .05; *** p <.01.

All the coefficients of the interaction variables are significant and in the expected direction. Due to our focus on the shape change of the inverted U-shape, the coefficients of interaction terms with the squared term of OOPD are critically informative, with regard to whether the curvilinear relationship is strengthened (negative coefficient) or attenuated (positive coefficient) (Haans, Pieters, and He 2016). As expected, brand positioning (b = 3.530, $p < .05$), brand innovativeness (b = .332, $p < .05$), and channel directness (b = 2.495, $p < .05$) attenuate the inverted U-shape between OOPD and category sales, in support of H_2, H_3, and H_4, respectively[10].

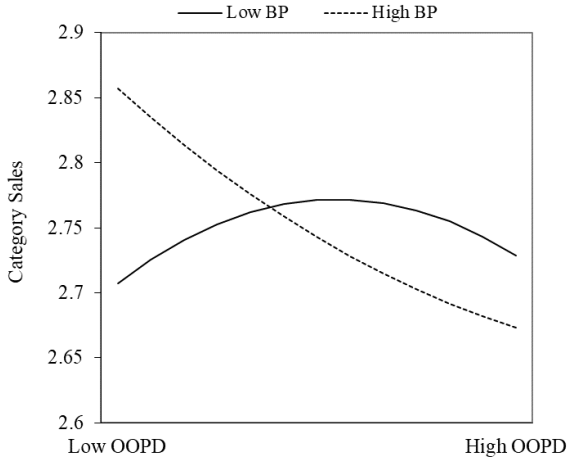
To gain more insights into the interaction effects, I apply Aiken, West and Reno's (1991) procedure to decompose the interactive terms and compare the effects of OOPD on total category sales at high and low levels of the moderating variables. Figure 8, Panel a, illustrates the moderating role of brand positioning. Consistent with H_2, brand positioning attenuates the effect of OOPD; the attenuation is so extensive that the shape flips, from an inverted U-shape to a negative and decreasing shape (Haans, Pieters, and He 2016). Specifically, when the brand's price positioning is high, OOPD effectiveness keeps decreasing at a diminishing rate. Sales performance reaches its nadir when OOPD reaches its peak. In contrast, when brand price positioning is low, OOPD has a more pronounced inverted U-shaped effect on sales, such that sales performance climbs to a maximum level before declining as OOPD increases. Figure 8, Panel b, further reveals that the inverted U-shape is flatter for a brand with high rather than low levels of innovativeness, confirming the attenuating effect I predicted in H_3. Finally, Figure 8, Panel c, demonstrates a similar pattern when a manufacturer has its own channel, such that the curve between OOPD and brand category sales becomes flatter, in support of H_4. The curvilinear effect of OOPD on sales

[10] In Appendix F, we provide the full model (Model 5) with all six interaction terms. The high correlations of interaction terms with the quadratic term of OOPD causes the moderating effects of brand innovativeness (BI) and channel directness (CD) to appear insignificant. We also report alternative Models 6–8, for which we include two of the three moderators in each model.

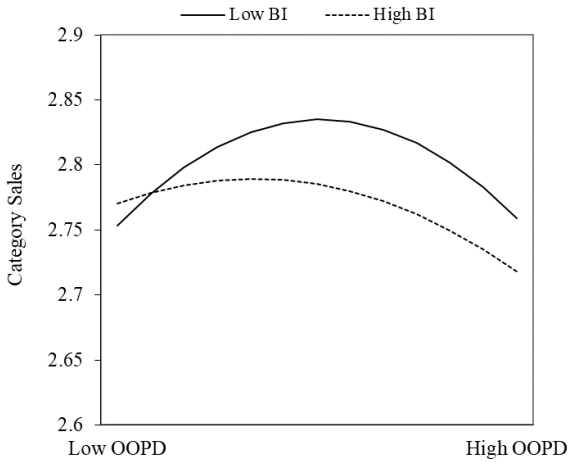
performance therefore is attenuated for high brand price positioning, innovative brands, and manufacturers with direct selling channels.

Figure 9. Moderating Effects at Two Levels of the Moderators

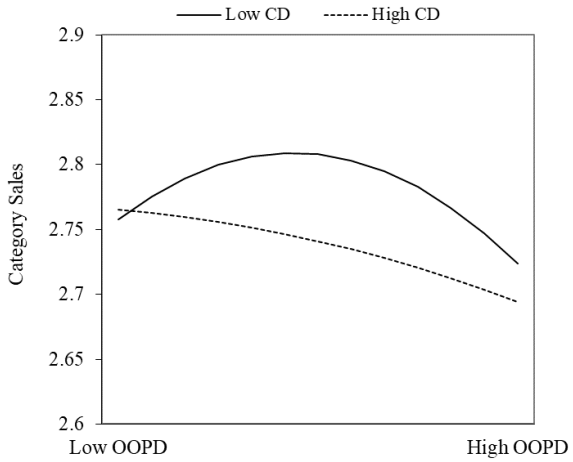
(a) Manufacturer's Brand Positioning



(b) Manufacturer's Brand Innovativeness



(c) Manufacturer's Channel Directness



4.5.2. Robustness Checks

Endogeneity assessment: Gaussian copulas. As an additional endogeneity check for OOPD, I implement Gaussian copula (Park and Gupta 2012), an instrument-free method, to account for endogeneity. The copula term represents the correlation between the endogenous variable (i.e. OOPD) and the error term. I included the copula term, specified as $OOPD_{it}^{c} = \Phi^{-1}[H_{OOPD}(OOPD_{it})]$ in the estimation models, where Φ^{-1} is the inverse of the cumulative distribution function, and $H_{OOPD}(OOPD_{it})$ represents the empirical cumulative distribution function of OOPD. No separate copula terms are required for the interaction or quadratic terms (Papies, Ebbes and Van Heerde 2017). The nonnormal distribution of the potentially endogenous regressor, $OOPD_{it}^{c}$, was confirmed by a Shapiro-Wilk test (W = .672, $p < .01$). As shown in Appendix G, after controlling for the copula term, the results yield consistent estimates of coefficients, indicating the robustness of our findings.

Alternative measures and estimations. I conducted several supplementary analyses to confirm the robustness of our results. First, I examined their sensitivity to an alternative measure of brand category sales performance. When I used sales volume (i.e., number of items sold) instead of sales value in our estimation model, I obtained consistent results (see Appendix H). Second, I tested the model using an ordinary least squares (OLS) estimation (see Appendix I). All of the hypotheses continued to receive support with the OLS

estimations. Third, I applied alternative measures for brand positioning and brand innovativeness (Web Appendixes J and K). Instead of a continuous variable, I measured brand positioning as a dummy variable, DBP_{it} that indicates the price positioning of a brand category *i* in month *t* (= 1 if the average price of a brand category is higher than the average of all products in the category; 0 otherwise). I also created a dummy variable DBI_{it} to measure brand innovativeness, based on whether the proportion of new products in the brand category *i* is greater than the proportion of new products in the entire product category in month *t* (= 1 if the proportion is greater than the average in the category; 0 otherwise). The dummy variable CD_{it} reflects manufacturer channel directness. When I used the GMM method to test our model with these alternative measurements, I again obtained consistent results for the main and moderating effects, indicating the robustness of our findings.

Split-sample analysis. To further verify the moderation effects, I conducted a split-sample analysis (Appendix L). On the basis of median splits, I created subsamples with low and high values of each moderator, then estimated the effects of OOPD on sales performance for both subsamples. The inverted U-shaped effects of OOPD on sales performance are significant when brand positioning is low (linear term: $b = 2.516$, $p < .10$; quadratic term: $b = -.206$, $p < .05$) but not when it is high ($p > .10$). Also, OOPD has stronger effects when brand innovativeness is low (linear term: $b = 4.196$, $p < .05$; quadratic term: $b = -.3.651$, $p < .05$) than when it is high (linear term: $b = 4.098$, $p < .10$; quadratic term: $b = -3.068$, $p < .10$). The inverted U-shaped effects of OOPD on sales also are significant only if the manufacturer does not have its own sales channel (CD = 0) (linear term: $b = 4.188$, $p < .05$; quadratic term: $b = -3.661$, $p < .05$). These results provide further evidence in support of H_2–H_4.

I summarize these robustness check results in Table 15. As shown, across several different estimation methods and measures, I obtain consistent results that support our hypotheses, which provide strong confidence in our findings.

Table 15: Robustness Checks with Different Estimation Methods and Alternative Measures

	Hypothesis	Sales Volume as DV	OLS estimation	Alternative measure of Brand Positioning	Alternative measure of Brand Innovativeness	Split sample analysis
OOPD	H_1 (+)	✓	✓	✓	✓	✓
$OOPD^2$	H_1 (-)	✓	✓	✓	✓	✓
$OOPD^2 \times BP$	H_2 (+)	✓	✓	✓	✓	✓
$OOPD^2 \times BI$	H_3 (+)	✓	n.s.	✓	✓	✓
$OOPD^2 \times CD$	H_4 (+)	✓	✓	✓	✓	✓

Notes: ✓ indicates significant coefficients ($p < .05$ or $p < .01$) in the expected direction. The main effects and control variables are the same as those included in Table 14 and were included in the analysis, but I exclude them from this table. For the full results, please see Appendixes G–K.

4.6. Discussion

In globally connected retailing environments, manufacturers have compelling motivations to adopt omnichannel distribution strategy to reach end-customers. However, configuring an effective product mix across online and offline channels in omnichannel management remains an ongoing challenge (Ailawadi 2021; MSI 2018), especially without research that adopts the manufacturer's perspective on online–offline product assortment differentiation. Empirical investigations of product assortments suggest how retailers might outcompete other retailers (Brynjolfsson, Hu, and Rahman 2009; Mehra, Kumar, and Raju 2018), but those considerations differ fundamentally from what manufacturers might do to strategize their assortments of product offerings across online and offline channels to maximize overall sales performance. In taking a manufacturer's perspective to introduce and quantify the effect of OOPD, I note both its benefit and cost effects and thereby establish an inverted U-shaped effect on sales performance. In line with power dependency theory, I observe that brand positioning, brand innovativeness, and channel directness, which all indicate the power of the manufacturer against channel partners, attenuate this inverted U-shaped relationship between OOPD and sales performance. The results accordingly reveal

valuable insights and implications for researchers and practitioners in omnichannel management, and particularly online offline product assortments.

4.6.1. Implications for Research

First, for manufacturers with hundreds of products, harmonizing the product assortment decision across channels is a complex, strategically important decision in omnichannel management (Ailawadi 2021). Perhaps due to the difficulty of accessing product and sales data from both online and offline sources (Cui et al. 2021), previous studies of channel differentiation mainly rely on surveys (e.g., Fürst, Leimbach, and Prigge 2017), which limits their ability to clarify causality and provide implementable guidance for manufacturers' omnichannel management. To extend this line of research, I conceptualize OOPD from the manufacturer's perspective, operationalize OOPD using matched online and offline sales data, and test its effects on the manufacturer's sales performance, thereby offering a direct response to calls to determine "Which is the right product mix in the right channel?" (MSI 2018). Our study enriches omnichannel marketing literature and echoes Ailawadi's (2021) efforts by investigating the sales outcome of a manufacturer's assortment decision and revealing the effectiveness of exclusivity across different channels.

Second, product assortment decisions from a retailer's perspective implies a competitive view: how one retailer can beat others (Dzyabura and Jagabathula 2018; Mehra, Kumar, and Raju 2018). But a manufacturer takes a broader view and seeks synergic effects from its product assortments across channels (Palmatier et al. 2020). It needs to consider potential gains from accessing distinct segments through online and offline assortments, but it also must account for coordination costs associated with arranging differentiated assortments across channels (Ailawadi 2021). By explicitly taking the manufacturer's view, I expand the theoretical underpinnings for the field. Furthermore, I theorize and show that OOPD can meet heterogeneous customer needs in diverse customer segments and thus enlarge market

coverage, but it also creates horizontal and vertical misalignments, such that it inhibits effective coordination and relationship outcomes. By integrating benefit and cost effects of OOPD together, I uncover the inverted U-shaped relationship between OOPD and sales performance, a novel finding that complements previous retailer-focused studies.

Third, when offering exclusive products across different channels, a manufacturer must tradeoff between gains and costs, with a consideration of power dynamics among channel members (Gielens, Gijsbrechts, and Dekimpe 2014). Manufacturers' brand and channel structure characteristics determine their power advantages, yet I know of no prior research that systematically examines their contingent roles for determining the varying levels of OOPD effectiveness. Through a power dependency theory lens, I examine the contingent role of three manufacturer factors: brand positioning, brand innovativeness, and manufacturer channel directness (Carson and Ghosh 2019; Van Der Maelen, Breugelmans, and Cleeren 2017). I thus extend prior research by detailing nuanced effects with the potential to influence manufacturers' design of their online and offline channel strategies so that they match their power advantage relative to channel partners. As our study demonstrates, OOPD effectiveness critically hinges on the power dependence relationships of the manufacturer with its channel members, such that I advance extant research on omnichannel marketing management (Ailawadi 2021; Shankar and Kushwaha 2020).

4.6.2. Implications for Practitioners

Considering the evidence I obtain, namely, that OOPD can significantly affect brand category sales performance, a central managerial implication pertains to the extent to which manufacturers should conduct OOPD and the boundary conditions they should consider in omnichannel management. In particular, OOPD affects total brand category sales in a nonlinear fashion, and in our study context, at a level of 58.8%, OOPD optimally drives manufacturers' sales performance, spanning their varied brand- and channel ownership–

related characteristics. This value implies that channel managers should seek to establish OOPD at a moderate level. For example, they might offer some exclusive products only online or offline, to increase customer traffic and meet heterogeneous customer needs. Yet they also should establish some level of cross-channel consistency by offering a certain proportion of their products in both channels. Doing so can improve the manufacturer's overall sales performance, through the effects of better coordinated channel partners, increased selling efforts, and greater customer satisfaction.

With regard to some boundary conditions, I note that OOPD is more critical for less powerful brands when it comes to enhancing their brand category sales performance. For example, if a manufacturer exhibits low brand price positioning (i.e., pricing is lower than average competitors in the same product category) or brand innovativeness (i.e., it introduces fewer new products to the market than average competitors in the same product category), its sales performance will be more sensitive to changing levels of OOPD. Because weak brand manufacturers depend more on their sales partners to sell products, both the benefits and the costs of OOPD get amplified. However, when a manufacturer manages a brand with high brand price positioning and/or innovativeness, its sales outcomes are less sensitive to OOPD. This result may help explain why some very powerful brands (e.g., Apple, Dyson) can synchronize their online and offline product assortments: They focus on product and service quality or new product introductions, rather than relying on OOPD to maximize sales.

Our findings also suggest that when a manufacturer has its own online or offline sales channels, the curve of the link between OOPD and sales performance becomes flatter, indicating reduced effects of OOPD on market coverage, as well as multichannel misalignments. Manufacturers with direct selling channels depend less on other online and offline channels for sales, so OOPD's capacity to enlarge market access becomes rather limited. Considering the potential conflict that OOPD may create among online and offline

channels, our results indicate that pursuing differentiated product assortments may not be a worthwhile attempt for brand manufacturers with self-owned channels.

4.6.3. Limitations and Avenues for Further Research

We rely on data from the home appliance industry, and though I gather panel data from four product categories, further research should examine the effectiveness of OOPD using data from different industries, to enhance the validity of our findings. In our hypotheses development, I propose benefit and cost effects of OOPD and an inverted U-shaped effect on sales performance. But the limitations of our secondary data prevent us from testing the underlying mechanisms by which OOPD affects sales performance. Additional, multimethod research efforts might collect subjective data from channel managers to verify the underlying mechanisms I propose, such as the bright side of market coverage and the dark side of multichannel misalignment.

Finally, though I control for the potential effects of price differentiation and product age in online and offline channels, our study only pertains to product assortment decisions, based on unique product models across channels. Regarding the proper marketing mix across online and offline channels, further research should explore how other dimensions, such as price, promotion, new products, and their combinations, may influence the manufacturer's overall sales. For example, in addition to placing different products online and offline, is there a benefit to adding younger versus older products or more expensive versus cheaper products online or offline? Should firms consider launching more or fewer promotions online or offline, in terms of frequency and discount level? Considering the ubiquity of omnichannel marketing, I hope this study fuels continued efforts to investigate how manufacturers can allocate and manage their offerings across increasing arrays of channel platforms.

Chapter 5. Conclusions

This dissertation aims to understand interfirm relationships with the supplier-distributor and manufacturer-channel members dyads due to its importance for marketing strategies. The first two studies were developed to address the distributor's survivability when facing the supplier encroachment and market uncertainty. The third study took the manufacturer's perspective to investigate how manufacturer can manage their product assortment across online and offline channel to maximize its sales performance.

In particular, by adopting the dynamic capability and network embeddedness theory, my first study substantiates the importance of distributor's customer-driving capability when facing the supplier encroachment to the downstream markets. We also resonate with Nenonen et al. (2019), who suggested that studies of customer-driving capability utilize context-specific heuristics. Being one of the first to document the performance impact of the customer-driving capability, our study contrasts with previous studies that mostly adopted the customer-driven perspective, and we generate new insights in the area of marketing capabilities. Moreover, we reveal a set of antecedents, i.e., supplier relationship exploration, distributor relational embeddedness, and customer service excellence, focusing on how distributors can diversify, excavate, and secure their resources through relationships with different market players in the network. Echoing the outside-in marketing strategy (Quach et al., 2020), our study revealed how distributors can work with external players to develop its own customer-driving capability, which will ultimately enhance the customer perceived value and firm performance. Taken together, our study contributes to the channel management literature by conceptualizing and empirically testing a framework to advise distributors in the face of increasing market encroachment by suppliers.

The second study provides substantial empirical evidence to countervail the effects of relationship exploration by differentiating and examining the effects of SRE and CRE on

detection and innovation capability. In line with information economics, our findings reveal that SRE will decrease the detection capability of incumbent supplier performance due to the resultant information inefficiency from substituting suppliers, while CRE will increase the detection capability due to information diversity. Additionally, we find that although a distributor's SRE has a negative impact on incumbent supplier relationship governance, it increases the distributor's innovation capability, as does CRE. Therefore, we are among the first to provide nuanced empirical evidence on the roles of different types of relationship exploration, thus echoing the academic debate on whether distributors should engage in relationship exploration and extending relevant channels. Moreover, the effects of detection and innovation capability on distributor performance are contingent on external market uncertainty.

In the third study, by taking a manufacturer's perspective to introduce and quantify the effect of OOPD, we note both its benefit and cost effects and thereby establish an inverted U-shaped effect on sales performance. Our study enriches omnichannel marketing literature and echoes Ailawadi's (2021) efforts by investigating the sales outcome of a manufacturer's assortment decision and revealing the effectiveness of exclusivity across different channels. By integrating benefit and cost effects of OOPD together, we uncover the inverted U-shaped relationship between OOPD and sales performance, a novel finding that complements previous retailer-focused studies. In line with power dependency theory, we observe that brand positioning, brand innovativeness, and channel directness, which all indicate the power of the manufacturer against channel partners, attenuate this inverted U-shaped relationship between OOPD and sales performance. The results accordingly reveal valuable insights and implications for researchers and practitioners in omnichannel management, and particularly online offline product assortments. We thus extend prior research by detailing nuanced

effects with the potential to influence manufacturers' design of their online and offline channel strategies so that they match their power advantage relative to channel partners.

References

Adidas (2021), "Adidas Annual Report 2020"

Aiken, Leona S., Stephen G. West, and Raymond R. Reno (1991), *Multiple regression: Testing and Interpreting Interactions*. SAGE.

Ailawadi, Kusum L. (2021), "Commentary: Omnichannel from a Manufacturer's Perspective," *Journal of Marketing*, 85(1), 121-125.

Ailawadi, Kusum L., Norm Borin, and Paul W. Farris (1995), "Market Power and Performance: A Cross-industry Analysis of Manufacturers and Retailers," *Journal of Retailing*, 71(3), 211-248.

Ailawadi, Kusum L., and Paul W. Farris (2020), *Getting Multi-channel Distribution Right*. John Wiley & Sons.

Ailawadi, Kusum L., Donald R. Lehmann, and Scott A. Neslin (2003), "Revenue Premium as an Outcome Measure of Brand Equity," *Journal of Marketing*, 67(4), 1-17.

Anderson, Erin, and Anne T. Coughlan. (2002). *Channel management: structure, governance, and relationship management* (pp. 223-47). London: Sage Publications.

Anderson, Erin, and Barton Weitz. (1992), "The use of pledges to build and sustain commitment in distribution channels", *Journal of Marketing Research*, Vol. 29 No. 1, pp. 18-34.

Ansari, Asim, Carl F. Mela, and Scott A. Neslin (2008), "Customer Channel Migration," *Journal of Marketing Research*, 45(1), 60-76.

Anupindi, Ravi, and Ram Akella. (1993), "Diversification under supply uncertainty", *Management Science*, Vol. 39 No. 8, pp. 944-963.

Arellano, Manuel, and Stephen Bond (1991), "Some Tests of Specification for Panel Data: Monte Carlo Evidence and an Application to Employment Equations," *The Review of Economic Studies*, 58(2), 277-297.

Arellano, Manuel, and Olympia Bover (1995), "Another Look at the Instrumental Variable Estimation of Error-components Models," *Journal of Econometrics* 68(1), 29-51.

Arya, Anil, Brian Mittendorf, and David EM Sappington (2007) The bright side of supplier encroachment. *Marketing Science*, 26(5), 651-659.

Atuahene-Gima, Kwaku, and Janet Y. Murray (2007). Exploratory and exploitative learning in new product development: a social capital perspective on new technology ventures in China. *Journal of International Marketing*, 15(2), 1-29.

Avery, Jill, Thomas J. Steenburgh, John Deighton, and Mary Caravella (2012), "Adding Bricks to Clicks: Predicting the Patterns of Cross-channel Elasticities Over Time," *Journal of Marketing*, 76(3), 96-111.

Aydin, Goker, and H. Sebastian Heese (2015), "Bargaining for an Assortment," *Management Science*, 61(3), 542-559.

Babich, Volodymyr, Apostolos N. Burnetas, and Peter H. Ritchken. (2007). Competition and diversification effects in supply chains with supplier default risk. *Manufacturing & Service Operations Management*, 9(2), 123-146.

Bansal, Naresh, Kissan Joseph, Minghui Ma, and M. Babajide Wintoki. (2017). "Do CMO Incentives Matter? An Empirical Investigation of CMO Compensation and its Impact on Firm Performance," *Management Science,* 63(6), 1993-2015.

Bell, David R., Santiago Gallino, and Antonio Moreno (2018), "Offline Showrooms in Omnichannel Retail: Demand and Operational Benefits," *Management Science,* 64(4), 1629-1651.

Blessley, Misty, Saif Mir, Zach Zacharia, and John Aloysius.(2018), "Breaching relational obligations in a buyer-supplier relationship: feelings of violation, fairness perceptions and supplier switching", *Industrial Marketing Management,* Vol. 74, pp. 215-226.

Blocker, Christopher P., Daniel J. Flint, Matthew B. Myers, and Stanley F. Slater. (2011). Proactive customer orientation and its role for creating customer value in global markets. *Journal of the Academy of Marketing Science*, 39, 216–233.

Blundell, Richard, and Stephen Bond (1998), "Initial Conditions and Moment Restrictions in Dynamic Panel Data Models," *Journal of Econometrics,* 87(1), 115-143.

Bolton, Ruth N., and Matthew B. Myers (2003), "Price-based Global Market Segmentation for Services," *Journal of Marketing,* 67(3), 108-128.

Bradach, Jeffrey L., and Robert G. Eccles (1989), "Price, Authority, and Trust: From Ideal Types to Plural Forms," *Annual Review of Sociology,* 15(1), 97-118.

Brass, Daniel J., Joseph Galaskiewicz, Henrich R. Greve, and Wenpin Tsai. (2004). Taking stock of networks and organizations: a multilevel perspective. *The Academy of Management Journal*, 47(6), 795-817.

Brege, Harald, and Daniel Kindström. (2020). Exploring proactive market strategies. *Industrial Marketing Management*, 84, 75-88.

Briesch, Richard A., Pradeep K. Chintagunta, and Edward J. Fox (2009), "How Does Assortment Affect Grocery Store Choice?," *Journal of Marketing Research,* 46(2), 176-189.

Brito, Renata P., and Priscila LS Miguel. (2017), "Power, governance, and value in collaboration: differences between buyer and supplier perspectives", *Journal of Supply Chain Management*, Vol. 53 No. 2, pp. 61-87.

Brown, James R., Jody L. Crosno, and Pui Ying Tong. (2019), "Is the theory of trust and commitment in marketing relationships incomplete?", *Industrial Marketing Management,* Vol. 77, pp. 155-169.

Brynjolfsson, Erik, Yu Hu, and Mohammad S. Rahman (2009), "Battle of the Retail Channels: How Product Selection and Geography Drive Cross-channel Competition," *Management Science,* 55(11), 1755-1765.

Bruni, Daniele Severi, and Gianmario Verona. (2009). Dynamic marketing capabilities in science-based firms: an exploratory investigation of the pharmaceutical industry. *British Journal of Management*, 20(1), 101-117.

Burke, Gerard J., Janice E. Carrillo, and Asoo J. Vakharia. (2007), "Single versus multiple supplier sourcing strategies", *European Journal of Operational Research*, Vol. 182 No. 1, pp. 95-112.

Carson, Stephen J., and Mrinal Ghosh (2019), "An Integrated Power and Efficiency Model of Contractual Channel Governance: Theory and Empirical Evidence," *Journal of Marketing*, 83(4), 101-120.

CHEARI (2018), "China Home Appliance Industry Annual Report, 2019"

Chen, Yen-Chun, Po-Chien Li, and Kenneth R. Evans. (2012). Effects of interaction and entrepreneurial orientation on organizational performance: insights into market driven and market driving. *Industrial Marketing Management*, 41(6), 1019-1034.

Choi, Thomas Y., and Janet L. Hartley. (1996). An exploration of supplier selection practices across the supply chain. *Journal of Operations Management*, 14(4), 333-343.

Chod, Jiri, Nikolaos Trichakis, and Gerry Tsoukalas. (2019), "Supplier diversification under buyer risk", *Management Science*, Vol. 65 No. 7, pp. 2947-3448.

Cohen, Wesley M., and Daniel A. Levinthal. (1990), "Absorptive capacity: a new perspective on learning and innovation", Administrative Science Quarterly, Vol. 35 No. 1, pp. 128-152.

Cronin Jr, J. Joseph, and Steven A. Taylor. (1992). Measuring service quality: a reexamination and extension. *Journal of Marketing*, 56(3), 55-68.

Cui, Tony Haitao, Anindya Ghose, Hanna Halaburda, Raghuram Iyengar, Koen Pauwels, S. Sriram, Catherine Tucker, and Sriraman Venkataraman (2021), "Informational Challenges in Omnichannel Marketing: Remedies and Future Research," *Journal of Marketing*, 85(1), 103-120.

Dahlquist, Steven H., and David A. Griffith (2014), "Multidyadic Industrial Channels: Understanding Component Supplier Profits and Original Equipment Manufacturer Behavior," *Journal of Marketing*, 78(4), 59-79.

Dalgic, Tevfik, and Maarten Leeuw (1994), "Niche Marketing Revisited: Concept, Applications and Some European Cases," *European Journal of Marketing*, 28(4), 39-55.

Danneels, Erwin. (2008). Organizational antecedents of second-order competences. *Strategic Management Journal*, 29(5), 519-543.

Deloitte. (2018). IoT opportunity in the world of semiconductor companies.

Deloitte. (2019). Semiconductor—the next wave, opportunities and winning strategies for semiconductor companies.

Desiraju, Ramarao, and Sridhar Moorthy. (1997). Managing a distribution channel under asymmetric information with performance requirements. *Management Science*, 43(12), 1628-1644.

Dong, Maggie Chuoyan, Fue Zeng, and Chenting Su. (2019). Network embeddedness as a dependence-balancing mechanism in developing markets: differential effects for channel partners with asymmetric dependencies. *Journal of the Academy of Marketing Science*, 47, 1064-1084.

Draganska, Michaela, Daniel Klapper, and Sofia B. Villas-Boas (2010), "A Larger Slice or a Larger Pie? An Empirical Investigation of Bargaining Power in the Distribution Channel," *Marketing Science*, 29(1), 57-74.

Dukes, Anthony J., Tansev Geylani, and Kannan Srinivasan (2009), "Strategic Assortment Reduction by a Dominant Retailer," *Marketing Science*, 28(2), 309-319.

utta, Shantanu, Jan B. Heide, and Mark Bergen. (1999), “Vertical territorial restrictions and public policy: theories and industry evidence”, *Journal of Marketing*, Vol. 63 No. 4, pp. 121-134.

Dzyabura, Daria, and Srikanth Jagabathula (2018), "Offline Assortment Optimization in the Presence of an Online Channel," *Management Science*, 64(6), 2767-2786.

El Akremi, Assâad, Karim Mignonac, and Rozenn Perrigot (2011), "Opportunistic Behaviors in Franchise Chains: The Role of Cohesion Among Franchisees," *Strategic Management Journal*, 32(9), 930-948.

El-Ansary, Adel I., and Louis W. Stern (1972) "Power Measurement in the Distribution Channel," *Journal of Marketing Research*, 9(1), 47-52.

Eisenhardt, Kathleen M., and Jeffrey A. Martin. (2000). Dynamic capabilities: what are they? *Strategic Management Journal*, 21, 1105-1121.

Elg, Ulf, Seyda Z. Deligonul, Pervez N. Ghauri, Wade Danis, and Veronika Tarnovskaya. (2012). Market-driving strategy implementation through global supplier relationships. *Industrial Marketing Management*, 41, 919-928.

Emerson, Richard M.(1962), "Power-dependence Relations," *American Sociological Review*, 31-41.

Emrich, Oliver, Michael Paul, and Thomas Rudolph (2015), "Shopping Benefits of Multichannel Assortment Integration and the Moderating Role of Retailer Type," *Journal of Retailing*, 91(2), 326-342.

Endres, H., Helm, R. and Dowling, M. (2020), “Linking the types of market knowledge sourcing with sensing capability and revenue growth: evidence from industrial firms”, *Industrial Marketing Management*, Vol. 90, pp. 30-43.

Ernst, Holger, Wayne D. Hoyer, and Carsten Rübsaamen. (2010). Sales, marketing, and research-and-development cooperation across new product development stages: implications for success. *Journal of Marketing*, 74(5), 80-92.

Feng, Hui, Neil A. Morgan, and Lopo L. Rego (2015), "Marketing Department Power and Firm Performance," *Journal of Marketing*, 79(5), 1-20.

Ferreira, J., Coelho, A. and Moutinho, L. (2020), “Dynamic capabilities, creativity and innovation capability and their impact on competitive advantage and firm performance: the moderating role of entrepreneurial orientation”, *Technovation*, Vol. 92-93, pp. 102061.

Flint, Daniel J., Robert B. Woodruff, and Sarah Fisher Gardial. (2002). Exploring the phenomenon of customers’ desired value change in a business-to-business context. *Journal of Marketing*, 66(4), 102-117.

Fornell, Claes, and David F. Larcker. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, 18(1), 39-50.

Frazier, Gary L., Elliot Maltz, Kersi D. Antia, and Aric Rindfleisch (2009), "Distributor Sharing of Strategic Information with Suppliers," *Journal of Marketing*, 73(4), 31-43.

Frohlich, M.T. and Westbrook, R. (2001), “Arcs of integration: an international study of supply chain strategies”, *Journal of Operations Management*, Vol. 19 No. 2, pp. 185-200.

Fürst, Andreas, Martin Leimbach, and Jana-Kristin Prigge (2017), "Organizational Multichannel Differentiation: An Analysis of Its Impact on Channel Relationships and Company Sales Success," *Journal of Marketing*, 81(1), 59-82.

Gallino, Santiago, and Antonio Moreno (2014), "Integration of Online and Offline Channels in Retail: The Impact of Sharing Reliable Inventory Availability Information," *Management Science*, 60(6), 1434-451.

Ganesan, Shankar, Morris George, Sandy Jap, Robert W. Palmatier, and Barton Weitz. (2009), "Supply chain management and retailer performance: emerging trends, issues, and implications for research and practice", *Journal of Retailing*, Vol. 85 No. 1, pp. 84-94.

Gao, Fei, and Xuanming Su (2017), "Omnichannel Retail Operations with Buy-Online-and-Pick-Up-in-Store," *Management Science*, 63(8), 2478-2492.

Geylani, Tansev, Anthony J. Dukes, and Kannan Srinivasan (2007), "Strategic Manufacturer Response to a Dominant Retailer," *Marketing Science*, 26(2), 164-178.

Ghauri, Pervez, Fatima Wang, Ulf Elg, and Veronica Rosendo-Ríos. (2016). Market driving strategies: beyond localization. *Journal of Business Research*, 69(12), 5682-5693.

Ghosh, Mrinal, and George John (2005), "Strategic Fit in Industrial Alliances: An Empirical Test of Governance Value Analysis," *Journal of Marketing Research*, 42(3), 346-357.

Ghosh, Mrinal, and George John. (2012). Progress and prospects for governance value analysis in marketing: when Porter meets Williamson. In *Handbook of business-to-business marketing*. Edward Elgar Publishing.

Gilliland, David I., and Stephen K. Kim. (2014). When do incentives work in channels of distribution? *Journal of the Academy of Marketing Science*, 42, 361-379.

Gielens, Katrijn, Els Gijsbrechts, and Marnik G. Dekimpe (2014), "Gains and Losses of Exclusivity in Grocery Retailing," *International Journal of Research in Marketing*, 31(3), 239-252.

Gielens, Katrijn, Els Gijsbrechts, and Inge Geyskens (2021), "Navigating the Last Mile: The Demand Effects of Click-and-Collect Order Fulfillment," *Journal of Marketing*, 84(4),1-20.

Gielens, Katrijn, and Jan-Benedict EM Steenkamp (2019), "Branding in the Era of Digital (Dis) Intermediation," *International Journal of Research in Marketing*, 36(3), 367-384.

Gensler, Sonja, Scott A. Neslin, and Peter C. Verhoef (2017), "The Showrooming Phenomenon: It's More than Just About Price," *Journal of Interactive Marketing*, 38, 29-43.

Glynn, Mark S (2010), "The Moderating Effect of Brand Strength in Manufacturer–Reseller Relationships," *Industrial Marketing Management*, 39(8), 1226-1233.

Gnyawali, Devi R., and Yue Song. (2016). Pursuit of rigor in research: illustration from coopetition literature. *Industrial Marketing Management*, 57, 12-22.

Golmohammadi, Amirmohsen, and Elkafi Hassini. (2020), "Review of supplier diversification and pricing strategies under random supply and demand", *International Journal of Production Research*, Vol. 58 No. 11, pp. 3455-3487.

Granovetter, Mark. (1985). Economic action and social structure: the problem of embeddedness. *American Journal of Sociology*, 91(3), 481-510.

Grewal, Dhruv, Ramkumar Janakiraman, Kirthi Kalyanam, P. K. Kannan, Brian Ratchford, Reo Song, and Stephen Tolerico (2010), "Strategic Online and Offline Retail Pricing: A Review and Research Agenda," *Journal of Interactive Marketing*, 24(2), 138-154.

Gu, Jane Z., and Giri Kumar Tayi (2017), "Consumer Pseudo-Showrooming and Omni-Channel Product Placement Strategies," *Management Information Systems Quarterly, 41(2), 583-606*.

Gu, Flora F., Namwoon Kim, David K. Tse, and Danny T. Wang. (2010). Managing distributors' changing motivations over the course of a joint sales program. *Journal of Marketing*, 74(5), 32-47.

Gu, Flora F., and Danny T. Wang (2011), "The Role of Program Fairness in Asymmetrical Channel Relationships," *Industrial Marketing Management*, 40(8), 1368-1376.

Gu, Flora F., Jeff Jianfeng Wang, and Danny T. Wang. (2019). The role of sales representatives in cross-cultural business-to-business relationships. *Industrial Marketing Management*, 78, 227-238.

Guitart, Ivan A., Jorge Gonzalez, and Stefan Stremersch (2018), "Advertising Non-Premium Products as If They Were Premium: The Impact of Advertising Up on Advertising Elasticity and Brand Equity," *International Journal of Research in Marketing*, 35(3), 471-489.

Gundlach, Gregory T., Ravi S. Achrol, and John T. Mentzer. (1995), "The structure of commitment in exchange", Journal of Marketing, Vol. 59 No. 1, pp. 78-92.

Gustafsson, A., Johnson, M.D. and Roos, I. (2005), "The effects of customer satisfaction, relationship commitment dimensions, and triggers on customer retention", Journal of Marketing, Vol. 69 No. 4, pp. 210-218.

Haans, Richard FJ, Constant Pieters, and Zi-Lin He (2016), "Thinking About U: Theorizing and Testing U-and Inverted U-Shaped Relationships in Strategy Research," *Strategic Management Journal*, 37(7), 1177-1195.

Hadfield, Ryan (2019), "50+ Essential Multichannel Marketing Statistics" (accessed Dec 6, 2019), https://blog.zoominfo.com/multichannel-marketing-statistics/

Hamilton, Stephen F., and Timothy J. Richards (2009), "Product Differentiation, Store Differentiation, and Assortment Depth," *Management Science*, 55(8), 1368-1376.

Handley, Sean M., and Corey M. Angst (2015), "The Impact of Culture on the Relationship Between Governance and Opportunism in Outsourcing Relationships," *Strategic Management Journal*, 36(9), 1412-1434.

Hansen, Lars Peter (1982), "Large Sample Properties of Generalized Method of Moments Estimators, " *Econometrica: Journal of the Econometric Society*, 50 (4), 1029–54.

Heide, Jan B. (1994), "Interorganizational Governance in Marketing Channels, " *Journal of Marketing*, 58(1), 71-85.

Heide, Jan B (2003), "Plural Governance in Industrial Purchasing," *Journal of Marketing*, 67(4), 18-29.

Heide, Jan B., and George John. (1988). The role of dependence balancing in safeguarding transaction-specific assets in conventional channels. *Journal of marketing*, *52*(1), 20-35.

Hendershott, Terrence, and Jie Zhang. (2006). A model of direct and intermediated sales. *Journal of Economics and Management Strategy*, 15(2), 279-316.

Hibbard, Jonathan D., Nirmalya Kumar, and Louis W. Stern (2001), "Examining the Impact of Destructive Acts in Marketing Channel Relationships," *Journal of Marketing Research,* 38(1), 45-61.

Homburg, Christian, Michael Müller, and Martin Klarmann (2011), "When Should the Customer Really Be King? On the Optimum Level of Salesperson Customer Orientation in Sales Encounters," *Journal of Marketing,* 75(2), 55-74.

Homburg, Christian, Josef Vollmayr, and Alexander Hahn (2014), "Firm Value Creation Through Major Channel Expansions: Evidence from an Event Study in the United States, Germany, and China," *Journal of Marketing,* 78(3), 38-61.

Huang, Song, Xu Guan, and Ying-Ju Chen. (2018). Retailer information sharing with supplier encroachment. *Production and Operations Management*, 27(6), 1133–1147.

Huang, Ying, Yadong Luo, Yi Liu, and Qian Yang. (2016). An investigation of interpersonal ties in interorganizational exchanges in emerging markets: a boundary-spanning perspective. *Journal of Management*, 42(6), 1557-1587.

Hunt, Shelby D., and John R. Nevin (1974), "Power in a Channel of Distribution: Sources and Consequences," *Journal of Marketing Research,* 11(2), 186-193.

Im, Subin, Barry L. Bayus, and Charlotte H. Mason (2003), "An Empirical Study of Innate Consumer Innovativeness, Personal Characteristics, and New-Product Adoption Behavior," *Journal of the Academy of Marketing Science,* 31(1), 61-73.

Inman, J. Jeffrey, Venkatesh Shankar, and Rosellina Ferraro (2004), "The Roles of Channel-Category Associations and Geodemographics in Channel Patronage," *Journal of Marketing,* 68(2), 51-71.

Iyer, Ganesh, and J. Miguel Villas-Boas (2003), "A Bargaining Theory of Distribution Channels," *Journal of Marketing Research,* 40(1), 80-100.

Jap, Sandy D.(2001), "Pie Sharing" in Complex Collaboration Contexts," *Journal of Marketing Research,* 38(1), 86-99.

Jap, Sandy D., and Shankar Ganesan. (2000), "Control mechanisms and the relationship life cycle: implications for safeguarding specific investments and developing commitment", *Journal of Marketing Research*, Vol. 37 No. 2, pp. 227-245.

Jaworski, Bernard J., and Ajay K. Kohli. (1993). Market orientation: antecedents and consequences. *Journal of Marketing*, 57(3), 53–70.

Jaworski, Bernard, Ajay K. Kohli, and Arvind Sahay. (2000). Market-driven versus driving markets. *Journal of the Academy of Marketing Science*, 28(1), 45–54.

Jin, Jason Lu, Chengli Shu, and Kevin Zheng Zhou (2019), "Product Newness and Product Performance in New Ventures: Contingent Roles of Market Knowledge Breadth and Tacitness," *Industrial Marketing Management,* 76, 231-241.

Jourdan, Julien, and Ilze Kivleniece (2017), "Too Much of a Good Thing? The Dual Effect of Public Sponsorship on Organizational Performance," *Academy of Management Journal*, 60(1), 55-77.

Kabadayi, Sertan, Nermin Eyuboglu, and Gloria P. Thomas (2007), "The Performance Implications of Designing Multiple Channels to Fit with Strategy and Environment," *Journal of Marketing*, 71(4), 195-211.

Kadiyali, Vrinda, Pradeep Chintagunta, and Naufel Vilcassim (2000), "Manufacturer-Retailer Channel Interactions and Implications for Channel Power: An Empirical Investigation of Pricing in A Local Market," *Marketing Science*, 19(2), 127-148.

Karhade, Prasanna, and John Qi Dong (2021), "Innovation Outcomes of Digital Enabled Collaborative Problemistic Search Capability," *Management Information Systems Quarterly*, 45(2), 693-718

Katila, Riitta, and Gautam Ahuja (2002), "Something Old, Something New: A Longitudinal Study of Search Behavior and New Product Introduction," *Academy of Management Journal*, 45(6), 1183-1194.

Katsikeas, Constantine S., Neil A. Morgan, Leonidas C. Leonidou, and G. Tomas M. Hult. (2016). Assessing performance outcomes in marketing. *Journal of Marketing*, 80(2), 1-20.

Käuferle, Monika, and Werner Reinartz (2015), "Distributing Through Multiple Channels in Industrial Wholesaling: How Many and How Much?," *Journal of the Academy of Marketing Science*, 43(6), 746-767.

Kennedy, Peter (2003), *A Guide to Econometrics*, 5th ed. Cambridge, MA: MIT Press.

Kim, Stephen K., and David I. Gilliland. (2017). Working more or working less? Contingent allocation of reseller effort in distribution channels. *Industrial Marketing Management*, 64, 44-56.

Kleinlercher, Kristina, Marc Linzmajer, Peter C. Verhoef, and Thomas Rudolph (2020), "Antecedents of Webrooming in Omnichannel Retailing," *Frontiers in Psychology*, 11, 3342.

Kline, Rex. B. (1998). Principles and Practice of Structural Equation Modeling. *The Guilford Press*, New York, NY.

Klingebiel, R., and Rammer, C. (2014), "Resource allocation strategy for innovation portfolio management", *Strategic Management Journal*, Vol. 35 No. 2, pp. 246-268.

Kohli, Ajay K., and Bernard J. Jaworski. (1990). Market orientation: the construct, research propositions, and managerial implications. *Journal of Marketing*, 54(2), 1-18.

Konuş, Umut, Peter C. Verhoef, and Scott A. Neslin (2008), "Multichannel Shopper Segments and Their Covariates," *Journal of Retailing*, 84(4), 398-413.

Koufteros, Xenophon, Shawnee K. Vickery, and Cornelia Dröge. (2012). The effects of strategic supplier selection on buyer competitive performance in matched domains: does supplier integration mediate the relationships? *Journal of Supply Chain Management*, 48(2), 93-115.

Kumar, Anuj, Amit Mehra, and Subodha Kumar (2019), "Why Do Stores Drive Online Sales? Evidence of Underlying Mechanisms from a Multichannel Retailer," *Information Systems Research*, 30(1), 319-338.

Kumar, Nirmalya, Lisa K. Scheer, and Jan-Benedict EM Steenkamp (1995), "The Effects of Perceived Interdependence on Dealer Attitudes," *Journal of Marketing Research*, 32(3), 348-356.

Kumar, Nirmalya, Lisa Scheer, and Philip Kotler. (2000). From market driven to market driving. *European Management Journal*, 18(2), 129–142.

Lau, Antonio KW, Esther Tang, and Richard CM Yam. (2010). Effects of supplier and customer integration on product innovation and performance: empirical evidence in Hong Kong manufacturers. *Journal of Product Innovation Management*, 27(5), 761–777.

Laursen, Keld, and Ammon Salter. (2006), "Open for innovation: the role of openness in explaining innovation performance among U.K. manufacturing firms", *Strategic Management Journal*, Vol. 27 No. 2, pp. 131-150.

Leonidou, Leonidas C., Bilge Aykol, Stavroula Spyropoulou, and Paul Christodoulides. (2019), "The power roots and drivers of infidelity in international business relationships*" Industrial Marketing Management,* Vol. 78, pp. 198-212.

Li, Cuihong. (2020). "Supplier competition and cost reduction with endogenous information asymmetry", *Manufacturing & Service Operations Management*, Vol. 22 No. 5, pp. 996-1010.

Li, Zhuoxin, Stephen M. Gilbert, and Guoming Lai. (2015). Supplier encroachment as an enhancement or a hindrance to nonlinear pricing. *Production and Operations Management*, 24(1), 89–109.

Li, Yuan, Victor Cui, and Heng Liu. (2017), "Dyadic specific investments, absorptive capacity, and manufacturers' market knowledge acquisition: evidence from manufacturer–distributor dyads", *Journal of Business Research*, Vol. 78, pp. 323-331.

Lind, Jo Thori, and Halvor Mehlum (2010), "With or Without U? The Appropriate Test for a U-Shaped Relationship," *Oxford Bulletin of Economics and Statistics*, 72(1), 109-118.

Lindell, Michael K., and David J. Whitney. (2001). Accounting for common method variance in cross-sectional research designs. *Journal of Applied Psychology*, 86(1), 114–121.

Liu, Huan, Lara Lobschat, and Peter C. Verhoef (2018), *Multichannel Retailing: A Review and Research Agenda*. Delft: Now Publishers Incorporated.

Lumineau, Fabrice, and Nuno Oliveira. (2020), "Reinvigorating the study of opportunism in supply chain management", *Journal of Supply Chain Management*, Vol. 56 No. 1, pp. 73-87.

Mangus, Stephanie M., Eli Jones, Judith Anne Garretson Folse, and Shrihari Sridhar. (2020), "The interplay between business and personal trust on relationship performance in conditions of market turbulence", *Journal of the Academy of Marketing Science*, Vol. 48, pp. 1138-1155.

McGrath, Rita Gunther (2001), "Exploratory Learning, Innovative Capacity, and Managerial Oversight," *Academy of Management Journal*, 44(1), 118-131.

Mehra, Amit, Subodha Kumar, and Jagmohan S. Raju (2018), "Competitive Strategies for Brick-and-Mortar Stores to Counter "Showrooming"," *Management Science*, 64(7), 3076-3090.

Moorman, Christine, and George S. Day. (2016). Organizing for marketing excellence. *Journal of Marketing*, 80(6), 6-35.

Morgan, Neil A., Douglas W. Vorhies, and Charlotte H. Mason. (2009). Market orientation, marketing capabilities, and firm performance. *Strategic Management Journal*, 30(8), 909-920.

MSI (2018), "2018-2020 Research Priorities," (accessed Sep 10, 2018), https://www.msi.org/research/2018-2020-research-priorities/

Mu, Jifeng, Yongchuan Bao, Tejvir Sekhon, Jiayin Qi, and Edwin Love. (2018). Outside-in marketing capability and firm performance. *Industrial Marketing Management*, 75, 37-54.

Narver, John C., Stanley F. Slater, and Douglas L. MacLachlan. (2004). Responsive and proactive market orientation and new-product success. *Journal of Product Innovation Management*, 21(5), 334–347.

Nath, Prithwiraj, Subramanian Nachiappan, and Ramakrishnan Ramanathan. (2010), "The impact of marketing capability, operations capability and diversification strategy on performance: a resource-based view", *Industrial Marketing Management*, Vol. 39 No. 2, pp. 317-329.

National Bureau of Statistics of China (2020), "*2019 Statistical Bulletin on National Economic and Social Development*," research report, Beijing: National Bureau of Statistics.

Nenonen, Suvi, Kaj Storbacka, and Charlotta Windahl. (2019). Capabilities for market-shaping: triggering and facilitating increased value creation. *Journal of the Academy of Marketing Science*, 47, 617-639.

Palmatier, Robert W., Rajiv P. Dant, and Dhruv Grewal. (2007), "A comparative longitudinal analysis of theoretical perspectives of interorganizational relationship performance", *Journal of marketing*, Vol. 71 No. 4, pp. 172-194.

Palmatier, Robert W., Rajiv P. Dant, Dhruv Grewal, and Kenneth R. Evans. (2006). Factors influencing the effectiveness of relationship marketing: A meta-analysis. *Journal of marketing*, *70*(4), 136-153.

Palmatier, Robert W., Eugene Sivadas, Louis W. Stern, and Adel I. El-Ansary (2020), *Marketing Channel Strategy*, 9th ed. Milton: Routledge.

Palmatier, Robert W., Mark B. Houston, Rajiv P. Dant, and Dhruv Grewal. (2013). Relationship velocity: Toward a theory of relationship dynamics. *Journal of Marketing*, *77*(1), 13-30.

Papies, Dominik, Peter Ebbes, and Harald J. Van Heerde (2017), "Addressing Endogeneity in Marketing Models." In *Advanced methods for modeling markets*, pp. 581-627. Springer, Cham.

Pauwels, Koen, and Scott A. Neslin (2015), "Building with Bricks and Mortar: The Revenue Impact of Opening Physical Stores in a Multichannel Environment," *Journal of Retailing*, 91(2), 182-197.

Park, Sungho, and Sachin Gupta (2012), "Handling Endogenous Regressors by Joint Estimation Using Copulas," *Marketing Science*, 31(4),567-586.

Persson, Niklas (2010), "An Exploratory Investigation of the Elements of B2B Brand Image and Its Relationship to Price Premium," *Industrial Marketing Management*, 39(8), 1269-1277.

Podsakoff, Philip M., and Dennis W. Organ. (1986). Self-reports in organizational research: problems and prospects. *Journal of Management*, 12(4), 531-544.

Prajogo, Daniel, and Jan Olhager. (2012). Supply chain integration and performance: the effects of long-term relationships, information technology and sharing, and logistics integration. *International Journal of Production Economics*, 135(1), 514-522.

Preacher, Kristopher J., and Andrew F. Hayes. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behavior Research Methods*, 40, 879–891.

Quach, Sara, Park Thaichon, Ju-Yeon Lee, Scott Weaven, and Robert W. Palmatier. (2020). Toward a theory of outside-in marketing: past, present, and future. *Industrial Marketing Management*, 89, 107-128.

Ray, Gautam, Waleed A. Muhanna, and Jay B. Barney. (2005). Information technology and the performance of the customer service process: A resource-based analysis. *MIS Quarterly*, 29(4), 625-652.

Rehme, Jakob, Daniel Nordigården, Daniel Ellström, and Daniel Chicksand. (2016). Power in distribution channels—Supplier assortment strategy for balancing power. *Industrial Marketing Management*, 54, 176-187.

Reinartz, Werner, Nico Wiegand, and Monika Imschloss (2019), "The Impact of Digital Transformation on the Retailing Value Chain," *International Journal of Research in Marketing*, 36(3), 350-366.

Richardson, Hettie A., Marcia J. Simmering, and Michael C. Sturman. (2009), "A tale of three perspectives: examining post hoc statistical techniques for detection and correction of common method variance", *Organizational Research Methods*, Vol. 12 No. 4, pp. 762-800.

Robertson, Thomas S. (1967), "The Process of Innovation and the Diffusion of Innovation," *Journal of Marketing*, 31(1), 14-19.

Roodman, David (2009), "How to Do Xtabond2: An Introduction to Difference and System GMM in Stata, " *Stata Journal*, 9 (1), 86.

Rubera, Gaia, and Ahmet H. Kirca (2012), "Firm Innovativeness and Its Performance Outcomes: A Meta-analytic Review and Theoretical Integration," *Journal of Marketing*, 76(3), 130-147.

Rubera, Gaia, and Ahmet H. Kirca (2017), "You Gotta Serve Somebody: The Effects of Firm Innovation on Customer Satisfaction and Firm Value," *Journal of the Academy of Marketing Science*, 45(5), 741-761.

Samaha, Stephen A., Robert W. Palmatier, and Rajiv P. Dant (2011), "Poisoning Relationships: Perceived Unfairness in Channels of Distribution," *Journal of Marketing*, 75(3), 99-117.

Sa Vinhas, Alberto, and Erin Anderson (2005), "How Potential Conflict Drives Channel Structure: Concurrent (direct and indirect) Channels," *Journal of Marketing Research*, 42(4), 507-515.

Sa Vinhas, Alberto, and Jan B. Heide (2015), "Forms of Competition and Outcomes in Dual Distribution Channels: The Distributor's Perspective," *Marketing Science*, 34(1), 160-175.

Samaha, Stephen A., Joshua T. Beck, and Robert W. Palmatier. (2014), “The role of culture in international relationship marketing”, *Journal of Marketing*, Vol. 78 No.5, pp. 78-98.

Sarkis, Joseph, and Srinivas Talluri. (2002), “A model for strategic supplier selection”, Journal of Supply Chain Management, Vol. 38 No. 4, pp. 18-28.

Scheer, Lisa K., C. Fred Miao, and Robert W. Palmatier (2015), "Dependence and Interdependence in Marketing Relationships: Meta-analytic Insights," *Journal of the Academy of Marketing Science*, 43(6), 694-712.

Schindehutte, Minet, Michael H. Morris, and Akin Kocak. (2008). Understanding market-driving behavior: the role of entrepreneurship. *Journal of Small Business Management*, 46(1), 4–26.

Shahzad, K., Ali, T., Takala, J., Helo, P. and Zaefarian, G. (2018), “The varying roles of governance mechanisms on ex-post transaction costs and relationship commitment in buyer-supplier relationships”, *Industrial Marketing Management*, Vol. 71, pp. 135-146.

Shankar, Venkatesh, and Tarun Kushwaha (2020), "Omnichannel Marketing: Are Cross-channel Effects Symmetric?," *International Journal of Research in Marketing*, 38(2), 290-310.

Sharma, Amalesh, Alok R. Saboo, and V. Kumar (2018), "Investigating the Influence of Characteristics of the New Product Introduction Process on Firm Value: The Case of the Pharmaceutical Industry," *Journal of Marketing*, 82(5), 66-85.

Sheng, Shibin, Kevin Zheng Zhou, and Leopold Lessassy. (2013), “NPD speed vs. innovativeness: the contingent impact of institutional and market environments”, *Journal of Business Research*, Vol. 66, pp. 2355-2362.

Sheng, Shibin, Kevin Zheng Zhou, and Julie Juan Li. (2011). The Effects of Business and Political Ties on Firm Performance: Evidence from China. *Journal of Marketing*, 75(1), 1–15.

Srinivasan, Raji, and Christine Moorman. (2005). Strategic firm commitments and rewards for customer relationship management in online retailing. *Journal of marketing*, *69*(4), 193-200.

Smith, J. Brock, and Donald W. Barclay. (1997), “The effects of organizational differences and trust on the effectiveness of selling partner relationships”, *Journal of Marketing*, Vol. 61 No. 1, pp. 3-21.

Soda, Giuseppe, and Marco Furlotti. (2017), “Bringing tasks back in: an organizational theory of resource complementarity and partner selection”, *Journal of Management*, Vol. 43 No. 2, pp. 348-375.

Song, Michael, Cornelia Droge, Sangphet Hanvanich, and Roger Calantone. (2005). Marketing and technology resource complementarity: an analysis of their interaction effect in two environmental contexts. *Strategic Management Journal*, 26(3), 259–276.Sriram, S., and Vrinda Kadiyali (2009), "Empirical Investigation of Channel Reactions to Brand Introductions," *International Journal of Research in Marketing*, 26(4), 345-355.

Steenkamp, Jan-Benedict EM, Harald J. Van Heerde, and Inge Geyskens (2010), "What Makes Consumers Willing to Pay a Price Premium for National Brands Over Private Labels?," *Journal of Marketing Research*, 47(6), 1011-1024.

Subramaniam, Mohan, and Mark A. Youndt (2005), “The influence of intellectual capital on the types of innovative capabilities”, *Academy of Management Journal*, Vol. 48 No. 3, pp. 450-463.

Swaminathan, Vanitha, and Christine Moorman. (2009). Marketing alliances, firm networks, and firm value creation. *Journal of Marketing*, 73(5), 52–69.

Tang, Sammi Yu, and Panos Kouvelis. (2011), “Supplier diversification strategies in the presence of yield uncertainty and buyer competition”, *Manufacturing & Service Operations Management*, Vol. 13 No. 4, pp. 439-451.

Tanskanen, Kari, and Anna Aminoff. (2015), “Buyer and supplier attractiveness in a strategic relationship - a dyadic multiple-case study”, *Industrial Marketing Management*, Vol. 50, pp. 128-141.

Teece, David J. (2007). Explicating dynamic capabilities: the nature and microfoundations of (sustainable) enterprise performance. *Strategic Management Journal*, 28, 1319-1350.

Teece, David, Margaret Peteraf, and Sohvi Leih. (2016). Dynamic capabilities and organizational agility: risk, uncertainty, and strategy in the innovation economy. *California Management Review*, 58(4), 13-35.

Texas Instruments. (2019). Texas Instruments 2018 Annual report.

Tomlin, Brian. (2006). On the value of mitigation and contingency strategies for managing supply chain disruption risks. *Management Science*, 52(5), 639-657.

Tsai, Kuen-Hung, and Shu-Yi Yang. (2013), “Firm innovativeness and business performance: the joint moderating effects of market turbulence and competition”, *Industrial Marketing Management*, Vol. 42 No. 8, pp. 1279-1294.

Tse, Sin Yan, Danny T. Wang, and Tracy J. Zhang. (2019). The effects of distributor relationship commitment and relationship exploration on opportunism: the moderating roles of exchange uncertainties and network factors. *Industrial Marketing Management*, 83, 301-313.

Tuli, Kapil R., Sundar G. Bharadwaj, and Ajay K. Kohli (2010), "Ties That Bind: The Impact of Multiple Types of Ties with a Customer on Sales Growth and Sales Volatility," *Journal of Marketing Research*, 47(1), 36-50.

Uzzi, Brian. (1997). Social structure and competition in interfirm networks: the paradox of embeddedness. *Administrative Science Quarterly*, 42(1), 35–67.

Van der Maelen, Sara, Els Breugelmans, and Kathleen Cleeren (2017), "The Clash of the Titans: on Retailer and Manufacturer Vulnerability in Conflict Delistings," *Journal of Marketing*, 81(1), 118-135.

Verhoef, Peter C., Pallassana K. Kannan, and J. Jeffrey Inman (2015), "From multi-channel retailing to omni-channel retailing: introduction to the special issue on multi-channel retailing," *Journal of Retailing*, 91(2), 174-181.

Villas-Boas, J. Miguel (1998), "Product Line Design for A Distribution Channel," *Marketing Science*, 17(2), 156-169.

Vorhies, Douglas W., and Neil A. Morgan. (2005). Benchmarking marketing capabilities for sustainable competitive advantage. *Journal of Marketing*, 69(1), 80–94.

Wang, Kitty, and Avi Goldfarb (2017), "Can Offline Stores Drive Online Sales?" *Journal of Marketing Research*, 54(5), 706-719.

Wang, Danny T., Flora F. Gu, and Maggie Chuoyan Dong. (2013). Observer effects of punishment in a distribution network. *Journal of Marketing Research*, 50(5), 627–643.

Wang, Meng, Danyang Zhao, and Flora F. Gu (2021), "Distributors' Customer-driving Capability under Supplier Encroachment," *Industrial Marketing Management*, 94 (April), 52-65.

Wathne, Kenneth H., and Jan B. Heide. (2004), "Relationship governance in a supply chain network", *Journal of Marketing*, Vol. 68 No. 1, pp. 73-89.

Webster Jr, Frederick E. (2000). Understanding the relationships among brands, consumers, and resellers. Journal of the *Academy of Marketing Science*, 28(1), 17-23.

Weerawardena, Jay, and Felix T. Mavondo. (2011). Capabilities, innovation and competitive advantage. *Industrial Marketing Management*, 40(8), 1220-1223.

Weiner, I. B., Jodie B. Ullman, and Peter M. Bentler, (2003). *Handbook of psychology (2nd ed.)*. Hoboken, N.J.: Wiley.

West, Joel, and Marcel Bogers. (2014), "Leveraging external sources of innovation: a review of research on open innovation", *Journal of Product Innovation Management*, Vol. 31 No. 4, pp. 814-831.

Wilden, Ralf, Timothy M. Devinney, and Grahame R. Dowling. (2016). The architecture of dynamic capability research identifying the building blocks of a configurational approach. *Academy of Management Annals*, 10(1), 997-1076.

Windmeijer, Frank (2005), "A Finite Sample Correction for the Variance of Linear Efficient Two-step GMM Estimators," *Journal of Econometrics*, 126(1), 25-51.

Winter, Sidney G. (2003). Understanding dynamic capabilities. *Strategic Management Journal*, 24(10), 991-995.Wirtz, Jochen, and Valarie Zeithaml. (2018). Cost-effective service excellence. *Journal of the Academy of Marketing Science*, 46(1), 59-80.

Wooldridge, Jeffrey (2006), *Introductory Econometrics*. Mason, OH: Thompson Higher Education.

Wuyts, Stefan, Stefan Stremersch, Christophe Van den Bulte, and Philip Hans Franses. (2004). Vertical marketing systems for complex products: a triadic perspective. *Journal of Marketing Research*, 41(4), 479–487.

Yang, Zhibin, Göker Aydın, Volodymyr Babich, and Damian R. Beil. (2012), "Using a dual-sourcing option in the presence of asymmetric information about supplier reliability: competition vs. diversification", *Manufacturing & Service Operations Management*, Vol. 14 No. 2, pp. 202-217.

Yoon, Eunsang, and Gary L. Lilien. (1988), "Characteristics of the industrial distributor's innovation activities: an exploratory study", *Journal of Product Innovation Management*, Vol. 5 No. 3, pp. 227-240.

Yoon, Dae-Hee. (2016). Supplier encroachment and investment spillovers. *Production and Operations Management*, 25(11), 1839-1854.

Zeng, Fue, Ying Chen, Maggie Chuoyan Dong, and Jinhui Zheng. (2015). Understanding distributor opportunism in a horizontal network. *Industrial Marketing Management*, 46, 171-182.

Zhang, Chun, Xuan Bai, and Flora F. Gu. (2018), "Contract learning in the aftermath of exchange disruptions: an empirical study of renewing interfirm relationships", *Industrial Marketing Management*, Vol. 71, pp. 215-226.

Zhang, Jie, Paul W. Farris, John W. Irvin, Tarun Kushwaha, Thomas J. Steenburgh, and Barton A. Weitz (2010), "Crafting Integrated Multichannel Retailing Strategies," *Journal of Interactive Marketing*, 24(2),168-180.

Zhang, Jie, and Aradhna Krishna (2007), "Brand-level Effects of Stockkeeping Unit Reductions," *Journal of Marketing Research*, 44(4), 545-559.

Zhang, Tracy J., Sin Yan Tse, Danny T. Wang, and Flora F. Gu. (2021), "The effect of distributors' relationship exploration on relationship quality under market uncertainty", *Industrial Marketing Management*, Vol. 93, pp. 344-355.

Zhao, Xiande, Baofeng Huo, Willem Selen, and Jeff Hoi Yan Yeung. (2011), "The impact of internal integration and relationship commitment on external integration", *Journal of Operations Management*, Vol. 29 No. 1-2, pp. 17-32.

Zhao, Xinshu, John G. Lynch Jr, and Qimei Chen. (2010). Reconsidering Baron and Kenny: myths and truths about mediation analysis. *Journal of Consumer Research*, 37(2), 197-206.

Zhou, Jing, Chuang Zhang, Lu Shen, and Kevin Zheng Zhou. (2020). Interpersonal guanxi and partner extra-role behavior: mediating role of relational and transactional governance strategy. *Industrial Marketing Management*, 91, 551-562.

Zhou, Kevin Zheng, and Caroline Bingxin Li. (2010). How strategic orientations influence the building of dynamic capability in emerging economies. *Journal of Business Research*, *63*(3), 224-231.

Zhou, Kevin Zheng, and Caroline Bingxin Li. (2012), "How knowledge affects radical innovation: knowledge base, market knowledge acquisition, and internal knowledge sharing", *Strategic Management Journal*, Vol. 33 No. 9, pp. 1090-1102.

Zhou, Kevin Zheng, Chi Kin Yim, and David K. Tse. (2005). The effects of strategic orientations on technology-and market-based breakthrough innovations. *Journal of Marketing*, 69(2), 42-60.

Appendices

Appendix A: Interview Sample Description

No	Informant	Title	Industry experience (Years)	Firm	Number of employees	Firm annual income (USD)
1	Ms. W	Marketing director	20	IC Electronics Limited	1000	1.8 billion
2	Ms. C	Regional supply manager	15	FT Electronics	1000	1.3 billion
3	Mr. F	Product manager	20	CE International Equipment	500	2 million
4	Mr. L	Regional director	30	AR Electronics	3500	7 billion
5	Mr. M	Marketing director	25	WT Technology	2200	10 billion
6	Mr. T	Senior vice president	25	WP Group	1600	10 billion
7	Mr. H	Sales director	16	MA Group	600	1.4 billion
8	Mr. K	Senior marketing director	30	SE Group	400	0.5 billion

Note: To protect privacy of the interviewees, I anonymize the interviewees' names and firms in this table.

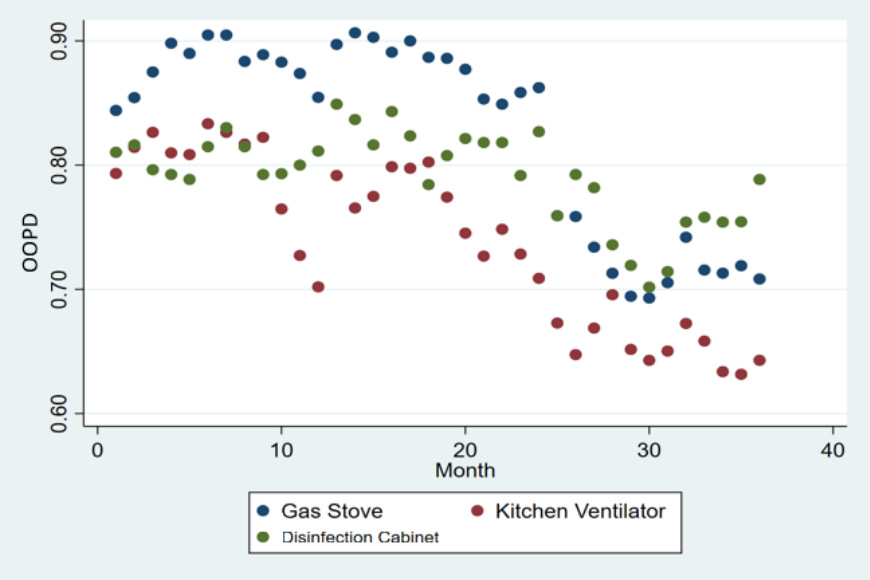
Appendix B: Narratives from In-depth Interviews

Informant No.	Narratives	Related Constructs
1	About ten years ago, our company only focused on doing what customers asked for. We can no longer just do the same, as the technologies have been changing too fast. We have to be more active in "pushing" our customers. For example, downstream customers may not know the latest technological trend in the industry. We need to take the initiative to tell them the possibilities of cutting cost or improving product performance based on the new technologies.	Customer-driving capability
2	Sensing and fulfilling customer needs are the basis in our industry. We frequently update customers with the latest information in our industry and get ourselves updated on their needs and concerns. We also propose solutions such as different combinations of products and services for our customers to create new business opportunities.	Customer-driving capability
3	If we cannot offer customers what they asked for, we have no opportunity for future orders. We get to know our customers better through fulfilling their existing needs, which also helps us make more reasonable recommendations for them. Sometimes customers do not know the latest trend in the industry or express their needs clearly, so we will explore together to find their real needs. We call this "demand creation" in our industry.	Customer-driving capability
4	Every time when we successfully complete a customer order, we know their needs better. When we satisfy their existing needs, they trust us more. They will tell us more about their problems, worries, and plans, so that we know what they really need and brainstorm a better solution for them.	Customer-driving capability
1	Now the entire industry is emphasizing "demand creation". The premise of creating demand is to understand and meet customers' current needs. If we can't do this, customers absolutely won't cooperate with us again, then how can we have the chance to explore their future needs? In other word, to satisfy customers' current needs is our basic duty.	Customer-driving capability
7	Of course we are worried if our customers order from suppliers. But we also have our own strength. We have long-time relationships with customers, and they trust us more. To customers, we are like problem solvers or solution providers. In other words, we not only sell products, but also provide forward-looking guidance and services. I think that's our advantage over suppliers.	Supplier encroachment
4	When suppliers contact downstream customers to promote their products, our customers often come back to us to check information or compare prices.	Supplier encroachment
8	Our suppliers sometimes directly contact our downstream customers. But you know how fast the information flows in the industry, we will soon know about it because of all the personal ties in the industry.	Supplier encroachment
8	We often attend conferences organized by industry associations and private gatherings with other distributors. The main purpose is to build connections and share information.	Distributor relational embeddedness
6	We have formal and informal contacts with our peers, such as in meetings organized by suppliers or during customer visits. We share new product trends, market conditions, and government policies. In short, there is no harm in communicating with peers.	Distributor relational embeddedness
5	If it doesn't affect our business, we don't mind giving favor to other distributors. We may help them with some logistic need. It's reciprocal. We sometimes need their help too.	Distributor relational embeddedness
2	We will help each other balance inventory and transfer goods. Also, sometimes we share product samples. These reciprocal acts are very common in the industry.	Distributor relational embeddedness
8	We always consider potential suppliers in our industry. A set of quality potential suppliers is very important. Even though we may not have conducted any business with them yet, they are very useful sources of information and potential partners in the future.	Supplier exploration
7	Maintaining potential relationships with suppliers is also important, because even though we have no cooperation now, we may cooperate in the future. We will take a long-term perspective to evaluate the marketing and technical capabilities of suppliers, and exchange industry information with them.	Supplier exploration

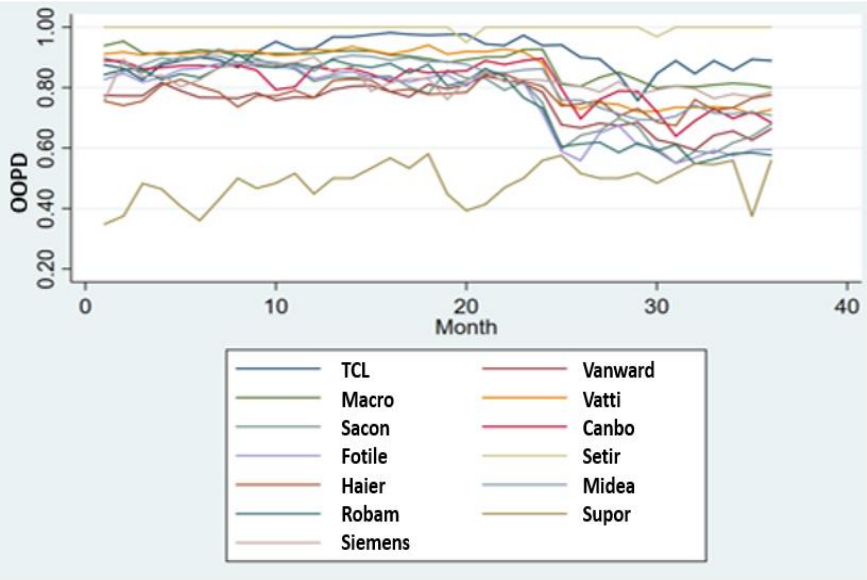
Appendix C: List of Home Appliance Brands

TCL	RongSheng	Letv
Vanward	Inse	Singfun
Macro	Ouyi	Skyworth
Vatti	Fardio	Sharp
Sacon	Aucma	Mi
Canbo	Baide	Konka
Fotile	Oulin	Whaley
Setir	ChangHong	Bftv
Haier	KKTV	Panasonic
Midea	LG	Hisense
Robam	PPTV	Sony
Supor	Samsung	Coocaa
Siemens	Toshiba	Philips

Appendix D: Levels of OOPD for Midea's Product Categories



Appendix E: Levels of OOPD across Different Brands in the Gas Stove Category



Appendix F: Full Model Including Main and Moderating Effects

In addition to the results provided in Models 1–4 of Table 14, here I provide the full model (Model 5) results, including all the interaction effects. The hypothesized inverted U-shaped effect of OOPD is significant ($OOPD_t$: $b = 5.314$, $p < .05$; $OOPD_t^2$: $b = -4.189$, $p < .01$). Although the interaction effects are all in the expected direction, the interaction effects of $OOPD^2 \times BI$ and $OOPD^2 \times CD$ are not significant ($p > .10$). To verify that the effects are due to multicollinearity between product terms, I estimated three models, each of which includes the moderating effects of two moderators (i.e., BP and BI in Model 6; BP and CD in Model 7; BI and CD in Model 8). The interaction effects of $OOPD^2 \times BI$ and $OOPD^2 \times CD$ are not significant ($p > .10$) in Model 6 and Model 7, respectively, but the interaction effects of both $OOPD^2 \times BI$ (b= .345, $p < .10$) and $OOPD^2 \times CD$ ($b = 2.234$, $p < .05$) are significant in Model 8, which supports the validity of our hypothesis. The results indicate the multicollinearity of the product terms and confirm our blockwise hierarchical approach to the moderating effect examinations.

	$Sales_t$			
	Model 5	Model 6	Model 7	Model 8
Main Effects				
$OOPD_t$	5.314**	5.258**	5.272**	3.489**
$OOPD_t^2$	-4.189***	-4.108**	-4.085**	-3.050**
BP_t	1.516**	1.547**	1.550**	.067
BI_t	.025	.024	.005	.115
CD_t	.257	.087**	.280	.772*
Interaction Effects				
$OOPD_t \times BP_t$	-4.482**	-4.611**	-4.545*	
$OOPD_t^2 \times BP_t$	3.208**	3.319**	3.223**	
$OOPD_t \times BI_t$	-.154	-.154		-.436
$OOPD_t^2 \times BI_t$	.149	.149		.345*
$OOPD_t \times CD_t$	-.704		-.753	-2.733**
$OOPD_t^2 \times CD_t$	.591		.616	2.234**
Controls				
$Sales_{(t-1)}$	.513***	.517***	.513***	.505***
Online product age_t	.011**	.011**	.011**	.011**
Offline product age_t	-.011***	-.011***	-.011***	-.011**
Price $difference_t$	.005	.004	.006	.004
Online market $share_{(t-1)}$	.544	.529	.550	.590
Offline market $share_{(t-1)}$	1.618***	1.595***	1.619***	1.463***
Product assortment $size_{(t-1)}$	.309***	.303***	.310***	.288***
Observations	2485	2485	2485	2485
Number of instruments	84	82	82	82
Wald χ^2	6559.68***	5879.65***	5576.38***	4851.96***
Hansen J statistic	69.24	69.46	69.57	69.95
AR(I) (z-score)	-4.84***	-4.90***	-4.81***	-4.82***
AR(II) (z-score)	-1.46	-1.46	-1.36	-1.41

* $p < .10$; ** $p < .05$; *** p

Appendix G: Endogeneity Assessment: Gaussian Copulas

	$Sales_t$			
	Model 9	Model 10	Model 11	Model 12
Main Effects				
$OOPD_t$	4.907**	9.875**	5.951***	11.629**
$OOPD_t^2$	-3.332***	-6.629**	-3.923***	-7.228***
BP_t	.083	2.191**	.077	.053
BI_t	.003	.005	.184	.005
CD_t	.071**	.091**	.071*	2.723**
Interaction Effects				
$OOPD_t \times BP_t$		-6.485**		
$OOPD_t^2 \times BP_t$		4.580**		
$OOPD_t \times BI_t$			-.647**	
$OOPD_t^2 \times BI_t$			.486**	
$OOPD_t \times CD_t$				-8.384**
$OOPD_t^2 \times CD_t$				6.055**
Controls				
$Sales_{(t-1)}$	.518***	.519***	.526***	.505***
Online product age_t	.013**	.012**	.013**	.012**
Offline product age_t	-.012***	-.012***	-.012***	-.011**
Price $difference_t$	-.000	.009	-.001	.005
Online $market\ share_{(t-1)}$	.501	.490	.489	.572
Offline $market\ share_{(t-1)}$	1.323***	1.675***	1.309***	1.513***
Product $assortment\ size_{(t-1)}$	.249***	.269***	.251***	.268***
Copula correction (OOPD)	-1.372	-1.746	-1.883	-3.949*
Observations	2485	2485	2485	2485
Number of instruments	80	80	80	82
Wald χ^2	3792.49***	3817.14***	3890.45***	3990.46***
Hansen J statistic	70.69	69.38	70.38	70.18
AR(I) (z-score)	-4.75***	-4.77***	-4.86***	-4.82***
AR(II) (z-score)	-1.33	-1.39	-1.50	-1.38

*p <.10; ** p < .05; *** p <.01.

Appendix H: Robustness Check Using Sales Volume as the Dependent Variable

	$SalesVolume_t$			
	Model 13	Model 14	Model 15	Model 16
Main Effects				
$OOPD_t$	2.940***	6.439***	3.218**	3.929**
$OOPD_t^2$	-2.444***	-4.846***	-2.713***	-3.343**
BP_t	-.087	1.786**	-.081	-.107*
BI_t	.008	.011*	.142	.011*
CD_t	.055	.068*	.052	.968**
Interaction Effects				
$OOPD_t \times BP_t$		-5.735**		
$OOPD_t^2 \times BP_t$		4.045**		
$OOPD_t \times BI_t$			-.538	
$OOPD_t^2 \times BI_t$			.429***	
$OOPD_t \times CD_t$				-3.448**
$OOPD_t^2 \times CD_t$				2.770**
Controls				
$Sales_{(t-1)}$	.568***	.567***	.572***	.550***
Online $product\ age_t$	.014**	.013**	.013**	.013**
Offline $product\ age_t$	-.012***	-.012***	-.012***	-.013**
$Price\ difference_t$	-.009	-.003	-.012	-.004
Online $market\ share_{(t-1)}$	.466	.483	.452	.535
Offline $market\ share_{(t-1)}$	1.080***	1.341***	1.031***	1.193***
$Product\ assortment\ size_{(t-1)}$	.236***	.277***	.239***	.261***
Observations	2485	2485	2485	2485
Number of instruments	80	80	78	82
Wald χ^2(d.f.)	2568.43***	2839.04***	2636.10***	2798.71***
Hansen J statistic	70.15	69.69	70.12	70.34
AR(I) (z-score)	-4.96***	-4.99***	-5.07***	-4.92***
AR(II) (z-score)	-1.13	-1.17	-1.32	-1.11

* p <.10; ** p < .05; *** p < .01.

Appendix I: Robustness Check Using Ordinary Least Squares Estimation

	Model 17	Model 18	Model 19	Model 20
Main Effects				
$OOPD_t$	.517**	2.404***	.558**	1.447***
$OOPD_t^2$	-1.039***	-2.426***	-1.053***	-1.897***
BP_t	.152***	.754***	.152***	.131***
BI_t	-.005	-.005	.06	-.002
CD_t	.174***	.173***	.174***	.900***
Interaction Effects				
$OOPD_t \times BP_t$		-1.983**		
$OOPD_t^2 \times BP_t$		1.462***		
$OOPD_t \times BI_t$			-.161	
$OOPD_t^2 \times BI_t$			.093	
$OOPD_t \times CD_t$				-2.922***
$OOPD_t^2 \times CD_t$				2.404***
Controls				
$Sales_{(t-1)}$	.025***	.025***	.025***	.024***
Online product age_t	-.024***	-.024***	-.024***	-.023***
Offline product age_t	-.002	.004	-.002	.006
Price $difference_t$	2.243***	2.224***	2.242***	2.251***
Online market $share_{(t-1)}$	2.245***	2.581***	2.452***	2.557***
Offline market $share_{(t-1)}$	.761***	.745***	.762***	.771***
Product assortment $size_{(t-1)}$	.025***	.025***	.025***	.024***
Constant	5.764	5.202	5.74	5.603
Observations	2485	2485	2485	2485
R^2	.872	.872	.872	.875

* p <.10; ** p < .05; *** p < .01.

Appendix J: Robustness Check Using the Alternative Measure of Brand Positioning

	$Sales_{it}$			
	Model 21	Model 22	Model 23	Model 24
Main Effects				
$OOPD_t$	2.430***	1.505*	2.388***	3.648**
$OOPD_t^2$	-2.046***	-1.188*	-2.056***	-3.097***
BP_t	.041**	.290*	.043**	.043***
BI_t	.001	.003	.108	.004
CD_t	.081**	.108**	.077**	.990**
Interaction Effects				
$OOPD_t \times BP_t$		-.88**		
$OOPD_t^2 \times BP_t$		.710**		
$OOPD_t \times BI_t$			-.412*	
$OOPD_t^2 \times BI_t$			.324**	
$OOPD_t \times CD_t$				-3.392**
$OOPD_t^2 \times CD_t$				2.703**
Controls				
$Sales_{(t-1)}$	.522***	.508***	.526***	.498***
Online product age_t	.012**	.012**	.012**	.011*
Offline product age_t	-.012***	-.011**	-.011***	-.011***
Price $difference_t$	.0004	-.008	-.004	.003
Online $market\ share_{(t-1)}$	.505	.596	.462	.620*
Offline $market\ share_{(t-1)}$	1.422***	1.503***	1.401***	1.496***
Product $assortment\ size_{(t-1)}$	.260***	.286***	.272***	.276***
Observations	2485	2485	2485	2485
Number of instruments	80	81	80	82
Wald χ^2(d.f.)	3303.64***	4367.33***	3240.70***	3820.91***
Hansen J statistic	70.23	69.56	70.21	70.12
AR(I) (z-score)	-4.81***	-4.78***	-4.86***	-4.78***
AR(II) (z-score)	-1.29	-1.25	-1.43	-1.26

* p <.10; ** p < .05; *** p < .01.

Appendix K: Robustness Check Using the Alternative Measurement of Brand Innovativeness

	$Sales_{it}$			
	Model 25	Model 26	Model 27	Model 28
Main Effects				
$OOPD_t$	2.509***	5.771**	2.905***	3.516**
$OOPD_t^2$	-2.129***	-4.402***	-2.447***	-3.019***
BP_t	.086	1.755**	.085	.066
BI_t	.012	.017	.611**	.017
CD_t	.073**	.086**	.075**	.897**
Interaction Effects				
$OOPD_t \times BP_t$		-5.206**		
$OOPD_t^2 \times BP_t$		3.710**		
$OOPD_t \times BI_t$			-1.919**	
$OOPD_t^2 \times BI_t$			1.405***	
$OOPD_t \times CD_t$				-3.108**
$OOPD_t^2 \times CD_t$				2.494**
Controls				
$Sales_{(t-1)}$	.517***	.518***	.523***	.501***
Online product age_t	.013**	.012**	.012**	.012**
Offline product age_t	-.012***	-.012***	-.011***	-.011**
Price $difference_t$	-.002	.007	-.002	.005
Online market $share_{(t-1)}$	.547	.532	.52	.606
Offline market $share_{(t-1)}$	1.351***	1.647***	1.369***	1.494***
Product assortment $size_{(t-1)}$	.261***	.294***	.258***	.280***
Observations	2485	2485	2485	2485
Number of instruments	80	80	80	82
Wald χ^2(d.f.)	3686.87***	4776.45***	3454.45***	3981.02***
Hansen J statistic	70.66	69.60	69.59	70.30
AR(I) (z-score)	-4.79***	-4.85***	-4.86***	-4.77***
AR(II) (z-score)	-1.32	-1.39	-1.37	-1.29

* p <.10; ** p < .05; *** p < .01.

Appendix L: Robustness Check Using the Median-Split Approach

	$Sales_t$					
	BP_Low	BP_High	BI _Low	BI _High	CD_Low	CD_High
Main Effects						
$OOPD_t$	2.516*	2.653	4.196**	4.098*	4.188**	2.148
$OOPD_t^2$	-2.056**	-2.24	-3.651**	-3.068*	-3.661**	-1.741
BP_t	.077	.069	.11	.086	-.008	.112
BI_t	-.001	.015	-.0001	.002	-.0007	.008
CD_t	.037	.171***	.077	.084	-.027	.014
Control Variables:						
$Sales_{(t-1)}$	.578***	.175	.442***	.402***	.693***	.209***
Online product age_t	.012*	.017**	.017**	.014**	.006	.011
Offline product age_t	-.012**	-.011*	-.017***	-.008*	-.011*	-.008
Price $difference_t$	.013	-.014	.036	-.023	.051	.002
Online $market\ share_{(t-1)}$	.356	.927	.641	.955**	-1.045*	1.513***
Offline $market\ share_{(t-1)}$	2.581**	2.200***	1.461***	1.627***	1.923**	2.060***
Product assortment $size_{(t-1)}$	.166**	.460**	.266**	.285***	.084	.280***
Observations	1245	1240	1208	1277	853	1632
Number of instruments	52	52	76	74	47	59
Wald χ^2(d.f.)	3815.67***	3771.22***	2475.74***	2988.75***	4103.13***	1098.97***
Hansen J statistic	41.17	40.37	63.77	67.50	34.79	51.40
AR(I) (z-score)	-3.34***	-3.84***	-3.99***	-2.38**	-3.09***	-4.62***
AR(II) (z-score)	-1.05	-.75	-.47	-.73	-1.54	1.10

* p <.10; ** p < .05; *** p < .01.