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**THE IMPACT OF NEW PRODUCT INNOVATIVENESS ON ITS PERFORMANCE  
IN RETAIL: MODERATING ROLE OF COMMERCIAL ENVIRONMENT**

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## PREFACE

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## KEY DEFINITIONS

**Commercial environment** – dynamic external system or conditions in which new product operates, competes and functions commercially (Dess & Beard, 1984; Gotteland & Boule, 2006).

**Commercialization** - culmination of new product development process, during which new product is introduced to the market. Commercialization is the attempt to profit from innovation, is the process that is often associated with marketing capabilities, such as market research, promotion, market planning and monitoring with the aim to launch new products successfully in the existing, often turbulent external environment (Adams, Bessant & Phelps, 2006; Hultink et al., 1997).

**Commercial success** – perspective of performance, which is measured in different dimensions, namely performance in either absolute or relative to total sales or profits (Brenner, 1994; Johne & Snelson, 1988; Kleinknecht & Van der Panne, 2012).

**Company's characteristics** – a set of variables used in this research (company's sales value in market, company's sales value in retail channel, company's portfolio width, value of trade marketing investment) to define commercial environment from perspective of company's level.

**Decision tree** - a tool that combines findings of regression analysis and, based on it, enables predictive modeling, and recognizes data patterns due to the interpretability of the constructed model (Myles, Feudale, Liu, Woody & Brown, 2004).

**Innovation** - idea, thing, procedure or system that is perceived to be new. Needs to be new to the person or organization that is adopting or implementing it (Rogers, 1995).

**Innovativeness** – a degree of novelty, which is described in relation to the company and the market (Song & Montoya-Weiss, 1998).

**Innovation diffusion** – the theory that explains how over a period of time, an idea or a product offering gains popularity or diffuses through social system. The final result of diffusion is that the potential user accepts the new idea or product after some time, and thus created economic value within (Rogers, 1962).

**Marketplace characteristics** – a set of variables used in this research (category sales value and category competitiveness) to define commercial environment from perspective of category on market level.

**Product innovation** - is the market introduction of a new, or significantly improved item, with respect to its capabilities, user friendliness, components or sub-systems (Travassoli & Karlsson, 2015).

**Retail category management decisions** – a set of variables used in this research (category sales value, category competitiveness, category role and presence of private label) to define commercial environment from perspective of retail channel.

## INTRODUCTION

The long-term survival of a business enterprise hinges upon its ability to successfully launch new products in the marketplace (Bobrow, 1991) - each year more and more products are introduced into markets. In addition, a firm's ability to innovate over longer periods of time is acknowledged as a competitive advantage that is able to deliver sustainable business growth (Le Bas & Scellato, 2014). Herewith, consumers encounter a great deal of information that is related to new product launches in many environments. However, despite the high number of new products in the market, the success rates of new products have been rather disappointing. Barczak, Griffin & Kahn (2009) indicate that success rates of new products are only around half. A study by Nielsen (2014) indicates that only one fourth of innovative products are able to achieve successful commercialization. Other industry research reports that success rates of new products differ within the level of product novelty: really new products have a success rate of 57 percent, line extensions – 49 percent, and imitative innovations have a success rate of only 23 percent (Ernst & Young, 1999). However, companies continue to invest in product innovations for obvious reasons, and the importance of knowing what antecedents predetermine successful introductions is undeniable. This dissertation aims to explore what leads to a higher propensity to innovate and commercialize? Why some innovative products are more successful than others and what role does the contextual environment play in new product performance?

### **Relevance of the research**

It is widely recognized that innovation is a key driver of economic growth. The development and launch of product innovations is the source of business growth and its commercial success, hence its relevance is undeniable. It is also acknowledged that the introduction of new products is one of the most important marketing activities (Sorecu & Spanjol, 2008). Likewise, Tsai, Huang & Tsai (2013) indicate that launch proficiency is found to be a dominant predictor of new product performance in the future. On the other hand, other research (Calantone & Montoya-Weiss, 1993) notes that a new product launch is considered to be the most demanding, expensive and risky process out of all phases of new product development; thus, it needs to be understood properly in ever-changing business environments. Companies face different kinds of challenges when entering a market with innovation, especially if products are launched in cooperation with retailers. While consumers are offered more

and more new opportunities to try new products, managers are concerned with the questions of whether the product will diffuse in the market successfully.

According to Rogers (1995), a new product launch is often associated with higher risks and lower product knowledge for all – manufacturers, consumers and retailers alike. With increasing competitiveness in the market, companies are searching for the competitive advantage to compete successfully; embracing innovativeness and developing innovations is often a path to differentiation in the market, which leads to economic advancement through the development and diffusion of innovations. Years ago, authors acknowledged the managerial importance of new product launches (Maidique & Zirger, 1984; Calantone & Di Benedetto, 1988; Cooper, 1979), yet Calantone & Di Benedetto (2007) highlight that this research area has only started to attract the extensive attention of researchers over the last decade. Based on Hultink, Griffin, Hart & Robben (1997), new product developers must address five key issues in regard to innovation – what, where, when to launch, why to launch and how to launch?

Both academia and practitioners aim to answer the latter questions of permanent interest. A study by Garcia-Zamora, Gonzalez-Benito & Munoz-Gallego (2013) indicates that research on innovation has increased, as innovation management has become a basic requirement for companies, willing to compete in the market successfully. Accordingly, many resources are being invested in the development and commercialization of new products. A relatively new stream of research aims to link innovation with performance as an attempt to emphasize its effect to commercialization and successful diffusion. Authors, for example, Camison-Zornoza, Lapiedra-Alcami, Segarra-Cipres & Boronat-Navarro (2004), have added the domain of performance, stating that the innovation is the newness of an idea that aims to bring its performance result as benefit to organization. Consequently, in volatile commercial environments, the question of new product success has always been and will always be of academic and managerial interest. This dissertation thus addresses new product development and commercialization strategy literature, and explores the nature of product innovation, its relation to performance and the role of commercial environment as a context to innovativeness – performance linkage.

In addition, as Damanpour & Schneider (2009) and Michael, Rochford & Wortruba (2003) indicate, products that represent different types of newness face different commercialization paths in diverse competitive environments; hence marketing and

sales strategies should be adapted respectively. It has also been highlighted (Evantscitzky, Eisend, Calantone & Jiang, 2012; Michael, Rochford & Wortruba, 2003) that business need to adapt different strategies to different products with diverse newness during introductions, especially in respect to different competitive environments – marketing and sales strategies, that allow opportunities to be exploited and risks anticipated. Consequently, understanding the patterns of success or failure in specific commercial environments is a crucial part of new product development. There are several research streams that are combined in this dissertation, namely innovation management, new product development and its commercialization in the context of retail.

Therefore, this research allows creating a complex framework, which illustrates the performance development of new products, reveals role of innovativeness to performance and integrates commercial environments as a context. Research explores the question in a conjoint way, leading to econometric product innovation commercialization modeling. The research focuses on the moderating impact of specific contextual factors on the link between innovativeness and performance; it creates a complex model, which concerns commercial environment that this research proposes to be important moderating antecedent to the linkage.

According to previous studies, despite many attempts to focus on the innovation – performance linkage, the literature remains inconclusive due to different angles of research that were previously employed. Kleinknecht & Panne (2012) indicate that the literature remains inconclusive in terms of new products, and especially innovation performance, which suggests the importance of the question, outlined in this dissertation. Likewise, Tavassoli (2015) argues that limited understanding is still present in the field; hence determinants of innovation behavior and its commercialization paths are crucial to evaluate for various types of innovations.

### **Novelty of the research**

A vast amount of research, dedicated to the new product development area, has focused and still focuses on the customer perspective. It is undeniable that the customer's point of view is the essence of new product development and performance studies, but some authors have already started to draw attention to the need for more complex studies. Luo, Kannan & Ratchford (2007) highlight that a unilateral focus on the customer can be a rather short-sighted perspective. In addition, authors (Moreau, Lehman & Markman (2001) and Steenkamp & Gielens (2003)) have started a research

stream which explores factors that influence individual consumer decisions towards a new brand, considering the contextual environment. Tsai, Huang & Tsai (2013) also suggest that the role of context or commercial environments in regard to new product performance is an area that has been explored too little to date, yet is crucial to understand. Likewise, previous studies (Tsai, Huang & Tsai, 2013; Steenkamp & Gielens, 2003) have suggested that despite the link between commercial environment and performance being addressed in many studies, there have been only few attempts to explore moderation and mediation between product innovation and performance. Recent studies (Lamey, Deleersnyder, Steenkamp & Dekimpe, 2018; Travassoli, 2015) have also highlighted that research gaps in the area do exist, especially a lack of evidence in retail shopper-marketing – new product performance studies, conceptualizing and enriching theory in regard to the role of retail context.

This dissertation aims to outline and conceptualize the role of commercial environments in the link between product innovativeness and its performance in retail. Regardless of extensive studies performed in the field, literature is available on new product development with a focus on product-related factors, whereas the role that retailers play and their impact to the process is stated to be underexplored (Lamey, Deleersnyder, Steenkamp & Dekimpe, 2018; Lin & Chang, 2012). Decades ago, scholars (Luo, Kannan & Ratchford, 2007; McCormack, 1997) claimed that retailers are taking a dominant position in many markets, and have hence become „gatekeepers” and first choice outlets to customers.

According to Cappel (2003), consumers choose retailers as their first shopping place because of practical reasons - competitive prices, attractive assortments and convenient locations. In addition, retail shopper marketing studies (Shankar, 2011) reveal that 50-70 percent of shoppers' decisions are made in-store, which emphasizes the importance of retail and retailer's actions to manufacturers, especially during new product launch. Consequently, access to consumers is concentrated in the hands of powerful retailers and thus affects national distribution and commercialization result of new products. Studies (Reynolds Howard, Cuthbertson & Hristov (2007) have highlighted it further – retail power is rising each year. Contemporary retailers move to power centers and superstores covering markets on a national, continental or even global level. It is acknowledged (Lamey, Deleersnyder, Steenkamp & Dekimpe, 2018; Shankar, 2011) that it is important to consider that retail-specific activities

influence new product purchase decisions; hence role of retail in new product development, and especially the phase of commercialization, is unquestionable.

The so called “retail revolution” enhances the importance of the retail channel, which is considered to be a gatekeeper to consumers who “filter” various offerings and form an assortment in regard to the consumer-made choices. With the growing importance of assortment management, scholars have noticed (Fornari, Grandi & Fornari, 2009; Broniarczyk, Hoyer & McAlister, 1998; Dreze, Hoch & Purk 1994) that rationalization of supply with the aim to achieve purchase economies without reducing performance of categories becomes a priority for the majority of retailers. Subsequently, it had become a challenge for companies that enter the market through retail channels.

Researchers have addressed the role of distribution in relation to retail, which is also addressed in this dissertation. Based on previous research, that has focused on the role of distribution as the success of diffusion of new products through retail is unquestionable (Montaguti, Kuester & Robertson, 2002; Gatington & Anderson, 1998; Jonas & Mason, 1990; Jonas & Ritz, 1991). Initial stage of diffusion is an important driver of future innovation success, studies acknowledge (Arthur, 1989; Cabral, 1990). Due to the rising importance of retailers in the markets, as well as its access to end consumers, more and more products are launched in retailer-manufacturer cooperation, which allows manufacturers to distribute their products more efficiently (Luo, Kannan & Ratchford, 2007). In addition, studies (Ghosh, Chakaborty & Ghosh, 1995) acknowledge that manufacturers’ strategies very often require close cooperation with retail. First, the product market is defined by competing manufacturers that represent the number of products and a decentralized dominant channel partner, having an equal pricing structure. However, manufacturers are responsible for product design and wholesale pricing while retailers aim to maximize category profit, which constitutes manufacturers – represented products in making product acceptance decisions, using category management and review techniques. Yet despite differences between parties, both seek to optimize value and achieve efficiency in operation and are bound by the end customer. Based on Anderson, Håkanon & Johanson (1997), retail operations are very much dependable on manufacturers, and vice versa, as all commercial operations take place among the network of manufacturers, retailers and end-customers. For example, Narus & Anderson (1988) highlight the importance of the partnership between manufacturers and retailers, as both of them serve the end-

customer, but from different perspectives. Hence, new product adoption by the retailer, as well as its spread to the market through the distribution channel, is an important antecedent of market structure. Studies indicate (Lamey, Deleersnyder, Steenkamp & Dekimpe, 2018) the importance of retail in new product studies and specify that the role of retail is undeniable and has a profound impact on new product success.

This study outlines that the marketing plans of new products are usually made depending on the market; however, failing to address the role of retail, which can be deficient due to the absence of manufacturer control of what happens with their new products in the stores. The literature (Grashof, 1970; Montgomery, 1975) has focused on the role of retail on new product adoption studies, and based on Everdingen, Slood, Nierop & Verhoef (2011), there were attempts to follow up this topic by later research, performed by Kaufman, Jayachandran & Rose (2006) and White, Troy & Gerlich (2002). It is acknowledged (Everdingen et al., 2011) that previous studies mainly focused on profit related variables, such as gross margin, price or trade support. Consequently, retailers would make listing decisions based on profit related factors.

As the role of retail and the decision-making process towards new product acceptance has changed, the scope of research also broadened. For example, a study by Everdingen et al. (2011) suggest that factors such as the manufacturer – retailer relationship and the attractiveness of new products are increasingly drawing scholars' attention, and is thus becoming an important research area. Although many researchers have explored the practice of new product launch in different aspects, new factors that are expected to have an impact on new product development appear. The majority of research in the field has focused on marketing factors and their use when launching the product with little attention paid to a more complex evaluation, including market, retailers' and product owners' points of interest. Following the conclusion that there is little research available to date that addresses consumer purchase decisions during the launch period evaluating aspects that are not controlled by consumer, this research is considered a valuable contribution to the field of innovation diffusion in retail channels, as well as new product performance studies.

The dissertation aims to conceptualize the moderating role of the commercial environment in innovativeness and performance linkage studies. The basis for the conceptual model is propositions several studies (Steenkamp & Gielens, 2003; Henard & Szymanski, 2001; Evantscitzky, Eisend, Calantone & Jiang, 2012), which discuss the role of market and retailer's actions as context in performance. In this research, an

additional layer of contextual variables are added, namely category management decisions and companies' characteristics, which are defined as key factors in performance studies (Gajanan, Basuroy, & Beldona, 2007; Lindbloom & Olkkonen, 2006). However, as suggested by Gruen & Shah (2002), these factors have not been addressed with proper consideration yet. In addition, Fornari, Grandi & Fornari (2009) argue that research addressing new product opportunities in respect to retail assortment is absent. Therefore, on the basis of research gaps, necessity to evaluate the importance of the environment in which new products commercialize and its impact on the innovativeness performance result the products deliver is clear.

### **Research problem**

This dissertation addresses several research problems that have been identified in previous research, as well as comprehended after theoretical development. First of all, this research addresses innovativeness - performance linkage. Despite the fact that this linkage has already been explored by previous studies, results remain contradictive. This is also acknowledged by researchers who have performed meta-analyses that outline current innovativeness – performance research (Stanko, Molina-Castilo & Harmancioglu, 2015; Rubera & Kirca, 2012; Evantscitzky, Eisend, Calantone & Jiang, 2012; Szymanski, Kroff & Troy, 2007; Henard & Szymanski, 2002). Findings in regard to innovativeness – performance linkage differ from negative, positive to no effects at all. This indicates a clear research gap and the need for further clarification and suggests that innovativeness – performance linkage cannot be explored unilaterally. Subsequently, this research aims to address the role of moderators to the linkage between innovativeness and performance. This research suggests that inconsistency in previous findings may be caused by lack of explanation, in regard to factors related commercial context. Based on Baron & Kenny (1986), moderators are typically used in research to explain existing inconsistent relation between variables.

Thus, this dissertation proposes that contradictive findings may exist in the field because the innovativeness – performance linkage cannot be evaluated unilaterally and employs moderation analysis to explain inconsistency of findings in previous research. This research suggests that innovativeness - performance linkage is influenced by many contextual situations that are expected to predetermine the type relationship towards performance, defined as various environmental contexts. Due to lack of understanding of the context, the innovativeness - performance linkage is not conceptually clear, and thus needs clarification for future guidelines. Recent research

has also highlighted the need to understand the role of context in the relationship between innovativeness and performance. Chang et al. (2014) suggest that moderating effects are crucial to understand the innovativeness - performance linkage, especially the role of distribution and promotion. In addition, Montaguti, Kuester & Robertson (2002) indicate that moderating effects of competitive and firm-specific factors would also contribute to increased understanding of role of innovativeness to performance. Also, Michael, Rachford & Wortuba (2003) complement that understanding of market specific factors as moderators to innovativeness – performance relationship, is also very important and should be addressed by future studies. Consequently, the conceptual research problem which is explored in this dissertation was encouraged by findings and suggestions outlined by previous studies and a willingness to contribute to new product performance studies, which is consistently of high interest due to its importance to the growth of businesses and economies.

**The aim** of this research is to reveal how the link between product innovativeness and its performance is influenced by the context of the commercial environment.

**The following objectives would help to reach the aim of research:**

1. Reveal the main theoretical aspects of the innovation concept and its link to performance;
2. Explore and outline major factors that contribute to new product performance
3. Based on the theoretical development of the dissertation, provide justification on the moderating role of commercial environment on the linkage between product innovativeness and its performance;
4. Develop a conceptual model that outlines the moderating role of the commercial environment in the relationship between product innovativeness and its performance;
5. Empirically test the hypothesis of conceptual model, and thus identify to what extent commercial environment settings moderate the link between product innovativeness and its performance;
6. Develop a forecasting pattern that allows the prediction of product innovation performance on the basis of specific commercial environment.

### **Theoretical contribution**

This research contributes to the understanding the role of commercial environment as a group of moderators to innovativeness – performance linkage. It also reveals the

impact of different levels of innovativeness to performance in different commercial settings. Although innovation possesses a very complex nature, scholars have been attempting to classify it in order to purify its understanding. Innovation categorization was employed for obvious reasons – different levels of innovativeness are exposed to diverse commercialization patterns. Thus, in this dissertation, product innovation commercialization patterns in a certain environmental settings are explored. In addition, the novelty of the dissertation is outlined by the depicted role of a commercial environment as a moderator to innovativeness – performance linkage. Findings are presented as an econometric model, which allow the practical forecast of the potentials of new products that possess different levels of newness in different commercial settings. It can be used for the planning and control of successful market introductions and thus allow to avoid commercial failures. Factors, explored by this research reflect the essence of the market, as well as the manufacturers' and retailers' perspective. However, the focus of this research is not only to create an econometric model for forecasting, but also to understand and explain the importance of external factors that have an impact on innovativeness – performance linkage.

Purposively, this dissertation addresses several research gaps: i) product innovativeness – performance link because of contradictive findings; ii) moderating role of commercial environment to innovativeness – performance link due to lack of understanding in relation to the link itself and previous extant focus on commercial environment as direct predictor of performance; iii) existing scarcity of holistic approach and the need to outline the main elements of marketplace structure, to allow a comprehensive evaluation of performance predictors. Consequently, the theoretical contributions of this dissertation is as follows: i) clarification of product innovation – performance link, ii) explanation of the moderating role of commercial environments in innovativeness - performance linkage, and iii) development of a forecasting tool which is able to forecast product innovation performance in different environmental settings.

### **Research methodology**

Empirical methods are employed in this research to address the aim of the dissertation. For the initial part of dissertation, the theoretical development is presented. The main findings of existing research in the area, as well as the main theories and research streams are presented, discussed and summarized. Subsequently, research gaps are identified. After a literature synthesis is provided, three groups of variables that are acknowledged to have impact on innovation

performance are outlined, and thus employed for further analysis, namely marketplace related variables, company related variables and retail category management decisions related variables. The effect of these factors and their interrelation is explored concerning contextual impact on different product innovations' financial performance. After the hypotheses are justified, a quantitative approach is used to empirically test the hypotheses. A combination of primary and secondary data is used, which constitute a unique data sample that reflects real life retail transactional data. Use of secondary data for innovativeness – performance linkage explanation is also advised by previous studies (Stanko, Molina – Castillo & Harmancioglu, 2015) as a meaningful research approach. Subsequently, regression analysis results are presented to outline interrelations among variables. In addition, conditional moderating effects of commercial environments are explored with regard to innovativeness – performance linkage. Finally, based on the research findings, econometric modeling is employed, which is presented as a decision tree for forecasting purposes. As presented, the dissertation consists of several parts, namely a literature review, followed by identification of research problems regarding research gaps, research methodology, and results of empirical research, conclusions, practical implications and limitations.

**Keywords:** product innovation, innovativeness, launch, performance, commercial environment, retail.

# 1. LITERATURE REVIEW

Introducing new goods to the market since the research of Schumpeter has always been associated with uncertainty and instability. Despite vast amount of studies that explored and contributed to the area of new product introduction, persistent learning in the area is relevant due to volatile business conditions. There is always a need to bolster understanding in this field of research. In this chapter, previous research and theories, which are taken as the theoretical justification of this dissertation, are discussed. The dissertation is positioned along several research streams – product innovation management, new product launch and commercialization in the context of retail. The dissertation focuses on new product success factors and performance, and thus originates from and contributes to both areas. The retail context enhances aspects of innovation diffusion in the sales channel.

As the concept of diffusion aims to reveal how innovations spread in a specific setting, this research originates from initial innovation diffusion theory and investigates the framework of how innovations spread and why they accelerate or slacken in retail. The use of innovation diffusion theory in this dissertation outlines the diffusion of new product innovation in different environmental settings. In the following chapters, the phenomenon of innovation, its classification, new product launch and antecedents of successful product innovation performance are discussed as the theoretical grounding of the dissertation. The philosophical stance of the study is defined as positivistic, hypothetic-deductive, and objective, framed by a theoretical justification and corresponding methodology.

## 1.1. Phenomenon of Innovation

This chapter aims to reveal and discuss the phenomenon of innovation, following up-to-date research in the field, with a focus on its relation to performance. In the global economy, effective management of innovation is recognized to gain a competitive advantage for companies (Calantone and Griffith, 2007), and hence allows successful competition in markets. Many previous studies have depicted the essence of innovation by a need to distinguish it from invention as a primary step to understanding it conceptually. It is highlighted that innovation should not be equal to invention, and invention may not necessarily lead to innovation. Freeman (1982) identifies invention

as an idea, sketch or a model for a new or improved device, product, process or system, whereas innovation is described in an economic sense to be accomplished only after the first commercial transaction. Hence, this research aims to reveal innovation in an economic and commercial sense by observing and analyzing the process of its launch, following conceptualizations of previous research, which are recognized by Calantone and Griffith (2007) as rather limited in a sense of understanding and with regard to managerial directions.

### **1.1.1. The concept of innovation**

Since the initial innovation research by Schumpeter (1934), the essence of innovation management has been defined as an “irreversible event of creative destruction”. Innovation was first defined and discussed by Schumpeter (1939) and characterized as construction of new plants and equipment, introduction of new firms, and the rise of leadership of new men, considering it as a new creation, which later disseminate across the market unit. Subsequent research by Robertson (1967) indicates that at that time innovation was perceived as discontinuous, as well as defined as unique, therefore could not be measured by the same standard. Consequently, interest in innovation management evolved into a broader research area. After half a century of research, innovation was depicted as any policy, structure, method or process, product or market opportunity that is perceived to be new (Nohria and Gulati, 1996).

Definition of innovation involves a wide range of layered issues, using the various levels of definition, as individuals, teams, projects or organizations (Drucker, 1999) and is outlined as a process of continuous change (Nonaka & Takeuchi, 1995). Many innovations are the result of new combinations of existing knowledge, new uses and creativity in their designs. Nevertheless, technology is increasingly becoming indispensable in terms of developing, manufacturing and distributing products and services. Damanpour & Gopalakrishnan (2001) form their definition as the adoption of an idea or behavior pertaining to a product, service, device, system, policy or programme that is new to the adopting organization, adding the level of organization. O’Sullivan & Dooley (2009), for example, define innovation as the application of tools and techniques that make changes to products, processes and services that results in the introduction of something new to organization that adds value. Hult, Hurley &

Knight (2004) define innovation as a new product or service, a new production process, a new structure or administrative system, broadening it to new levels. Other scholars (Knox, 2002; Lumpkin & Dess, 1996) describe innovation as a process which offers added value and a degree of novelty to the market – organization, suppliers, customers, that allows new procedures, solutions, products and services to evolve and develop, establishing new ways of marketing.

Integral part of innovation is its spread in the marketplace, as is acknowledged by another stream of research which indicates that it is not only creation of innovation that is the essence; it has to spread in the market. For example, some scholars in the field (Garcia & Calantone, 2002; Smith, 1996; Freeman, 1991; Layton, 1977) highlight that a most important issue to consider in innovation management research is that it occurs through the processes of production, marketing and diffusion into the marketplace, being able to deliver economic value. And yet, since Schumpeter's research, innovation has been largely recognized as one of the crucial factors in creating economic value. Followed by independent research on innovation, Organization for Economic Co-operation and Development (OECD) lifted the concept of innovation to a broader use at operational level of any organization across economic systems. The Oslo Manual (2005), dedicated to understanding the innovation, by OECD provides guidelines for understanding and interpreting the innovation, indicates that in a knowledge-based economy, innovation is set to play a central role. It is acknowledged that innovation is the dominant factor in national economic growth and international patterns of trade. Hence, innovation is always associated with value creation, after it spreads in an economy.

Any type of innovation is usually characterized as a representation of change and added value, usually in comparison with previously existing forms of almost everything, based on Rogers (1962), inventor of Innovation Diffusion theory. Rogers (1995) later broadened the definition of innovation as an idea, thing, procedure or system that is perceived to be new by whomever is adopting it. Following the definition of Rogers, the innovation does not necessarily need to be newly developed, it only needs to be new to the potential adopter. Rogers (1962) identifies five major attributes of innovation – relative advantage, compatibility, complexity, trial ability and observability. Relative advantage, as one of the innovation characteristics, stresses the importance of additional value offering versus previous offerings. In addition to relative advantage, specification of compatibility and complexity complements the identity of innovation,

which reflects its nature. The traits of trial ability and observability define its tangibility, hence the importance of dissemination in the market. In addition to the characteristics of innovation by Rogers, OECD (1981) complements understanding of innovation characteristics and provides its own definition. According to it, innovation consists of scientific, commercial and financial attributes that are needed for successful development and marketing of new or improved tangibles and its commercial use. In relation to the importance of innovation in economies, OECD (2005) expanded their initial description of innovation, describing it as a new or significantly improved product, process, marketing method, and organizational method in business practice, workplace, organization or external relation, which underlines the importance of newness in organizations and economies as a source of development. In comparison with previous studies and aims to characterize innovation, OECD highlights the importance of commercialization and economic value that is expected to be created by innovation. Since, in previous decades, innovation was recognized as a tool of development on a global scale, organizations similar to OECD have been focusing on its development in markets as a tool for economic growth. For example, the European Commission (EC) also acknowledges the importance of innovation in economies by providing its own definition and characterization of the concept. EC (1995) underlines the main qualifications for innovation – renewal and enlargement of the range of products and services, establishment of new methods of production, supply and distribution, as well as introduction of changes in management, work organization, and the working conditions and skills of the workforce. EC (1995) highlights that innovation in products, processes and services can appear in all sectors of economic activity spanning from traditional to high-tech, public to market, industrial agricultural or tertiary. In parallel to other existing characteristics on innovation that have been discussed, EC provides its own angle by conceptualizing innovation as a whole and giving it operational understanding for an economy's daily activities and development. From its origin, the concept of innovation has always been associated with change, newness, value creation and complexity. However, despite the complexity of innovations, authors have aimed to define its intricacy. Several common aspects are used to outline the essence of innovation, namely innovative activity, dimension of innovation, and commercial performance that is delivered by innovation.

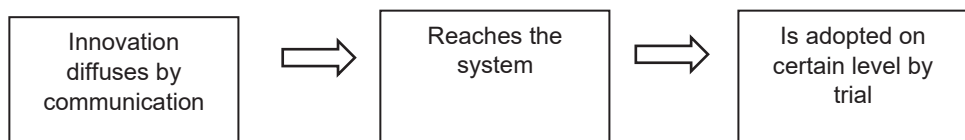
Due to innovation uniqueness and complexity, this dissertation provides several definitions of innovation which proves that no single description can outline the

essence of innovation due to its diverse nature. Following the essence of innovation and numerous attempts to define it, it is observed that the definition and understanding have been broadened by authors over time. Initially, it was explored by independent research but due to its uncontested importance in societies, its importance has been acknowledged by various global economic organizations. It is also observable that the definition of innovation evolved over time because of the density of the concept, as new layers of understanding are added. Innovation, which commenced as a new concept in research, is now understood as a daily operation in all activities. Aiming to address the diversity of innovation, a statement by Wolfe (1994) can be applied which suggests that there is no single theory of innovation – the more we explore and learn, the more we realize that its wholeness cannot be categorized and described easily. After describing the phenomenon of innovation and its characteristics, in the following sections, innovation spread as the source of economic value, innovation typology as a tool to categorize innovation and product innovation as the central concept of the dissertation are explored and discussed.

### 1.1.2. Innovation spread

As discussed in the previous chapter, innovation, as a deliverable, is anticipated to create economic value in the marketplace. Value creation is therefore associated with potential adopters and users in markets. Innovation Diffusion theory, by Rogers (1962), was the first to aim to conceptualize innovation spread among its prospective followers or adopters. Potential adopters or followers are defined in a broad perspective at different levels, namely as individuals, groups, organizations or any unit that may form a market (Drury & Farhoonmand, 1999), as outlined in in Figure 1 (created by author, based on Rogers).

**Figure 1. Outline of innovation spread from creator to adopter**



Theory of innovation diffusion (Rogers, 1995; Bass, 1969; Rogers, 1967) defines and explains elements that are related and important to its spread in the system. In theory, four basic elements are depicted to describe the process: 1) the innovation itself, 2) the channels of communication, 3) the social system, and 4) the time. Basic elements of innovation diffusion and its definitions are presented in Table 1 (based on Rogers, 1995).

**Table 1. Systemized elements of innovation diffusion process**

Element	Characteristics
The innovation	Characteristics of innovation – relative advantage, compatibility, complexity, trial ability and observability. The more intense the characteristics are, the higher the probability of being adopted more quickly.
Communication channels	Information sharing process which contributes to a faster achieving of a common understanding. Communication process requires an innovation and unit of adoption (individual or organizational) which interrelate by the use of innovation. Communication between two units (exposed to innovation and not exposed) – deliverer and adopter.
Social system	Unit in which innovation is spreading, can be defined in terms of different levels – individual, group, organization, economy or other units that are connected by a common objective that links them as a social system.
Time	Time defines the duration for innovation diffusion, described in three components – 1) innovation-decision as a timeframe for potential adopter to become aware of innovation on an individual or organizational level; 2) adopter categories measure how inclined an adopter is to take the innovation in comparison to other members in the social system, namely innovators, early adopters, early majority, late majority, and laggards; 3) rate of adoption is the speed at which an innovation is adopted within a social system.

As discussed in Table 1, innovation diffusion interferes with several elements – the innovation itself, communication as a tool for innovation spread in a market unit which is connected by a common objective, and during specific timing. Overall, the process of innovation diffusion depicts its dissemination in the unit and creates economic value within. The key parameter used to measure innovation diffusion is the rate of diffusion, which is a proportion of users who adopt the innovation against time, as illustrated in Annex 1 (based on Bass, 1969) and Annex 2 (based on Rogers, 1983).

The Bass model is the basis for modeling the diffusion of new products, as outlined in Annex 1, the process constitutes from the main elements, such as market potential (m), potential adopters (n), across the time frame (t). The Rogers model, as outlined

in Annex 2, discusses the potential and nature of market, as well as classifies adopters. The model suggests that consumers are different by their nature and willingness to adopt, thus the speed and result of adoption is dependable on willingness to try the innovation, as soon as it enters the market. Consequently, innovation efforts and results evolve over time, along the adopter types. This model is also widely used to predict performance of consumer durable innovations.

It is widely recognized that without diffusion, innovation will not have economic value which benefits society at large. Therefore, the concept of innovation diffusion (Rogers, 1995; Rogers, 1967) can be defined as an interaction process between certain units with certain timing, originated and stimulated by the innovation. After innovation diffuses, it becomes beneficial at large – for the company, society and the economy. Dissemination of innovation (new techniques, services, products, activities) across different units of interest, allows cumulative gain to be achieved. Based on the Oslo Manual (2005), diffusion of innovation is the way in which innovations spread through market channels. The complete process of diffusion is done after it reaches economic impact – that is the stage of commercialization.

In the phase of commercialization, after the spread, innovation moves to the level of adoption where it encounters an existing commercial environment or present offerings that, by definition, are inferior to it, yet habitual to society. Hence, it is crucial for innovation to overcome the barriers of existing behaviors to be adopted by society. Adoption of innovation is defined as a proactive strategy which allows to differentiate from competitors, as a response to changes in the market, technology, competition, but at the same time demanding resources and initiatives from the company (Jensen, Van den Bosch & Volberda, 2006). Likewise, innovation diffusion and adoption expose the interaction between supply and demand in later phases. As innovation diffusion is associated with the market with a number of models that define spread of innovation in the marketplace, from Fourt and Woodlock's model (Fourt & Woodlock, 1960) to Bass's model (Bass, 1969), these models depict the diffusion process in terms of customers who adapted a specific item in a specific period of time. Initial models have been criticized (Mahajan & Muller, 1979) due to omitted practical aspects of product management, such as management and marketing efforts. However, later models have broadened their scope and emphasized the importance of different marketing variables from the product itself (Robinson & Lakhani, 1975), advertising (Horsky & Simon, 1978) to detailing (Lilien & Rao, 1978) and its impact on innovation diffusion

and successful commercialization. Peterson & Mahajan (1978) were the first to argue that new products do not exist in a vacuum, and therefore, environmental factors should be considered as well. After the concept of innovation diffusion emerged, it has faced constant improvements and updates regarding the incorporation of additional variables, the importance of which has emerged over time.

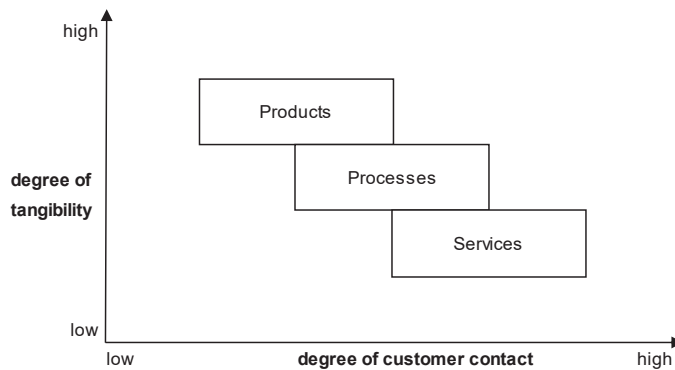
It is also accepted that with no spread in society, innovation is unable to create value, as well as deliver economic impact. Theory of innovation diffusion describes elements that are essential for innovation to spread and be adopted by its potential users, namely innovation itself, communication channels, market unit and time frame. These elements form a basic system for innovation to diffuse. In addition, different, more sophisticated innovation diffusion models are designed to make estimations on innovation potential and spread. The need to make estimations regarding the economic value innovation potential is expected to create has been recognized. It is recognized that new products do not exist in a vacuum, and thus the holistic understanding of innovation spread is needed. The need for contribution to this research area is also indisputable, as companies make huge investments in the process of development in various innovations; hence innovation acceptance in the marketplace plays an essential role in its management and success.

### **1.1.3. Innovation typology**

Although innovation possesses a very complex nature, scholars have been attempting to classify it in order to understand it better. Innovation categorization was employed for obvious reasons – different types of innovation exist and different categories of innovation are exposed to diverse behavior patterns. In general, the literature on innovation at the organization level can be classified into three streams – diffusion of tangibles, intangibles and process theory studies, representing three major types of innovations. Typologies of innovations have been explored since the 1970s by Zaltman, Duncan & Holbek (1973) with early findings of conceptual differences between product and process innovation. Despite the conceptual differences and complicity of innovation, Rogers (1962) notes that three types of innovations exist, namely product, process and organizational. Organizations embrace the potential offered by all types of innovations, and all types are very much different, yet interrelated.

Based on a basic categorization of innovations, it is classified across two axes – its typology (product, process, organizational) and its dimensions in terms of strength of its newness (radical and incremental as two marginal characteristics). The axes delineate to dimensions that describe innovation typology in terms of degree of tangibility and customer contact, as indicated in Figure 4 (based on O’Sullivan, 2009).

**Figure 2. Classification of innovations**



O’Sullivan (2009) uses a two axis methodology to classify innovations, using common typology which distinguishes among three types. Process innovation, as intermediary between products and services, based on O’Sullivan (2009), is described as an introduction of a new or significantly improved method of some kind which adds value to an organization, specified as a range of certain input – output in terms of operational activities, such as manufacturing, logistics, or sales services. Process innovation is classified as an intermediate innovation between product and service, where the degree of tangibility and customer contact is medium, of which the outcome is organizational improvements. Process innovation can also be associated with improvements that lead to products or services and might stimulate an innovation process towards other activities.

Service innovation, for example, can be defined as a change to a product that is intangible and is associated with customer interaction. O’Sullivan (2009) describes a service as a sequence of value-adding activities or a value co-producing activity between the client and provider; hence the level of interaction is very high and it is difficult to separate the service itself and the person delivering the service. Very high

tangibility and degree of customer contact are the main aspects of service, along with customer contact, inhomogeneity and perishable production.

Product innovation, in comparison, is a very different notion, resulting in high tangibility, high customer contact, and is often associated with higher investments, has a longer duration and visibility than process and service innovation. Product innovation is defined as a new or significantly improved tangible item, with respect to its capabilities, user friendliness, components and sub-systems (Travassoli & Karlsson, 2015).

There also exists several collateral typologies of innovation, which is emerging. Authors, for example, Sessant & Tidd (2007), expand existing typology of innovations by adding novel types of innovations, such as “paradigm innovation” which is defined by changes in the strategic behavior of an organization and “position innovation” which is used for changes in positioning in a specific industry or business segment to define. While OECD (2005) add one more level in typology, introducing marketing innovation which covers new methods of marketing, including significant changes in design, packaging, market promotion and market-based pricing. It is observable that, despite existing typologies of innovation which is in use, innovation as such is acquiring more complexity. The modern complexity of innovation reflects from novel typologies that are formed by emerging research in the area. Hence, due to its complexity, a more detailed innovation typology is expected to emerge in the future.

Phenomenon of innovation is associated with change versus previously existed offerings – therefore, newness is the essence of innovation. There exists typology of innovations, distinguishing three types of innovations – process, service and product, based on the tangibility of the offering, customer contact and the level of newness. Typology of innovations is observed to be broadening with new studies, including new types of innovations, such as paradigm innovation or marketing innovation. In the next chapter, product innovation is discussed in more detail as the central object of this study.

#### **1.1.4. Nature of product innovation**

Product innovation, as the most tangible and having highest degree of customer contact among all types of innovations, is crucial and endemic among manufacturers and distributors of consumer-packaged goods. For this business area, product

innovation can be described as an essential part of the company strategy to obtain business growth and expansion. According to Danneels (2002), development and marketing of new products is a practice that allows a company to expand expertise in different fields and therefore exploit new growth opportunities. Cooper (1993) and Montoya-Weiss & Calantone (1994) identify that a positive synergy exists in the relationship between product innovation and a company, which stimulates the performance of the product. As the central object of the study is product innovation, this chapter aims to discuss current state of product innovation research.

The literature defines innovation as a result of firms' ability to generate new knowledge and apply developments to new products and varieties, processes, as well as organizational designs in terms of different combinations (Fagerberg, Mowery & Nelson, 2005). It is recognized that, conceptually, the nature of product innovation is very much different from other types of innovations as it mostly encounters and is affected by external commercial environments. Definitions of product innovation mainly focus on improvements in the comparison of product innovation to existing products. Following previous research in the field (Herrmann, Tomczak & Befurt, 2006; Ali, 1994), product innovation is a novelty that possesses differences in comparison to previous offerings. In this dissertation, the definition of product innovation, provided by Travassoli & Karlsson (2015) is used – "Product innovation is the market introduction of a new or significantly improved good with respect to its capabilities, user friendliness, components or sub-systems. Product innovation (new or improved) is new to the enterprise where it is introduced (in this case, a retailer), but it does not necessarily have to be new to the market."

Newness of the product, which may be defined in different aspects, is central to the understanding of product innovation. Product innovation is usually related to goods that have significant improvements in the technical specifications, components and materials that cause changes in a products characteristics or application. Early studies of product innovation (Zirger & Maidique, 1990; Cooper, 1983; Cooper, 1979) identify that the success of product innovations consists of meeting customers' needs, having technological and production synergy and adding more effective marketing, which altogether creates superior value to the customer. Yet according to Danneels (2002), product innovation also requires specific competencies of a product owning company, namely technological, customer and market-related know-how which can be defined as a relevant set of resources. Scholars (Song & Parry, 1997; Cooper, 1993) indicate

that there are two key tasks related to product innovation management – first, the ability to physically develop the product innovation, which requires technological competence, and the second, ability to commercialize the product innovation to specific customers, known as customer competence. These two types of competencies, significant for product innovation management are distinguished into two groups – technically-related and market-related knowledge (Danneels & Kleinschmidt, 2001; Moorman & Slotegraaf, 1999; Mitchell, 1992). Customer competence is defined in terms of knowledge of customer needs, preferences and purchasing habits, distribution and sales access to customers, customer goodwill, reputation of the company and its brands, and communication channels for information exchange with target groups. Technological competence is defined as the ability to design and manufacture a physical product that has specific characteristics and comprises mainly technically related resources, namely design and engineering know-how, product and process design equipment, manufacturing facilities and know-how, with additional procedures for quality control. The linkage between technological and customer competence in terms of ability to create product innovation is indicated in Figure 5 (based on Danneels, 2002).

**Figure 3. Links among product innovation, technology and customer competences**



Scholars (Danneels, 2002; Dougherty, 1992; Ghemawat, 1991) acknowledge that new products, or product innovations and its development, are very highly dependent on two cornerstones – technological and customer know-how which is inseparable as indicated in Figure 5, while product innovation can be described in terms of different combinations of the mentioned competencies. Later studies that followed the nature of product innovation, for example, Bessant & Tidd (2007), depict the essence of the need for changes in products that represent benefits for customers, as well as

fulfillment of market needs. Other later studies, such as Garcia (2010), add the layer of performance as inseparable to product innovation research and hence define product innovations as tangible objects that are aiming to deliver new performance or enhance existing performance by adding specific improvements.

Consequently, changes is the essence of development of new goods, which can be either large scale, or small scale, depending on the level of newness which is similarly applicable to product innovations. In addition, authors (O'Sullivan & Dooley, 2009; Gopalakrishnan & Damanpour, 1997; Knight, 1967) agree that a key feature of product innovation is the presence of novelty elements. O'Sullivan & Dooley (2009) argue that changes, possessed by innovation, lead to increasing value of the product, which can be defined as the ability to innovate as a value driver for product innovation. Product innovation can also be associated with positive effect on its performance measured in the ability to achieve sales, profitability and market share goals (Evanschitzky et al., 2012; Rubera & Kirca, 2012; Calantone, Harmancioglu & Droge, 2010; Szymanski, Kroff & Troy, 2007). However, the adoption and diffusion literature identifies that the greater the discontinuity of the innovation, the more difficult it is for the customer to adopt it (Rogers, 1983, 1995). The decision to adopt the innovation can be also based on the costs and benefits of new products, as identified in a similar research stream.

Authors indicate that not only product innovations allow firms to compete more successfully in the market, but according to Floyd & Lane (2000) and Danneels (2002) stimulate both the renewal of the organization itself and the marketplace. However, scholars have researched product innovation from a resource-based perspective and indicated that core competencies, such as employee skills and know-how, technological systems, administrative systems, values and norms tend to contribute to successful commercialization (Leonard-Barton, 1992; Dougherty, 1995). Product innovations are found to possess two central elements, that is, technological competence and customer competence that need to be combined in the development of product innovation. In addition, the scale of newness is central to the concept of product innovation, representing its nature. The next chapter aims to expose the concept of innovativeness, which is inseparable from the product innovation research stream.

### 1.1.5. Deconstructing product innovativeness

As discussed in previous chapters, the essence of innovation, despite its type, is subject to the scale of novelty. Novelty, newness, or innovativeness, which is considered a key feature of the new offering, has its own conceptual definition, interpretation and methodological principles, which are presented and discussed in this chapter. Since Schumpeter's initial research, there has always been a differentiation among innovations, as they cannot be treated equally because of their complex nature. The aim of this chapter is to deconstruct innovativeness as a tool to define the relative newness of innovation. The most common and recognized concepts in the field are used for classification, namely studies by Garcia & Calantone (2002), Danneels & Kleinschmidt (2001), Song & Montoya-Weiss (1998), Moorman & Miner (1997), Booz, Kleinschmidt & Cooper (1991) and Allen & Hamilton (1982), Rogers (1976) and Schumpeter (1939).

According to Schumpeter (1939) and Rogers (1976), two extremes exist in the definition of newness – that is, radical and incremental innovations. Radical innovations shape big changes in the world, while incremental innovations fill in the process of change continuously. In existing typologies, definition of innovativeness is depicted using three major dimensions – dependence on the perspective of customers, perspective of the company as well as perspective of the marketplace. Firth & Narayanan (1996) attempted to define and extend the understanding of innovativeness, focusing on the relative difference between new and previous offerings that are able to add value to both customer and company. However, the approach to classify product innovation on the basis of its innovativeness in recent research is common due to understanding that different innovation behavior patterns for different levels of newness exist.

In regard to existing knowledge, there were several attempts to conceptualize innovativeness. For example, Song & Montoya-Weiss (1998) describe product innovativeness as a product's degree of novelty, which is often characterized in relation to the company and the market. For example, highly innovative products usually have a capacity to create a paradigm shift in technology, industry or market, typically possessing technological or marketing change versus previous offerings. However, copied private labels are indeed different to products that induced technological revolutions in the markets, representing simple improvements to

fundamental innovations, which differentiates low to high innovativeness. Hence, collision between these two products cannot happen, as innovativeness or newness is set to play a central role in differentiation. In the study of Danneels & Kleinschmidt (2001), the authors identify and discuss two main types of innovativeness – technological and marketing innovativeness, aiming to retreat from existing classification. Hence, the authors define technological innovativeness as in terms of sets of development, engineering, and design activities, while marketing innovativeness depicts the extent to which market research, advertising, and promotion novelty is employed, attempting to differentiate them on the scale of newness more specifically. It is crucial to employ a proper classification tool for degree of innovativeness, as studies reveal that innovativeness, as a characteristic, is found (Henard & Szymanski, 2001; Song, 1998; Song & Parry, 1996; Freeman, 1994; Robertson, 1967) to influence the process of new product development as well as its performance. Moreover, an innovative advantage creates opportunity to differentiate in the market, as well as reach a higher share of potential consumers.

Despite the vast amount of research exploring innovativeness in the new product development literature, researchers (Kalluri & Kodali, 2014; Rubera & Kirca, 2012; Garcia & Calantone, 2002; Henard & Szymanski, 2001) indicate that there is a lack of consistency in widely accepted common categorizations. It is observable that there are two extremes of categorization examples, incremental and radical innovations which do not represent concept of innovativeness properly. For example, a study by Kleinschmidt & Cooper (1991) verifies that a multitude of innovations in markets are products that make continuous improvements while only a small amount make it to milestone improvements. Studies (Chang, Franke, Butler, Musgrove & Ellinger, 2014) argue that classification of innovativeness should be understood as a continuum, not as two duplex constructs. In addition, Henard & Szymanski (2001) highlight the necessity to clarify it in methodology, entitling this situation as concept identification crisis. Garcia & Calantone (2002) suggest that lack of consistency in labeling and operationalizing innovations in the new product literature may have caused rather slow advance of knowledge in this area.

Consequently, having the aim to fill theory gaps in the field, authors (Garcia & Calantone, 2002) have performed meta-analyses of all previous attempts to operationalize the concept of innovativeness and presented a now widely used and acknowledged operational definition to depict the newness of product innovations. A

comparison of the empirical literature, addressing the level of innovativeness, reveals several research streams that have focused on different dimensions on macro or micro levels. The macro level concerns and measures how the characteristics of a product are novel from an exogenous perspective - the world, market or industry (Atuahene-Gima, 1995; Lee & Na, 1994; Maidique & Zirger, 1984). The micro level is used as the product innovativeness is described on the basis of a firm or the customer perspective (More, 1982). For example, a study by Danneels (2002) argues that it is essential to define the persistence of a new product, and therefore two major dimensions occur – that is technological assessment and market assessment, which represent technical and customer related know-how. Technological assessment is related to the technological feasibility of the product, while market assessment indicates the market potential of the product. In terms of scope of innovativeness, the literature often distinguishes between two notions– radical innovation, which is a breakthrough, and an incremental innovation, which is a kind of progressive improvement to an existing product. These are incomparable and many innovations are “lost” in the scale, and are hence unidentified.

However, many scholars use this twofold concept and discuss major differences between radical and incremental innovations. Radical innovation represents major shifts in technology, marketing, design or other aspects of product newness. This type of product stimulates disruption in the market, while incremental innovation usually deliver added value possessed by new improvements of an existing product, such as new features, refinements and benefits. As discussed, when classifying the innovativeness, a multilayer approach is recommended to be used to reveal its complexity, namely different matrixes of technological versus business driven innovations emerge, products are new to the market versus new to the company, as well as possessing different types of improvements, and therefore many classifications for innovation strength are used in the field. Though product innovation theory is very much related to performance studies, and it has vastly explored topics in relation to having a positive link towards performance, Rubera & Kirca (2012) indicate that relative effects across radical and incremental innovations are still unclear. Also, a study by Kalluri & Kodali (2014) suggests that previous research have failed to address innovativeness – performance linkage properly due to lack of consistency in classification.

Despite an extensive debate about which level of innovation, radical or incremental, has a more intense effect on performance, the role of innovativeness on performance is still not clear. It is also observable that in a twofold scale, radical and incremental is insufficient to explain concept of innovativeness, as products that are described of moderate innovativeness are lost between two extremes. In addition, authors acknowledge that there is a need to have a more detailed scale to measure innovativeness and its effects on performance. Therefore, this research argues that more complexity should be added to the explanation of innovativeness which also suggests that research gap in the area exists. Scholars have attempted to address classification of innovativeness in previous studies; however, based on previous research (Kalluri & Kodali, 2014; Rubera & Kirca, 2012; Henard & Szymanski, 2001; Garcia & Calantone, 2002) consistency and explanation power are still lacking. Other studies (Herrmann, Tomczak, Befurt, 2006) also ask for a more diverse classification and argue that it is a necessity to separate innovations with high novelty value from those, which have low novelty value.

Booz, Allen & Hamilton (1982) were one of the first scholars who aimed to conceptualize innovativeness, and hence distinguished four levels of innovativeness by expanding the Schumpeterian view of radical – incremental classification. The taxonomy provided by Booz, Allen & Hamilton (1982) differentiates newness, based on several levels – market, company and customer. This classification distinguishes between the following levels, namely: i) new to the world products that are new to both the company and the market, ii) new to the firm products which might not be new to the market, iii) line extensions representing improvements with a focus on refinement, repositioning or cost reductions, iv) me-too products with the intention to copy existing offerings, and v) various product modifications with the purpose of replacement.

Kleinschmidt & Cooper (1991) later updated the existing classification by narrowing it to three categories. Highly innovative products that are new to the world represented radical innovations, similarly to previous research in the field. On the contrary, low modification products represented incremental innovations that were only new improvements to the firm. Other new products, based on Kleinschmidt & Cooper (1991) that were found to represent the majority of new market introductions were defined as moderately innovative products that were new to the company. Initial research in relation to product newness were based mainly on company and market levels.

Other studies (Moorman & Miner, 1997) presented a classification based on two dimensions - customer and company, eliminating the market variable, and presented a matrix which differentiates innovations. These classifications distinguishes four types of innovations on the product level, namely i) incremental where novelty for both company and customer is low, ii) company – novelty is only high for the company yet low to the customer, iii) customer – novelty is only high for the customer yet low for the company, iv) radical where novelty is high for both company and customer.

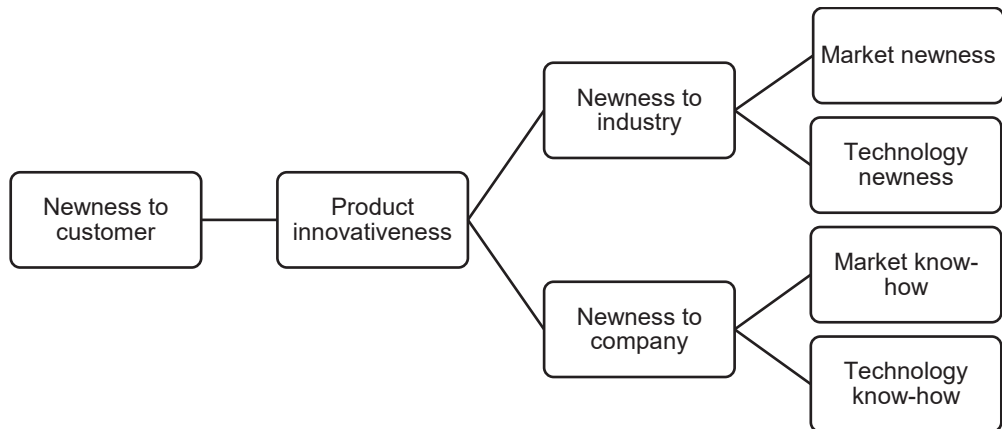
A study by Joshi & Sharma (2004) also acknowledge that despite two distinctions, radical and incremental innovations, the construct should use a continuous scale. In addition, it is acknowledged that vast amount of innovative products represent medium level of innovativeness, thus the use of two distinctions can be short-sighted and might lead to lack of explanatory power. The use of continuum scale reveals essence of innovation in a more detailed way, as authors also indicate that a company and industry perspective is an important antecedent to be taken into account in classification. Systemized summary of existing classification of innovativeness is provided in Table 2 (developed by the author).

**Table 2. Systemization of existing classification of innovativeness**

Study	Levels to define innovativeness	Typology (number of types)
Schumpeter (1982)	Market	Radical and incremental (2)
Booz, Allen & Hamilton (1982)	Market, company and customer	New to the world, new to the firm, improvements to existing products, copied existing offerings, product modifications with the purpose to replace (5)
Kleinschmidt & Cooper (1991)	Market, company	Highly innovative products, moderately modified new products, low modification products (3)
Moorman & Miner (1997)	Company and customer	Radical innovations, customer – related novelties, company – related innovations, incremental innovations (4)
Garcia & Calantone (2002)	Market, company and customer	Radical innovations, really – new innovations, discontinuous innovations, incremental innovations, imitative innovations (5)
Joshi & Sharma (2004)	Market and company	Radical and incremental (2)

A study by Garcia & Calantone (2002), which attempted to unify the classification, is used to measure innovativeness. This particular classification of innovativeness is based on the methodology presented by Booz, Allen & Hamilton (1982), which combines three major reflectors of innovation performance - market, company and customer prospects and newness is defined on two levels – exogenous and endogenous. Scholars have used a similar approach to identify the nature of innovation by using macro and micro levels on the basis of customer approach which indicates that researchers often use a combination of both micro and macro modeling and provide a typology, whilst using a categorization basis in the manner of a radical and incremental approach, which is not sufficient, too simplistic and tends to lack explanatory power. Consequently, classification of innovativeness is provided in Figure 6 (based on Garcia & Calantone, 2002) on the basis of the macro and micro level, representing the market and the company as well as adding a layer of marketing and technological aspects.

**Figure 4. Classification of innovativeness**



According to classification proposed and conceptualized by Garcia & Calantone (2002), all new products can be classified by using two levels – macro and micro, followed by two sub-levels – marketing and technology. This type of classification represents all relevant layers of newness that were acknowledged to be important for the definition of innovativeness. This classification also reflects the most important determinants of innovation essence and evolution – market, company and customer as verified by previous literature findings. A systemized table (Table 3, based on

Garcia & Calantone, 2002) is presented as a map of classifications for new products. It is also used as a concept definition, as well as a methodology basis for product innovation classification in this research.

**Table 3. Systemization of innovativeness on product level**

Type of innovation	Macro-level			Micro-level		
	Market	Technology	Marketing	Company	Technology	Marketing
Radical innovations	new	new	new	new	new	new
Really-new innovations		new	new	new	new	new
Discontinuous innovations			new	new	new	new
Incremental innovations				new	new	new
Imitative innovations				new		

Authors (Garcia & Calantone, 2002) have distinguish five levels of innovativeness, namely radical innovations, really-new innovations, discontinuous innovations, incremental innovations and imitative innovations. The respective types of innovativeness are explained and discussed in detail hereafter.

Radical innovations. Colarelli (1998), Song & Montoya-Weiss (1998) define radical innovations as those that embody a new technology, whilst creating a paradigm shift in the use of a particular product or service. This type of newness, based on Chandy & Tellis (2002), is characterized by new technology that is associated with a novel utility experience for the user. Consequently, it results in development of a new demand and a new market on both macro and micro levels, which causes new competition in the market, as well as attracts new customers (Garcia & Calantone, 2002). This type of innovativeness is able to endanger other offerings in the market, which still employ old technology. Based on Tellis, Chandy & Prahbu (2009), this type of innovativeness is also able to disrupt existing market positions and drive new markets. According to an explanation by O’Sullivan (2009), radical innovation has the potential to bring huge changes to industries, thus transforming them by eradicating the existing market and creating a new, innovative one. With new markets that evolve with the launch of radical innovation, acquisition of market know-how becomes very important; hence organizations are obliged to adjust to changes in the market. However, according to previous research, organizations must be able to rearrange themselves internally to implement radical innovation entry to the market successfully.

For example, Michael, Rochford & Wotruba (2003) reveal that more innovative products are harder for companies to deal with, because of the adaptation needed on all levels, company to market; hence these types of products are likely to be more challenging to introduce successfully. In addition, a study by Kusunoki (1997) highlights the significance of organizational capabilities to introduce a radical innovation – to develop innovative products, it is crucial to re-consider not only technological issues, but strategy, communication channels and procedures of information processing. Therefore, a common approach and strategy for combining technology and marketing strategies within a company to launch a radical innovation is essential. Likewise, radical innovations are often associated with higher risks, as well as a high potential of deliverables, such as sales and profits, while it usually demands bigger investments in comparison to simpler products. However, radical innovations are considered to be a driving force for economic growth, which is defined as a breakthrough or discrete innovation.

Really new innovations. Kleinschmidt & Cooper (1991) provide a definition for really new innovations, which in general represent moderately innovative products. Really new products originate from production, already owned by the company, usually seen as new product lines, line extensions by adding new, improved items, or capturing existing markets with new technology. Song & Montoya-Weiss (1998) contribute to the definition of really new innovations by adding the ability to create a really new category, production or delivery system, representing newness on the product owner level. However, Garcia & Calantone (2002) argue that really new innovations are sometimes difficult to differentiate because of the broad range in the scale, as discussed by Kleinschmidt & Cooper (1991), and similarities among innovations. Therefore, the authors suggest that the current state of research can be improved by introducing additional criteria for classification. It is suggested that really new innovations can be identified by using criteria of discontinuity in comparison with previous practice – which may occur in technological or marketing basis of the new product.

Discontinuous innovations. In the scale of innovativeness, Rice, O'Connor, Peters & Morone (1998) depict discontinuous innovation as a “game changer” which has new performance features and the potential to improve the performance of an existing product, as well as create a reduction in costs. Scholars (Colarelli & O'Connor, 1998; Veryzer, 1998; Tushman & Anderson, 1986) often refer to discontinuous innovations as technological discontinuities. Having technological discontinuity, these innovations

are new on the company level, but at the same time employ a new marketing approach, which enables a different understanding to be created in regard to the use of a particular product.

**Incremental innovations.** Incremental innovations are defined as products that provide new features and benefits, which are gained through minimal improvements to the existing technology in the existing market (Garcia & Calantone, 2002; Song & Montoya-Weiss, 1998). Based on Chang et al. (2014), this requires less organizational and customer learning, and is able to create more synergy with existing resources and capabilities of the company. Incremental innovations are usually those that have previously refined, adapted or enhanced products, and therefore many companies choose to invest in less ambitious but less risky innovations that are expected to be easier to adopt by potential users. This type of innovation is usually understood as moderately improved products. For example, authors (Tontini, Picolo & Silveira, 2014; Chandy & Prabhu, 2010) have defined incremental innovation as an “add on” to an existing product with minor changes and improvements in benefits without changing the essential concept. Rowley (2001) define add on or changes of incremental innovation as updated design, additional features or new options of use to existing ones. As incremental innovations occur on the micro level, Johnes & Snelson (1988) highlight that the importance of incremental innovations is invoked based on two main subjects – they can serve as a competitive weapon in a technology-mature market and also can be used as an opportunity because of streamlined procedures, especially as a shift to a new technological plateau. According to Garcia & Calantone (2002), for many organizations, incremental innovations are core to the business, making a smaller endeavor towards development and maintenance of competitiveness.

**Imitative innovations.** Imitative innovations, which represent products that are only new to the company, are of the lowest innovativeness, compared to other items in the scale. Grupp (1998) describes imitative innovations as products that have an iterative nature, following a real innovator. Therefore, they are new to the firm but not to the market. Imitative innovators frequently carry low technological and market innovativeness, and are hence defined as an imitation of existing products, and of a reproductive nature, such as private labels or other copied products. However, Garcia & Calantone (2002) argue that imitative innovations should not be underrated because this types of products have the ability to alter market direction if the real innovation

does not move quickly enough, consequently causing competition redistribution in the market.

As presented in this chapter, there exists several typologies to classify innovativeness, yet it is acknowledged that the area is rather inconsistent. In this dissertation, the typology of innovativeness, conceptualized by the research of Garcia & Calantone (2002), is employed. It is observable that current state of research summarizes that a more sensitive scale to measure innovativeness in comparison to a regular radical – incremental innovation approach is advised to use. While authors (Garcia & Calantone, 2002) have highlighted the importance of proper innovation classification in research, other researchers (Kleinknecht & Van Der Panne, 2012) still argue that despite the use of classification, there are not enough research findings and consistency in the literature, in the area of the relation between product innovativeness and its performance. Consequently, in this dissertation, questions regarding the link between innovativeness and performance are raised. Are more innovative products outperforming less innovative products or otherwise? Which product innovations have more potential compared to others? In the next chapter, the link between innovativeness and performance is discussed.

#### **1.1.6. Innovativeness – performance linkage**

Based on previous research in the field and Oslo Manual recommendations, provided by OECD, it is widely recognized that improved products are a must for business growth and to gain a competitive advantage. Given the intensity of competition and rivalry in many markets, the challenge of renewal and the ability to innovate remain among the most important practices for companies to survive and develop. Although some authors have discussed the value that a new product generates, innovativeness can be considered as a source of competitive advantage yet as a risk from the different perspective.

Innovations, widespread in the market, are expected to result in significant improvements in a firm's performance. For example, a study by Johannessen (2009) indicates that innovativeness is a decisive factor for economic growth and company development in a competitive environment; however, contradictory findings cannot conclude how innovativeness contributes to performance. Previous research has extensively studied the concept of innovativeness and its role in performance.

However, it is recognized in previous studies (Stanko, Molina-Castilo & Harmancioglu, 2015; Chang et al., 2014; Duhamel & Santi, 2012; Rubera & Kirca, 2012) that the research area is not yet fully understood despite the comprehensive studies it has been explored in. A meta-analysis, which outlines the innovativeness – performance studies over past decades, presented by Henard & Szymanski (2002), unexpectedly identified that there is no direct relationship between product innovativeness and its financial performance.

In many studies, the concept of newness is associated with product advantage and higher perceived quality, owing to the assumption that more innovative products are expected to have more quality attributes; therefore customers are willing to buy more of such products (Tsai, Huang & Tsai, 2013; Agkun et al., 2007; Szymanski et al., 2007). Despite the findings presented by Henard & Szymanski (2002), some studies (Nakata, Im, Park & Ha, 2006; Henard & Szymanski, 2001) indicate that among many drivers of new product performance, a product's innovativeness and competitive advantage have the largest effect on its performance. In regard to this type of study in the field, it is assumed that innovativeness can be associated with positive firm performance; however, as discussed, a lack of consistent research exists in the field. Yet, the endeavor by many scholars who aimed to reveal the link between innovativeness and performance has resulted in contradictive findings.

A study by Kleinknecht & Van Der Panne (2012) indicates that a higher level of product innovativeness carries higher uncertainties in comparison with a lower level of innovativeness, and more radical innovations are less predictable in terms of performance forecasting, which can be related to a higher degree of effort to adopt the innovation and a more difficult learning curve for both a customer and a company which develops it commercially. Other studies confirm (Kessler & Chakrabarti, 1999; Olson, Walker & Ruekert, 1995; More, 1982) that radically innovative products are accompanied by greater risk compared to less innovative products. Yet, regardless of the risk that new products carry, studies have also revealed that radical innovations have a stronger impact on performance in comparison to incremental ones (Chang et al., 2014; Rubera & Kirca, 2012; Sorescu & Spanjol, 2008). Thus, new innovative products face twofold conceptual understanding, as they are associated with competitive advantage, which creates value for the customer, yet carry higher uncertainty, which is associated with perceived risk towards it. This question

consequently leads to evaluation of new product performance, which can also be influenced by this twofold understanding, thus is conceptually not clear.

It is accepted that innovativeness is associated with performance, but at the same time with existing relative risks of adoption. Studies in the field indicate a tendency that radical innovations are more often associated with higher uncertainty than incremental innovations. For example, Song & Thieme (2009) explain that uncertainty is related to new technologies, which are harder to adopt because of the need to change present behavioral patterns and develop a matrix of innovation conditions, which depict differences between radical and incremental innovations. A similar study by Song & Thieme (2009) indicates that incremental innovations possess moderate levels of uncertainty during the predesign stage and lowest levels of uncertainty during the commercialization stage. Radical innovations are associated with the highest levels of uncertainty during predesign and moderate levels of uncertainty during the commercialization stage. De Brentani & Reid (2012) as well as Boulding & Christen (2003) also contribute to explanation of the differences between the two levels of innovativeness – radical innovations usually require larger investments in research and development, as well as marketing, which can lead to lower financial performance of the company. Followers of radical innovations can take advantage of a first mover because of the possibility to gain a better understanding of customers' needs. However, results of the study by Szymanski, Kroff & Troy (2007) contradict prior findings – the authors indicate uncertainty for radical innovations develops as the product creates first mover barriers, such as patents, which are used as protection against other companies aiming to launch a similar innovation. As competitors need time, investments as well as other resources to succeed as an innovation owner, it also develops as a lead time advantage. If compared to radical innovations, incremental innovations usually have moderate improvements that create less market uncertainty and easier customer learning, and are easier to commercialize. Sethi (2002), for example, indicates that incremental innovations involve less financial and performance related risks because the customer learning process was previously facilitated by radical innovations which leads to easier adoption.

Many studies in the field (Chang et al., 2014; Duhamel & Santi, 2012; Molina-Castillo & Munuera-Aleman, 2009; Calantone, Chan & Cui, 2006; Van der Panne, Van Beers & Kleinknecht, 2003; Danneels & Kleinknecht, 2001; Song & Parry, 1999; Hultink & Robben, 1999; Hultink, 1998; Gatington & Xuareb, 1997; Ziger, 1997;

Atuahene-Gima, 1996; Firth & Narayanan, 1996; Yap & Souder, 1994; Kleinknecht & Cooper, 1991; Mever & Roberts, 1986) have explored the link between product innovativeness and its performance, aiming to explain the commercial success or failure of new product, as outlined in the Table 4. However, results from previous studies differ from no relationship, to positive or moderately positive and even negative effects, obviously suggesting that clarification is needed.

Part of the research done in the field (Stanko et al., 2015; Chang et al., 2014; Duhamel & Santi, 2012; Song & Parry, 1999; Hultink & Robben, 1999; Hultink, 1998; Zirger, 1997; Firth & Narayanan, 1996; Kleinknecht & Cooper, 1991) has found a positive relationship between innovativeness and performance. However, other studies (Calantone, Chan & Cui, 2006; Kleinknecht & Cooper, 1991) have reported no significant link between concepts or reported a moderately positive effect (Danneels & Kleinknecht, 2001; Gatington & Xuareb, 1997) between innovativeness and performance. Studies, which positively associate innovativeness with performance mainly explain this relationship in relation with product advantage and perceived value which innovation is able to create in comparison with previous offerings. On the contrary, some studies in the area (Molina-Castillo & Munuera-Aleman, 2008; Atuahene-Gima, 1996; Yap & Souder, 1994; Mever & Roberts, 1986) have even reported a negative connection between these two concepts which is mainly associated with perceived risk. A summary of studies in the field and their findings is presented in Table 4 (developed by author).

**Table 4. Summary of innovativeness - performance related studies**

Main constructs explored	Type of effect, summarized findings	Type of relationship explored	Study
Innovativeness and organizational performance	Innovativeness is associated with positive organizational performance	Innovativeness as a direct predictor	Henard & Szymanski (2001) Cainelli, Evangelista & Savona (2004) Nakata, Im, Park & Ha (2006) Johannessen (2009) Bowen, Rostami, Steel (2010) Stanko, Molina-Castillo & Harmancioglu (2015)
Innovativeness and product performance	Higher innovativeness is	Innovativeness as a direct predictor	Kleinknecht & Cooper (1991)

	associated with better new product performance		Firth & Narayanan (1996) Gatington & Xuareb (1997) Zirger (1997) Hultink (1998) Song & Parry (1999) Hultink & Robben (1999) Danneels & Kleinknecht (2001) Sorescu & Spanjol (2008) Rubera & Kirca (2012) Duhamel & Santi (2012) Chang et al. (2014) Stanko et al. (2015)
Innovativeness and product performance	Higher innovativeness is associated with negative performance	Innovativeness as a direct predictor	Meyer & Roberts (1986) Yap & Souder (1994) Atuahene-Gima (1996) Molina-Castillo & Munuera-Aleman (2009)
Innovativeness and product performance	No significant link between innovativeness and product performance	Innovativeness as a direct predictor	Kleinknecht & Cooper (1991) Calantone, Chan & Cui (2006)
Innovativeness and willingness to buy	Innovativeness is associated with a higher willingness to buy	Innovativeness as a direct predictor	Agkun et al (2007) Szymanski et al. (2007) Tsai, Huang a&Tsai (2013)
Innovativeness and perceived risk	Higher innovativeness is associated with higher risks	Innovativeness as a direct predictor	Olson, Walker & Ruekert, (1995) Kessler & Chakrabarti (1999) Der Panne (2012)

As outlined in Table 4, it is observable that an inconsistency in the field of research exists. Inconsistencies in the field of research can be related with two different paradigms, related to innovation research, namely product advantage or higher perceived risk which can be related to performance outcome in diverse ways. In addition, previous research has mainly addressed innovativeness – performance linkage unilaterally, as a direct linkage which can also be related to contradictive findings in the area due to lack of evidence related to contextual factors.

In addition to research by Henard & Szymanski (2002), investigation performed by Szymanski, Kroff & Troy (2007) and Evanschitzky et al. (2012) also aimed to summarize previous studies in the area and presented cumulative evidence on major research related to the link between innovativeness and performance. Szymanski, Kroff & Troy (2007) provide a synthesis of cumulative evidence of the relationship between product innovativeness and its success rate and consequently indicated that a correlation between the latter exists but is moderate, expectedly asking for further clarification. A study by Evanschitzky et al. (2012) that aimed to update meta-analysis on success factors of product innovation, also conclude that large number of studies in the field often represent heterogenous and even contradictive findings. In addition, this study suggests that research related to new product success factors is a very rapidly changing research area, influenced by volatile business and economic environment. Consequently, new factors tend to emerge over time and need to be addressed.

Scholars who explored the field also argued that the area is not fully focused, and therefore needs further synthesis, clarification and future guidelines. In addition, existing research in the field (Duhamel & Santi, 2012; Kleinknecht & Van Der Panne, 2012; Harmancioglu, Droge & Calantone, 2009; Lichtenhaler, 2007; Szymanski, Kroff & Troy, 2007) argues that the area remains unclear because of a primary focus on the relationship between innovation and company performance, with little focus on innovation performance itself, or in specific environments, such as marketplace characteristics.

It is clear that the link between innovativeness and performance is expected to be dependable on more factors than previous research has addressed. It has also been confirmed by some studies (Fornari, Grandi & Fornari 2009; Fernie, Moore & Fernie, 2003; Dawson, 2000), which suggest the need to study the role of retail channels in various processes, including the process of development and diffusion of innovations. In addition, some research (Chang, Franke, Butler, Musgrove & Ellinger, 2014; Grinstein, 2008; Baker & Sinkula, 2007) have also remarked that the literature is inconsistent in knowledge regarding different mediating and moderating effects in innovativeness – performance studies, as well as, based on Chang et al. (2014), on product type variation – performance link. Despite the urged motivation to address moderation in relationship between innovativeness and performance, there were a few scholars who have aimed to address the role of moderators in relation between

innovativeness and performance yet findings were also inconsistent. It is indicative that studies (Chang et al., 2014; Rubera & Kirca, 2012; Henard & Szymanski, 2001) have attempted to explore a moderating linkage, yet have found no significant moderating effects. For example, a study by Herrmann, Tomczak & Befurt (2006) also attempted to analyze the determinants of radical product innovations, suggesting that firm size is a potential indicator for innovation creation, yet did not show significant effects as a moderator. Also, a study by Chang et al. (2014) aimed to capture moderating effects in the relationship between innovativeness and performance, yet also revealed mixed evidence. A particular study found that market orientation has an effect on performance, however only for radical innovations and also encouraged further exploration of the area.

A more detailed investigation of moderating effects towards innovativeness – performance was also asked by other studies in the field. A study by Michael, Rochford & Wotruba (2003) indicate that future studies should focus more on the moderating effects in the relationship between innovativeness and performance, especially on market-specific factors. A study by Montaguti, Kuester & Robertson (2002) attempt to address the moderating effect of technological, competitive and firm-specific factors on innovation performance and direct future studies in the same direction – explore the moderating effects of environmental covariates representing various environments such as competitive conditions and firm- specific factors, especially with historic sales data regarding introductions. A study by Chang et al. (2014) also recommended to explore mediating and moderating effects in the innovativeness – performance link, especially focusing more on factors such as price, distribution and promotion, as well as reveal more findings on potential moderators through meta – analytic approach.

Analysis of innovativeness – performance area of research revealed several research gaps that are aimed to be addressed by this research. First, the direct link between innovation and performance has been explored in previous studies, yet the findings are rather inconclusive and even contradictive. In addition, it is observed that mainly a direct linkage between innovativeness and performance was explored, though it is recognizable that innovation does not exist in vacuum. Likewise, little attention was paid to moderating effects towards the link in between innovativeness and performance, which was also found to lack explanation towards the linkage. Despite attempts to conceptualize moderation towards innovativeness – performance linkage, it is indicative that this approach is still valid to be used for the conceptual

explanation of the link. Moderation approach is also recommended to be used as classic empirical tool in case of existing inconsistencies along to date findings (Baron & Kenny, 1986). This thus indicates a potential research gap to be addressed as scholars have paid attention to the existing literature gaps, thus many later studies emphasized the importance of not only direct relations which is common in literature but especially contextual mediating and moderating effects in the relationship between innovativeness and performance. As outlined by the state of literature in the field, the area remains inconclusive in regard to product innovativeness and its performance link, as well as the moderating effects of specific environments towards innovativeness – performance linkage which suggests potential research gaps to be addressed. It also raises the question of why so many studies that explore direct relations between constructs are so contradictive, which leads to research which aims to relate explanation with contextual effects.

Thus, this research aims to clarify and fill theoretical gaps hypothesizing that not only direct relations should be looked at, but also moderating effects. Moderating links are expected to be important because innovativeness and performance link may be influenced by external factors that can only be identified through exploration of moderating effects. Consequently, gaps in the research concerning the innovativeness – performance link have yet to be addressed. This research angle was also suggested by Szymanski, Kroff & Troy (2007) who emphasized that the relationship between innovativeness and performance is more substantial if contextual factors are taken into account, and hence can be explained in more detail. Are products with a high degree of innovativeness performing better or worse compared to other incrementally improved products? How does performance vary in a set of specific commercial environments? Thus, when evaluating the relationship between two constructs – innovativeness and performance, contextual factors need to be addressed properly because of the proposition that innovativeness is related to new product commercial success under certain market conditions. Aiming to fill these gaps in the existing knowledge, this dissertation explores previous studies in regard to this phenomenon and hence suggests that innovativeness is a direct predictor of performance. Consequently, it is proposed that performance of innovation can be influenced by the commercial environment during its commercialization. Also, that more innovative products are more resistant to a turbulent commercial environment, which is discussed in more detail in further chapters.

## 1.2. New product performance

Innovation, as discussed in previous chapters, enables itself to achieve economic results through commercialization. As a new product passes through different phases of development, commercial success as the ultimate goal, is expected. Commercial success can be defined as its productivity in terms of commercialization or financial performance. Commercialization, as one of the phases of new product development is essential to achieving an impact in the market and gaining an advantage over less successful competitors. Financial impact in the market is undoubtedly anticipated by companies and exploited in the phase of commercialization to return the investments of a newcomer. Thus, the ability to transform an idea into a commercially successful product becomes a key concern for many companies. Many definitions, as discussed in previous chapters, which aim to depict the essence of innovation are directed to its aim to achieve commercial success in the market. In this chapter, commercialization phase and new product success factors to performance are outlined and discussed. The literature stream of new product success and performance is explored, the main predictors of future product innovation performance are outlined, based on which conceptual model is later developed.

The theory of new product development, based on Abernathy & Clark (1985), describes innovation as a derivative of invention; however, in combination with market introduction, it is related to the end-user through diffusion and adoption. A vast amount of research (Cooper, 2008; Udel & Hignite, 2007; Frisjammur & Ylinenpaa, 2007; Lagrosen, 2005; Kotler, 1994; Urban & Hauser, 1993; Cooper, 1990, 1993; Cooper & Kleinschmidt, 1986; Booz, Allen & Hamilton, 1982) has been dedicated to the new product development stream, which attempts to conceptualize new product development, its phases and relevant activities. Authors (Booz, Allen & Hamilton, 1982) who pioneered the research stream of new product development also highlight that not only the creation of innovation, but future developments and actions towards successful commercialization are essential.

There exist several attempts to conceptualize phases of new product development which are outlined further. Booz, Allen & Hamilton (1982) provide a six-stage new product development process which applies to all new products. The model includes the following steps: i) idea exploration, ii) idea screening, iii) business analysis, iv) development, v) testing, and vi) commercialization. The model, proposed by Booz,

Allen & Hamilton (1982) was followed by other attempts to conceptualize the process. For example, a model provided by a study by Cooper & Kleinschmidt (1986), extended previous research to a 13-phase process, drawing attention to planning and testing stages. A model by Cooper & Kleinschmidt (1986) was extended with new steps that focus on several stages of assessment and testing, placing an emphasis on analytics and preparation prior to new product launch, adding stages of piloting, in-house and consumer testing, production, market and selling testing, including pre-commercialization business analysis. Extension of the model suggests that preparation for commercialization is worth focusing on, thus is emphasized in the latter model. This shift in new product development phases also exposes the importance of preparation for successful commercialization. Subsequently, theory in the field is being built aiming to understand and purge the concept and make it adaptable and usable. In a later study, Cooper (1990, 1993) developed a model with a few different steps that outline the importance of the process of new product development - namely 12 phases that start as idea generation and result in the final phase – commercialization, which similarly increased the focus on preparatory analytics and testing. Despite extant attempts to conceptualize new product development and contribute to the knowledge, other authors in later studies, for example, Urban & Hauser (1993) and Kotler (1994), proposed using a shorter, 5-stage new product development model which consists of i) idea screening, ii) concept test, iii) product development, iv) test marketing and v) launch. Other, later published studies simplified the cycle of new product development by presenting a 3-phase process which consists of i) discovery, ii) development and iii) commercialization (Cooper, 2008; Frisjammara & Ylinenpaa, 2007; Lagrosen, 2005).

It is observable that all previous conceptualizations of new product development aim not only to create a new product, but also commercialize it, which is inseparable part of innovation, thus important to be addressed by research. Based on Cooper (2001), when moving from idea generation to commercialization, new product development is often associated with uncertainty, which is related to its acceptance by the market and consequence value creation. Also, Udel & Hignite (2007) adds that the process of commercialization requires careful planning and resource commitment which is related with organizational capabilities and readiness to develop and introduce the innovation. For example, a study by Antuahene-Gima et al. (2005) indicate that launch proficiency in implementing activities that facilitate smooth introduction until it begins to generate sales and profits after the commercialization stage is implemented

successfully. Notably, the stage of commercialization is also an important research area that is addressed in this dissertation, especially antecedents of commercial success that will be discussed hereinafter.

Despite the vast amount of research performed in the field of new product development, many studies (Saji & Mishra, 2013; Saji & Nair, 2010; Szymanski, Kroff & Troy, 2007; Udel & Hignite, 2007; Adams, Bessant & Phelps, 2006; Henard & Szymanski, 2001; Urban & Hauser, 1993; Nevens et al., 1990; Calantone & Benedetto, 1988; Calantone, Benedetto & Cooper, 1986; Cooper & Robert, 1983, 1984; Cooper, 1980) have aimed to reveal the antecedents of product innovation's successful commercialization which is an ultimate goal of each and every new product. Commercialization, according to Adams, Bessant & Phelps (2006), the attempt to profit from innovation, is the process that is often associated with marketing capabilities, such as market research, promotion, market planning and monitoring with the aim to launch new products successfully in the existing, often turbulent external environment. For example, a study by Szymanski, Kroff & Troy (2007) identified two major categories of predictors that are related to the successful commercialization of new products, namely company based and consumer based factors. Elements that fall under the company elements are defined as those that characterize the company and competitive marketplace in which it acts. Yet, consumer based factors represent elements related to the end user and his or her evaluation of the newcomer. However, a different study on the most common reasons for new product failures by Udel & Hignite (2007) states that product superiority is not enough to achieve successful commercialization; many other variables contribute. Thus, a successful launch is not only associated with capabilities to create a new product or positive market appraisal, but with encountering customers, competitors, market turbulence and other aspects which should be collided by the newcomer.

Since Cooper (1980), there have been many attempts to address new product success and failure, as well as a focus on antecedents, contributing to its performance. Yet, initial research by Cooper (1980), Cooper & Robert (1983; 1984), Calantone, Benedetto & Cooper (1986), Calantone & Benedetto (1988), Steenkamp & Gielens (2003) and many more are a basis for this research with expectations to contribute to the field of new product development in the stage of commercialization. As widely agreed, new product development and its commercialization is a source of a company's success in the market. Thus, continuous innovation and commercialization

of new products do not become a tool to compete, but a strategy imperative to survive in the market. According to new product development research (Saji & Nair, 2010; Henard & Szymanski, 2001; Nevens et al., 1990), it is indicated that companies that have the capability to successfully introduce new technologies in their newcomers, succeed more than companies that fail to invest in technologically new products. According to Saji & Mishra (2013), commercialization can be considered as a culmination of the process of new product development which is widely accepted to be influenced by both internal, company related and external, marketplace related antecedents. In the next chapter, the dissertation explores strategic determinants of new product performance.

### **1.2.1. Strategic determinants of new product performance**

Interest in factors that influence new product performance has long been an emerging issue in marketing research. Many authors have focused on factors driving new products' success or failure, consequently trying to reveal why some products experience no success, moderate success or even major success. Many previous studies have attempted to explore and summarize antecedents of new product performance, which has always been engaging area for both scholars and practitioners. Exploration of factors that contribute to new product performance by previous research is rather compound, representing several layers of predictors that are related with different aspects of new product development and commercialization.

Several classical meta-analytical studies (Montoya-Weiss & Calantone; 1994; Henard & Szymanski, 2001; Evanschitzky et al., 2012) aim to summarize factors that contribute to the success of a new product the most. They distinguish several groups of factors, such as strategic factors, process factors, marketplace factors and organizational factors. A study by Montoya-Weiss & Calantone (1994) aims to conceptualize new product success by building groups of factors that are the most relevant and aim to develop a holistic understanding towards drivers of new product performance. The same approach is also common in other research, mainly due to complexity of the concept. For example, a classic study by Cooper & Kleinschmidt (1995) provide the concept of a performance diamond, which is derived from previous studies, and expanded upon and aims to create a broader understanding of performance predictors. These authors depict major drivers for new product success,

stressing the importance of product innovation, and technology, resources commitment and portfolio management, organizational climate and a structured launch system, which can be defined as strategic performance predictors. An important study in the field, done by Henard & Szymanski (2001), performed and introduced a meta-analysis on studies in regard to critical factors to new product performance and identified the following predictors of new product performance, that is, product characteristics, a company's strategy characteristics, a company's process characteristics and marketplace characteristics.

Consequent research by Cooper & Kleinschmidt (2007) extended knowledge on critical factors of innovation performance and highlighted that key success factors for successful performance are the following – product related strategic issues as high-quality new product process and a clearly defined strategy for it, adequate resources that represent a company's capabilities in terms of human resources and possible investments and constant research and development spending. In addition to internal strategic factors, studies (Green, Barclay & Ryans, 1995; Gatington, Weitz & Bansal, 1990; Green & Ryans, 1990) contributed to the stream of new product performance by conceptualizing marketplace conditions as an important antecedent for new product performance. A study by Evanschitzky et al. (2012) also concluded that very diverse factors contribute to new product success are changing over time, as commercial and economic environment changes, and consequently new factors emerge. Findings of studies that previously outlined the most important new product success factors are used to create a basis for theoretical justification of the research question, raised by this dissertation.

The most influential new product performance studies in the field followed a holistic approach and also designated that performance of a new product is part of a very complex structure and is dependent on many different aspects. In Table 5 (based on Evanschitzky et al., 2012; Cooper & Kleinschmidt, 2007; Henard & Szymanski, 2001; Cooper & Kleinschmidt, 1995; Montoya-Weiss & Calantone, 1994), a summary and definitions of factors that are found to drive new product performance are presented. As discussed, it is clear that the process of new product development and especially the commercialization phase are broad areas that have been analyzed from different angles. Critical drivers for new product performance are also of a very complex nature.

**Table 5. Strategic drivers for new product development and performance**

Drivers for new product success	Definition
Product characteristics	Product innovativeness Product advantage as superiority over competitive offerings Ability to meet customer needs Product price Product technological sophistication
Strategic factors	Strategic vision for the business Strategy of the new product Clear competitive definition and focus on role of new product Order of entry Goals for product innovation Quality of strategy execution Marketing synergy Technological and manufacturing synergy
Development process factors	Proficiency of technological activities Proficiency of marketing activities Proficiency of up-front activities Launch proficiency Top management support Speed for market Proficiency of financial and business analysis Performance result measurement
Resource allocation	Availability of resources Constant resource commitment Necessary human resources allocation Cross functional integration and communication Proper marketing support budget
Market environment factors	Market potential and size Market competitiveness Likelihood of competitive response Competitive response intensity External environment
Organizational factors	Internal and external relation of a team Organization of the team Innovative climate and culture in the company

Classical body of literature, which conceptualized area of new product performance, as outlined in Table 5, suggest that the most important predictors of new product performance are very complex and represent several important areas, such as the new product itself and its characteristics, product owner characteristics that represent process and resource related factors, and marketplace specifics. Consequently, predictors of new product performance can be defined as internal and external, which create a holistic perspective, which is found to influence performance outcome.

In addition to factors, defined as critical drivers of new product performance, more detailed definition of variables that influence performance outcome was outlined by

previous body of research (Evantschitzky et al., 2012; Henard & Szymanski, 2001; Cooper, Easingwood, Edgett, Kleinschmidt & Storey, 1994) which is used as a conceptual framework for this dissertation. Research by Evantschitzky et al. (2012), Henard & Szymanski (2001) and Cooper et al. (1994) also followed a holistic new product performance approach which allows to combine complexity of diverse performance predictors. Framework of this research identifies that successful commercialization of a new product is related to synergy and expertise in product strategy and characteristics, marketplace characteristics, competition in the area and launch capabilities. A summary of the variables that influence new product performance is presented in Table 6 (based on Evantschitzky et al., 2012; Henard & Szymanski, 2001; Cooper et al., 1994).

**Table 6. Predictors to new product performance**

Factor	Definition and impact
Product advantage	Defined as superiority versus other offerings available and works as a differentiator in the market, and is therefore a key success predictor. In addition to a superior offering, price – performance conjunction and technological sophistication, as innovativeness is expected.
Firm strategy characteristics	A congruence of resources that a company possesses to enroll a new product successfully – marketing and technological synergy, order of entry, dedicated human and research and development resources.
Firm process characteristics	Process characteristics are defined by a structured approach and proficiency in marketing, technology, launch, customer orientation, cross-functional integration and communication. This antecedent of new product success can also be described as lean process execution.
Marketing support	Indicated as one of the most important success factors, which is distinguished separately, and contributes to the effective communication of the product advantage as well as builds an image. Marketing support strongly contributes to increased customer awareness, ability to communicate benefits of new products, creates brand image and appropriate positioning.
Nature of marketplace	Defined in terms of market attractiveness and competitiveness that has an impact on new product performance, as well as expected and anticipated competitive response to a new product introduction.

A study by Cooper et al. (1994) emphasizes that synergy among marketplace and management, defined as expertise in related activities, is a strong cumulative success predictor defined as fit amongst major activities that are related to new product development and launch – expertise in combining marketing resources, their usage and distribution options. In addition to it, Henard & Szymanski (2001) provide a broader

view of predictors that contribute to new product success and complement the study by Cooper et al. (1994). It is important to indicate that Evantschitzky et al. (2012) and Henard & Szymanski (2001) identify several major groups of predictors, which are found to influence new product performance, namely product characteristics, firm strategy characteristics, firm process characteristics and marketplace characteristics. A company, expecting a substantial new product performance should be able to ensure a good fit between the needs of resources for the implemented activities, required skills and expertise in marketing, management and finance related areas, as outlined in Table 6.

A study by Kalluri & Kodali (2014) concludes that classical body of research in new product development, including innovation performance research stream was developed during twelve-year period, which was outlined and discussed in their meta-analytic research. Their study also highlights the complexity of the area and the need to integrate different perspectives that outline diverse new product performance predictors. In addition, the latter study concludes that attention to innovation performance research area is increasing over the time, which suggests the growing interest in the field and its potential for new research. It is observable that research in the area grows around one hundred percent average during three four-year time frames, 1998 to 2009. In addition, ideas for product innovation performance research tend to evolve during the time, which represents knowledge advancement in the area. The area is found (Kalluri & Kodali, 2014; Evantschitzky et al., 2012) to move from new product strategic factors, to organizational issues, to development and execution to commercialization and performance studies as the emerging trends. The finding suggests that interest in the research field is growing yet it is changing conceptually which creates evolution and advancement in knowledge creation in new product development research area which is shifting to performance predictors and performance measurement studies. The evolution in the research area can be concluded as “in search of efficiency and effectiveness of actions”, based on Kalluri & Kodali (2014) and Neely, Gregory & Platts (2005). The area is found to move from conceptual to empirical qualitative to empirical quantitative approach which suggests the rise of objective evidence based research in the field and consideration of new, emerging factors (Evantschitzky et al., 2012; Neely, Gregory & Platts, 2005).

Despite many efforts to conceptualize the area, some studies (Lin & Chang, 2012; Talke & Hultink, 2010; Szymanski, Kroff & Troy, 2007; Di Benedetto, 1999; Hultink &

Robben, 1999; Cooper, 1998) have revealed that after so many attempts to disclose success or failure practices, there is a lack of information concerning the possibility of forecasting the future for new product commercial development. Forecasting research is defined as relative new stream of new product development studies (Kalluri & Kodali, 2014). It is notable that certain performance practices, such as success or failure, are studied, though there have been few attempts to connect it with a more complex approach to improved performance which would combine more structural factors that are related to new product performance. As scholars (Di Benedetto, 1999; Bowman & Gatington, 1995; Gatington, Weitz & Bansal, 1990; Maidique & Birger, 1984) emphasize the importance of successful product launch and commercialization, which is a crucial driver for performance, the area remains under constant attention from academia and practitioners because of ever-changing markets, competitive environments and emerging innovations. Szymanski, Kroff & Troy (2007) indicate that further understanding of the link between innovativeness and performance is needed, especially concerning the characteristics of today's marketplace and environment, which requires validation in the research area. Validation is asked (Szymanski, Kroff & Troy, 2007) to be found regarding certain moderating effects of the market, company or consumer factors that are expected to have a significant impact on the innovation-performance relationship. In addition, given extant literature concerning successful commercialization, Talke & Hultink (2010) highlight that evidence related to commercialization drivers during the launch period is still inconclusive. Likewise, Lin & Chang (2012) argue that despite the vast amount of literature available on new product development, contextual issues, such as those related to retailers and their impact is under-explored. Thus, on the basis of previously discussed research, this dissertation focuses on a holistic approach by combining different variables that are expected to have a moderating impact on innovation performance. In the following chapters, effects of the marketplace, company-related and retailer related factors that represent commercial environment are presented and explored.

### **1.2.2. Commercial environment as performance predictor**

As already outlined in previous chapters, prior studies have addressed the role of commercial environment to innovation performance, yet mainly direct effects were investigated. Due to extensive focus and exploration of direct relationship, little

research aimed to investigate role of commercial environment as a moderator. Having discussed the inconsistency of innovativeness – performance linkage, the current state of research suggests that moderating effects between innovativeness and its performance is under-explored. It demands further clarification which needs to be addressed as a potential research gap.

Previous outlook on critical factors to new product performance outlined that among product, organizational strategic and process factors, nature of the marketplace and its characteristics has cogent effect on new product performance. In this research, commercial environment is defined as dynamic external system or conditions in which new product operates, competes and functions commercially (Gotteland & Boule, 2006; Dess & Beard, 1984). Commercial environment is recognized to be a critical driver of new product success (Evanschitzky et al., 2012; Henard & Szymanski, 2001; Cooper et al., 1994), thus organizations are obliged to continuously observe, analyze and react to changes conditioned by commercial environment. Previous and the most influential conceptualizations were used to define different conditions that constitute a commercial environment, which is important to be understood and addressed by new products developers. Also, based on organization learning theory (OLT), companies are anticipated to continuously learn about, adapt to and exploit ever-changing environments (Baker & Sinkula, 2007), including adaptation to volatile business and commercial environments. Information not only should be learned but also adapted to future firm behaviors and decisions in the market. It is acknowledged that a general understanding of the environment enables companies to understand customers' needs and participate in information exchange with customers, competitors and the overall market.

Previous studies that have conceptualized the area, define and group commercial environments based on the following logic – i) studies, related to marketplace effects on new product performance, ii) studies, that focus on company related characteristics and its link to performance, iii) studies, that focus on external relations (retail and distribution channels) and its effect on performance. The logic aims to remain consistent to previous research that highlighted the importance of understanding marketplace characteristics as an integrity, thus defined as commercial environment. The tables below outline an overview of previous studies in the field that represent three major groups of commercial environment. Thus, this chapter aims to explore type

of relationship, which was examined in previous studies, emphasize major findings and logical difference between direct and moderating effects.

Table 7 summarizes studies, related to linkage between marketplace conditions and performance. First of all, it is observable that variables, that represent marketplace, are defined as market potential and its growth, competitive environment and environmental dynamism. Secondly, part of marketplace-related studies have addressed direct linkage to performance with a few attempts to capture moderating effects. Noticeable that research stream that aims to reveal role of marketplace characteristics to performance was initiated by scholars who attempted to conceptualize critical factors of new product performance, namely Cooper & Kleinschmidt (1993), Cooper & Kleinschmidt (1987), Cooper (1979), Cooper et al. (1994) and others. The stream suggests that relevance of the role of marketplace characteristics to performance is undisputable, also demonstrates growing interest to address role of marketplace characteristics as a moderator.

**Table 7. Summary of previous studies on marketplace characteristics – performance linkage**

Variables affecting new product performance	Type of relationship explored	Authors
Link between marketplace characteristics and performance		
Environmental factors (market potential and its competitiveness)	Direct to new product performance	Cooper & Kleinschmidt (1993), Cooper & Kleinschmidt (1987), Cooper (1979)
Marketplace conditions and its nature (potential, growth and competitive situation)	Direct to new product performance	Gatington, Weitz & Bansal (1990), Green & Ryans (1990), Cooper et al. (1994), Green, Barclay & Ryans (1995)
Introduction timing and market effectiveness	Direct to new product performance	Hultink & Robben (1999), Yoon & Lilien (1985)
Category competitiveness	Direct to new product trial	Steenkamp & Gielens (2002)
Market potential and competitive situation	Direct to new product performance	Carbonell & Rodriguez (2006)
Technological turbulence, competitive intensity	Direct to new product performance and moderating to the link between market orientation and new product performance	Augusto & Coehlo (2009)
Customer and competitor orientation, interfunctional coordination	Direct to the number of introductions	Lukas & Ferrell (2000)

Market turbulence, environmental turbulence and market growth	Moderating to the link between market orientation and business performance	Kohli & Jarowski (1990)
Environmental dynamism (characterized as uncertainty and hostility) and competitive intensity	Moderating to the link between multidimensional innovation and business performance	Garcia-Zamora, Gonzalez-Benito & Munoz-Gallego (2013)

Major body of studies in the field relate marketplace conditions with positive either negative economic climate which is found to have positive either negative effect on performance. Previous studies associate market potential and growth with improved new product or business performance (Carbonell & Rodriguez, 2006; Green, Barclay & Ryans, 1995; Cooper et al., 1994; Cooper & Kleinschmidt, 1993; Gatington, Weitz & Bansal, 1990; Green & Ryans, 1990; Cooper & Kleinschmidt, 1987; Cooper, 1979) which can be defined as positive economic climate that leads to business opportunities. Positive economic climate contributes to improved performance, which can be related with market potential and its growth, thus associated with increased demand and consumption. Also, previous studies associate competitive situation, its intensity and turbulence with negative impact to new product or business performance (Augusto & Coehlo, 2009; Carbonell & Rodriguez, 2006; Steenkamp & Gielens, 2002; Green, Barclay & Ryans, 1995; Cooper et al., 1994; Cooper & Kleinschmidt, 1993; Gatington, Weitz & Bansal, 1990; Green & Ryans, 1990; Cooper & Kleinschmidt, 1987; Cooper, 1979) which can be defined as non - favourable economic climate and is perceived as potential business threat.

As outlined previously, new product success – performance studies in the field have mainly addressed direct effects of marketplace as performance predictor. There were few attempts to conceptualize the moderating role of marketplace conditions in several linkages to performance (Garcia-Zamora, Gonzalez-Benito & Munoz-Gallego, 2013; Kohli & Jarowski, 1990). Previous studies, as outlined in Table 7, associated marketplace conditions with enhanced or suppressed effect to performance linkage. Thus, following the similar justification pattern as direct linkage to performance, marketplace conditions that represent positive economic climate are expected to enhance performance linkage, yet negative economic climate tends to suppress performance linkage. For example, a study by Kohli & Jarowski (1990) suggests that market orientation - performance linkage is enhanced by positive economic climate, which leads to improved performance when market orientation is higher. In addition, a study by Garcia-Zamora, Gonzalez-Benito & Munoz-Gallego (2013) suggests that

environmental dynamism and competitive intensity have a moderating effect on the link between multidimensional innovation and business performance. Constructs, outlined in the latter study represent non – favourable marketplace conditions that are expected to have a direct negative effect to performance, yet as a moderator, it outlines the importance of scaled independent variable to performance outcome. Role of moderation thus arises from the role of dependent variable and its enhanced or suppressed effect to performance, caused by moderator. In existing studies, moderators are introduced due to the need to clarify role of independent variable, thus differentiating between its complexity, such as small or large, or low and high measures. In addition, a different, non – directional effect is explored in moderation studies. For example, research by Garcia-Zamora, Gonzalez-Benito & Munoz-Gallego (2013) suggests that environmental dynamism and competitive intensity have a moderating non – directional effect on multidimensional innovation – performance linkage. This study, as such, asks for further clarification as a consequential development of this research question. In this research, competitive intensity is thus associated with enhanced innovativeness –performance linkage due to importance of competitive advantage, which is owned by more innovative products.

Table 8 summarizes studies, related to linkage between company characteristics and performance, which is currently the most extensive body of research in the field of new product success studies. Initially, it is observable that variables, representing product owner characteristics are defined in terms of company's characteristics (size and age of the company, cultural and market orientation, ownership structure, innovativeness and others), competitive advantage, and commitment of resources. Many factors, related to companys' characteristics are found to be related to performance, as indicated in Table 8. Also, as already identified as potential research gap, previous studies have mainly addressed direct effect of product owner characteristics, rather than its role as a moderator. Although main interest was focused to direct effects, there were a few attempts to address the moderation. Findings of previous studies also suggests that interest into wider understanding of performance predictors is emerging.

**Table 8. Summary of previous studies on company's characteristics – performance linkage**

Study	Type of relationship explored	Variables affecting new product performance
Company's characteristics and its link to performance		
Ability to invest (marketing expenditures)	Direct to new product performance	Urban and Hauser (1993), Cooper (1998), Garrido-Rubio & Polo-Redondo (2005)
Marketing and technological resources	Direct to new product performance	Harmancioglu et al. (2009), Song & Parry (1996)
Company size	Direct to business performance	Narver & Slater (1990), Ali, Krapfel & LaBahn (1995)
Strength of the company (greater resources, market power, superior reputation) and its strategic orientation	Direct to new product performance	Gattington, Weitz & Bansal (1990), Gattington & Xuareb(1997)
Competitive advantage	Moderating to the link between market orientation and business performance	Kohli & Jarowski (1990)
Cultural and market orientation	Direct to business performance	Liu (1995), Matear, Osborne, Garrett & Gray (2002)
Market orientation	Direct to new product performance	Atuahene-Gima (2005), Atuahene-Gima (1995)
Company capabilities, relevant support	Direct to new product performance	Cooper et al. (1994)
High quality internal processes, selected sound strategy, necessary resource commitments	Direct to new product performance	Bobrow (1998)
Age, size and resources of the company	Direct to business performance	Hurley & Hult (1998), Sorensen & Stuart (2000)
Width of the portfolio the company owns	Direct to new product performance	Hultink & Robben (1999)
Know-how (marketing and management skills, process coordination and resource allocation) the company has	Direct to new product performance	DiBenedetto (1999)
Strategic behavior	Direct to business performance	Wang (2008)
Customer orientation, competitor orientation, firm innovativeness, competitive strength, interfunctional coordination	Direct to new product performance and moderating to the link between market orientation and new product performance	Augusto & Coehlo (2009)
Cross functional cooperation	Direct to new product performance	Ernst, Hoyer & Rubsaamen (2010)
Corporate mindset	Direct to new product performance	Talke & Hultink (2010)
Size of the company	Direct to business performance	Damanpour (1996)

Size of the company	Moderating to the link between market orientation and business performance	Liu (1995)
Organizational characteristics	Moderating to the link between strategic orientation and new product performance	Gattington & Xuareb (1997)
Firm innovativeness, customer orientation, competitor orientation, competitive strength, competitive intensity, interfunctional coordination	Direct to new product performance and moderating to the link between market orientation and new product performance	Augusto & Coehlo (2009)
Innovation in management and marketing actions	Moderating to the link between multidimensional innovation and business performance	Garcia-Zamora, Gonzalez-Benito & Munoz-Gallego (2013)

As outlined in Table 8, major body of research that previously addressed product owner or company's characteristics - performance linkage, associate increased company size and strength with improved performance (Augusto & Coehlo, 2009; Sorensen & Stuart, 2000; Hultink & Robben, 1999; Hurley & Hult, 1998; Gattington & Xuareb, 1997; Damanpour, 1996; Ali, Krapfel & LaBahn, 1995; Liu, 1995; Cooper et al., 1994; Narver & Slater, 1990; Gattington, Weitz & Bansal, 1990). The logic of this link is mainly explained by competitive strength, positional advantage and capabilities, which contribute to better acceptance of a new product, which leads to improved business performance.

Also, different body of research associates improved new product or business performance with company's capabilities in terms of ability to invest (Harmancioglu et al., 2009; Garrido-Rubio & Polo-Redondo, 2005; Sorensen & Stuart, 2000; Hurley & Hult, 1998; Cooper, 1998; Gattington & Xuareb, 1997; Song & Parry, 1996; Cooper et al., 1994; Urban & Hauser, 1993; Gattington, Weitz & Bansal, 1990), either resource commitment in terms of know-how and competence (Ernst, Hoyer & Rubsaamen, 2010; Wang, 2008; DiBenedetto, 1999). In addition to company's capabilities, increased market and customer orientation is also associated with improved performance (Augusto & Coehlo, 2009; Atuahene-Gima, 2005; Matear, Osborne, Garrett & Gray, 2002; Atuahene-Gima, 1995; Liu, 1995). Previous studies that have previously conceptualized company's characteristics – performance linkage acknowledge that company's strength in the market in terms of its size, capabilities and orientation is directly associated with performance outcomes which is explained by better market acceptance due to competitive strength and superior reputation.

Despite vast amount of research related to direct company's characteristics – performance effects, a few previous studies in the field also attempted to address the moderating role of company's characteristics towards performance linkage. For example, studies by Liu (1995), Gatington & Xuareb (1997), Augusto & Coehlo (2009) suggest the link between market and strategic orientation and business performance is moderated by company's characteristics. A study by Garcia-Zamora, Gonzalez-Benito & Munoz-Gallego (2013) reveals that complementarity between innovation and company size is a positive moderating predictor to business performance. Garcia-Zamora, Gonzalez-Benito & Munoz-Gallego (2013) also indicates that company size is more often used as a control variable, rather than a moderator which suggests a research gap to be addressed. In line with previous research that have addressed direct linkage between company's characteristics and performance, moderation research by Garcia-Zamora, Gonzalez-Benito & Munoz-Gallego (2013) uses the same logic, which relates large and capable companies with enhanced performance linkage. The moderating effect towards the linkage is explained by capabilities of large companies, which are related with greater resources that help to achieve better innovation results and avoid or address possible failures easier due to financial strength.

Table 9 summarizes studies, related to performance linkage, which concerns role of retail and distribution channels that are defined as retail category management decisions studies. Studies, that have addressed relation between retail related factors and performance, were mainly focusing on the role of shopping environment, effect of private label, category roles related variables and trade marketing investment related factors. It is observable that amount of studies related to role of retail in new product performance is rather limited and also represent rather new area of research. As noted previously, studies (Lin & Chang, 2012) have also concluded that understanding the role of retail environments towards new product performance is rather under-explored. In addition, research by Fornari, Grandi & Fornari (2009) indicate that studies that address new product opportunities in respect to retail assortment are also missing. Despite several studies that indicated a need to address role of retail in regard to new product performance, it is also observable that research stream which related retail and new product performance is fairly recent and emerging.

**Table 9. Summary of previous studies on retail environment – performance linkage**

Study	Type of relationship explored	Variables affecting new product performance
Retail environment related characteristics and its link to performance		
Presence and share of the private label in the category	Moderating to the link between shopper marketing activities and new product performance	Lamey, Deleersnyder, Dekimpe & Steenkamp (2018)
Importance of category role and expected cannibalization of the store brand	Direct to new product adoption	Everdingen Sloot, Nierop & Verhoef (2011)
Trade support and consumer marketing support	Direct to new product adoption	Everdingen Sloot, Nierop & Verhoef (2011)
Category sales volume and growth	Direct to new product adoption	White, Troy & Gerlich (2000), Rao & McLaughlin (1989), Everdingen Sloot, Nierop & Verhoef (2011)
Trade marketing support and slotting fees	Direct to new product adoption	Wilkie, Desrochers & Gundlach (2002), Everdingen Sloot, Nierop & Verhoef (2011)
Category characteristics and marketing strategy	Direct to new product trial and moderating to the link between consumer characteristics and new product trial	Steenkamp & Gielens (2003).
Retail shopping environment, out of store and in store marketing elements, retail context, category proliferation and concentration	Moderating to the link between shopper marketing activities and new product performance	Lamey, Deleersnyder, Steenkamp & Dekimpe (2018)

As outlined in Table 9, previous studies have mainly related category management decisions, such as impact of category role (Everdingen, Sloot, Nierop & Verhoef, 2011), role of category characteristics (Everdingen et al., 2011; Steenkamp & Gielens, 2003; White, Troy & Gerlich, 2000; Rao & McLaughlin, 1989) and role of private label (Lamey, Deleersnyder, Dekimpe & Steenkamp, 2018; Steenkamp & Gielens, 2003) to performance. Similarly to marketplace characteristics – performance studies, large category potential and its value is associated with performance opportunities created by positive economic climate, while presence of private label, similarly to competitive situation, is associated with potential performance threat. Also, previous studies have directly related trade marketing support (Everdingen et al., 2011; Wilkie, Desrochers & Gundlach, 2002) with improved performance.

In addition to research that outlined direct role of retail environment to performance, there were few attempts to conceptualize its role as a moderator. Studies by Lamey et al. (2018) and Steenkamp & Gielens (2003) suggested retail environment as a moderator between consumer characteristics, shopper marketing activities and performance. A study by Steenkamp & Gielens (2003) concludes that consumer innovativeness – new product trial is positively moderated by retail environment, such as impulse buying categories, display activities and advertising expenditure which outlines the importance of retail environment as moderator to performance linkage. A recent study by Lamey, et al. (2018) is conceptually built on previous research by Steenkamp & Gielens (2003) and suggests that retail environment moderates the linkage between shopper marketing activities and new product performance. Variables, such as share of private label in a category and uniqueness of the product moderate the link between upper and lower shopper marketing variables. A study differentiates between upper and lower funnel shopper marketing, namely manufacturer controlled variables and variables, determined by retailer-manufacturer negotiations. Research by Lamey et al. (2018) consequently concludes that moderating role of retail environment is important to new product performance outcome and encourage future research by enriching understanding the role of retail specific factors to new product performance.

Following the findings summarized in Table 7, Table 8 and Table 9, conclusion is drawn, that little research has addressed the moderating effects to the relationship between innovation and performance. However, many studies have attempted to address the direct link by diving it into several groups of factors – external factors that represent marketplace characteristics and internal factors that represent product owner related characteristics (Garcia-Zamora, Gonzalez-Benito & Munoz-Gallego, 2013). Based on Gatington & Xuareb (1997), internal factors are described as company's characteristics that are found to contribute to the potential to innovate and manage innovations, which leads to improved performance, while external are related to commercial, non-company related settings that are defined as business and economy context.

As presented in Table 7, variables, such as company size, its strength, age, capabilities, orientation and other company's characteristics, representing company related factors were found to be directly related to performance outcome. A major conclusion of these studies associates large companies with superior reputation with

higher efficiency and better adaptivity, while smaller to medium companies are found to struggle more when achieving financial and operating performance. However, market orientation allows both sizes of companies to operate effectively and efficiency, while the ability to innovate in turbulent environment makes the innovation itself as more prolific. On the contrary, other studies have aimed to reveal the role of external factors to performance and found that market potential, competitiveness and its turbulence were the major predictors of performance. This stream of research mainly concludes that larger market potential is associated with higher performance, yet competitiveness in the market and its turbulence contributes to negative performance.

Also, as indicated in Table 8, the majority of previous studies in the field have explored the direct relationship between antecedents of new product success and its performance, and there have been a few attempts to outline the role of moderating effects. Studies that have addressed the moderating role of both external and internal factors to performance linkage are observed to differentiate among various and complex independent variables to performance yet employ similar arguments used in direct-to-performance research. Although several studies (Garcia-Zamora, Gonzalez-Benito & Munoz-Gallego, 2013; Augusto & Coehlo, 2009; Gatington & Xuareb, 1997; Damanpour, 1996; Liu, 1995; Kohli & Jarowski, 1990) have explored the moderating effects of the environment towards new product success, only a mixed pattern of results have been found and was explained by differences in industries the research was performed in. Hence, no clear findings in relation to the moderating role of environmental settings towards performance exist. Consequently, given the extant literature which addresses the relationship between innovation and its performance, this research indicates a clear research gap which would allow this research to contribute to the deeper understanding of the effectiveness of commercialization in product innovation management. Recently, product innovation development and management has become a crucial practice to compete in markets successfully; therefore, the number of studies that focus on this area has also increased.

Despite the factors that have been discussed in this section and which embrace and complement previous studies in the field in a holistic approach, Garcia-Zamora, Gonzalez-Benito & Munoz-Gallego (2013) indicate that the relationship between innovation and performance is still not clear and the moderating roles, which should be understood in this particular relationship, remain limited and inconclusive. Authors (Garcia-Zamora, Gonzalez-Benito & Munoz-Gallego, 2013) argue that understating

the moderating effects in this relationship would allow understanding of where to direct effort and resources to reach the best possible result. Tsai, Huang & Tsai (2013) indicate that previous analyses did not draw a clear understanding of performance drivers and did not reveal structural relationships; hence the crucial need to explore the topic exists. Authors (Tsai, Huang & Tsai, 2013) have not only highlighted the need to study drivers of new product performance but also to set it to the new contexts to validate prior results.

In addition to previous studies, which are rather contradictive, this research expects that environmental forces might be the reason which conditions mixed evidence towards similar research question Authors (Garcia-Zamora, Gonzalez-Benito & Munoz-Gallego, 2013) have confirmed that environmental and organizational factors significantly moderate the relationship link between innovation and business performance, in line with other researchers (Roberts & Amit, 2003) who were acknowledged as pioneers in the exploration of the link between different levels of novelty inside innovations and organizational performance. Despite their attempts to explore the role of moderation towards performance, Garcia-Zamora, Gonzalez-Benito & Munoz-Gallego (2013) propose extending knowledge in this area by analyzing other environmental and organizational features that would contribute to clarity of innovation management. In addition to direct effects in the relationship between product innovation and performance, later studies also proposed that moderating effects have significant conditioning, and asked for clarification in this area (Chang et al., 2014; Rubera & Kirca, 2012; Herrmann, Tomczak & Befurt, 2006; Michael, Rochford & Wotruba, 2003; Montaguti, Kuester & Robertson, 2002; Henard & Szymanski, 2001).

Hence, this research aims to conceptualize and reveal factors that are able to moderate the innovation - performance relationship, namely marketplace conditions (including market and retail distribution channel aspects) as external variables, and product owner related characteristics, representing internal variables. By using various moderator groups this research intends to explain the role of different variables more specifically. Following findings that outlined the role of commercial environment to performance, next chapters aim to address each group of factors that define commercial environment in more detail, and focus on their role as moderators.

### **1.2.3. Moderating role of marketplace conditions to innovativeness – performance link**

This chapter aims to conclude the impact of marketplace conditions towards performance, as well as outline and explain its role as a moderator to innovativeness – performance linkage. This chapter also discusses theoretical propositions in the extant literature, related to impact of marketplace characteristics to performance. Marketplace conditions is one of the major drivers to new product performance. Tsai, Huang & Tsai (2013) reviewed the impact of market drivers towards new product performance and indicated that market drivers of new product performance are an important issue to address, however highlighted that despite extensive research in the area, knowledge has yet to be validated, especially in terms of its moderating role.

The literature (Gatington & Xuareb, 1997) defines the market in relation to new product performance and indicates that there exist five performance drivers – market turbulence, competitive intensity, competitor orientation, as well as product advantage and product innovativeness. Tsai, Huang & Tsai (2013) extend and discuss market drivers indicating that market orientation, customer orientation, market potential and launch proficiency complement the previous model of five drivers. A market is defined as external performance driver, which is defined in terms of market potential, competitive situation and its turbulence. Market potential is described as the size and growth of a market, competitive situation or intensity refers to the level of competition and response, while turbulence is defined as the rate of change in the composition of customers and their preferences (Tsai, Huang & Tsai, 2013; Garcia-Zamora, Gonzalez-Benito & Munoz-Gallego, 2013; Jarowski & Kohli, 1993; Cooper, 1979). Market definition is also subject to product seasonality, as different purchase and product life cycles are observable for seasonal products (Berkowitz, 1986). Studies (Berkowitz, 1986; Gisser, 1972) generalize that market, competition and seasonality factors are of equal importance for companies that enter new markets, and hence have to be addressed properly.

As outlined in previous chapter, there have been attempts to address the direct relationship between marketplace conditions and performance outcome (Tsai, Huang & Tsai, 2013; Augusto & Coehlo, 2009; Carbonell & Rodriguez, 2006; Steenkamp & Gielens, 2002; Lambert & Slater, 1999; Hultink & Robben, 1999; Bayus, Jain & Rao, 1997; Frazier & Lassar, 1996; Cooper et al., 1994; Cooper & Kleinschmidt, 1993),

Cooper & Kleinschmidt (1987), Yoon & Lilien, 1985; Cooper, 1979) which acknowledge that different market conditions have different impact on performance. Different market conditions thus are defined either related with opportunities (positive economic climate) or threats (non-favourable economic climate). The main findings of previous studies revealed that market potential, its growth, turbulence and competitiveness are important antecedents of performance, majorly explored as direct predictors, but also attempted to be addressed as moderators.

As already discussed, market potential is found to be related to the commercial outcome of a new product. For example, a study by Carbonell & Rodriguez (2006) and later a study by Tsai, Huang & Tsai (2013) found that market potential has a positive impact on new product performance, explaining market potential as being large, growing and owning a positive economic climate (Cooper, 1995). Yet there have only been a few attempts to address the moderating role of market conditions towards performance. Several studies (Garcia-Zamora, Gonzalez-Benito & Munoz-Gallego, 2013; Kohli & Jarowski, 1990) that contributed to the research area indicate that market conditions have the potential to strengthen or weaken the link towards performance and also encourage to expand the understanding of moderation which is defined as limited.

It is acknowledged by previous studies that higher category sales value is directly associated with improved performance due to its higher demand and consumption thus is defined as a market opportunity. Consequently, its impact as a moderator is expected to enhance innovativeness – performance linkage that suggests increased importance of innovativeness to performance in higher sales value categories. This proposition follows the logic based on studies by Damanpour & Schneider (2009) and Michael, Rochford & Wortruba (2003) that conclude that different levels of innovativeness follow different performance patterns. Also, higher sales value categories may induce more intense rivalry in the category, thus competitive advantage which is commonly associated with higher innovativeness is important to performance outcome (Tsai, Huang & Tsai, 2013; Agkun et al., 2007; Szymanski et al., 2007; Nakata et al., 2006; Henard & Szymanski, 2001).

Based on previous studies that conceptualized the direct link towards performance, this research aims to extend the theory in regard to the moderating link between innovativeness and performance. Aiming to contribute to this research area, this research suggests that higher market potential, defined as sales value, is possibly

related with better new product performance. Previous studies (Garcia-Zamora, Gonzalez-Benito & Munoz-Gallego, 2013; Kohli & Jarowski, 1990) that have explored non directional moderating role of marketplace conditions suggests that it is either associated with positive economic climate, or potential threat which has impact on performance outcome. Thus, category sales value enables more innovative new products to achieve commercial success more easily in comparison with markets that have lower sales value.

Higher category sales value in a market is associated with reinforced link between new product innovativeness and its performance due to several reasons. First, high category sales value is associated with higher consumption of the category which is defined in terms of positive economic climate (Cooper, 1995) which contributes to new product ability to achieve commercial success. Secondly, based on Garcia-Zamora et al. (2013) and Steenkamp & Gielens (2002), higher category demand is associated with higher competitiveness inside the category, which induces more intense rivalry. Thus, the more innovative the product, the easier for it is to achieve a commercial breakthrough which can be associated with product advantage and customers' willingness to buy more of such product (Tsai, Huang & Tsai, 2013; Agkun et al., 2007; Szymanski et al., 2007). Product innovativeness, as its competitive advantage is associated with positive effect on performance (Nakata et al., 2006; Henard & Szymanski, 2001), and this effect is reinforced by category sales value in the market. This applies to market potential in general, as well as category potential in retail as retail antecedents – new product performance studies (White, Troy & Gerlich, 2000; Rao & McLaughlin, 1989) have also focused on category sales volume and its expected growth.

Research (Rao & McLaughlin, 1989; White, Troy & Gerlich, 2000; Everdingen et al., 2011) done in the field has mostly associated category potential, its sales volume and growth to faster adoption of new products which can be associated with commercial success. For example, a study by Everdingen et al. (2011) explored the role of category potential in new product listings and indicated that the decision to adopt is impacted by the current performance of the category to which the new product is assigned and launched, and is consequently expected to be related to its performance as well.

This research thus aims to suggest that category sales value, which can also be defined as potential has a positive moderating effect on performance, namely should

reinforce the link between new product innovativeness and its performance. Similarly, to category sales value in the market, this proposition is associated with higher demand of high sales value categories, which also leads to more intense competition. Thus, higher innovativeness becomes more important to achieve commercial success in categories with higher sales value.

Given the proven direct positive effect and proposed moderating effect of market and category potential to performance, on the contrary, competitive intensity is considered to be a barrier to successful commercialization (Tsai, Huang & Tsai, 2013; Garcia-Zamora, Gonzalez-Benito & Munoz-Gallego, 2013; Augusto & Coehlo, 2009; Carbonell & Rodriguez, 2006; Steenkamp & Gielens, 2002; Song & Parry, 1997; Frazier & Lassar, 1996; Cooper & Kleinschmidt, 1993; Cooper, 1979). Similar to studies that have addressed the role of market potential, previous body of research has focused on the direct competitiveness – performance linkage. Respectively, there were few attempts to conceptualize the role of competitiveness as a moderator (Garcia-Zamora, Gonzalez-Benito & Munoz-Gallego, 2013; Kohli & Jarowski, 1990), as well as encouragement to contribute to knowledge extension in the area.

The mentioned studies have concluded that the more intense the competitive situation, the more difficult it is for an innovation to make a breakthrough. A study by Frazier & Lassar (1996) indicates that a competitive environment may be damaging to new products as it may provoke price wars and demand higher investments to maintain a position. On the other hand, it stimulates improvements in the company in the case of changes, such as timely production, competition and quality management that are increasing competitiveness in the marketplace. In addition, research by Steenkamp & Gielens (2002) verified previous findings, indicating that the number of brands in the category increases inner competition, and therefore creates greater barriers for a new brand to commercialize. Tsai, Huang & Tsai (2013) also found that competitive intensity is related to new product performance, yet in a negative way, suppressing its performance. However, a study by Carbonell & Rodriguez (2006) contributes to the explanation of the relationship between competitive intensity and innovation performance, revealing that competition can be twofold – it can help to gain a positional advantage or increase the competition if there is no differentiation, expectedly depending on conditional factors. Thus, assumption is made that higher innovativeness becomes more important as a competitive advantage, which allows overcoming the competition easier.

Referring to the studies that conceptualized the direct link between competitiveness and performance and attempts to capture the role of competitiveness as a moderator, this research suggests that competitive situation has a positive moderating role between innovativeness and performance. More specifically, higher category competitiveness in a market should reinforce the link between new product innovativeness and its performance due to several reasons. First, a competitive situation is treated as a barrier for performance (Tsai, Huang & Tsai, 2013; Song & Parry, 1997, Cooper, 1979), thus the more innovative the product, the easier to create differentiation among competition because of competitive advantage. Secondly, as studies (Carbonell & Rodriguez, 2006) suggest competition can be duplex, and in the cases when positional advantage is weaker, innovation breakthrough can be more complicated.

Based on the findings of previous research, this dissertation proposes that marketplace characteristics, namely category sales value in the market and in retail sales channel, as well as competitive intensity in the market and in retail sales channel, are expected to have a positive moderating effect on the link between product innovativeness and performance.

#### **1.2.4. Moderating role of company's characteristics to innovativeness – performance link**

With the growing turbulence and instability in marketplace and business, organizational resources and capabilities have become an essential need for companies to develop. Organizational resources and capabilities allow companies to achieve a competitive advantage (Newbert, 2007; Grant, 1996) and are well known to be a strength that allows successful management (Itami, 1987), which hence leads to successful competition in the marketplace, development of business and introduction of innovations. It is acknowledged that innovations rely on investments to be launched successfully and achieve commercial results.

Previous studies (Calantone, Roger, Di Benedetto, 1988; Cooper & Kleinschmidt, 1988; Cooper, 1979) conclude that a successful launch that leads to effective commercialization is a major driver for new product success yet demands certain capabilities. The capability to launch or commercialize an innovation demands certain resources, which, based on Bobrow (1998), is considered as one of the cornerstones

of new product performance. Authors (Cooper et al., 1994) have also identified that new product process takes place in an organizational environment, which contributes to the ability to operate in the marketplace successfully. For example, an organizational environment can be defined by specific company's characteristics, which shows a combination of company – controlled factors that are developed by the company and defined as marketing support and processes, related to activities through the process of development, and are strong predictors of new product success. The state of research can also be complemented by a study by Leonhard-Barton (1992) that also associates organizational structures, processes and management systems to core competencies that are found to be related to competitive position.

Studies by Ernst, Hoyer & Rubsaamen (2010) and Garcia-Zamora, Gonzalez-Benito & Munoz-Gallego (2013) approve the importance of company-related factors and highlight that cross-functional cooperation in the company and its characteristics are the most critical drivers for successful commercialization. In addition, Talke & Hulting (2010) explored new product market performance in terms of organizational-behavior and found that a corporate mind-set has a positive impact on launched products. These studies reflect the significance of capabilities, competence and the ability to apply it throughout various processes of new product launch.

As discussed, previous studies have attempted to address the role of company's characteristics to performance. Mainly, there have been attempts to relate these concepts directly (Augusto & Coehlo, 2009; Wang, 2008; Garrido-Rubio & Polo-Redondo, 2005; Matear, Osborne, Garrett & Gray, 2002; Atuahene-Gima, 2001; Sorensen & Stuart, 2000; DiBenedetto, 1999; Hultink & Robben, 1999; Cooper, 1998; Bobrow, 1998; Hurley & Hult, 1998; Ali, Krapfel & LaBahn, 1995; Cooper et al, 1994; Urban & Hauser, 1993; Narver & Slater, 1990; Gatington, Weitz & Bansal, 1990) concluding that company size, its age, width of portfolio the company owns, customer, cultural, competitor and market orientation, strategic behavior, firm innovativeness, competitive strength, inter-functional coordination and other factors directly contribute to performance. In general, company's characteristics are associated with the strength of the company in terms of market power, superior reputation, greater resources and capabilities that enable a company to gain a competitive advantage and achieve commercial success in the market. In addition, there have been attempts (Garcia-Zamora et al., 2013; Augusto & Coehlo, 2009; Gatington & Xuareb, 1997; Damanpour, 1996; Liu, 1995) to consider the role of company's characteristics as a moderator, yet

the area has not been fully explored. Similarly to the previous propositions, this research aims to reveal the moderating role of company's characteristics in the link between innovativeness and performance.

The literature considers firm size to be an antecedent of performance, especially for radical product innovations. Yet, some authors (Herrmann, Tomczak & Befurt, 2006; Chandy & Tellis, 1998) disagree with this approach. Other studies (Ali, Krapfel & LaBahn, 1995; Narver & Slater, 1990) present a more detailed evidence related to company's nature and new product performance and reveal a positive direct relationship between company size and new product performance. In addition, Hultink & Robben (1999) identify that the broader the product assortment a company has, the better the market acceptance of a new product exists which is related to company's positional strength in the market. The explanation of this relationship is related with greater resources, market power, superior reputation and image that larger companies usually possess (Gatington, Weitz & Bansal, 1990).

Following previous conceptualizations in regard to moderating role of company's characteristics (Garcia-Zamora et al., 2013), this research suggests that firm size moderates the linkage between new product innovativeness and its performance. Firm size, defined as company sales value and portfolio width, is expected to suppress the link between innovativeness and performance. The logic of moderating linkage is explained by firm's size relation to market power, superior reputation and greater resources (Hultink & Robben, 1999; Gatington, Weitz & Bansal, 1990). It is expected to increase new product acceptance and thus lead to commercial success. In addition, better new product performance of larger companies is associated with easier acceptance (Hultink & Robben, 1999), also due to positional and competitive strength in the marketplace. Consequently, higher new product innovativeness becomes less important, as larger companies tend to overcome the competition easier. Furthermore, large companies are associated with better expertise, capabilities and resources (Garcia-Zamora et al., 2013; Bobrow, 1998; Cooper et al., 1994) which also contributes to more efficient operations and commercial success which makes innovativeness less important to performance outcome in comparison with smaller companies.

In addition to company's characteristics that are related to its size, scholars also enhance the role of capabilities in terms of the relevant marketing support a company is able to provide. A study by Di Benedetto (1999) reveals that marketing skills and resources defined in terms of activities the company makes, such as performing

appropriate market research and testing, delivering quality in selling effort, service and technical support, as well as properly managing distribution channels, are critical drivers for performance. All the mentioned activities are considered as the expertise and capabilities the company possesses and is able to exploit. It is acknowledged that investments and marketing expenditures are considered to be one of the most powerful tools to compete in the market or are defined (Cooper, 1998) as a necessary resource commitment to achieve performance results. Other studies, for example, Garrido-Rubio & Polo-Redondo (2005) and Urban & Hauser (1993), support this and argue that marketing expenditures, in terms of ability to invest in product communication, provide a greater probability to reach innovation success.

In cooperation with retailers, based on Bloom, Gundlach & Cannon (2000), suppliers are expected to pay slotting and trade marketing fees to a retailer, especially during the launch. Slotting and trade marketing fees usually include advertising, additional placement or promotional fees which are expected to support a new product. Despite extant literature related to the trade marketing support – performance linkage, few studies have explored the role of trade support in retail and, yet, the findings of some studies are rather contradictory. Thus, further clarification is important to be brought to the area. For example, a study by Wilkie, Desrochers & Gundlach (2002) associated higher trade marketing support for new products with a higher risk of failure, suggesting that higher trade support signals uncertainty related to a new product performance. However, a study by Everdingen et al. (2011) suggested that higher trade marketing support increases the probability to launch a new product more effectively. In addition, as concluded in previous chapter, studies in the field have mainly attempted to capture the direct linkage between constructs.

Encouraged by a lack of theoretical explanation between the retail trade marketing support and new product performance linkage and given the contradictory results of previous studies, this research suggests that trade marketing support moderates the linkage towards performance. More specifically, trade marketing support, invested in the retail channel, should enhance the link between innovativeness and performance, making it more important to more innovative products' performance. First, logic of this linkage is associated with companies with higher trade marketing support investments are more likely to launch new products more efficiently (Garrido-Rubio & Polo-Redondo, 2005). Secondly, it is recognized that radical innovations usually require

larger investments in research, development and marketing due to the need to communicate competitive advantage and value of innovation.

Products of higher innovativeness are related with higher market uncertainty and more intense customer learning (Michael, Rochford & Wotruba, 2003; Sethi, 2002), thus demands higher investments into marketing and communication to facilitate customer learning and new product acceptance. Also, based on Steenkamp & Gielens (2003), differentiation exists between products of different innovativeness levels. For example, for radical innovations, relative advantage and value is expected to high, but also risk related at the same time. Thus, the learning curve for consumers is likely to take longer and may require specific behavioral changes. Consequently, better performance of more innovative products is associated with increased trade marketing support.

On the basis of findings provided by previous studies, this research suggests that company related factors, such as a company's sales value in the market and retail, its portfolio width and trade marketing investment to retail, have a moderating effect on innovativeness – performance linkage.

#### **1.2.5. Moderating role of retail category management decisions to innovativeness – performance link**

With the growing importance of retailers, companies need not only to consider issues that concern product development, but also the best possible channels to reach the consumer. A company's competitive advantage in the current marketplace is very much dependent on its ability to develop and launch new products, yet often new products are launched in cooperation with retailers, which creates additional challenges and barriers. Based on Calantone & Griffith (2007), new product performance is highly dependable on commercial environments, especially the ability to exploit external counterparts, such as distributors. Consequently, authors have stressed the importance of coordination and management of a company's external network of distributors. For example, Garcia & Calantone (2002) indicate that a company that expects the successful performance of a new product must achieve balance through the cooperation and the acquisition of expertise in manufacturing, sales and distribution. According to a study by Fornari, Grandi & Fornari (2009), the role of retailers and the effect of assortment choice on product owners' strategies and

performance have become significant – the success and failure of newly launched innovations has become more important regarding distribution issues, as retailers gained positional advantage as “gate keepers” to consumers. Also, a study by Lamey et al. (2018) concludes that manufacturers’ collaboration with retailers is crucial to new product performance, thus needs to be addressed properly. Consequently, with the more advanced role of retailers in the market, distribution of product innovations is more consistent and is demanding a focus on balance between consumers and retailers in many ways.

Companies that launch innovations in cooperation with retailers must go through listing procedures performed by the retailers, and each addition and launch of a new product is expected to influence performance and further developments of the existing assortment. For example, research by K ok, Fisher & Vaidyanathan (2009) conceptualized the extent of substitution in retail and revealed that, due to limited shelf space, every addition of a new product is expected to cause delisting of worse performing products in the category. Generally, substitution takes place within the category, based on specific criteria. Based on a study by Nilsson & Host (1987), retailers follow main criteria, based on which it is decided whether to list and maintain new products in an assortment. The main criteria are economic, logistic and marketing, so the studies have acknowledged that respective marketing and technological resources have been proven to increase the market success of new introductions (Barczak, 1995). For example, Pellergrini & Zanderight (1991) have defined marketing criteria as new product-potential-related factors, such as sales potential, marketing investments or competitive position which is very much related with antecedents of successful new product performance, discussed in previous chapters.

As discussed, assortment related activities and decisions are aligned with respective category management activities and decisions, performed by retailers. Despite the main criteria employed for listing new products, studies (Gruen & Shah, 2000; Dupre & Gruen, 2004) have revealed that, in the last decade, category management has become an additional tool for managing retail operations efficiently as the use of this practice helps to optimize resources and enhance business results, while, at the same time, focus on delivery of superior value for customers. Based on previous category management theoretical conceptualizations (Everdingen et al., 2011; Dhar, Hoch & Kumar, 2001), the key category management practice, which is widely used by retailers, is to define the importance of each category and identify its

role in the overall portfolio, as well as to consequently adapt actions to reach desired goals.

According to industry studies (Nielsen, 1992), the concept and practice of category management implies that different product categories are defined and managed as separate business units, according to a company's objectives. These categories are distinct manageable groups of products that consumers, so the retailers, perceive as interrelated and substitutable. Hence, retailers and suppliers use category management to combine market characteristics with category specifics, and consequently adapt assortment decisions, based on customer needs. Studies in the area also acknowledge (Benito et al., 2010; Durrant & Kaban, 2009; Desrochers & Nelson, 2006) that category management decisions are used to reflect and predict the particularity of consumer needs, as retail categories or product groups are understood as a reflection of possible consumer behavior. Categories are customized according to the shopping needs and marketing objectives that are set. These processes can be evaluated as a customer-oriented approach that, at the same time, helps to achieve a company's targets, while also focus on customers' needs in terms of delivering value. Basuroy, Mantrala, & Walters (2001) and Morgan, Kaleka, & Gooner (2007) describe category management as the allocation of resources within sets or business units of complementary and/or competing brands or products to achieve maximum outcomes.

Research (Han, Fu & Chen, 2013) in the area indicates that category management has recently become a fundamental practice in retail, the aim of which is to manage operations efficiency, as well as uncover the potential of new products and consumption patterns on a category, not on product level, which induces threat to manufacturer brands on product level. Based on previous conceptualizations (Morgan, Kaleka & Gooner, 2007; Basuroy, Mantrala & Walters, 2001), category management allows competitiveness to be increase in the market, profits to be maximized and a long-term relationship between retailer and customer maintained. Category management practice consists of analysis of category-level data, assignation of category role and goals for performance, formulation and execution of plans to maximize results within that particular unit (Bounds, 2005; Dupre & Gruen 2004; Desrochers, Gundlach & Foer 2003), which is largely employed by retailers in their new product acceptance decisions.

Yet, despite willingness to provide certain assortments to customers and manage categories as business units, category management practice possesses certain threats

for suppliers. For example, authors have highlighted further benefits of category management for retail, but also challenges for suppliers – balancing competition inside a category might cause a negative effect on the performance of some products (Bergen, Dutta & Shugan, 1996), related to possible product' substitution. Retailer's willingness to cross-sell related products, as well as oblige suppliers to participate in various trade promotions (Kasulis, Morgan, Griffin & Kenderdine, 1999), is focused to the general increase in consumption of specific categories or retail assortments (Wansink & Ray, 1996), yet bring questionable value to single branded products in the category. With the use of category management in retail, they seek to optimize category profits overall rather than managing manufacturer brands independently within the category (Zenor, 1994). Research by Glynn, Motion & Brodie (2007) classify category management related benefits as financial, managerial, and consumer driven, which are expected to affect suppliers and commercial performance of their products. Consequently, based on the current state of research in the area, this research argues that the specific commercial environment in which the innovation operates and competes is characterized in the boundaries of its category and may have an impact on its performance outcomes.

Consequently, the relationship between retailer and manufacturer appears to be twofold - competition and cooperation occur simultaneously. Yet, the role of retail category variables, based on Everdingen et al. (2011) and Lamey et al. (2018), is stated to have received limited attention from scholars in the past research, and hence lacks theoretical conceptualization. Therefore, following previous research in the area and the theoretical conceptualization of category management, this research suggests that distribution channel or retail related commercial conditions are expected to influence new product performance. In this research, it is assumed that the retailer, by employing different category strategies and tactics, assigns category roles and decides how wide or deep the categories might be; therefore, performance of a newly launched innovation might be influenced by the retailer's decisions. Thus, the goal of retailer is performance of the overall category, while single branded products in its assortment contribute differently to the categories they are assigned to. Some categories are considered as traffic builders, others as profit builders, while some brands are meant to create excitement for the customer, depending on the strategy of retailer.

A study by Dhar, Hoch & Kumar (2001) explored factors that predetermine strong category performance and concluded it is associated with category assortment, feature advertising and presence of a strong private label. In addition, other studies (Lamey et al., 2018; Glynn, 2007) have acknowledged relevance of changes in retail operations, which are expected to influence performance of products within the categories, thus important to be addressed by manufacturers. These changes include increased emphasis on category management practice, introduction of private label products, consolidation into larger organizations and expansion beyond traditional national boundaries (Shocker, Srivastava & Ruekert, 1994). This research is framed by following previous research in regard to category management decisions and a studies by Steenkamp & Gielens (2003) and Dhar, Hoch & Kumar (2001) with a specific focus on the mentioned variables, such as value of the category, its competitiveness, the effect of different category roles and presence of private label. Exploration of these particular variables was also encouraged by research that have indicated gaps in category management research.

This dissertation aims to address the understanding how category management decisions influence new product performance as a product is added to a specific category with certain environmental settings where it commercializes. It also aims to relate innovativeness and performance through the perspective of retailer category management decisions. Variables that are described in reference to category management decisions are used in this dissertation, namely assignment of category role, category sales value, its competitive situation defined in terms of competing products in the category, and the presence of a private label. Variables to define category management decisions were chosen following existing conceptualizations in the area (Lamey, et al., 2018; Everdingen et al., 2011; Steenkamp & Gielens, 2003; Wilkie, Desrochers & Gundlach, 2002; White, Troy & Gerlich, 2000; Rao & McLaughlin, 1989).

As presented, assignment of category roles is used for strategic purposes in retail. The practice differentiates within four category roles: destination, routine, occasional (seasonal) and convenience (Nielsen, 2006). With reference to a retailer's strategy, category roles are set, and later actions in the categories are planned accordingly. In Table 10 (based on Nielsen, 2006, developed by author), a definition of the category roles is provided.

**Table 10. Definition of category roles**

Category role	Definition	Strategy	Task	Part of the assortment	Possible assortment coverage
Destination	To be the primary category provider and help define the retailer as the store of choice by delivering consistent, superior target consumer value	Reflection of a retailer's strategy Retailer as the primary category provider	Image enhancing Traffic building Transaction building Excitement formation	5-10%	90%
Routine (core)	To be one of the preferred category providers and help develop the retailer as the store of choice by delivering consistent, competitive target consumer value	Retailer as one of the preferred category providers These categories generate major revenue for the retailers	Transaction building Cash generating Profit generating Turf defending	50-70%	66-80%
Occasional (seasonal)	To be a major category provider, help reinforce the retailer as the store of choice by delivering frequent, competitive target consumer value	Expectance to be treated as major category providers on a given occasion Demand for these categories is not stable, usually short term and often influenced by seasonality	Excitement creating Traffic building Transaction building Profit generating	10-15%	33-66%
Convenience	To be a category provider and help reinforce the retailer as	Product groups that offer convenience for the customer to	Transaction building Profit generating Image enhancing	10-15%	30%

	the full-service store of choice by delivering good target consumer value	buy all they need at one store following the idea of "one stop shop".			
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As observed, different categories have different levels of importance for retailers to obtain their desired market position or specific targets. For a retailer, using categories' roles in category and assortment management is beneficial in many ways. A study by Han, Ye, Fu & Chen (2014) indicates that using category roles is essential to maintaining a consistent strategic and tactical plan, which very much reflects the retailer's strategy. The use of category roles allows retailers to keep a homogenous approach on many operational issues, such as assortment, pricing and promotions.

Cross category qualitative analysis (Basuroy et al., 2009; Dussart, 1998) has been widely used to assign categories – this method combines three dimensions that have to be taken into consideration – importance to consumers, importance to retailers and importance to the marketplace. Importance to consumers is defined as consumers' demand for the category. The more desired the category, the more it is essential and important for consumers. Indicators, such as annual expenditure, purchase frequency and purchase volume reflect a category's importance to consumers. Importance to retailers refers to the category's sales performance, as high revenue is desired. Measures, such as sales volume, sales revenue, sales gross profit and efficiency plateau are used to describe this dimension. Importance to the marketplace spotlights the importance of the given category in the future, focusing not on the current status of the categories, but on future market opportunities - future demand and purchase propensity. The following indicators are used to describe future trends – average growth rate, purchase trends, and market share changes trends. Following the practice of category management, retailers' aims differ when assigning roles to specific categories. The following category roles are used in category management – destination, core or routine, occasional and convenience, as outlined in Table 10. Setting roles and tasks for particular categories allow retailers to unify their strategy and operations, thus research suggest that different category roles are expected to have different impacts on new product performance.

Despite importance of category management practice to retailers, and its possible impact on products in the categories, studies have shown little evidence in regard to

exploration of the category management decisions – new product performance linkage, especially moderating role of category management decisions. However, a few studies have addressed the impact of category roles to performance. For example, a study by Dhar, Hoch & Kumar (2011) attempted to conceptualize the relation between different category roles and performance outcome and stressed the importance of category roles management in retail. In addition, a study by Everdingen et al. (2011) suggests that category importance to the retailer is also associated with improved new product and overall category performance. The more the category is important to the retailer strategically, the better the performance of the products inside is expected to be. Other research (Glynn, 2007) also indicates that category importance to retailer can be also associated with strategic decisions, thus category groupings in regard to customer preferences and demand, category growth and level of competition varies among categories, and is hence expected to have an impact on products within the category.

Given the limited theoretical contribution in the area, this research associates moderating effects of retailer category management decisions with impact to innovativeness – performance linkage. Thus, following previous conceptualizations on impact of category roles on performance, which mainly addressed direct impact of category roles, this research suggests that different category roles have diverse moderating impacts on new product performance. The explanation of retail category management decisions role to innovativeness – performance linkage is based on previous conceptualizations, which associate different environmental conditions with favourable or non – favourable economic climate that is induced by retailer category management decisions. Similarly, to marketplace characteristics – performance research stream, different conditions might create opportunities or threats for newly introduced products, thus affect its performance, and reveal diverse innovativeness – performance patterns.

As outlined in Table 10, there exists four types of category roles, which are discussed accordingly in more detail. Destination categories are those that the retailer usually uses to differentiate and position itself as the store of choice. Selection and definition of destination categories is based on the needs and shopping behavior patterns of certain customers' target groups by constantly delivering superior value within the chosen categories. Destination category is treated a key category role for retailers, thus is associated with positive economic climate and possible opportunities.

Everdingen et al. (2001) reveal the importance of destination category to the retailer, indicating that this type of category is used to differentiate the retailer and is usually excelled by specific actions, such as better visibility, wider assortment and more promotions. With retailers' willingness to perform better and become the primary category provider in destination categories, objectives expectedly, cause a growing sales value of the category, as well as of the single products that are assigned to it. Consequently, destination category is associated with positive direct effect to performance (Everdingen et al., 2001). Due to lack of knowledge, related to moderating effects of destination category role, it is suggested that product assignment to the destination category should enhance the link between new product innovativeness and its performance. First, destination category is used as a strategic differentiation tool by retailers which is defined as positive economic climate which is able to create business opportunities. Its strategic purpose is to enhance image, build traffic and build transactions, and at the same time create excitement. Thus, this category role aims to attract customers, as well as generate their interest into the category and products inside. In addition, it aims to enlarge the size of average purchase and consequently generate profit which makes the destination category a priority among other possible category roles. Therefore, the concept of the category role is encouraging the consumption of the category and the products inside. It is possibly related with direct „lift“ effect, delivered by increased attention to category performance which is related to improved performance and business opportunities. Secondly, identity of destination category role is related to rather wide assortments in the categories which is suggested to be around ninety percent of total market offerings. This assortment strategy also implies higher than average competition in the category despite relatively small share of total retailer' assortment coverage. Category assortment strategy is consequently twofold – generates rather high level of competition, yet is rather concentrated in terms of share of total retailer's assortment, which is around ten percent. It consequently implies that for products, assigned to destination categories, higher innovativeness is more important to achieve successful performance due to the need to differentiate among competition. Differentiation in the marketplace, based on previous research, is associated with competitive new product advantage (Tsai, Huang & Tsai, 2013; Agkun et al., 2007; Szymanski et al., 2007; Nakata et al., 2006; Henard & Szymanski, 2001).

Routine (core) categories are categories through which the retailer wants to be one of the preferred providers. It usually covers a large amount of categories and are used to generate sales and profit with rather large width of assortments inside. Strategic purpose of this category is to build transactions, generate cash flow, profit, and at the same time maintain traditional customer base. This category corresponds to sales of daily necessities and is rather stable in terms of demand and assortment, yet assortment coverage is rather high and represents up to eighty percent of possible market offers. Similarly, routine categories represent rather high share of total retailer's assortment, which is sixty percent on average. Strategic purpose of routine categories suggests that product assignment to this category should enhance the link between new product innovativeness and its performance due to several reasons. First, intense level of competitiveness in this type of categories suggests that competitive advantage and product value is essential for successful performance, thus higher innovativeness is expected to assist new products to successful performance. Secondly, as routine categories represent core purchases and stable buying behavior, perceived risk of new products is relatively higher due to longer consumer learning curve and adaptation (Michael, Rochford & Wotruba, 2003). Thus, higher innovativeness creates an opportunity to differentiate and consequently motivates consumers to shift their choices to more valuable innovative products in comparison to simple adjustments of existing products. Similarly, advantage of more innovative products is expected to create additional value among competition, thus achieve better performance outcome in comparison with less innovative products (Tsai, Huang & Tsai, 2013; Agkun et al., 2007; Szymanski et al., 2007; Nakata et al., 2006; Henard & Szymanski, 2001). Based on the conceptualization of the routine category, its strategic goals, this research associates the routine category as a moderator, with increased importance of innovativeness to successful performance.

Occasional (seasonal) type of categories are used by retailers to increase number of customers and cash flow during specific seasonal demand peaks. Retailers aim to build traffic and transactions to generate the profit with this category role. In addition, it aims create customer's excitement with the use of occasional categories. Also, occasional or seasonal categories change in importance for retailer positioning depending on seasonal or occasional circumstances such as mosquitoes, sun protection or Christmas presents. This category makes a retailer a major category provider to buy products of certain seasonality; therefore demand for this type of category is rather

unstable, and actions within it vary according to demand which is usually short term. Due to its seasonal demand, occasional category role is rotating through different categories. On average, ten to fifteen percent of total retailer's assortment is assigned to seasonal categories. Assortment coverage for this type of categories, on average, is around half.

Following the characteristics of seasonal category role, retailers aim to exploit demand peaks of specific products and categories by encouraging its consumption. Encouragement of consumption is accordingly related to additional marketing actions, such as in-store elements, promotions and more aggressive pricing. Thus, products that are assigned to seasonal category role are expected to experience "lift" effect due to retailer's actions, related to willingness to increase its consumption. However, given dynamics and expedient retailer's attention to overall performance of the category role, which is rather similar to destination category role, innovativeness becomes more important to achieve successful commercialization for products in this category due to the need to differentiate among competition. Therefore, product assignment to the seasonal category is expected to enhance the link between new product innovativeness and its performance.

Convenience type of categories is the fourth role, used in the practice of category management. This type of categories are defined as non-core which allows retailer to offer full service shopping, while customer are enabled to find the necessities at "one stop shop". Convenience categories require the retailer to have a full assortment, but do not represent categories used for differentiation, and it is usual that commodities assigned to this category are rather limited. Convenience categories usually constitute ten to fifteen percent of total retailer's assortment and have limited assortment coverage which is around one third of market offerings. One third of all offerings in the market reflects purposefully built assortment in the category which aims to focus on known products. Retailers usually use convenience categories to build transactions and generate profits, aiming to increase the value of customer's shopping basket. It helps the retailer to provide comfort to the consumer so they can satisfy their needs using one stop, while earning higher profit margins. Consequently, product assignment to the convenience category is associated with suppressed link between new product innovativeness and its performance due to several reasons. First of all, category strategy suggests retailer's willingness to generate profits, ensure convenience in one stop shopping and stimulate impulse purchase. It reflects possible assortment

strategies which aims to have balanced assortments with rather limited, but well known offerings. Secondly, category strategy pursues that customers impulsively buy known products without paying too much attention. Thus, less interest into new products is expected which suggests that new products are less likely to achieve commercial success in this category. Consequently, innovativeness is suggested to be less important for new products assigned to convenience categories, thus the linkage towards performance is suppressed by impact of this category role.

In addition to the discussed retailer's operational activities, category management decisions also include an increased emphasis on private labels in retail (Shocker, Srivastava, & Ruekert, 1994). Private labels are brands owned by retailers and sold exclusively in their stores (DeWulf et al., 2005; Bushman, 1993), which is a considerable part of retail business; hence the importance of private labels in retail strategic decisions is observable. Many international retailers perceive the adoption and diffusion of private labels to be one of their foremost priorities (Baltas & Argouslidis, 2007) in assortment formation. It makes private label management an emerging trend in retail business, influencing both retailers' and manufacturers' businesses, as well as the strategic and tactical decisions of both in the market. Private label strategy is very often highly related to retailers' strategy. Private labels or store brands have become an important part of retailers' business due to the value they are able to offer - fortunate private labels give retailers such benefits as store differentiation, store loyalty, brand enhancement, contributes to traffic building and capturing a higher market share (Burt & Sparks, 2002; Ailawadi, Gedenk & Nelsin, 2001; Corstjens & Laj, 2000; Richardson, 1997). Private labels often generate higher profit margins for the retailer and at the same time offer customers fair prices for products similar to other brands in categories (Hoch & Banjeri, 1993); however these products pose strong competitive threats to national brands (Karry & Zaccour, 2006; Ailawadi & Keller, 2004). Having private labels in assortments increases retailers' bargaining power and contributes to gaining a stronger position in market. Following the benefits that private labels are able to offer, and the increase in their introduction by retailers, private labels are found to appear in an increasing number of categories and penetrate at a much greater pace than manufacturers' brands (Lincoln & Thomassen, 2008; Baltas & Argouslidis, 2007). For these reasons, the strategic importance of private label brands has become more significant for retailers, while being a more relevant threat for owners of manufacturers' brands. Introduction of

private labels is an obvious benefit for retailers, but pose a threat for manufacturers' brands as these activities increase rivalry not only on the retailers' shelves but in the market as well.

As retailers started to increase investments in the quality of private labels, it led to a tendency of increased perceived quality of retail itself. Activities, such as introduction of innovative quality products, application of sophisticated packaging, adaptation of various pricing practices and widening assortments are found to appear in retail (Kumar & Steenkamp, 2007). It consequently increased private label value perception and created increased trust in these brands. On the other hand, it provoked a more intense rivalry between private labels and branded products. It is acknowledged that emphasis on private labels has significantly changed category management decisions in retail. For example, a study by Dhar, Hoch & Kumar (2001) reveals that the presence of a private label is associated with strong category performance. In addition, research by Sethuraman & Gielens (2014) unveiled the impact of private label products on retailers' category performance. A study indicates that advertising of the category has a significant direct influence on private label performance – the more branded products advertise the more private label sales are found to increase. Obviously, retailers are taking advantage of the ability to recognize branded products and guiding customers' attention to private labels. It is acknowledged that private labels often adopt a copycat strategy, which is supported by marketing activities that do not demand high marketing expenses, such as in-store advertising, premium merchandizing and competitive pricing, retailers are gaining a competitive advantage in comparison to branded products by exploiting the concept of comparison among other products available on the shelves. For example, the concept of comparison is often used to highlight similarities with branded products and enhance the proposition of value that private labels are able to offer.

Consequently, it is suggested that the presence of a private label in the category should enhance the link between new product innovativeness and its performance, which is related to few explanatory factors. First, retailers are willing to induce competition for branded products by placing private label into attractive categories to generate higher profit margins (Hoch & Banjeri, 1993). Thus, retailers are willing to promote private labels over branded products to generate higher sales and margins, hence exploit its resources to prompt own products, which creates negative economic climate for performance development of branded products. Secondly, the induced

competition has a direct negative effect on performance of branded products (Karry & Zaccour, 2006; Ailawadi & Keller, 2004). Therefore, a general direct negative effect on performance suggests that higher innovativeness is more important for new products that are present in the categories where private label exists because it helps to differentiate among competition, including private label products. Better performance of more innovative products is also associated with competitive advantage, which was also outlined by previous studies (Agkun et al., 2007; Szymanski et al., 2007; Tsai, Huang & Tsai, 2013; Nakata et al., 2006; Henard & Szymanski, 2001). Thus, higher innovativeness of new products contributes to delivery of improved performance because it allows exploiting newness as competitive advantage to overcome rivalry of commoditized private labels. Yet, if the new product in the category is less innovative, it is more likely it will not be able to overcome competition of private labels due to lower propensity to differentiate among competition and due to retailer's actions to promote private labels. Thus, performance of more innovative new products are suggested to be less vulnerable by impact of private labels in retail.

Based on previously conceptualized knowledge of the role of retailer category management decisions – new product performance studies, this dissertation suggests that different category roles as well as the presence of private labels have diverse moderating effects on innovativeness – performance linkage.

### 1.3. Conclusions for theoretical development

Theoretical development of this dissertation aimed to reveal and discuss the main theories and research in the field of interest. Performed analyses of the existing literature suggest the following findings, based on which this research is framed and hypotheses are justified:

1. This research deconstructs product innovativeness, which distinguishes among different levels of newness that has already been presented in previous research. Although many methodologies exist, a lack of consistency is present in the theory. Literature often distinguishes between two notions – radical and incremental innovations, but these types are acknowledged to be incomparable, as many mediocre innovations are lost in the scale, thus effects are not identified. For further conceptualization of innovativeness in this dissertation, level of newness is defined using methodology provided by Garcia & Calantone (2002). It characterizes and distinguishes five levels of newness, namely radical, really new, incremental, discontinuous and imitative innovations. It is also acknowledged by previous studies that different levels of product newness are expected to follow diverse performance paths (Damanpour & Schneider, 2009; Michael, Rochford & Wortruba, 2003), which highlights the importance to use complex independent variable.
2. As the central relationship of this study, the dissertation explores the role of innovativeness in performance and concludes that inconsistency in the research area exists – results vary from positive, negative to no effect at all. There exists two paradigms in the explanation of innovativeness – performance linkage – relation to value creation and relation to possible risk. Some studies assume (Tsai, Huang & Tsai, 2013; Agkun et al., 2007; Szymanski et al., 2007; Nakata, Im, Park & Ha, 2006; Henard & Szymanski, 2001) that more innovative products are expected to deliver a more successful performance than less innovative products; innovation is associated with the ability to deliver economic value and growth which leads to its competitive advantage in the market. Some studies, on the contrary assume that more innovative products are associated with higher uncertainty of new technology (De Brentani & Reid, 2012; Kleinknecht & Van Der Panne, 2012; Song & Thieme, 2009; Boulding & Christen, 2003; Kessler & Chakrabarti, 1999) and

longer learning curve for all stakeholders (Sethi, 2002; Kusunoki, 1997) that are related to higher risks to successful market entry.

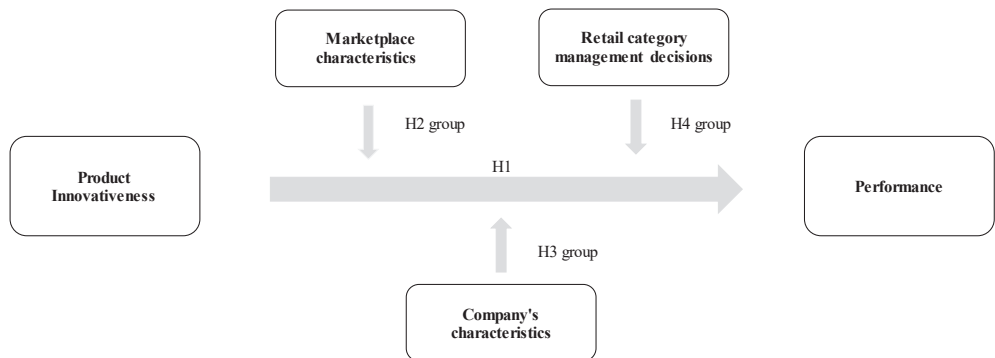
It is also indicative that inconsistency might be associated with the previously addressed direct linkage from various perspectives in different contexts. Theoretical development of this dissertation concludes that the innovativeness – performance linkage cannot be evaluated unilaterally, thus it is assumed that previous contradictory results between innovativeness and performance can be conditioned by a lack of explanations concerning contextual effects.

3. Previous studies have attempted to explore non-directional moderating effects to several types performance linkages (Garcia-Zamora, Gonzalez-Benito & Munoz-Galego, 2013; Jarowski & Kohli, 1993), thus exploration of directional moderation is a consequential development of the research area. It is assumed that moderation is expected to play an important role in defining performance antecedents and is able to contribute to the explanation of contradictory findings in the area of research.
4. There exist many previous studies that explored the factors contributing to the performance of new products: this research distinguishes among four major groups of variables that are found to have an impact on performance, namely product advantage, company characteristics, nature of the marketplace and role of retail. It defines commercial environment and is associated with either favourable or non-favourable economic climate that affects new product performance and exposes role of innovativeness in specific context. However, as indicated, findings of previous studies remain contradictory. Therefore, a clear gap, related to moderating role of commercial environment, is identified. Moderation approach in research is recommended and also found to be used in case of inconsistency in previous findings (Baron & Kenny, 1986).
5. In line with previous studies that addressed antecedents of performance, this research distinguishes three major groups of moderators (marketplace characteristics, companies' characteristics and retailer category management decisions) that are already acknowledged as direct predictors of performance, and are defined as key characteristics of the commercial environment that need to be addressed. Therefore, mentioned variables are suggested to moderate the linkage between innovativeness and performance.

## 1.4. Structural model and hypothesis

In this research two types of linkages are explored, namely role of different levels of product innovativeness on its performance and the moderating role of the commercial environment on the linkage between innovativeness and performance. Following the aim of this study, the research hypothesizes that contextual factors that are defined as commercial environment moderate the link between product innovativeness and its performance. In Figure 7 (developed by the author), a conceptual model of this research is presented.

**Figure 5. Conceptual research model**



In the theoretical development of the dissertation, several linkages that are of interest to this research were identified. First, this research addresses the link between innovativeness and performance. Following existing findings that are rather contradictive, this research aims to explore this link and bring clarity to the research area. Secondly, as indicated in Figure 7, three groups of commercial environment factors were distinguished as moderators after the literature review. These groups of variables are well acknowledged to have a direct impact on performance. Yet, knowledge on their role as moderators is limited to high extent. Encouraged by existing research gaps in the area, this dissertation suggests that the indicated groups of variables that define a commercial environment have a moderating effect on the link between innovativeness and performance. Hereafter, the hypotheses for the research are formulated. Following the conceptual model, which is presented in Figure 7, this research aims to advance the existing knowledge in the area of new product performance studies by revealing the role of the commercial environment to the

innovativeness and performance linkage. In order to disclose the proposed relationships among constructs, hypotheses are formulated and justified against existing literature.

The central relationship of this study is a direct linkage between innovativeness and performance. Despite the vast amount of research performed in the area, research (Stanko et al., 2015; Rubera & Kirca, 2012; Szymanski et al., 2007; Henard & Szymanski, 2002) has indicated that the concept of innovativeness and its relation to performance is not yet fully understood. Yet, despite the attempts to conceptualize the linkage between innovativeness and performance, the results of previous studies remain contradictory. Some studies (Calantone, Chan & Cui, 2006; Kleinknecht & Cooper, 1992) in the field have reported no significant linkage, while others (Stanko et al., 2015; Daneels & Kleinknecht, 2001; Gatington & Xuareb, 1997) reported a moderate positive effect. This study follows the philosophical stance that associates higher innovativeness with an additional value creation as competitive advantage in the market; hence a differentiation among competitors is expected to lead to improved performance. Studies (Chang et al., 2014; Duhamel & Santi, 2012; Rubera & Kirca, 2012; Sorescu & Spanjol, 2008; Song & Parry, 1999; Hultink & Robben, 1999; Hultink, 1998; Zirger, 1997; Firth & Narayanan, 1996; Kleinknecht & Cooper, 1991) have acknowledged that innovativeness is a direct predictor of performance on an organizational level yet lacks explanation on a product level. Despite a focus on organizational performance, some research (Chang et al., 2014; Rubera & Kirca, 2012; Sorescu & Spanjol, 2008), which revealed innovativeness to be antecedent of positive performance, suggests that radical innovations have a stronger impact on performance in comparison to incremental innovations. Likewise, prior studies (Atuahene-Gima, 1996; Yap & Souder, 1994; Mever & Roberts, 1986) proved the innovativeness and performance link on a product level to be significant, reporting the same higher newness – improved performance outcome.

This research associates higher innovativeness with improved performance outcome due to several reasons. First, innovativeness is considered as a key feature of a new offering which represents product advantage. Product advantage is subsequently associated with higher perceived value for the customer; thus the higher perceived value that leads to a better performance result. Secondly, innovativeness plays a central role in differentiation in comparison to existing offerings in the marketplace. Thus, the greater ability for product to differentiate in the marketplace,

the better competitive advantage is created. Superiority over competitive offerings, as an advantage in the marketplace, is anticipated to deliver better performance outcome. Consequently, based on previous research in the field, and encouraged by the contradictive findings in regard to the innovativeness – performance linkage as well as the lack of studies concerning the innovativeness – performance linkage on a product level, this research suggests:

*H 1: Innovativeness is a direct predictor of performance. The more innovative the product, the better the performance is anticipated to be.*

In the theoretical development part of this dissertation, antecedents of new product performance were explored and discussed. Prior studies mainly addressed the direct linkage between various predictors of performance and its outcome, yet scholars (Lin & Chang, 2012; Evantschitzky et al., 2012; Talke & Hultink, 2010; Szymanski, Kroff & Troy, 2007; Henard & Szymanski, 2001) have asked for clarification in regard to contextual and moderating effects on the linkage between innovativeness and performance. This research also assumes that previously discussed contradictive results between innovativeness and performance might be caused by a lack of explanations concerning contextual effects of commercial environment, which may result in diverse findings, presented previously.

As discussed in Section 1, previous studies (Evantschitzky et al., 2012; Cooper & Kleinschmidt, 2007; Henard & Szymanski, 2001; Cooper & Kleinschmidt, 1995; Montoya – Weiss & Calantone, 1994) have addressed and indicated critical drivers of new product performance. Findings reveal that new product success is partly determined by factors related to the commercial environment. Market value, size and its potential (Cooper & Kleinschmidt, 2007; Henard & Szymanski, 2001; Cooper & Kleinschmidt, 1995; Montoya – Weiss & Calantone, 1994) is found to be a direct predictor of performance – it is suggested that the higher the market potential, the better the performance is anticipated to be. In addition, studies (Tsai, Huang & Tsai, 2013; Carbonell & Rodriguez, 2006) have confirmed that market potential, usually identified in terms of its value and size, has a positive direct impact on new product performance. Likewise, higher market potential is associated with higher demand due to a higher number of potential adopters, which is a reflection of a positive economic climate. Positive economic climate thus enables a new product to achieve better performance result in comparison to markets or categories that have lower growth and value potential. Yet, explanations in regard moderating role of market conditions to the

linkage between innovativeness and performance are rather limited. Only a few studies (Garcia-Zamora, Gonzalez-Benito & Munoz-Gallego, 2013; Kohli & Jarowski, 1990) have shown that market conditions have the potential to strengthen or weaken the linkage towards performance.

In this study, the term “market value” is used to define category sales value in market in terms of its monetary value. Category sales value in a market and in retail channel is treated as commercial environment characteristics. Category sales value in market and in retail channel reflects a category of substitutable products that meet similar customer needs and is treated as a single unit. The theoretical proposition, related to moderating role of category sales value in market and in retail sales channel follows previous conceptualizations, thus explains: a) higher sales value in market is a direct as well as moderating predictor of performance, associated with higher demand and positive economic climate; b) with increasing sales value in market, performance is also expected to improve; c) sales value in market has the potential to strengthen the link between innovativeness and performance, which is related to possible new product differentiation that allows to create a competitive advantage among competition. Thus, this study suggests that:

*H 2a: Higher category sales value in a market should reinforce the link between new product innovativeness and its performance.*

*H 4a: Higher category sales value in retail should reinforce the link between new product innovativeness and its performance.*

Consequently, in the relationship between innovativeness and performance, increasing sales value in market or category is proposed to enhance the linkage to performance. Higher innovativeness becomes more important in high sales value categories and markets because of competitive advantage, which more sophisticated innovation is able to deliver, and thus differentiate among competition.

Similarly to category sales value potential, category competitiveness is defined as another important characteristic to define marketplace as commercial environment. Yet, contrary to market potential conceptualizations, previous studies (Tsai, Huang & Tsai, 2013; Song & Parry, 1997; Cooper, 1979) have acknowledged that competitive intensity is a considerable barrier to successful performance. As outlined in theoretical development of this dissertation, prior studies have mainly focused on the direct linkage between competitive intensity and performance. There were only a few attempts (Garcia-Zamora, Gonzalez-Benito & Munoz-Gallego, 2013; Kohli & Jarowski,

1990) to conceptualize it as a moderator, so was revealed its negative impact towards performance. Previous studies relate more intense competition with more difficulties for innovation to make a breakthrough. Hence, worsened performance is anticipated due to high competition. Previous studies (Tsai, Huang & Tsai, 2013; Steenkamp & Gielens, 2002; Frazier & Lassar, 1996) have also shown that competitive intensity is directly related to new product performance, yet in a negative way.

Following previous conceptualizations, this research associates competitive intensity with performance barriers. Intense competitive situation in a market or on retail category level induces internal rivalry and consequently more intense competitive response to new product introduction which is associated with negative economic climate. Therefore, role of competitive situation as a moderator between innovativeness and performance suggests that innovativeness becomes more important to achieve successful new product performance in the context of intense rivalry.

Thus, given the evidence that competitive intensity is shown to be a direct negative predictor of performance, it is hence is treated as a performance barrier. However, in intense competition higher innovativeness – performance linkage is more important for commercial success due to product advantage, which is originates from higher innovativeness and allows competing more successfully. Consequently, the study suggests:

*H 2b: Higher category competitiveness in a market should enhance the link between new product innovativeness and its performance.*

*H 4b: Higher category competitiveness in retail should enhance the link between new product innovativeness and its performance.*

Similarly to the marketplace conditions towards new product performance, company's characteristics are recognized as an important new product success predictor. A study by Cooper et al. (1994) acknowledges that a new product process takes place in an organization environment, which contributes to the ability to operate in the marketplace successfully. In the theoretical development of this dissertation, company's characteristics were mainly outlined as direct predictor of performance due to existing research gaps. Previous studies (Wang, 2008; Hermann, Tomczak & LaBahn, 2006; Garido-Rubio & Polo-Redondo, 2005; Matear, Osborne, Garrett & Gray, 2002; Atuagene-Gima, 2001; Cooper, 1998; Urban & Hauser, 1993; Hultink &

Robben, 1999) have conceptually established a direct linkage between company characteristics and performance.

Specifically, studies have concluded that company's size, its age, portfolio width, competitive strength and other similar factors are related to performance. For example, based on Hermann, Tomczak & LaBahn (2006), company size is a direct predictor of performance - the bigger the company, the better the commercial result is achieved. The finding is possibly related to superior reputation and extensive resources and capabilities that are possessed by larger companies. Likewise, previous studies conclude that company's characteristics are associated with the strength of the company and its reputation in the market, usually in terms of market power, perceived superiority, greater resources and capabilities, which enables new product to achieve commercial success easier. In addition, Hultink & Robben (1999) associate broader product assortment with improved performance and suggest that the broader the product assortment a company has, the better the market acceptance for new products is expected. This dissertation thus proposes that innovativeness is then less important because new products are already predetermined to better acceptance in the market. Despite the existing content of previous studies that mainly focused on direct impact of company's characteristics to performance, there have also been a few attempts to evaluate its role as a moderator. Previous research (Gonzalez-Benito & Munoz-Gallego, 2013; Augusto & Coehlo, 2009; Gatington & Xuareb, 1997; Liu, 1995) has addressed company characteristics as a moderator and revealed that market power and superior reputation are able to contribute positively to the link towards performance, which is also explained by relating large companies and better acceptance of new products.

Consequently, based on previous research findings that related company size and improved new product performance, this research suggests that higher company sales value and portfolio width (defined as monetary sales value and number of products represented, respectively) are also indirect predictors of new product performance. Accordingly, company's characteristics, such as sales value in the market and retail channel, as well as company portfolio width are the reflections of a company strength and its competitive position in the marketplace. The stronger the competitive position of a company, the more the company is associated with superior reputation, greater resources and capabilities, which enable it to achieve commercial success easier. Thus, mentioned characteristics are able to contribute to better new product

acceptance in the market. The proposition suggests that higher innovativeness – improved performance linkage is suppressed, as role of innovativeness becomes less important due to overall good market acceptance of new products, which is conditioned by company's superior reputation. Thus, company's characteristics are expected to have a negative moderating effect on innovativeness – performance linkage, assuming:

*H 3a: Higher company sales value in the market should suppress the link between innovativeness and performance.*

*H3b: Higher company sales value in the retail channel should suppress the link between innovativeness and performance.*

*H 3c: Larger company portfolio width should suppress the link between innovativeness and performance.*

Regardless of company size, which is acknowledged to be a predictor of performance, previous research enhances the role of company's capabilities in terms of marketing investment it is able to provide to new products. Years ago, studies (Garrido-Rubio & Polo-Redondo, 2005; Cooper, 1998; Urban & Hauser, 1993) proved that marketing expenditures are related to commercial success. This dissertation also acknowledges the importance of marketing support yet from a different angle that has not fully been explored to date. A study by Bloom, Gudlach & Cannon (2002) indicated that companies that cooperate with retailers as potential outlets for their products are expected to pay various slotting fees as trade marketing support, especially during the new product launch. In addition, trade marketing support for products on the shelves is recognized as an important part of the retail business revenues (Wilkie, Desrochers & Gundlach, 2002). Thus, it has become an important antecedent of successful new product performance. Also, a study by Everdingen et al. (2011) suggests that higher trade marketing support increases chances to launch a new product more successfully, which results in anticipation of commercial success.

Likewise, this research suggests that innovativeness – performance linkage is also related to the value of trade marketing investment to retail channel, as higher innovativeness products tend to require larger investments into marketing. It helps to communicate new product competitive advantage to potential adopters. Also, previous studies suggest that less innovative products, which own minor improvements are easier to commercialize in comparison to more radical innovations. For example, a study by Sethi (2002) relates innovation success with customer learning process and

indicates that higher innovativeness products require longer learning process. Also, the adoption of such products is more complex and involves the need to facilitate the customer learning curve. The longer learning curve also involves organizational capabilities, such as re-consideration of technological, strategy, communication and processing of information, a study by Kusunoki (1997), concludes.

Thus, organizational resources, in terms of trade marketing support in retail, are suggested to moderate the linkage between innovativeness and performance positively. Following discussed rationale, this dissertation associates higher trade marketing expenditures, which is required for higher innovativeness products to alleviate the learning process, with improved commercial performance. Trade marketing support in retail channel reflects company's capability to invest into a new product, and thus communicate the innovation across the units of interest accordingly. Encouraged by the reasoning provided by previous studies and the lack of explanation between retail trade marketing support and new product performance linkage, this research suggests:

*H 3d: Higher trade marketing support, invested in the retail channel, should enhance the link between innovativeness and performance.*

This research also acknowledges the importance of retail operations in regard to successful new product commercialization. As outlined in theoretical development of this dissertation, studies (Fornari, Grandi & Fornari, 2009; Calantone & Griffith, 2007) reveal that new product performance is very much dependable on commercial environments, especially their ability to exploit external counterparts - network of distributors. This dissertation specifically addresses the role of retail category management decisions in new product performance because of findings of previous research (Gruen & Shah, 2000; Dupre & Gruen, 2004) that indicate that the practice of category management has become a tool to manage retail operations.

A study by Dhar, Hoch & Kumar (2001) explores factors that predetermine strong category performance in terms of category management decisions and indicates that assortment, feature advertising and strong private label contribute to successful category performance in retail. On the basis of previous category management decisions – performance studies, this research suggests that retail category management decisions, such as assignation to categories with specific roles and strategies, and presence of private labels, are capable of affecting new product performance in diverse patterns.

However, studies have paid limited attention to the category management decisions – performance linkage, especially in regard to retail category roles. It is identified that this area has a high potential for contributions due to existing research gaps, as suggested by Everdingen et al. (2011). A few attempts (Everdingen et al., 2011) to conceptualize the category role – performance linkage indicate that the importance of the category to retailer has resulted in improved performance of products assigned to that category. In addition, Glynn (2007) suggests that category differences and management from the retail point of view, which is associated with category importance to retail, are expected to have an impact on single products that form the category.

It is assumed that performance of new products that are assigned to specific categories is predetermined by specific retail activities in regard to different categories based on their strategies and objectives. For example, the aim of the destination category is usually to enhance the retailer's image, build traffic and transactions, as well as form excitement for the customer. This category role reflects the retailer's strategy, which usually aims to become a primary category provider. Everdingen et al. (2001) suggest that the destination category is treated as a key category role for the retailer, having the aim to differentiate and deliver value to the customer through it. In addition, the performance of the destination category is usually excelled by additional actions in retail, such as better visibility, wider assortment, more promotions, etc.

This research associates destination category role with strategic importance to retailer due to its definition to reflect retailer's strategy and thus for retailer to become a primary this category provider to consumers. For this reason retailer uses various tactics to advance the category itself, either the products assigned to this category. Therefore, products assigned to this category are expected to experience direct "lift" effect, which can be defined as positive economic climate that enhances performance. In addition, more emphasis of destination category performance development, which is related, with wide coverage of available assortment, by retailer is expectedly related to more intense competition and a need to differentiate which leads to successful performance. Hence, destination category role is expected to strengthen the link between innovativeness and performance, as innovativeness is more important for commercial success in this category role due to competitive advantage of new product. Estimating the importance of the destination category to the retailer as well as considering possible strategies and actions that are used to alleviate performance of

this type of category, as well as the need for new product to differentiate among competition, this research suggests:

*H 4c: Product assignation to the destination category should enhance the link between new product innovativeness and its performance.*

Routine or core category role represents a rather high share in retailers' assortments, which, according Nielsen (2006) is around fifty to seventy percent. This percentage indicates the importance and weight of this type of category in terms of the value delivered. Routine categories are usually used for transaction building, as well as cash and profit generation. Consequently, the retailer aims to become one of the preferred category providers for this category with a choice of assortments inside the category, which also induces rivalry and thus the need to differentiate, inside the category. Routine category role is usually assigned to higher value categories which are important to retailer due to generation of sales and profit. This research associates routine categories with high potential and high consumption rate categories which usually contain intense competition due to available assortments. Thus, higher innovativeness becomes more important due to competitive advantage it is able to create, and consequently differentiate among competition.

This type of categories are expected to have twofold effect on new product performance. First, high potential of these categories generate stable demand which benefit performance of new products. Secondly, wide assortment coverage induces rivalry inside the category which makes innovativeness more important for differentiation. Consequently, this research suggests:

*H 4d: Product assignation to the routine category should enhance the link between new product innovativeness and its performance.*

Occasional or seasonal category role represents categories that have unstable yet high during peaks demands due to its seasonal importance. Retailers use this type of category role to create excitement, build traffic, transactions and generate profit during demand peaks. Assortment strategy and marketing plans for category performance are very much related to the concept of destination category, namely wide assortment choice, high extent of promotions and visibility of the category. Due to unstable and usually short-term demand, retailers exploit the category by using additional tools of merchandising, as well as promotions to increase its visibility and undertake seasonal demand. In addition, as outlined, assortments are adjusted to meet the customers' demand. Given the concept of the category (Nielsen, 2006), retailers expect to be

treated as major category providers on given occasions. Thus, this type of category has discussed similarities with destination categories in regard to its strategic purposes which also induces more intense rivalry inside the category which is beneficial for retailer. Given the commercial environment, created by seasonal category role, new product innovativeness becomes more important to reach commercial success due to ability to create competitive advantage and differentiate among competition.

In this research, seasonal category role is suggested to be able to enhance the link to performance of more innovative new products due to its importance to retailers. This category role aims to exploit demand peaks during specific occasions, thus retailers adjust their strategies accordingly- extend assortment, review merchandizing and provide promotions in order to become primary category provider during the season. Consequently, products that are assigned to seasonal categories, are expected to experience “lift” effect which has impact on their performance. Higher level of innovativeness is expected to alleviate successful performance in this category role due to ability to create competitive advantage and differentiate among competition. Thus, it is suggested that:

*H 4e: Product assignment to the seasonal category should enhance the link between new product innovativeness and its performance.*

Convenience categories are mainly used by retailers to build transactions and generate profit. This category role represents retailers’ willingness to have a full assortment so the customer can find all necessities in one place. It helps the retailer to provide comfort to consumers so they can satisfy their needs using one shop stop. According to industry studies (Nielsen, 2006), this category usually represents limited assortment of commodity products, but with higher prices and accordingly higher profit margin for retailer and is also related to impulse buying behavior. Category tactics, such as limited assortment with higher item’s prices to generate the margin are expected to have negative impact on new product performance. Negative effect is also related with consumer’s ability to purchase specific items elsewhere, and impulse buying. Thus, higher innovativeness becomes less important to achieve commercial success in convenience categories due to retailer’s assortment and pricing tactics, as well as consumer behavior when choosing products assigned to this category role. Hence, based on the category conceptualization and its strategic purposes, this research suggests that:

*H 4f: Product assignation to the convenience category should suppress the link between new product innovativeness and its performance.*

As discussed previously, retail category management decisions also include increased emphasis on private label development. Based on previous research, many retailers perceive that private label development is one of their foremost priorities (Baltas & Argouslidis, 2007; De Wulf et al., 2005; Shocker, Srivastava & Ruekert, 1994). Based on previous research (Burt & Sparks, 2002; Ailawadi, Gedenk & Nelsin, 2001; Corstjens & Laj, 2000; Richardson, 1997), private labels contribute to retail business development in many ways, namely store differentiation, loyalty, enhancement of the brand, contribution to traffic building, which results in strategic importance due to expected and deliverable performance, market share results. It is found (Hoch & Banjieri, 1993) that private label products generate higher profit margins, while being able to offer fair prices to the consumer. However, given the importance of private labels to the retailer, it is also acknowledged (Karry & Zaccour, 2006; Ailawadi & Keller, 2004) that these products pose a competitive threat to branded products and weaken their performance in the category due to rivalry moving from retail shelves to the overall marketplace.

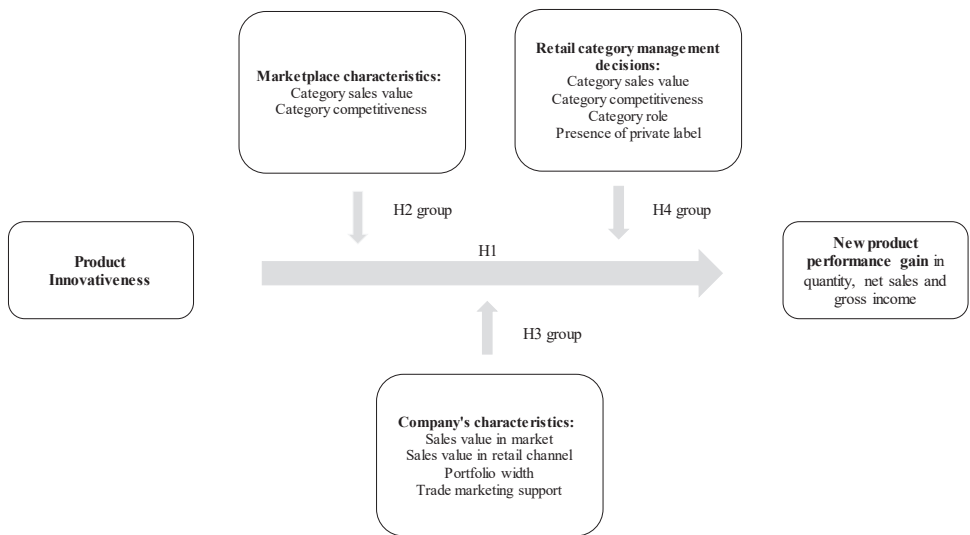
Following previous studies in the field that remark on the importance of private labels in retail, this research associates presence of private label with negative effect on new product performance due to several reasons. First, retailers adopt private labels in more attractive categories and it stimulates intense competitive threat to branded products due to its strategic importance to retailer, as retailers are willing to patronize private label over branded products. Secondly, private labels impose copy-cat strategies over branded products which reflects in pricing, design and merchandizing tactics that aim to motivate consumers to substitute branded products with private labels. Third, retailer's investments into development of private labels in order to increase its perceived quality arouse convergence between private labels and branded products which also evokes negative effect on new product performance in categories, where private label exists. Thus, it is more complicated for new branded products to achieve commercial success in categories where private label is present. However, if the new product is innovative enough, it is more likely for it to achieve commercial success due to additional value it is able to create which leads to competitive advantage in comparison to less innovative product. Thus, this research suggests that it is easier for more innovative products to compete with commoditized

private labels. Consequently, higher innovativeness becomes more important in categories where private label exists in order to reach commercial success. Accordingly, this study suggests that:

*H 4g: The presence of a private label in the category should enhance the link between new product innovativeness and its performance.*

A detailed theoretical model, which outlines the suggested hypotheses of this research, is presented in Figure 8 (developed by the author). As indicated, this study mainly focuses only on the moderating relationship, not direct effects, in order to delineate the set of variables and research question more accurately.

**Figure 6. Theoretical research model**



Following the theoretical research model based on the existing literature review, the hypotheses of this study are summarized in Table 11 to answer the research question and address the existing research gaps.

**Table 11. Summary of hypothesis**

Hypothesis linkage	Proposed direction
H1: Innovativeness to Performance	Positive direct
H2a: Category sales value in market to Linkage between Innovativeness and Performance	Positive moderating
H2b: Category competitiveness in market to Linkage between Innovativeness and Performance	Positive moderating
H3a: Company's sales value in market to Linkage between Innovativeness and Performance	Negative moderating
H3b: Company's sales value in retail to Linkage between Innovativeness and Performance	Negative moderating
H3c: Company's portfolio width to Linkage between Innovativeness and Performance	Negative moderating
H3d: Trade marketing support to Linkage between Innovativeness and Performance	Positive moderating
H4a: Category sales value in retail to Linkage between Innovativeness and Performance	Positive moderating
H4b: Category competitiveness in retail to Linkage between Innovativeness and Performance	Positive moderating
H4c: Category role destination to Linkage between Innovativeness and Performance	Positive moderating
H4d: Category role routine to Linkage between Innovativeness and Performance	Positive moderating
H4e: Category role seasonal to Linkage between Innovativeness and Performance	Positive moderating
H4f: Category role convenience to Linkage between Innovativeness and Performance	Negative moderating
H4g: Presence of private label to Linkage between Innovativeness and Performance	Positive moderating

## **2. THE RESEARCH METHODOLOGY**

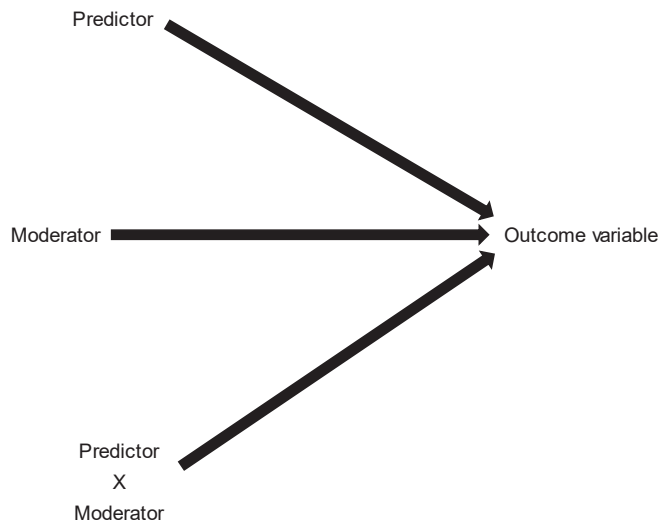
### **2.1. Research design**

Research design is the substance of the research that allows the goal and objectives that were set to be addressed. It is a crucial element for implementation of empirical research. According to Grunow (1995), research design is defined as an essential tool for planning, substantiation and guidance in research procedures. In addition, research design is delineated as a consequence of research objectives, theoretical development and the research context. Research design defines various methodologies that can be considered in regard to the concept of the study. Studies outline possible designs, such as observational, descriptive, correlational, and experimental or review in regard to research questions and hypotheses (Graziano & Raulin, 1993). Research design is also defined as a planning device which allows the research components and procedures to be structured (Grunow, 1995) around the research question (Grunow, 1995). A study by Grunow (1995) outlines the ideal process of research design. Initially, research questions are set in regard to theoretical, practical or methodological interests. Afterwards, theory building is performed, addressing previously accumulated knowledge and experiences. Based on the theoretical framework, research design is performed. It consists of clarification of the general approach, main elements, implementation plan and expected practical obstacles. Finally, practical realization is performed, namely research and analysis.

This study aims to conceptualize the moderating role of commercial environment in the link between product innovativeness and its performance. This dissertation uses moderator model (based on Baron & Kenny, 1986), as presented in Figure 9. Moderation model, as the central axis of this research was chosen due to several reasons – first, as presented in the theoretical development of this dissertation, there is a lack of evidence on moderating role of commercial environment to the link between new product innovativeness and its performance. Current state of research clearly indicates the area as a potential research gap which is encouraged to be addressed. Secondly, based on Baron & Kenny (1986), moderation model is useful to be applied for research, where relationship between predictor and criterion variables are weak or inconsistent. Similar conclusion was presented in regard to innovativeness – performance linkage as rather contradictive findings were presented by previous

research in the area. On the contrary, mediation is usually applied for relationship which is strong between predictor and criterion variables. Third, this research aims to reveal how the link between product innovativeness and its performance is influenced by the context of the commercial environment. Thus, moderation model is employed due to its ability to indicate, based on Baron & Kenny (1986), how the direction or strength of relationship is changed by introducing additional variables which specifies appropriate conditions for its operation.

**Figure 7. Moderator model**



In this research, a commercial environment is simulated using real life marketplace and sales transactions data, treated as secondary data. For this reason, quantitative approach was chosen for the study, which is expected to quantify and later conceptualize the results. There are several reasons for choosing a quantitative approach for this research - first, it is important to present the results in a statistical manner, which would allow the importance of different variables and groups variables to be shown within the model. Second, the results of this research are intended to be presented using a mathematically grounded forecasting model (decision tree), which can later be used as a practical tool to predict the potential of newly launched products. Hence, the statistical expression of variables and the conditional importance of these variables is an important aspect, which can only be shown objectively by using a quantitative research approach. The decision to use a quantitative approach for the

study is also grounded in previous research in the area. According to Kiesling, Gunther, Strummer & Wakolbinger (2012), mathematical modeling of innovation diffusion is still relevant in various aspects. Despite the constant interest in this area of research, a quantitative approach is still the most commonly used methodology for predictive analytics since Fourt & Woodlock (1960); Mansfield (1961) and Bass's (1969) models were created. Likewise, it is acknowledged (McMillan & Sally, 2010) that quantitative research provides results in statistical expression, which allows subjectivity and researcher biases to be minimized.

As discussed, the aim of this research is to reveal the causal effects between product innovativeness and its performance, and to additionally explore the moderating role of commercial environments in the link between independent and dependent variables.

The empirical research aims to address the following objectives:

1. Evaluate the overall applicability of the proposed conceptual model;
2. Empirically test the relationship between the constructs presented in the conceptual model;
3. To prove the moderating role of commercial environments on the linkage between product innovativeness and its performance empirically;
4. Create a decision tree that can serve as a managerial tool to forecast the performance of newly introduced product innovations.

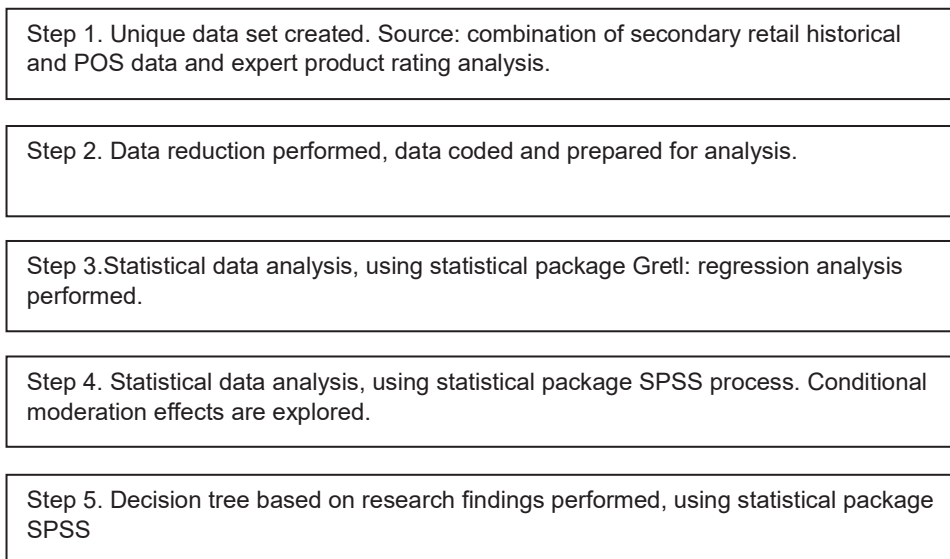
This research consists of several parts, namely theory building and empirical analysis, and consequently aims to answer the research goal and objectives. The theory building, which addressed previously performed studies in relation to the constructs of interest, was presented in a previous part of the dissertation. Hereafter, the research process is described in three major steps, which are outlined as the research design of this study.

First, the theoretical framework and conceptual model are presented, which mainly differ in their details. The theoretical framework delineated the main concepts that are addressed in the study as well as the suggested relations among it. The conceptual model outlines the main constructs and variables that are used in the study, as well as presents the hypotheses. The theoretical framework and research model are justified by an in-depth literature review and exploration, which are provided in Section 1 of this dissertation. In addition to the research model, the hypotheses are justified in the

existing literature. Secondly, operationalization of variables that are used in the research is provided. Operationalization of variables is also a reflection of previous research and existing knowledge in the area, yet are specifically unified for this particular study. It allows the operationalization of each variable in the research, as well as definition and understanding of its nature. Third, data collection is performed.

The data collection procedure allowed a unique data set to be created for this research. Following the theoretical lenses of the study and its methodology, the strategy for data collection was created by taking several aspects into account. First, the nature of the research, which is of a predictive analytics type. Second, the type of data that is used is mostly secondary data that represent real life commercial decisions and their consequences in regard to financial new product performance. Third, the research aims to not only conceptualize the proposed links and advance marketing theory, but also to provide a managerial tool, which can be used to predict performance paths of newly introduced products. Consequently, based on the research concept, research strategy and respective actions were identified are *presented in* Figure 10 (developed by the author).

### **Figure 8. Strategy of empirical research**



Initially, the type of data to be used in the empirical research was determined. It was decided to use real life transactional sales data for several reasons. First, many studies in the field use questionnaires that are mainly addressed to particular decision makers, hence perceived performance is usually evaluated. This research defines performance in financial terms, and therefore it is important to collect objective performance results which are later analyzed. Secondly, this research aims to contribute to marketing knowledge by explaining the role of the commercial environment in new product innovativeness - performance linkage, which is a rather complex topic. Due to this reason, this research employs a mix of primary and secondary data, which are later analyzed using different statistical techniques.

As explained in Figure 10, initially, a unique data set is created. It consists of a combination of primary and secondary data. Primary data are used to operationalize product innovativeness, hence an expert judgement technique is employed. Secondary data are used to operationalize commercial environment, therefore for this reason marketplace data are used. For operationalization of the dependent variable, namely new product performance, actual POS sales data are employed. After data reduction, an analysis is performed. Analysis is done using several statistical programs, namely Gretl and SPSS. Finally, a decision tree is created which serves as a tool to forecast new product performance on the basis of particular environmental settings. The process, described above, enables the planning and structuring of the research, as well as its implementation. Consequently, in the next chapters, the research framework is presented, the hypotheses are discussed against previous literature findings and research gaps, the methods and process of data collection and operationalization of variables are presented and discussed.

## **2.2. Empirical context**

In the theoretical development of this dissertation, the role of innovativeness, commercial environment and retail in product innovation commercialization was unveiled. Likewise, the importance of retail was considered relevant for the setup of an empirical study due to its importance. Therefore, the Lithuanian pharmaceutical retail industry was chosen as the field of interest for this study.

In regard to the scope and field of this research, it is important to indicate the level of global innovation index which is applied to Lithuania, as empirical context of the study. The international innovation index measures innovation of the country, which reflects innovation activities, its acceptance and encouragement by both business and government. The study ranks both innovation input and output, as a measure to the ranking. Consequently, this index is an indicator of both business and consumer behavior, related to innovation acceptance. Based on Global Innovation Index (2018), Lithuania ranks at 40<sup>th</sup> position in the list which is the lowest in all Baltic States. Comparatively, Latvia ranks at 34<sup>th</sup> and Estonia at 24<sup>th</sup> position out of 126 countries. Also, in comparison Switzerland, Netherlands and Sweden are the leaders in the Global innovation index list. More specifically, based on Global innovation index for both innovation input and output, Lithuania ranks at 36<sup>th</sup> position on innovation input and 44<sup>th</sup> position on innovation output. Comparatively, Latvia ranks at 35<sup>th</sup> position on innovation input and 38<sup>th</sup> position on innovation output, while Estonia 26<sup>th</sup> and 17<sup>th</sup>, respectively. The results of Global innovation ranking (2015), in comparison, show that in 2015, Lithuania ranked at overall rating at 38<sup>th</sup>, while for innovation input ranked at 35<sup>th</sup> position and for output ranked at 42<sup>nd</sup> out of 141. Results show that Lithuania, as the country specific empirical context of the study experienced general rating decline by moving from 38<sup>th</sup> to 40<sup>th</sup> when comparing 2015 and 2018, reports of Global Innovation Index. The results of Global Innovation ranking (2018) and its comparison to previous years suggest that Lithuania, as a context for this research, can not be defined as leader in both innovation input and output, thus business and consumer willingness towards innovation acceptance can be limited.

In addition to country specific context of this study, pharmaceutical retail set up was chosen for several reasons as the secondary empirical context. First, pharmaceutical retail is highly regulated in the Lithuanian market, thus the retailer is a real representation of a “gate keeper” to end consumers and the effect of the commercial environment is more clearly detectable in comparison to other industries. Twofold regulation exists in this area – state healthcare agencies regulate distribution and competition of over the counter and other medicines. In addition, it is recognizable that manufacturers that choose retail pharmacies as distribution channels stick to it due to willingness to position their brand image as “pharmacy products”. This applies to food supplements, medical devices and dermatological cosmetics, sold exclusively in retail pharmacies. Secondly, the chosen retailer from which the data are obtained allowed

exploration of its internal data for research purposes. This allows this research to present conclusions drawn from real life situations. Sales transactions data increases the validity of the study, and makes the study exceptional by offering the opportunity to simulate real life data. Third, pharmacy products are usually sold in a pharmaceutical retail channel due to twofold regulation, which is represented by several retailers in the Lithuanian market. Therefore, this reason allows the study to avoid sales fluctuations originating from the presence of diversity of sales channels.

The data for this study and analysis originated from several sources and constitute a unique data sample. First, the independent variable – the level of product innovativeness – was evaluated using expert judgement, namely retail product group managers who are responsible for overall product category performance and new product listings to retailers' assortment. Secondly, the dependent variable – the end customer of the retailer's panel sales data was used to observe the performance of each product innovation.

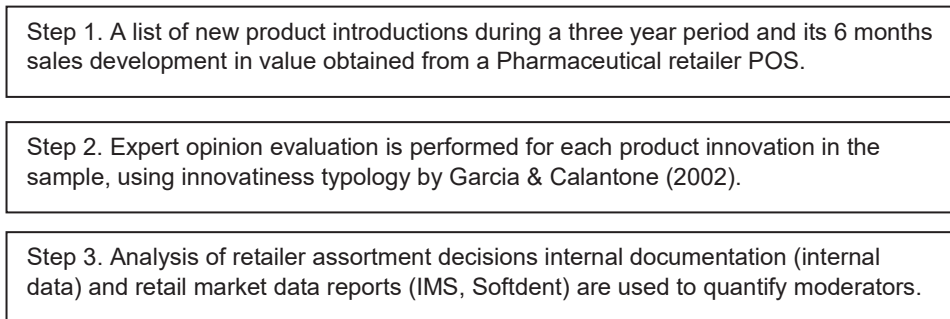
### **2.3. Data collection and operationalization**

One of the aims and differentiation angles in comparison to previous research was creation of a unique data sample. It allowed the study to gain a conceptual difference in methodology comparatively to existing studies in the field. The data sample was created using two data sources – primary and secondary data. Expert opinion evaluation was used as a primary data source to measure the level of innovativeness for a new product, which is the independent variable of this study. Secondary data were used to quantify elements of the commercial environment and track performance of product innovations in the sample, which represent the moderating and dependent variables of this study.

Data collection and the sample creation procedures were divided into several steps (as previously indicated in Figure 10). In the first step of data collection, a list of all new products that were introduced into the retailer's assortment during the period 2012 - 2015 was analyzed. Data was drawn from an internal data warehouse, using the retailer's reporting system. The initial sample consisted of 3015 new products (stock keeping units, abbr. SKU) that were listed in the retailer's assortment during a three-year period, which was explored by the study. Secondly, expert opinion evaluation was performed to conceptualize the level of innovativeness for each item in the sample. A

scale provided by Garcia & Calantone (2002) was used to operationalize innovativeness. In addition, as a third step, analysis of the retailer's internal documentation was performed to quantify variables that are used in the research. Moreover, market data reports were used to quantify marketplace conditions.

### **Figure 9. Procedure to data set creation**

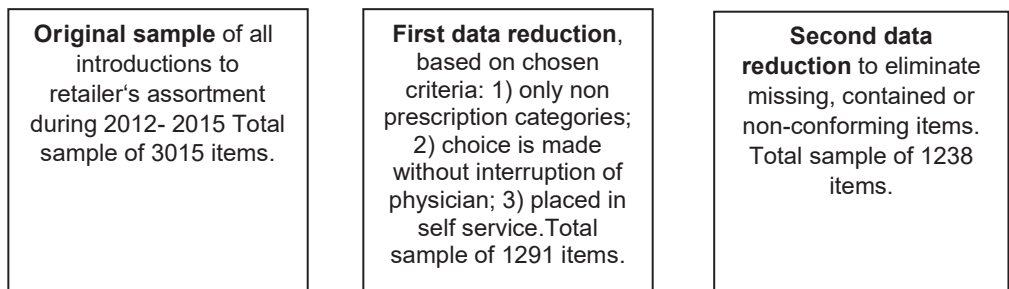


As presented in Figure 11, historical data records for each product introduction were stored in the retailer's internal reporting system. Finally, analysis of internal documents of category management processes and market data analytics was performed to compute a group of moderating variables. Each item in the sample is assigned with different variables – categorical, which identifies the nature of an innovation and numerical or categorical, which define the characteristics of the commercial environment. More detailed information on primary and secondary data collection, as well as operationalization of variables, is discussed hereafter.

The data was collected and later aggregated during several steps procedure. As the first step of data collection, creation of an initial sample was performed, which was later developed based on the research design and its methodology. Initially, a list of all introductions to the retail channel was obtained from an internal data warehouse, which consisted of 3015 new product introduction cases. After the primary data reduction, the unit of analysis was reduced to 1291 introductions. Primary data reduction was done based on the following criteria. First, items that were suitable for analysis were defined as “product innovations” that represented non reimbursed medications categories, such as over the counter drugs, medical devices, food supplements and cosmetics goods. Items that were used in the study were also defined as “consumer decision oriented”. Decision making to choose a particular item represented no or little influence by third party recommendations or prescriptions, such

as physicians. Secondly, all items in the sample were supposed to be merchandized in self-service assuming that customers are given the ability to make the decision among other available competitors in the category. After initial data reduction was performed, a substantial share of new items was drawn from the sample. Consequently, the sample consisted of 1291 new introductions. Afterwards, a second stage of data reduction was performed followed by list wise deletion to eliminate items that contained missing values. Finally, 1238 items were left for complete case analysis, which was distributed among 98 categories as outlined in Figure 12 (developed by the author).

**Figure 10. Development of the sample**



In this research, the dependent variable is new product financial performance withdrawn from the retail POS system, which represents actual sales transactions. A six-month launch period was chosen to be observed for each item in the sample, defined as six month sales after introduction to the retailer's assortment. As a tool to quantify the results, a cross sectional data analysis methodology was employed for the empirical research because of the nature of the data. This approach was chosen for several reasons: first, the data set was very diverse, and therefore a common comparable variable was needed; secondly, the initial dependent variable was of a longitudinal nature, and therefore it had to be compressed into a constant value to conform to cross-sectional data. Data were treated as cross sectional because only the dependent variable is longitudinal and other variables are of a fixed nature.

Based on the theoretical development of this dissertation, a conceptual research model was created and presented. Variables, used in the conceptual model, were operationalized based on their theoretical importance, discussed in previous research and existing scales in order to measure them in an objective manner. Variables that are used in the study, and their operationalization in reference to previous research,

are presented in Table 12 (developed by the author). It aims to conclude all variables used in the study, define their nature, and identify a scale for measurement in reference to previous research from which it was adapted.

**Table 12. Variables, operationalization, and data sources**

Variable		Scale	Operationalization	Reference
<b>Dependent variable</b> Financial performance	Financial, sales gain in quantity, net sales and gross margin, calculation during time periods	Financial gain, actual numerical	Financial performance measured in quantity, net sales and gross income gain during observed period	Brenner (1994) Johne & Snelson (1988)
<b>Independent variable</b> Innovativeness	Innovativeness typology	Radical, Really new, Discontinuous, Incremental, Imitative innovations	Product innovativeness classification	Garcia & Calantone (2002) Fornari, Grandi & Fornari (2009)
<b>Marketplace factors:</b> market-related, moderators	Numerical variables	Category sales value in market Category competitiveness	Monetary value of category in market Number of products in category in market	Nielsen, A.C. (2006) Cooper et al. (1994) Carbonnel & Rodriguez (2006) Steenkamp & Gielens (2002)
<b>Category management decision factors:</b> distribution channel-related moderators	Numerical variables and categorical variables	Category sales value in retail Category competitiveness Category role Presence of private label	Monetary value of category in retail Number of products in retail category Name of category role assigned by retailer If private label is present in the category	Nielsen, A.C. (2006) Hultink & Robben (1999) Carbonnel & Rodriguez (2006) Steenkamp & Gielens (2002) Frazier & Lassar (1996) Cooper et al. (1994)
<b>Company related factors:</b>	Numerical variables	Sales value in market Sales value in retail	Monetary value of supplier portfolio in market and retail	Nielsen, A.C. (2006) Hultink &

Supplier characteristics-related moderators		Portfolio width  Trade marketing support	Number of products in supplier' portfolio Monetary investment into marketing services to retail channel	Robben (1999)
<b>Control variables</b>	Categorical variables	Seasonality of the product Supply exclusivity	If product is seasonal If supplier is exclusive to retail channel	Berkowitz (1986) Hultink, Griffin & Robben (1997)

First, the independent variable is defined. After the literature review was performed, measurement of this variable was chosen among scales proposed by Booz-Allen Hamilton (1982), Garcia & Calantone (2002) and Fornari, Grandi & Fornari (2009). A scale of innovativeness measurement is used, proposed by Garcia & Calantone (2002) which originates from research by Booz-Allen Hamilton (1982), and was replicated and validated by other studies, such as Fornari, Grandi & Fornari (2009). The scales of innovativeness aim to depict the level of newness among five levels of newness. Data on the level of innovativeness for items in the sample are obtained from expert judges who are defined as market experts. Experts in the study are responsible for new introductions to the retail channel, as well as the listed share of items in the sample, being responsible for specific category development and category management decisions within it. Secondly, the dependent variable, defined as financial performance, is chosen to be measured in financial terms due to its objectivity and comparability. Addition sets of variables, such as category management strategic, tactical decisions and suppliers' characteristics are taken from internal company data or market data, the source of which is SoftDent – data gathered in the pharmaceutical industry.

This research also includes two control variables – seasonality of the product and supply exclusivity. First control variable is seasonality. Seasonality is subject to definition of market conditions and is mainly related to different purchase and product life cycles (Berkowitz, 1986). Seasonal demand profiles (Berkowitz, 1986), which are related to rather short business cycles, are found to be related to sales variation, unstable earnings, diverse capitalization costs, increased inventory costs or skewed work force levels which have to be addressed by management decisions. In addition, seasonality is a measure of product usage, suggesting an unstable demand and level

of interest. Thus, is related to fluctuating demand and higher success rates for seasonal products, also is acknowledged as a key element in performance (Berkowitz, 1986). This research associates product seasonality with unstable demands which induces consumption peaks. Respectively, consumption peaks are willing to be exploited by market players due to its increased potential. Given the short business cycle as a commercial constraint for performance of seasonal products, however demand peaks during the season, it is suggested that seasonal products can be related with better performance due to willingness to exploit the peaks properly, and thus induce higher success rates of new products.

Second control variable is supply exclusivity. Supply exclusivity is one of the organizational decisions that characterize the supplier in terms of distribution model. According to previous studies (Coelho, Easingwood & Coelho, 2003; Thornton & White, 2001), distribution is considered to be a key marketing variable that enables companies to develop a competitive advantage in the marketplace. A study by Hultink, Griffin & Robben (1997) suggests that launch decisions, including distribution strategy, have a different impact on performance and is hence defined as a strategic decision of new product commercialization. For example, a study by Coelho, Easingwood & Coelho (2003) suggests that multiple channel strategies can expose the company to negative outcomes, such as customer confusion if the offer reaches the market at a different price level. In addition, a multiple channel strategy is defined as time consuming, which requires additional resources and investments and is suggested to induce loss of strategic flexibility. However, the study by Coelho, Easingwood & Coelho (2003) suggests that use of multiple channels may not necessarily ensure stronger sales performance over a single channel, although it may help to create balanced sources of business, which in a way indicates that clarification is needed in regard to the distribution decisions – performance linkage. On the contrary, Hultink, Griffin & Robben (1997) suggest that use of a single or exclusive distribution channel is a predictor of new product success. Dutta et al. (1995) define exclusivity as a single channel adoption when one hundred percent of sales are being generated from a single channel. For example, a study by Hultink, Griffin & Robben (1997) suggests that the choice of a single distribution channel over a mass market, especially for niche innovations, is a direct antecedent of successful new product performance. Thus, it is, able to bring sales economies due to centralization and more expedient reach of potential adopters. It also helps to avoid channel conflict as well as diverse offering

perception from the customer's point of view, which may be influenced by unilateral decisions by the retailer, as suggested by a study performed by Coelho, Easingwood & Coelho (2003).

#### **2.4. Measurement of independent variable**

As discussed in the section of the variables' operationalization, primary and secondary data were combined in this research. Experts' opinions, and their rating of product innovation typology, was a source of primary data which was elicited from field experts, operating in the area of pharmaceutical retail. It is clear that the knowledge a company possesses is one of the most important assets it owns, which in a way is managed by dedicated employees, and experts in the field. The literature defines expert intelligence as an asset, which requires continual verification within the scope of its correctness and effectiveness (Michalczyk & Trupa, 2010). In accordance to previous research (Althoff, Auriol, Barletta & Manago, 1995), it can be facilitated to collect information for diagnosing, classification, forecasting, evaluation, interpretation, planning, designing, teaching, knowledge, and experience management. The methodology of expertise is able to provide knowledge on real life case events, based on experts' experience, knowledge and opinions, which as mentioned are especially valuable for classification and evaluation purposes. Due to applicability of expert judges' methodology to the question of this research, it was chosen as appropriate methodological tool to evaluate new product innovativeness.

Methodology of expert judges was employed to define and operationalize independent variable, namely level of innovativeness for new products in the sample. This approach was chosen due to several additional reasons. First, a sample of experts was chosen to reflect the intelligence of the marketplace. Experts in the study are responsible for all commercial operations that are related to listing a new product assortment, as well as managing suppliers' relations, negotiating supply conditions, performing market and category evaluations, forming retailers' assortments, followed by planning category activities. Evaluation and estimation of the unit of analysis was done by decision makers responsible for specific commercial operations, which allows ensuring objective product evaluation, and thus reliable results of the study. Experts were chosen based on purposive sampling, targeting assortment listing decision makers in the retail channel from which other data for the study were obtained.

Purposive sampling was chosen because of the heterogeneous knowledge experts could provide. Additionally, the chosen experts were expected to have a comprehensive knowledge and understanding of the topic under research.

Field experts that met the chosen criteria were asked to assign product innovation type for each newly listed product during the observation period. Experts were chosen based on the following criteria: i) working in the company no less than 5 years (being responsible for new product listings); ii) have product group manager responsibility; iii) took the decision to list new products based on category and market assessment. Each of the participants had worked in the company for more than 5 years in the position of category group manager, were responsible for new product listings, category analysis, performance tracking and assortment management. The expert group consisted of 6 product group managers (as identified and detailed in Table 13, developed by the author), who were directly responsible for new product listings during 2012-2014. Responses were taken after first data reduction, on an individual basis.

**Table 13. Details of expert group**

Expert	Years in company	Title	Responsibilities	Items ranked
Expert 1, RG	8 years	Product group manager	Assortment management in given category, new product listings, category analysis and reviews, performance tracking on the category and item level	54
Expert 2, EK	6 years			114
Expert 3, VK	6 years			25
Expert 4, IZ	5 years			733
Expert 5, JP	10 years			140
Expert 6, RJ	4 years			225
Total				1291

Respondents that qualified as market experts were asked to rank each newly introduced product using a scale by Garcia and Calantone, which defines level of newness. A validated scale by Garcia and Calantone to evaluate alternatives was provided to the experts. Initially, the quality of evidence in the expert opinion evaluation was ensured by a pilot study, which was held prior to real data collection to ensure understandability and clarity of the research instrument. A list of 20 randomly chosen items were pretested with two experts, using a scale by Garcia and Calantone. The aim of the pilot study was to understand if the task and the scale in use were

understandable. Based on questions raised during pre-testing, a list of questions and answers (Q&A) was developed and later used as recommendations for typology evaluation. The scale was pretested, and the decision to make a Q&A explanatory chart was taken, which was later used as a matrix to rank product innovations. Secondly, a clear definition of the scale was provided to experts, and supervision during the ranking was done by the author of this dissertation. Ranking of each item was done by separate reasoning on an item level, following the procedure communicated before ranking. Reasoning was performed by possible analogies, on certain, in this case, category levels. During evaluation, experts were asked to rank each item according to a given scale in accordance to their opinion. All cases of introductions were independent and recorded real events; thus, they were evaluated separately.

Each expert later received a list of products that they introduced into an assortment, alongside the product's introduction day, manufacturer, category and subcategory. The data table was enclosed with Garcia & Calantone's (2002) innovativeness classification matrix, as well as an explanation of definitions that were used in the matrix. Subjects were asked to evaluate a list of given product innovations at the moment of introduction to assortment, provided by a data collection supervisor. Prior to the study, respondents were educated on the study's research objectives and other relevant information. Experts were asked to evaluate the level of innovativeness for each given product on a given list. Specific definitions and research questions were communicated, recommendations for assessment given, pattern for evaluation given, as presented before. Respondents were asked to assign value from the given scale, reflecting a given innovation typology in regard to products in the pharmaceutical market, selling channel and particular category. Quantitative assessment using a developed pattern was done, and numerical rating provided as an evaluation outcome.

Although it is acknowledged that a small sample expert opinion might be associated with bias, inconsistency, and questionable magnitude of the effect, the expert judgements technique was chosen for this research. Due to the specifics of the research question, as well as the research design, this methodology was applied due to its good applicability for the study concept and set up. Despite the limitations of using an expert opinion evaluation, indicated by Armstrong (1985) who suggests that expert opinion alone is not of much value for forecasting and generalizing therefore does not bring much value. However, to address the possible limitations, secondary

data are added to the model to obtain higher accuracy of the problem that is under research.

## **2.5. Measurement of dependent variable**

This research aims to reveal role of commercial success antecedents as a group of moderators to innovativeness – performance linkage. Performance or commercial success measurement is one of the most highly debated areas in many fields that distinguish between two major streams – financial and non-financial indicators. Existing methodologies of performance measurement follow quantifiable or subjective measurements, which refers to the evaluation of new product outcome. As discussed, due to the set-up of this research and the nature of the data that is being used for empirical research, a focus on the financial outcome was chosen. It allows measurement of the dependent variable as an essential tangible result of performance and avoids biases.

Previous studies (O'Dwyer & Ledwith, 2009; Kleinknecht & Van Der Panne, 2012; Cooper & Kleinschmidt, 2007; Moorman & Miner, 1997; Cooper & Kleinschmidt, 1994) have attempted to conceptualize new product performance measurement methodologies by dividing it into several categories. Typology of performance measures distinguishes five major categories: i) market-level measures; ii) financial measures; iii) customer measures; iv) product-level measures and v) timing measures. In addition, typology presented by O'Dwyer & Ledwith (2009) suggests that new product performance should be evaluated in a versatile way. Other studies (Kleinknecht & Van Der Panne, 2012; Cooper & Kleinschmidt, 2007; Moorman & Miner, 1997; Cooper & Kleinschmidt, 1994) have also focused on success indicators for new products, similarly dividing it into financial and non-financial outcomes. Based on previous studies (Kleinknecht & Van Der Panne, 2012; Cooper & Kleinschmidt, 2007; Moorman & Miner, 1997; Cooper & Kleinschmidt, 1994), in Table 14 (based on Kleinknecht & Van Der Panne, 2012), major indicators of commercial success are provided.

**Table 14. Indicators of commercial success**

Type	Indicator
Financial	Attaining break-even point
	Product sales
	Profit margin/profitability
	Percentage of total sales generated by newly introduced products
Non-financial	Market share
	Customer acceptance
	Meeting initial performance objectives
	Innovative products' share in product portfolio

It is observable that, despite the number of indicators, both financial and non-financial indicators are generally covering the most important aspects of new product development, namely the results of the product itself as well as the market and customer perspective. Yet, typology of categorization and approach to measurement should be adapted to the research design and set up, as well as be aligned to its concept. However, scholars (Kleinknecht & Van Der Panne, 2012; Cooper & Kleinschmidt, 2007; Im, Nakata, Park & Ha, 2003; Griffin & Page, 1993) who contributed to new product development studies the most argue that customer and financial measures are the core of the new product performance measurement.

In addition to previously discussed methodologies, the Oslo Manual (2005) also indicates that there are several ways to measure innovation performance, namely i) the proportion of sales due to innovative products; ii) the result of innovation effort; and iii) the impact of innovation on the use of factors of production. While the proportion of sales due to innovative products is considered rather low in pharmaceutical retail, and the impact of innovation on its use is usually analyzed for process innovations, which affects factors of production, the second recommendation is adapted for this research. Hence, innovation efforts are evaluated which is also aimed to be comparable among units of analysis. Innovation effort (Oslo Manual, 2005) is recommended to be calculated using preceding periods of innovation performance in comparison to posterior periods to evaluate the gain. In addition to the OECD methodology, a study by Brenner (1994) indicates that the majority of studies that explore performance of newly launched products use financial indicators in absolute or relative terms. For example, sales volume or profits earned (Johne & Snelson, 1988). This also aligns with previous methodologies, suggested by scholars (Kleinknecht & Van Der Panne, 2012; Cooper & Kleinschmidt, 2007) in the field.

As discussed, measuring financial performance allows for the achievement of greater objectivity, is precise and is easily quantifiable (Kleinknecht & Van Der Panne, 2012; Hauschildt, 1991). Hence, for this study, this type of performance measurement was chosen. Performance is quantified using three financial outcomes, which are thought to represent the commercial success of a new product – sales in monetary value, sales volume in quantity and earned profit margin. The following general calculation is used for measure of dependent variables:

*Y = sum of value in period 2 (4-6 months) / sum of value in period 1 (1-3 months), expressed in percentage*

Later on, it is adjusted for each of the three dependent variables of this study, which results in three different models:

- 1. Net sales gain (sales monetary value) = sum of sales value in period 2 (4-6 months) / sum of sales value in period 1 (1-3 months), expressed in percentage*
- 2. Quantity gain (sales volume in quantity) = sum of sales volume in period 2 (4-6 months) / sum of sales volume in period 1 (1-3 months), expressed in percentage*
- 3. Gross income gain (profit margin value) = sum of profit margin value in period 2 (4-6 months) / sum of profit margin value in period 1 (1-3 months), expressed in percentage*

In addition to the objectivity of the methodology that was chosen, this type of performance measurement allows for evaluation of innovation effort as proposed by the Oslo Manual (2005) and evaluation of two periods of performance. The choice of measurement for the dependent variable was also considered based on several criteria, namely: i) the data set was very diverse, and therefore a common comparable variable was needed; and ii) the initial dependent variable was of a longitudinal nature, therefore it had to be compressed into a constant value to conform to cross-sectional data analysis. Data was treated as cross sectional because only the dependent variable is longitudinal and other variables are of a fixed nature. Based on previous studies, it was chosen to address sales value, sales volume and profitability as dependent variables.

The decision was made to use a six month period to evaluate performance outcome. This was based on previous studies in the field. A study by Everdingen et al. (2011), which also explored the adoption of new products in retail, analyzed a sample

of new product adoption decisions. Similarly to this study, a study gathered introduction data for 26 weeks. Following a similar approach, in this study, a period of six months of new introductions and the respective sales are explored. In addition, a new product trial period, which was used by retailer, corresponded to the six-month period.

This chapter discussed and outlined the methodology, in regard to research design, data collection and operationalization. The chosen research design and methodology allowed for the creation of a unique data sample, which was developed by combining primary and secondary data. The next chapter discusses the empirical research results of this study.

### 3. RESULTS OF THE EMPIRICAL RESEARCH

#### 3.1. Approach to empirical research

An empirical approach with a combination of primary and secondary data analysis methodology is used in this research. The unique data sample used in the research outlines marketplace, retail category management decisions and company's characteristics related variables, being complemented by each innovation ranking by experts and financial performance of each product which is obtained through the use of real transactions data in retail. This methodological approach allows this research to maintain objectivity and address research question in a most appropriate way.

This chapter describes the data sample and its characteristics, as well as the data analysis techniques that were used to analyze it. Finally, the empirical research results are presented. The process of empirical research is split into several steps with respective objectives, which is outlined in Figure 13 (developed by the author).

**Figure 11. Approach to empirical research**

<b>Diagnostic tests for the model:</b> Collinearity test Normality of residuals Heteroscedasticity Ramsey's reset test	<b>Regression factor analysis:</b> OLS modeling	<b>Logistic regression for conditional moderating effects:</b> Hayes Process modeling	<b>Decision tree:</b> Decision chart creation
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Initially, conceptual research models are tested by performing diagnostics tests: i) collinearity test, ii) normality of residuals, iii) heteroscedasticity, iv) Ramsey's RESET test. In a second step, overview of regression analysis (ordinary least squares, abbr.OLS) using the statistical package Gretl is performed. Ordinary least squares regression modeling was chosen for several reasons (based on Wooldridge, 2002) - it is highly appropriate for explanatory variables of a fixed nature and stochasticity of explanatory variables. OLS regression is also suggested to be used for large and diverse data samples. Afterwards, the statistical package SPSS is used for descriptive statistics and histograms, SPSS Process is employed for identification of conditional moderating effects. Finally, the empirical research phase is finished with a decision

tree, which is created using SPSS Process modeling. The decision tree is created to be used as a practical tool for forecasting purposes.

Next, in this chapter, the research findings, in regard to sample data justification and its descriptive characteristics, data validity and reliability, model diagnostics, OLS regression analysis and conditional moderation analysis, as well as decision tree are presented.

### **3.2. Sample and data justification**

As discussed in the chapter on the empirical context, the chosen setting for the research is the pharmaceutical retail industry in Lithuania. The total data sample was generated from several sources, such as market reports, internal retailers' data and collected by surveying which was later quantified and prepared for further analysis. The main unit of analysis of this study is the performance of product innovations that were introduced into the pharmacy chain BENU in Lithuania, during a three-year period and its response to the commercial environment.

The data for this research were collected in two rounds during February – May 2016. First, newly introduced innovations were retrieved from internal data warehouse and registered. The data set reported all new items that were listed in the assortment during the observed period. Afterwards, primary data reduction was performed and environmental variables added. The first part constituted a secondary data sample. As a second step, primary data sample was developed. Expert opinion evaluation on each product innovation was performed to collect intelligence on its typology. Finally, an aggregated data sample was created which initially consisted of 3015 observations, which was later reduced to 1238 final case observations and was used for analysis, as was presented in Figure 11, the data collection and operationalization section of this dissertation. The data set consisted of 1238 product innovations, which were distributed throughout 98 categories of consumer goods on a stock keeping unit level after several data reductions were performed. The final data sample represented 41.06 percent of the initial total sample. The literature concludes (based Hair et al., 2010) that the minimum amount of observations in the data set should be one hundred which is required to perform statistical analysis. Consequently, the sample should be large enough to obtain statistical and explanatory power. Composition of the data sample, and data sources are provided in the Table 15 (developed by author).

**Table 15. Composition of data sample**

Variable	Variable type*	Sourcing type	Source	Derived variable
Quantity gain	D	Secondary	Retail panel sales data	Quantity gain type
Net sales gain	D	Secondary	Retail panel sales data	Net sales gain type
Gross income gain	D	Secondary	Retail panel sales data	Gross income gain type
Innovativeness	I	Primary	Expert opinion	
Category sales value in market	M	Secondary	SoftDent market report	
Category competitiveness in market	M	Secondary	SoftDent market report	
Category sales value in retail	M	Secondary	SoftDent market report	
Category competitiveness in retail	M	Secondary	SoftDent market report	
Presence of private label	M	Secondary	Internal retailer's category review data	
Category role destination	M	Secondary	Internal retailer's category review data	
Category role convenience	M	Secondary	Internal retailer's category review data	
Category role seasonal	M	Secondary	Internal retailer's category review data	
Company's sales value in retail	M	Secondary	SoftDent market report	
Company sales value in market	M	Secondary	SoftDent market report	
Company's portfolio width	M	Secondary	SoftDent market report	
Trade marketing support	M	Secondary	Internal retailer's category review data	
Seasonality of the product	C	Secondary	Internal retailer's category review data	
Supply exclusivity	C	Secondary	Internal retailer's category review data	

\* Dependent abbreviated as “D”, Independent abbreviated as “I”, Moderator abbreviated as “M”, Control abbreviated as “C”

As presented in Table 15, variables are of primary or secondary origin and constitute an original data sample. In addition to existing variables, several new variables were derived in order to present a more detailed analysis. Derivate variables were created from the dependent variable, performance gain, which reflected innovation effort during points of time. However, as this dissertation addresses the commercial success of new products, it was important to categorize innovation effort in terms of the performance tendency it delivers to increase the explanatory power of research results. Therefore, dependent variables were categorized using frequency distribution as percentile classification which allows to indicate if performance effort was positive, balanced or negative, in respect to which percentile ranges it was assigned to. The first percentile quarter was defined as “positive gain”, median as “balanced gain” and the third percentile as “negative gain”. In Table 16, a summary of the descriptive statistics for variables used in the study is provided. It indicates variable type, mean, median, minimum and maximum meanings.

**Table 16. Summary statistics of variables, used in the study**

Variable name	Type*	Mean	Std. Deviation	Median	Minimum	Maximum
Quantity gain, %	D	0.5091	0.2066	0.5073	0.0053	1.0000
Quantity gain type	D	2.0016	0.7011	2.0000	1.0000	3.0000
Net sales gain, %	D	0.5079	0.2109	0.5107	0.0000	1.0000
Net sales gain type	D	2.0032	0.7068	2.0000	1.0000	3.0000
Gross income gain, %	D	0.6584	4.7142	0.5206	-17.5850	152.12000
Gross income gain type	D	1.9992	0.7063	2.0000	1.0000	3.0000
Innovativeness	I	2.5436	1.1248	2.0000	1.0000	5.0000
Category sales value in market**	M	2230.0	2091.1	1840.3	9.1103	11442.0
Category competitiveness in market	M	208.930	225.47	95.000	2.0000	918.000
Category sales value in retail**	M	206.84	201.88	138.65	0.0070	846.04
Category competitiveness in retail	M	85.930	102.99	39.500	2.0000	355.00
Presence of private label	M	0.1091	0.3118	0.0000	0.0000	1.0000

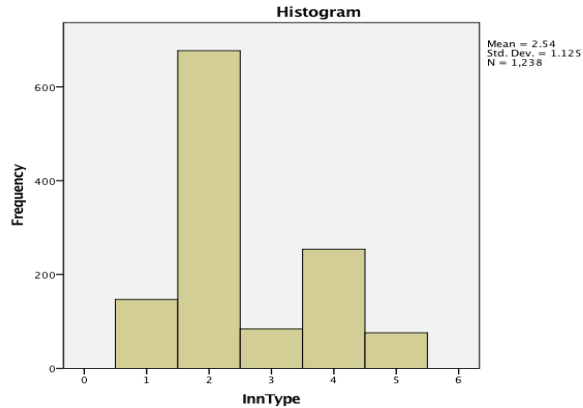
Category role destination	M	0.2633	0.4406	0.0000	0.0000	1.0000
Category role convenience	M	0.0565	0.2311	0.0000	0.0000	1.0000
Category role seasonal	M	0.0525	0.2231	0.0000	0.0000	1.0000
Company's sales value in retail**	M	242.23	381.35	185.83	1.2470	9155.4
Company's sales value in market**	M	2213.9	4048.3	949.96	1.3930	32900.0
Company's portfolio width	M	113.90	83.537	99.000	1.0000	309.00
Trade marketing support**	M	9.4915	8.1747	8.5000	0.0000	40.378
Seasonality of the product	C	0.19952	0.3998	0.0000	0.0000	1.0000
Supply exclusivity	C	0.18174	0.3857	0.0000	0.0000	1.0000

\* Dependent abbreviated as "D", Independent abbreviated as "I", Moderator abbreviated as "M", Control abbreviated as "C"

\*\*In thousands

Hereafter, descriptive statistics are provided for independent, dependent, moderating and control variables. Initially, independent variable is discussed. Afterwards, descriptive statistics for the dependent variable are provided. In Figure 14, a distribution histogram of the innovativeness variable is presented, and Table 17 outlines the distribution frequencies of the dependent variable. It is indicative that the innovativeness variable has a normal distribution, which allows the diversity of the sample to be observed. In addition, the descriptive statistics of this research outline that moderately innovative products represent the majority of the sample, yet based on Michael, Rochford & Wotruba (2003), it is usual that this type of product constitutes the majority of new products, hence it is important to keep the sample close to the representative range of new products.

**Figure 12. Histogram for independent variable**



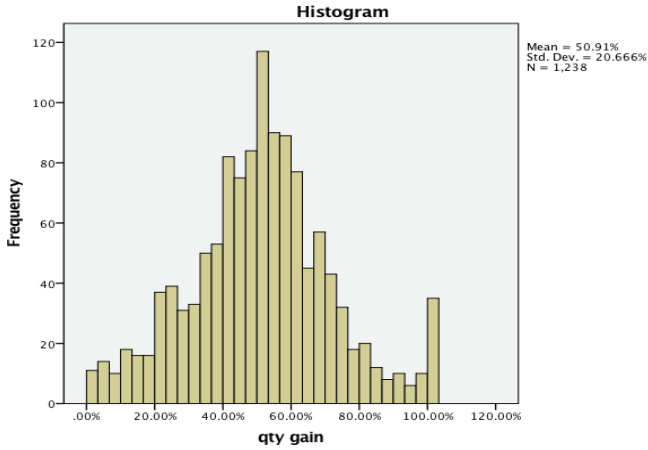
**Table 17. Distribution of frequencies for independent variable**

Innovativeness level	Frequency	Percent
Imitative innovations	147	11.90%
Incremental innovations	677	54.70%
Discontinuous innovations	84	6.80%
Really-new innovations	254	20.50%
Radical innovations	76	6.10%
Total	1238	100%

Below, descriptive statistics for the dependent variables are presented. Initially, histograms are provided and then, distribution analysis is provided for primary dependent variables – sales gain in quantity, sales gain in net sales value and gain in gross income, expressed in percentage. Later, distribution of frequencies is provided, followed by categorized dependent variables – performance was categorized in accordance to positive, balanced and negative gain types. Distribution of frequencies for dependent variables are derived from all primary dependent variables separately.

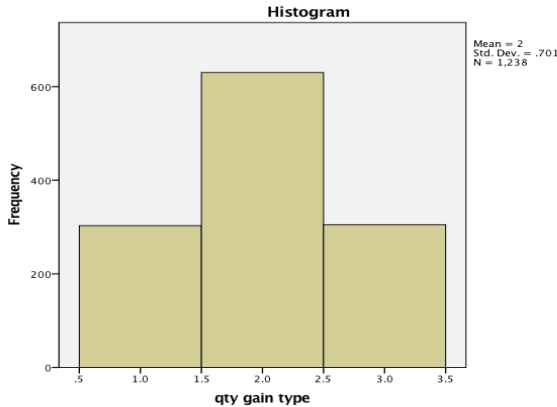
In Figure 15, the uncategorized dependent variable of quantity sales gain is described based on the provided histogram. It is observable that the mean of the sample is 50.19 percent gain with a standard deviation of 20.67 percent.

**Figure 13. Histogram of dependent variable quantity sales gain, uncategorized**



To obtain a more detailed analysis, a secondary dependent variable is created for the quantity sales gain variable. The dependent variable, quantity gain, is categorized based on its performance outcome – positive, balanced and negative. In Figure 16, a histogram for categorized gain type is provided. Distribution of frequencies is provided in Table 18.

**Figure 14. Histogram of dependent variable quantity gain, categorized**

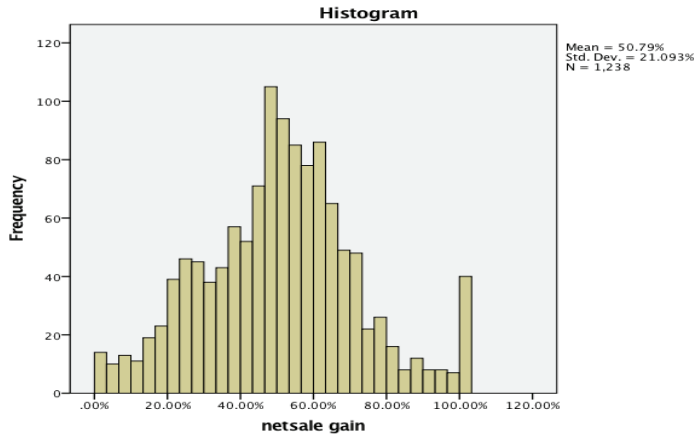


**Table 18. Distribution of frequencies for categorized dependent variable, quantity gain type**

Gain type	Frequency	Percent
Positive gain	303	24.50%
Balanced gain	603	50.90%
Negative gain	305	24.60%
Total	1238	100%

Similarly to the dependent variable, quantity gain, a similar technique was employed for other dependent variables, namely net sales gain and gross income gain. Below, descriptive statistics are provided for the remaining dependent variables. In Figure 17, a histogram for uncategorized net sales gain, expressed in a percentage, is provided. In Table 17, distribution for the categorized dependent variable derived for net sales gain is presented, followed by a histogram (Figure 18).

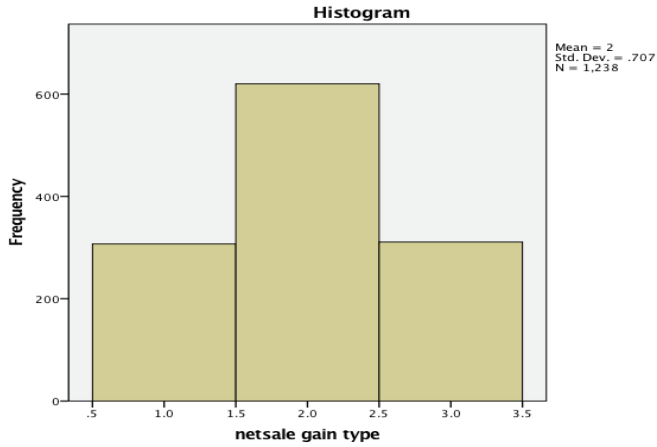
**Figure 15. Histogram of dependent variable net sales gain, uncategorized**



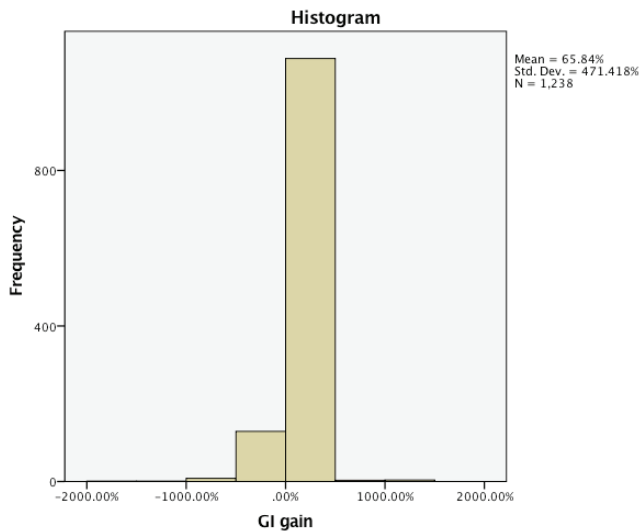
**Table 19. Distribution of frequencies for categorized dependent variable, quantity gain type**

Gain type	Frequency	Percent
Positive gain	307	24.80%
Balanced gain	602	50.10%
Negative gain	311	25.10%
Total	1238	100%

**Figure 16. Histogram of dependent variable net sales gain, categorized**



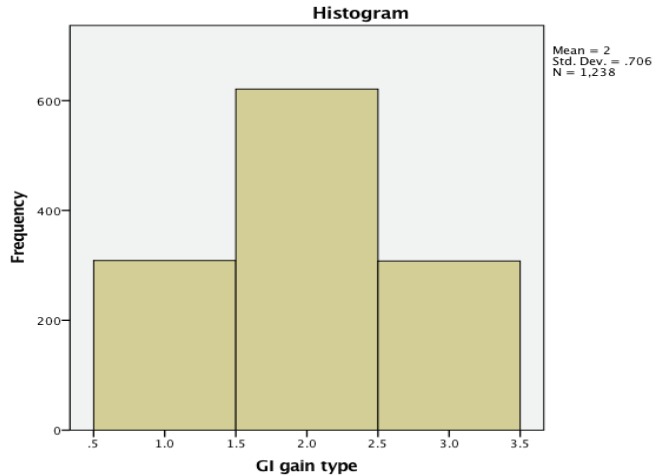
**Figure 17. Histogram of dependent variable gross income gain, uncategorized**



**Table 20. Distribution of frequencies for categorized dependent variable, gross income gain type**

Gain type	Frequency	Percent
Positive gain	309	25.00%
Balanced gain	621	50.20%
Negative gain	308	24.90%
Total	1238	100%

**Figure 18. Histogram of dependent variable gross income gain, categorized**



The data sample, which is original, consists of secondary and primary data. Primary data were used for classifying innovations, hence expert judgement was used based on the chosen scales. Other data that are used in the study is secondary, collected from several sources.

### **3.3. Data validity and reliability**

In this section, the methodological choices are described, also evaluation of strength of evidence, validity and reliability of results are also described. By combining primary and secondary data in this sample, it is aimed to create a unique data pool which would allow the research question to be answered in the most appropriate way. This chapter addresses construct validity and regression diagnostics tests that reflect the validity of the data.

First, to ensure validity of the data, construct validity is discussed. Construct validity reflects the degree to which the test measures what it is intended to be measured (Nunnally & Bernstein, 1994). To properly address construct validity, several methodological steps were already taken in previous chapters. First, the literature analysis outlined the main theoretical constructs used in this research, namely innovativeness, new product launch and commercialization literature, as well as antecedents of new product performance. Secondly, variables that are measured in this study were operationalized, following existing approaches and scales that were

also discussed in the methodology part of this dissertation. These steps ensured appropriate construct validity.

In addition, regression diagnostics, which are applied for validation of secondary data, are performed. Regression diagnostics seek to address the validity of the data, as well as reveal the explanatory power of the model and quantify the relationships among variables. Regression analysis can be used with a sample of 20 observations, while multiple regression requires a sample in the range of 50-100 observations. In this research, the sample consists of 1238 observations, which suggests that adequate sample size requirement is maintained for regression analysis. Consequently, regression diagnostics are performed and their results are discussed. Four tests were chosen to be performed on the data set: i) normality residuals, ii) heteroscedasticity, iii) Ramsey's RESET test and iv) collinearity test aiming to describe the quality of the data sample. In addition, model fit by observing adjusted R-squared is used to evaluate the explanatory power. Model fit is evaluated using coefficient of determinant ( $R^2$ ), which measures the overall strength of the relationship among variables.  $R^2$  ranges from 0 to 1.0 and represents the amount of variance of the dependent variable, explained by the combination of independent variables. In this research, adjusted R-square is used, which reduces the  $R^2$  by taking into account the sample size and the number of independent variables in the regression model.

Scholars (Hu, You & Zhou, 2016; Baltagi, 1996) acknowledge that regression models have been a dominant approach to analyze secondary cross sectional data, and consequently linear regression with the use of ordinary least squares method was also chosen for this research. As a primary step of regression modeling, regression diagnostics is performed. Below, the nature of the tests that were performed for regression diagnostics is described. Osborne (2015) suggests that regression diagnostics allow for the identification of which data points in the sample are outliers or influential cases and which data might impact the overall results due to high leverage. Consequently, based on Osborne (2015), it is important to examine the data prior to further research. In order to evaluate the data sample and initial models, several tests are applied for regression diagnostics:

1. Collinearity test. This test identifies linear combinations among variables in the sample and shows similarities in terms of perfect linear combinations among variables if such exist. It shows that in the presence of multicollinearity, regression estimates can be unstable and have high standard errors;

2. Normality of Residuals. For regression models that employ ordinary least squares, it is important to have normally distributed errors to reduce the bias of the outcome (Osborne, 2015), hence residuals should be normally distributed;
3. Heteroscedasticity (Breauch-Pagan) test. The test of Breauch and Pagan tests whether the variance of errors from regression is dependent on the values of the independent variables. It identifies that residuals should not be heteroscedastic, which otherwise can result in bias in test statistics and confidence intervals;
4. Ramsey's RESET test. This test identifies regression specification errors and is used to test if non-linear combinations of fitted values explain the response variable.

Subsequently, the results of model diagnostics are provided in the next chapter. Diagnostics tests are performed for three models, which are different in their type of dependent variable. Three models outline new product performance in sales gain in quantity, net sales value and gross income earned. For interpretation, normality of residuals, heteroscedacity and RESET tests are expected to reach a value of  $p > 0.05$ , while a collinearity test is expected to reach a value of  $< 10$  for each variable. Results and interpretation of tests are provided in the next chapter.

### **3.4. Regression diagnostics**

Following the research question, theoretical development, conceptualization of models and the nature of the data, this research aims to explore three models with different dependent variables, namely performance effects outlined as new product gain in sales value, quantity and gross income during the six-month observation period. As presented in the previous chapter, for model diagnostics the following tests were performed – collinearity test, normality of residuals, a heteroscedacity test (Breauch – Pagan test), Ramsey's RESET test. Tests were performed using the statistical analysis package Gretl. Model diagnostics was started with collinearity test, which initially revealed rather high variance inflation factors (VIF). Thus, to reduce multicollinearity, all variables in the study were mean-centered. Summary results of models' diagnostics are provided in table below (Table 21) with dependent variables as gain in quantity, net sales value gain and gross income gain.

**Table 21. Summary of model diagnostics**

Model	Model fit	Normality of residuals	Heteroscedacity test	Ramsey's RESET test	Collinearity	Sign. direct effects	Sign. indirect effects
Model 1	0.099	Chi-sq= 6.686, p=0.035	LM/Chi-sq= 90.74, p=0.000	F=3.31, p=0.037	14% variables have values above 10	7	5
Model 2	0.097	Chi-sq= 3.698, p=0.157	LM/Chi-sq= 73.79, p=0.000	F=0.98, p=0.373	14% variables have values above 10	9	4
Model 3	0.003	Chi-sq= 368263.06, p=0.000	LM/Chi-sq= 12132.46, p=0.000	F=21.26 p=0.000	14% variables have values above 10	0	2

Model diagnostics revealed several issues that are taken into consideration for further research development and implementation of empirical research. First, collinearity tests are performed for all models. These aim to reveal a correlation between predictor variables in a regression model. It is revealed that all initial models have collinearity problems, which results in 70 percent of total variables to have values above 10. OLS regression analysis results with non-mean centered variables, for both models, are presented in Annex 3 and Annex 4. Collinearity test for initial models revealed issues with inflated variance factors. Having a significant part of the predictors have a value above 10, variables in the data set were mean centered. However, it is recognized that extreme collinearity is observed if values are above 20. Table 22 summarizes and compares collinearity among variables.

**Table 22. Summary of collinearity test**

Predictor	Variance inflation factors, before mean centering	Variance inflation factors, after mean centering
Innovativeness	7.087	2.250
Category sales value in market	23.429	5.908
Category competitiveness in market	18.297	4.377
Category sales value in retail	51.504	15.177
Category competitiveness in retail	11.818	13.333
Presence of private label	7.739	1.588
Company's sales value in market	11.669	1.841
Company's sales value in retail	19.604	2.486

Company's portfolio width	13.053	1.772
Trade marketing support	8.990	1.413
Category role destination	14.053	2.049
Category role convenience	10.234	1.553
Category role seasonal	5.129	1.128
Category sales value in market × Innovativeness	32.423	7.082
Category competitiveness in market × Innovativeness	18.036	5.654
Category sales value in retail × Innovativeness	47.633	13.537
Category competitiveness in retail × Innovativeness	n/a	13.675
Category role destination × Innovativeness	13.391	2.049
Category role convenience × Innovativeness	10.125	1.553
Category role seasonal × Innovativeness	5.155	1.128
Presence of private label × Innovativeness	6.585	1.786
Company sales value in market × Innovativeness	10.430	1.804
Company sales value in retail × Innovativeness	17.129	2.324
Supplier portfolio width × Innovativeness	14.650	2.319
Trade marketing support × Innovativeness	11.453	1.601
Seasonality of the product	9.908	1.879
Supply exclusivity	8.744	1.533
Supply exclusivity × Innovativeness	7.422	1.744
Seasonality × Innovativeness	10.015	1.782

As presented in Table 22, many of variables in the models before mean-centering have values above 10, which indicated collinearity problems. However, meaning above 20 is considered to be critical in terms of collinearity. If collinearity is high, it is indicative that some of the variables explain the same variance in the dependent variable, which reduces the statistical significance of the model. However, multicollinearity is expected not to reduce the prognostic power of the model. Model specification included moderators which are conditioning higher collinearity. Variables that are moderators and have additional interaction with innovativeness are observed to have higher collinearity. It is expected that multicollinearity, which is present in all three models, is caused by a high number of interactions because of the nature of the model, which aims to address moderating effects. However, variables were mean centered to avoid insignificance for several variables due to inflated errors.

Secondly, model fit was evaluated for all three potential models. It revealed the percentage of variation that is explained by a model, specifically nine percent for the first and second models, but zero for the third model. Also, model fit was evaluated for direct effects only. Tests revealed first model and second model's fit of eight percent, the third model had model fit remained zero percent. This comparison indicates the role moderating effects which are found to increase explanatory power among variables.

Third, normality of residuals is evaluated. It differs within each model and is satisfactory for Model 2 as  $p > 0.05$ . Yet, Model 1 and Model 3 does not qualify for normally distributed residuals, having  $p < 0.05$ . Due to the large sample in this research, it is indicative that residuals are of normal distribution, which limits unexplained variation in the model.

Fourth, a heteroscedacity, Breauch-Pagan test is performed which is applied to ordinary least squares residuals. The results revealed that for all three models, the p value is below expectations, meaning that residuals are heteroscedastic. Hu, You & Zhou (2016) suggest that with the presence of heteroscasticity, its existence has to be addressed properly because it may result in inefficient estimation of regression coefficients and biased estimators of covariance. Having a value of  $p < 0.05$  suggests that error variances are not equal, and hence indicates that heteroscedacity in regression exists. However, the results might be influenced by the large and diverse sample which consists of a high number of observations and high number of predictors. Yet Hu, You & Zhou (2016) indicate that in practice, random errors are often heteroscedastic, especially in large secondary data sets. Baltagi (1995) also suggests that heteroscedacity does not affect the consistency of the estimators.

Fifth, Ramsey's RESET test is performed which indicates whether a model's specification functional form is adequate. For Model 2, Ramsey's RESET test resulted in  $p > 0.05$ , which is satisfactory, especially for Model 2, where  $p = 0.37$ . Result for Model 1 is rather marginal, and for Model 3, the p value is below the expected boundary.

In addition to model diagnostics, the magnitude of significant effects within each model was calculated. As indicated in Table 21 above, Model 1 has a total of twelve significant effects, seven significant direct and five significant moderating effects. Model 2 has a total of thirteen significant effects, nine significant direct and four significant moderating effects. However, Model 3 has only two significant effects, both significant moderating effects, but none significant direct effects.

After model diagnostics were performed, several outcomes were revealed – first, Model 1 and Model 2 have good model fit which is nine percent. Yet Model 3 diagnostics revealed model fit to be zero percent. Second, normality of residuals and Ramsey’s RESET tests meet satisfactory criteria for Model 2, is marginal for Model 1, but not acceptable for Model 3. Third, the heteroscedacity, Breauch-Pagan test does not meet satisfactory criteria for any of the models, but it can be explained by the large and diverse data sample, which consists of a large number of observations (DiStefano, 2002). In addition, it is also acknowledged (Nye & Drasgow, 2011; Lei & Lomax, 2005) that the parameters of model diagnostics, especially in regard to chi-square evaluation, is highly dependent on the size of the sample, data normality, and complexity of the model in terms of interactions. Fourth, it is observed that variables in the data sample have multicollinearity issues, thus it was decided to mean center variables in the sample which allowed to reduce multicollinearity. However, high multicollinearity is related to the nature of the models and a high number of interactions due to the observed moderating effects. Consequently, based on the findings it was decided to leave Model 1 and Model 2 for further analysis, but reject Model 3 with dependent variable gross income gain due to the results of statistical tests that have already been discussed. Table 23 summarizes the further analyzed models. Following the indicated reasons and further development of two models (Model 1 and Model 2), derivate dependent variables are used for further decision tree modeling.

**Table 23. Summary of Models and dependent variables**

Model	Dependent variable	Description of dependent variable
Model 1	Sales gain in quantity	Percentage gain
Model 1a	Sales gain in quantity, categorized	Categorized gain: negative, balanced and positive
Model 2	Sales gain in value	Percentage gain
Model 2a	Sales gain in value, categorized	Categorized gain: negative, balanced and positive

This approach, to develop second order dependent variables, was chosen in order to increase the explanatory power of the models and obtain more detailed results. Consequently, two dependent variables (quantity gain and net sales gain) are split into three categories based on their typology, using percentile classification, and employing logit analysis. Primary dependent variables are divided into three larger groups based on gain percentage, which was calculated for each variable and then assigned to

certain percentile ranges. Percentile analysis of quantity and net sales in percentages is performed (as indicated in Table 24).

**Table 24. Categorization of dependent variables based on gain type**

Percentile ranges	Model 1 (Quantity gain)	Model 2 (Net sales gain)	Category assigned
First quarter	0.38	0.37	Positive gain if gain is below first quarter percentile
Median	0.51	0.51	Balanced gain if in between median and third quarter
Third quarter	0.63	0.63	Negative gain if gain is above third quarter

Additionally, two more models that use logit with ordered regression are tested, summarized results are provided in Annex 5 and Annex 6.

**Table 25. Summary of model diagnostics. Dependent variables as logit of performance gain type**

Model	Dependent variable	Prediction ratio	Chi-squared	Number of significant direct effects	Number of significant moderating effects
Model 1a	Sales gain in quantity	56.2%	Chi-sq= 298.43, p=0.00	5	6
Model 2a	Sales gain in net sales	52.5%	Chi-sq= 281.955, p=0.00	5	4

As per the initial part of diagnostics, the final models have been identified – Model 1 and Model 2. Model 1 depicts the dependent variable sales gain in quantity and in Model 2 – sales gain in value. For further analysis derivative dependent variables are used, which represent categorization of sales performance, namely positive, balanced and negative as identified in the prior model diagnostics. In the next chapter, the findings of regression analysis are presented.

### 3.5. Regression analysis

In this section, the results of the regression analysis are presented. Initially, ordinary least squares (OLS) analysis results are presented and discussed, and conditional moderation analysis is subsequently performed. Regression analysis for each model

aims to unveil the underlying structure among the explored variables. Initially, a direct relationship between innovativeness and commercial environment towards performance is tested, and subsequently moderating effects are tested and compared in a unified model. Model 1 and Model 1a outline performance gain in quantity and is later categorized according to type, specifically negative, balanced and positive gain. Afterwards, the same procedure is applied for Model 2 and Model 2a which specifies gain in net sales value. Regression modeling with the use of ordinary least squares (OLS) is employed for initial factor analysis and, in the next chapter, further analysis of Hayes Process modeling is employed for the next stage moderation analysis. In this analysis,  $\beta$  coefficients are compared in line with the p-value. The p value is considered to be significant if it reaches value  $\leq 0.1$ , it is interpreted as significant however weak the level of significance. If the p value is  $\leq 0.05$ , it is interpreted as a moderate level of significance and a p value of  $\leq 0.01$  is interpreted as a high level of significance. Initially, regression analysis is applied to the direct relationship between innovativeness and performance as suggested in the theoretical development and hypotheses of the dissertation. After, a more detailed analysis of the moderating effects in the relationship between innovativeness and performance is performed and discussed. Hypotheses are confirmed or rejected if statistically significant links are found. In addition, the categorized effects of performance are explored. Subsequently, Hayes Process conditional modeling is applied for statistically significant links among variables and the magnitude of moderating effects is revealed. Both, conditional moderation effects and test of hypothesis is performed with a model, which has the best regression diagnostics tests and reveals the most substantial findings of regression analysis. Based on existing theoretical findings in the area and hypotheses that were based on it, the nature of the links between innovativeness and performance, as well as its moderating effects are identified. The next chapters discuss findings of empirical results for all models and identify the relationship among the variables of interest.

### **3.5.1. Model 1. Analysis on quantitative sales gain**

In the tables below, the results of ordinary least squares (OLS) regression are provided, and consequently the main findings are outlined and discussed. Initially, analysis is performed for Model 1,  $\beta$  -coefficient and p-values are indicated. Table 26

outlines and summarizes the main findings of Model 1 (adjusted R-squared of the model = 0.09).

**Table 26. Summary of OLS regression analysis for Model 1**

Dependent variable: quantity sales gain	$\beta$ -coefficient	p-value
Main effects:		
Const	0.0194926	0.01637**
Innovativeness => Performance	0.00220154	0.76729
<b>Category sales value in market =&gt; Performance</b>	<b>0.00002824</b>	<b>0.00001***</b>
<b>Category competitiveness in market =&gt; Performance</b>	<b>-0.00014827</b>	<b>0.00426***</b>
<b>Company's sales value in market =&gt; Performance</b>	<b>-0.00000469</b>	<b>0.01207**</b>
<b>Company's sales value in retail =&gt; Performance</b>	<b>0.000094205</b>	<b>0.00005***</b>
Company's portfolio width => Performance	0.000042053	0.63615
Trade marketing support => Performance	-0.00000088	0.27306
<b>Category sales value in retail =&gt; Performance</b>	<b>-0.000466413</b>	<b>0.00002***</b>
<b>Category competitiveness in retail =&gt; Performance</b>	<b>0.000560586</b>	<b>0.00466***</b>
Category role destination => Performance	-0.024623	0.17444
<b>Category role convenience =&gt; Performance</b>	<b>-0.204255</b>	<b>0.00001***</b>
Category role seasonal => Performance	0.0047426	0.85827
Presence of private label => Performance	-0.0177438	0.43128
Seasonality of the product => Performance	0.00432229	0.8215
Supply exclusivity => Performance	0.0265738	0.13797
Moderating effects:		
<b>Category sales value in market × Innovativeness =&gt; Performance</b>	<b>-0.000012505</b>	<b>0.03899**</b>
<b>Category competitiveness in market × Innovativeness =&gt; Performance</b>	<b>-0.000110116</b>	<b>0.05516*</b>
Company's sales value in market × Innovativeness => Performance	0.0000003084	0.86129
<b>Company's sales value in retail × Innovativeness =&gt; Performance</b>	<b>-0.0000624779</b>	<b>0.00095***</b>
Company's portfolio width × Innovativeness => Performance	0.000126502	0.19367
Trade marketing support × Innovativeness => Performance	-0.000000191	0.79902
<b>Category sales value in retail × Innovativeness =&gt; Performance</b>	<b>0.000190475</b>	<b>0.05091*</b>
Category competitiveness in retail × Innovativeness => Performance	-0.00000791	0.97054
Category role destination × Innovativeness => Performance	-0.00235482	0.89545
<b>Category role convenience × Innovativeness =&gt; Performance</b>	<b>0.0740103</b>	<b>0.00619***</b>
Category role seasonal × Innovativeness => Performance	0.0151514	0.46375
Presence of private label × Innovativeness => Performance	-0.0148921	0.41198
Seasonality of the product × Innovativeness => Performance	-0.0164159	0.27725
Supply exclusivity × Innovativeness => Performance	-0.00496166	0.75534

As presented in Table 26, findings of the regression analysis does not support a significant direct positive linkage between innovativeness and performance. Although it is found that innovativeness is positively associated with new product performance ( $\beta=0.00220154$ ), this effect is not significant ( $p>0.1$ ).

OLS analysis revealed several significant direct predictors of performance. First, category sales value in market is found to deliver direct positive effect on new product performance ( $\beta=0.00002824$ ,  $p<0.1$ ). Secondly, category competitiveness in market is found to deliver direct negative moderating effect on new product performance ( $\beta=-0.00014827$ ,  $p<0.1$ ). Third, company's sales value was also find to be a direct predictor of performance, however twofold. Company's sales value in market was found to deliver direct negative effect on new product performance ( $\beta=-0.00000469$ ,  $p<0.05$ ), but company's sales value in retail was found to have adverse effect, as it induces direct positive effect on new product performance ( $\beta=0.000094205$ ,  $p<0.01$ ). Fourth, category sales value in retail in retail is found to deliver direct negative effect on new product performance ( $\beta=-0.000466413$ ,  $p<0.01$ ). Fifth, category competitiveness in retail is found to deliver a direct positive effect on performance ( $\beta=0.000560586$ ,  $p<0.01$ ). Sixth, category role convenience is found to be a direct negative performance predictor ( $\beta=-0.204255$ ,  $p<0.01$ ).

Subsequently, moderating effects were evaluated. Several moderators were found to have significant and positive effects on innovativeness – performance linkage. First, category sales value in retail is found to enhance the linkage towards performance ( $\beta=0.000190475$ ,  $p<0.01$ ), which does not align with direct effects delivered by category sales value as predictor, where significant and negative direct effect was observed. Secondly, retail category role convenience is also found to strengthen the linkage towards the dependent variable ( $\beta=0.0740103$ ,  $p<0.01$ ) which, as well, as a direct predictor, has an opposite effect.

Contrarily, several significant negative moderating effects were outlined. First, category sales value in market is found to suppress the innovativeness – performance link ( $\beta=-0.000012505$ ,  $p<0.05$ ) yet, as a direct predictor, delivers a positive effect. Secondly, category competitiveness in the market is also found to weaken the linkage towards performance ( $\beta=-0.000110116$ ,  $p<0.1$ ) which is the same direction of effect in comparison to direct effect of this variable. Third, company's sales value in retail also

delivers a negative moderating effect ( $\beta=-0.0000624779$ ,  $p<0.01$ ) while, if analyzed as direct predictor, a positive effect is observed.

Results of the regression analysis for Model 1 revealed several findings: i) there is a direct positive, but not significant linkage between innovativeness and performance which only outlines positive trend observation to be delivered by innovativeness to performance; ii) the model outlined several direct positive significant effects towards performance, namely impact of category sales value in the market, company's sales value in retail, category competitiveness in retail; iii) the model also outlined several direct negative effects towards performance, namely category competitiveness in the market, company's sales value in the market, category sales value in retail and category role convenience; iv) moderation analysis revealed that several variables delivered opposite effects as moderators in comparison with direct effects, namely category sales value in market, company's sales value in retail and category role convenience; v) some predictors were observed to have no significant effect as moderators yet were found to have a significant direct effect, such as company's sales value in market and category competitiveness in retail. Generally, findings of regression analysis outlined the presence of moderating effects as well as their magnitude on performance. Effects which were delivered with Model 1a (Annex 5) which uses logit regression which will be later used for decision tree modeling. All statistically significant effects that were revealed were found to be aligned in both models, which confirms the effects and their magnitude towards performance. Model 1 was also chosen for a further conditional moderation analysis as well as for testing the hypothesis due to better indicators of regression diagnostics.

### **3.5.2. Model 2. Analysis on monetary sales gain**

Similar regression analysis is performed with Model 2 (detailed results are presented in Table 27 and in Annex 6), which outlines effect of the second dependent variable, net sales gain, that discusses the effect on monetary sales improvements. Model 2 presented adjusted R-squared = 0.09. First of all, main effects, then moderating effects are presented and discussed. Afterwards, the results are compared and main findings outlined.

**Table 27. Summary of OLS regression analysis for Model 2**

Dependent variable: net sales gain	$\beta$ -coefficient	p-value
Main effects:		
Const	0.0225033	0.0067***
Innovativeness => Performance	0.000312109	0.96725
<b>Category sales value in market =&gt; Performance</b>	<b>0.000036502</b>	<b>0.00001***</b>
<b>Category competitiveness in market =&gt; Performance</b>	<b>-0.000162254</b>	<b>0.00221***</b>
<b>Company's sales value in market =&gt; Performance</b>	<b>-0.000003293</b>	<b>0.08491*</b>
<b>Company's sales value in retail =&gt; Performance</b>	<b>0.0000493406</b>	<b>0.03647**</b>
Company's portfolio width => Performance	-0.000096668	0.28726
<b>Trade marketing support =&gt; Performance</b>	<b>-0.0000017418</b>	<b>0.03581**</b>
<b>Category sales value in retail =&gt; Performance</b>	<b>-0.000534073</b>	<b>0.00001***</b>
<b>Category competitiveness in retail =&gt; Performance</b>	<b>0.00075955</b>	<b>0.00018***</b>
<b>Category role destination =&gt; Performance</b>	<b>-0.0340503</b>	<b>0.06614*</b>
<b>Category role convenience =&gt; Performance</b>	<b>-0.178723</b>	<b>0.00001***</b>
Category role seasonal => Performance	-0.0123936	0.64787
Presence of private label => Performance	-0.0277791	0.22795
Seasonality of the product => Performance	0.00330654	0.86586
Supply exclusivity => Performance	0.0127129	0.48719
Moderating effects:		
Category sales value in market x Innovativeness => Performance	-0.0000094397	0.1271
<b>Category competitiveness in market x Innovativeness =&gt; Performance</b>	<b>-0.000119553</b>	<b>0.04161**</b>
Company's sales value in market x Innovativeness => Performance	-0.000000085	0.96207
<b>Company's sales value in retail x Innovativeness =&gt; Performance</b>	<b>-0.000034003</b>	<b>0.07778*</b>
Company's portfolio width x Innovativeness => Performance	0.000103197	0.29932
Trade marketing support x Innovativeness => Performance	0.0000005405	0.48084
Category sales value in retail x Innovativeness => Performance	0.0000914393	0.35872
Category competitiveness in retail x Innovativeness => Performance	0.0000909321	0.67764
Category role destination x Innovativeness => Performance	0.0127145	0.48746
<b>Category role convenience x Innovativeness =&gt; Performance</b>	<b>0.0613894</b>	<b>0.02618**</b>
Category role seasonal x Innovativeness => Performance	0.0261086	0.21668
<b>Presence of private label x Innovativeness =&gt; Performance</b>	<b>-0.0315682</b>	<b>0.08889*</b>
Seasonality of the product x Innovativeness => Performance	-0.0203394	0.18771
Supply exclusivity x Innovativeness => Performance	0.0125641	0.44000

First of all, a direct effect of innovativeness towards performance is observed. OLS regression analysis for Model 2 revealed that innovativeness is positively associated with performance, yet not significantly.

Analysis also revealed several variables to have a direct positive and significant effect on performance, namely category sales value in the market is found to deliver a direct positive effect ( $\beta=0.000036502$ ,  $p<0.01$ ), company's sales value in retail ( $\beta=0.0000493406$ ,  $p<0.05$ ) and retail category competitiveness ( $\beta=0.00075955$ ,  $p<0.001$ ).

Yet, several variables were found to have a direct negative and significant effect on performance, namely category sales value in market ( $\beta=-0.000162254$ ,  $p<0.01$ ), company's sales value in market ( $\beta=-0.000003293$ ,  $p<0.1$ ), trade marketing support ( $\beta=-0.0000017418$ ,  $p<0.05$ ), category sales value in retail ( $\beta=-0.000534073$ ,  $p<0.01$ ), category role destination ( $\beta=-0.0340503$ ,  $p<0.1$ ), and category role convenience ( $\beta=-0.178723$ ,  $p<0.01$ ). Regression analysis for Model 2 also outlined several significant moderating effects that deliver a statistically significant effect on performance.

Some variables were found to enhance the linkage between innovativeness and performance, namely category role convenience ( $\beta=0.0613894$ ,  $p<0.05$ ). It is observed that category role convenience delivers the opposite, yet also significant, effect as direct predictor.

Some variables were also found to suppress the linkage between innovativeness and performance, namely category competitiveness in market ( $\beta=-0.000119553$ ,  $p<0.05$ ), company's sales value in retail ( $\beta=-0.000034003$ ,  $p<0.1$ ) and presence of a private label ( $\beta=-0.0315682$ ,  $p<0.1$ ).

Results of OLS regression analysis for Model 2 revealed several findings: i) there is a direct positive linkage between innovativeness and performance, but it is not statistically significant; ii) the model outlined several direct positive significant effects towards performance, namely impact of category sales value in the market, company's sales value in retail, category competitiveness in retail; iii) the model also outlined several direct negative effects towards performance, namely category competitiveness in market, company's sales value in market, trade marketing support, category sales value in retail, category role destination and category role convenience; iv) moderation analysis revealed that several variables delivered opposite moderating effects in comparison with its direct effects, namely company's sales value in retail, and category role convenience; v) some variables were observed to have no significant effect as

direct predictors, yet was found to have a significant moderating effect, such as presence of private label in retail which was found to suppress the linkage between innovativeness and performance. Generally, in line with Model 1, the findings of regression analysis outlined the presence of moderating effects as well as their effect on performance. As indicated before, logit analysis is performed for Model 2a (Annex 6), statistically significant direct and moderating effects that were found in the model, generally replicate the findings of Model 2.

After regression analysis was executed for Model 1 and Model 2, the effects are summarized and distinguished into two major groups: positive and negative effects, as well as significant effects (Table 28). After primary regression analysis is performed, its findings allow for the conclusion that the commercial environment does indeed have a moderating role in new product performance and there exists a difference between performance paths among different levels of innovativeness. Comparison of  $\beta$  coefficients (Table 28) clearly indicates that the performance of product innovations is very much affected by the commercial environment. It is also observed that the findings of models with different dependent variables, sales gain in quantity and sales gain in monetary value, are rather similar in terms of analysis results.

**Table 28. Comparison of OLS regression analysis for Model 1 and Model 2**

Variable	Model 1: sales gain in quantity		Model 2: sales gain in net sales	
	Direct effect, $\beta$ coefficient	Moderating effect, $\beta$ coefficient	Direct effect, $\beta$ coefficient	Moderating effect, $\beta$ coefficient
Innovativeness	0.00220154	n/a	0.000312109	n/a
<b>Category sales value in market</b>	<b>0.00002824***</b>	<b>-0.000012505**</b>	<b>0.000036502***</b>	0.0000094397
<b>Category competitiveness in market</b>	<b>0.00014827***</b>	<b>-0.000110116*</b>	<b>0.000162254***</b>	<b>0.000119553**</b>
<b>Company's sales value in the market</b>	<b>-0.00000469**</b>	0.0000003084	<b>-0.000003293*</b>	-0.000000085
<b>Company's sales value in retail</b>	<b>0.000094205***</b>	<b>0.000062478***</b>	<b>0.000049341**</b>	<b>-0.00003400*</b>
Company's portfolio width	0.000042053	0.000126502	-0.000096668	-0.000034003
Trade marketing support	-0.00000088	-0.000000191	<b>0.0000017418**</b>	0.0000005405
<b>Category sales value in retail</b>	<b>0.000466413***</b>	<b>0.000190475*</b>	<b>0.000534073***</b>	0.0000914393

<b>Category competitiveness in retail</b>	<b>0.000560586***</b>	-0.00000791	<b>0.00075955***</b>	0.0000909321
Category role destination	-0.024623	-0.00235482	<b>-0.0340503*</b>	0.0127145
<b>Category role convenience</b>	<b>-0.204255***</b>	<b>0.0740103***</b>	<b>-0.178723***</b>	<b>0.0613894**</b>
Category role seasonal	0.0047426	0.0151514	-0.0123936	0.0261086
Presence of private label	-0.0177438	-0.0148921	-0.0277791	<b>-0.0315682**</b>
Seasonality of the product	0.00432229	-0.0164159	0.00330654	-0.0203394
Supply exclusivity	0.0265738	-0.00496166	0.0127129	0.0125641

In this chapter, regression analyses for Model 1 and Model 2 were performed. Initially, direct effects between innovativeness and performance were observed, however not statistically significant. In addition, analysis revealed that direct, as well as moderating effects exist in all models. Category sales value in the market, company's sales value in retail and category competitiveness in retail were identified as main direct and positive predictors of performance. Category competitiveness in market, company's sales value in market, category sales value in retail and category role convenience were identified as main direct and negative predictors of new product performance. The most important positive moderators were found to be category role convenience and category sales value in retail, while the most important negative moderators were found to be category competitiveness in market, company's sales value in retail, category sales value in market and presence of private label. To some extent, effects delivered by some variables are even of the opposite direction if direct and moderation effects are compared. These findings suggest that the performance of new products is statistically significantly affected by the commercial environment. However, due to some differences in regression analysis, further analytics are employed in the next chapter to outline more detailed effects of moderating variables and reveal effects of conditional moderation. Further analysis would enable the provision of a more detailed analysis of moderating effects, thus deliver conclusions based on the magnitude of specific effects.

### 3.5.3. Conditional moderation analysis

This chapter aims to address conditional moderating effects by using Hayes Process modeling. This analysis aims to bring clarification and further understanding to moderation effects by employing logistic regression. The SPSS process was employed to give the ability to draw more detailed conclusions of conditional moderating effects to relationship between innovativeness and new product performance. Also, it reveals the extent of moderation effects with the aim of answering the research question of when a commercial environment has a moderating effect on innovativeness – performance linkage. Based on Hayes (2012), the question of “when” is usually answered through deeper moderation analysis. Hayes (2012) indicates that in comparison to other analytical analysis approaches, moderation determines the effect of putative causation which outlines more specified interactions among variables. Conditional process modeling, which is used in this dissertation, aims to quantify processes of influence among variables and not only to identify the nature of causal effects, but also reveal its extent. Consequently, different paths of influence and their magnitude are revealed. This type of moderation is able to include several moderators in an analysis and hence enriches the traditional moderation approach. Based on Hayes (2012), conditional moderation outlines “regions of significance” which is suggested to be a well applied technique in recently published research.

A further conditional moderation analysis is provided for Model 1 which explores performance gain in quantity. Model 1 was chosen for further analysis due to better indicators of regression diagnostics. Variables that were found to have a significant effect on the dependent variables were selected for a more detailed analysis. In this chapter, conditional moderating effects are explored with the aim to specify the nature and range of moderation, thus identifying conditional effects towards the explored linkage. A more detailed analysis of variables that delivered significant effects in the initial regression analysis (category sales value in market, category competitiveness in market, company’s sales value in the retail channel, category sales value in retail and its competitiveness, category role, presence of a private label and trade marketing support) was performed. First, a matrix for conditional effects was developed (Annex 7). On the right side, level of significance of pairwise combinations is indicated. On the left side, level of variance in pairwise combinations is provided.

Conditional effects are calculated and later tested only if one interaction per pair is significant. Interactions in pairs that are not significant (marked in grey), as identified in the matrix, are not analyzed. To evaluate conditional moderating effects, all possible combinations with significant effects were computed by using the SPSS process. In total, 28 pairwise interactions were tested (Annex 7).

As discussed, conditional effects were categorized according to three groups of variables, similarly to the conceptual research model. Market related variables were represented by category sales value and its competitiveness in the market. Company's characteristics related variables were represented by company's sales value in retail and trade marketing support, and retail category management decisions related variables were represented by category sales value and its competitiveness in retail, category role and presence of a private label. In the further analysis, numeric variables are divided into percentiles, 16th, 50th and 84th in the order of a sequence in the tables. This applies to all except categorical (category role and presence of private label) values.

Conditional moderating analysis addresses groups of variables which are organized based on the significant effects they deliver. Hereafter, conditional effects of moderating variables are discussed, aiming to reveal when specified conditions for significant moderation occur. Initially, the findings that outline the effects of market-related variables are presented. Then, the effects of retail category management decisions-related and company's characteristics-related variables follow. A summary of conditional effects are provided in the tables below. Table 30 outlines the effect of category sales value in market and its moderating impact on the innovativeness – performance link.

**Table 29. Effects of market category sales value on performance**

Category sales value in market	Category competitiveness in the market	Effect	p-value	Pairwise variance (R)
<b>Small (383.9453)</b>	<b>Low (34)</b>	<b>1.4192</b>	<b>0.0673*</b>	<b>0.2495</b>
<b>Small (383.9453)</b>	<b>Medium (95)</b>	<b>1.4355</b>	<b>0.0519*</b>	<b>0.2495</b>
Small (383.9453)	High (513)	1.2702	0.2235	0.2495
Medium (1.840.2585)	Low (34)	0.7526	0.2433	0.2495
Medium (1.840.2585)	Medium (95)	0.7689	0.1843	0.2495
Medium (1.840.2585)	High (513)	0.8803	0.4290	0.2495

Large (4.048.3416)	Low (34)	-0.2581	0.7460	0.2495
Large (4.048.3416)	Medium (95)	-0.2419	0.7367	0.2495
Large (4.048.3416)	High (513)	-0.1304	0.9040	0.2495
Category sales value in market	Retailer's category sales value	Effect	p-value	Pairwise variance (R)
Small (383.9453)	Small (40.2499)	1.3670	0.0624	0.2541
<b>Small (383.9453)</b>	<b>Medium (138.6452)</b>	<b>2.1998</b>	<b>0.0098***</b>	<b>0.2541</b>
<b>Small (383.9453)</b>	<b>Large (551.6054)</b>	<b>5.6951</b>	<b>0.0257**</b>	<b>0.2541</b>
Medium (1.840.2585)	Small (40.2499)	-0.1528	0.8434	0.2541
Medium (1.840.2585)	Medium (138.6452)	0.6800	0.2232	0.2541
<b>Medium (1.840.2585)</b>	<b>Large (551.6054)</b>	<b>4.1753</b>	<b>0.0395**</b>	<b>0.2541</b>
Large (4.048.3416)	Small (40.2499)	-2.4572	0.0903	0.2541
Large (4.048.3416)	Medium (138.6452)	-1.6244	0.1212	0.2541
Large (4.048.3416)	Large (551.6054)	1.8709	0.1724	0.2541
Category sales value in market	Category competitiveness in retail	Effect	p-value	Pairwise variance (R)
Small (383.9453)	Low (15)	1.2365	0.1022	0.2513
<b>Small (383.9453)</b>	<b>Medium (39)</b>	<b>1.4128</b>	<b>0.0540*</b>	<b>0.2513</b>
<b>Small (383.9453)</b>	<b>High (137)</b>	<b>2.1326</b>	<b>0.0271**</b>	<b>0.2513</b>
Medium (1.840.2585)	Low (15)	0.4603	0.4644	0.2513
Medium (1.840.2585)	Medium (39)	0.6366	0.2654	0.2513
Medium (1.840.2585)	High (137)	1.3564	0.0749	0.2513
Large (4.048.3416)	Low (15)	-0.7166	0.3743	0.2513
Large (4.048.3416)	Medium (39)	-0.5403	0.4578	0.2513
Large (4.048.3416)	High (137)	0.1795	0.8121	0.2513
Category sales value in market	Company's sales value in retail	Effect	p-value	Pairwise variance (R)
<b>Small (383.9453)</b>	<b>Small (31.1080)</b>	<b>1.8926</b>	<b>0.0110*</b>	<b>0.2638</b>
Small (383.9453)	Medium (185.8290)	1.1222	0.1280	0.2638
Small (383.9453)	Large (330.4730)	0.4020	0.6166	0.2638
<b>Medium (1.840.2585)</b>	<b>Small (31.1080)</b>	<b>1.4763</b>	<b>0.0134**</b>	<b>0.2638</b>
Medium (1.840.2585)	Medium (185.8290)	0.7059	0.2027	0.2638
Medium (1.840.2585)	Large (330.4730)	-0.0143	0.9813	0.2638
Large (4.048.3416)	Small (31.1080)	0.8450	0.2566	0.2638

Large (4.048.3416)	Medium (185.8290)	0.0746	0.9112	0.2638
Large (4.048.3416)	Large (330.4730)	-0.6456	0.3400	0.2638
Category sales value in market	Category role	Effect	p-value	Pairwise variance (R)
Small (383.9453)	Destination (1)	1.6082	1.6082	0.3198
Small (383.9453)	Routine (2)	0.5795	0.2802	0.3198
<b>Small (383.9453)</b>	<b>Seasonal (3)</b>	<b>7.2600</b>	<b>0.0018***</b>	<b>0.3198</b>
Small (383.9453)	Convenience (4)	2.7915	0.1406	0.3198
Medium (1.840.2585)	Destination (1)	1.0823	0.4127	0.3198
Medium (1.840.2585)	Routine (2)	0.0536	0.9337	0.3198
<b>Medium (1.840.2585)</b>	<b>Seasonal (3)</b>	<b>6.7341</b>	<b>0.0038***</b>	<b>0.3198</b>
Medium (1.840.2585)	Convenience (4)	2.2657	0.2299	0.3198
Large (4.048.3416)	Destination (1)	0.2850	0.8185	0.3198
Large (4.048.3416)	Routine (2)	-0.7437	0.3328	0.3198
<b>Large (4.048.3416)</b>	<b>Seasonal (3)</b>	<b>5.9368</b>	<b>0.0147**</b>	<b>0.3198</b>
Large (4.048.3416)	Convenience (4)	1.4683	0.4647	0.3198
Category sales value in market	Presence of a private label	Effect	p-value	Pairwise variance (R)
<b>Small (383.9453)</b>	<b>Not present (0)</b>	<b>2.1271</b>	<b>0.0051***</b>	<b>0.2579</b>
<b>Medium (1.840.2585)</b>	<b>Not present (0)</b>	<b>1.4079</b>	<b>0.0174**</b>	<b>0.2579</b>
Large (4.048.3416)	Not present (0)	0.3175	0.6468	0.2579
Small (383.9453)	Present (1)	-2.2539	0.1394	0.2579
<b>Medium (1.840.2585)</b>	<b>Present (1)</b>	<b>-2.9731</b>	<b>0.0407**</b>	<b>0.2579</b>
<b>Large (4.048.3416)</b>	<b>Present (1)</b>	<b>-4.0636</b>	<b>0.0068***</b>	<b>0.2579</b>

Category sales value in market was divided into percentile classifications and thus categorized based on its value, namely small, medium and large category sales value. Several findings were revealed.

First, with increasing category sales value and increasing competition in the category, effects tend to have a negative tendency to the innovativeness – performance linkage, suggesting that innovativeness becomes less important to performance outcome in these settings. The higher the category sales value, and the higher the competition, the more negative the effects on innovativeness - performance link are anticipated to be. However, small categories with lower or medium competition deliver significant positive effects to innovativeness – performance link. In general,

small and medium categories, despite the magnitude of competitiveness, are found to present a positive effect to innovativeness – performance link which indicates that higher level of innovativeness is more important to reach commercial success in smaller value categories. Yet, on the contrary, large value categories are found to suppress the link towards performance despite the level of competition, but not significantly.

Secondly, category sales value in the market was also paired with category sales value in retail. It also revealed several findings. First of all, small categories in a market, no matter how it performs in retail, delivers a significant positive effect to innovativeness – performance link, suggesting increased role of higher innovativeness to performance. However, large value categories tend to deliver a negative yet not significant effect to innovativeness – performance link. In cases where a category in retail is underperforming, meaning has large value in the market but medium or small value in retail, and negative effects on the linkage tend to occur. Underperforming categories in retail can be related to less attention to the development of these business units, thus a weaker performance is observed. Yet if the category is over performing in retail, meaning has large value in retail but small or medium value in market, positive significant effects on innovativeness – performance link occur. Similarly, over performing categories can be related to more attention to the development of it as a business unit, and thus more respective actions to enhance its performance.

Third, category sales value in the market was paired with category competitiveness in retail. Categories that are considered to be small or medium in the market, despite the level of competition in retail, are found to deliver a positive effect to the innovativeness – performance linkage and with increasing competitiveness in retail, a positive effect is found to increase as well, suggesting increased role of higher innovativeness to performance. Yet, large categories in market and competitiveness are found to deliver negative effects to the linkage. However, for large categories in the market and increasing competitiveness in retail, negative effects are found to decrease. The largest negative effect on innovativeness - performance link is delivered in a combination of large category sales value and low competitiveness, suggesting high level of innovativeness is less important in these commercial settings. The effect is also negative for the combination of large category sales value and medium competitiveness, yet the magnitude of negative effect is found to decrease. In a

combination of large category sales value in the market and high level of competitiveness in retail, a positive but not significant effect on innovativeness – performance link is delivered.

Fourth, the impact of the combination of category sales value and company's sales value was evaluated. It revealed a general tendency that, despite the category sales value in market, with increasing company's sales value in retail, negative effects on innovativeness - performance are found to appear and strengthen which indicates that innovativeness becomes less important with increasing company's sales value. In addition, several performance patterns were found to exist. For example, companies that have small or medium sales value in retail are revealed to deliver an enhancing effect to innovativeness – performance linkage, despite the category sales value in the market. Small sales value companies are also found to deliver significant and stronger effects, in comparison to medium sales value companies which suggests that for smaller sales value companies, higher innovativeness products are more important to reach the commercial success.

Fifth, category sales value in the market was paired with category role in retail, which also revealed several findings. As indicated in Table 30, seasonal category role is found to deliver a positive moderating effect to the linkage towards performance which can be associated with fluctuating demand and willingness to exploit the peaks of demand. Thus, importance of more innovative products in this category role is found to be related to commercial success. The second largest positive effect was delivered by occasional category role and destination category role, but was not significant. Generally, all category roles are found to deliver positive effects across different category values in the market except for the combination of large category value in the market and routine category. This combination was found to deliver a negative effect towards innovativeness - performance linkage, but was not significant.

Sixth, category sales value in the market was paired with presence of a private label in a category and it also revealed several significant observations. In general, two performance paths were revealed. The first case represented non-presence of a private label in a category and is found to deliver a significant positive moderating effect on innovativeness – performance link. In addition, with increasing category sales value in the market (small to large), positive effect is found to have a weakening tendency, yet in all cases is positive. This finding reveals that higher level of innovativeness is more important to reach commercial success if private label is not

present in the category. The second case represented the presence of a private label in a category and on the contrary, it is found to deliver a significant negative effect to innovativeness – performance link. In addition, with increasing category sales value in the market, a negative effect is found to have a strengthening tendency. This finding suggests that higher innovativeness is less important to performance in categories where private label products are present.

After the role of category sales value in market was evaluated, evaluation of category competitiveness and paired variables effects were evaluated. Results of the analysis are outlined in Table 31, below.

**Table 30. Effects of market category competitiveness on performance**

Category competitiveness in the market	Presence of a private label	Effect	p-value	Pairwise variance (R)
<b>Low (34)</b>	<b>Not present (0)</b>	<b>1.5081</b>	<b>0.0330**</b>	<b>0.2576</b>
<b>Medium (95)</b>	<b>Not present (0)</b>	<b>1.3421</b>	<b>0.0318**</b>	<b>0.2576</b>
High (513)	Not present (0)	0.2048	0.8465	0.2576
<b>Low (34)</b>	<b>Present (1)</b>	<b>-3.2307</b>	<b>0.0257**</b>	<b>0.2576</b>
<b>Medium (95)</b>	<b>Present (1)</b>	<b>-3.3967</b>	<b>0.0196**</b>	<b>0.2576</b>
<b>High (513)</b>	<b>Present (1)</b>	<b>-4.5341</b>	<b>0.0191**</b>	<b>0.2576</b>
Category competitiveness in the market	Category role	Effect	p-value	Pairwise variance (R)
Low (34)	Destination (1)	1.6190	0.2835	0.3197
Low (34)	Routine (2)	0.2904	0.4150	0.3197
<b>Low (34)</b>	<b>Seasonal (3)</b>	<b>7.1831</b>	<b>0.0020***</b>	<b>0.3197</b>
Low (34)	Convenience (4)	2.6015	0.1673	0.3197
Medium (95)	Destination (1)	1.3744	0.3318	0.3197
Medium (95)	Routine (2)	0.0459	0.9433	0.3197
<b>Medium (95)</b>	<b>Seasonal (3)</b>	<b>6.9386</b>	<b>0.0028***</b>	<b>0.3197</b>
Medium (95)	Convenience (4)	2.3570	0.2108	0.3197
High (513)	Destination (1)	-0.3013	0.8226	0.3197
High (513)	Routine (2)	-1.6299	0.1955	0.3197
<b>High (513)</b>	<b>Seasonal (3)</b>	<b>5.2628</b>	<b>0.0456**</b>	<b>0.3197</b>
High (513)	Convenience (4)	0.6812	0.7654	0.3197

First, category competitiveness in the market was paired with presence of a private label. This combination revealed several significant findings – there exists a significant tendency which associates an increased level of competitiveness with a respectively suppressed innovativeness – performance linkage. This finding indicates decreasing importance of innovativeness to performance. Also, several performance paths were found. In cases where a private label is not present in the category, significant positive effects to innovativeness – performance link are observed, yet as mentioned, with an

increasing level of competition, positive effects tend to weaken, but remain positive. This suggests increased role of innovativeness to performance. On the contrary, if a private label is present in the category, significant negative effects to innovativeness – performance linkage are found. In addition, with an increasing level of competition in the market and the presence of a private label in the category, significant negative effects to innovativeness – performance linkage are found to increase as well. This suggests decreased role of innovativeness to performance.

Secondly, the combination of category competitiveness in the market and category role was evaluated. It revealed that the seasonal category role delivers a significant positive effect to innovativeness – performance linkage despite the level of competition in the market. This finding also aligns with previous findings, which suggests that despite category sales value in the market, the seasonal category is capable of delivering a significant positive effect to innovativeness – performance link and indicates increased role of higher innovativeness of new products in seasonal category role. However, with an increasing level of competition, the significant effect is found to weaken, yet remains positive. In addition, convenience category role is also found to enhance the innovativeness – performance link of new products, but not significantly. Other category roles are found to deliver a positive moderating effect except in cases where the level of competition is high. If the level of competition is high, destination and routine categories are found to deliver negative, yet not significant moderating effects to innovativeness – performance linkage.

Consequently, the role of retail category management decisions in new product performance is explored. Table 32 summarizes the results of pairwise combinations in regard to category sales value in retail.

**Table 31. Effects of retail category sales value on performance**

Category sales value in retail	Company's sales value in retail	Effect	p-value	Pairwise variance (R)
Small (40.2499)	Small (31.1080)	1.2886	0.0679	0.2620
Small (40.2499)	Medium (185.8290)	0.4460	0.5189	0.2620
Small (40.2499)	Large (330.4730)	-0.3418	0.6508	0.2620
<b>Medium (138.6452)</b>	<b>Small (31.1080)</b>	<b>1.3479</b>	<b>0.0244**</b>	<b>0.2620</b>
Medium (138.6452)	Medium (185.8290)	0.5053	0.3638	0.2620
Medium (138.6452)	Large (330.4730)	-0.2824	0.6446	0.2620
Large (551.6054)	Small (31.1080)	1.5972	0.1972	0.2620

Large (551.6054)	Medium (185.8290)	0.7545	0.5181	0.2620
Large (551.6054)	Large (330.4730)	-0.0332	0.9769	0.2620
Category sales value in retail	Category role	Effect	p-value	Pairwise variance (R)
Small (40.2499)	Destination (1)	0.6244	0.7093	0.3175
Small (40.2499)	Routine (2)	-0.0528	0.9433	0.3175
<b>Small (40.2499)</b>	<b>Seasonal (3)</b>	<b>7.0252</b>	<b>0.0026***</b>	<b>0.3175</b>
Small (40.2499)	Convenience (4)	2.4910	0.1863	0.3175
Medium (138.6452)	Destination (1)	0.5675	0.7014	0.3175
Medium (138.6452)	Routine (2)	-0.1098	0.8634	0.3175
<b>Medium (138.6452)</b>	<b>Seasonal (3)</b>	<b>6.9683</b>	<b>0.0027***</b>	<b>0.3175</b>
Medium (138.6452)	Convenience (4)	2.4340	0.1997	0.3175
Large (551.6054)	Destination (1)	0.3285	0.8073	0.3175
Large (551.6054)	Routine (2)	-0.3487	0.8057	0.3175
<b>Large (551.6054)</b>	<b>Seasonal (3)</b>	<b>6.7293</b>	<b>0.0144**</b>	<b>0.3175</b>
Large (551.6054)	Convenience (4)	2.1951	0.3711	0.3175
Category sales value in retail	Presence of a private label	Effect	p-value	Pairwise variance (R)
<b>Small (40.2499)</b>	<b>Not present</b>	<b>1.4642</b>	<b>0.0459**</b>	<b>0.2571</b>
<b>Medium (138.6452)</b>	<b>Not present</b>	<b>1.2374</b>	<b>0.0394**</b>	<b>0.2571</b>
Large (551.6054)	Not present	0.2856	0.8043	0.2571
<b>Small (40.2499)</b>	<b>Present</b>	<b>-3.0181</b>	<b>0.0409**</b>	<b>0.2571</b>
<b>Medium (138.6452)</b>	<b>Present</b>	<b>-3.2449</b>	<b>0.0250**</b>	<b>0.2571</b>
<b>Large (551.6054)</b>	<b>Present</b>	<b>-4.1967</b>	<b>0.0241**</b>	<b>0.2571</b>

Initially, category sales value in retail was paired with company's sales value in retail. This combination revealed the tendency that with increasing category sales value in retail and increasing company's sales value in retail, the innovativeness – performance link of a new product is suppressed, yet not significantly. Pairwise combination revealed a significant linkage, which indicates that in the case of medium category sales value in retail and small company sales value, a significant positive moderating effect is anticipated. Subsequently, the combination of category sales value in retail and category role effects were tested. It revealed a similar tendency as in previous combinations – seasonal category role is capable of significantly enhancing the innovativeness - new product performance link. However, positive moderating effects tend to slightly decrease with the increasing value of category sales value. Convenience and destination category roles are also found to deliver positive

moderating effects, but not significantly. Similarly, with increasing category value, positive moderating effects are found to weaken.

Next, the combination of category sales value in retail and presence of a private label is explored. As presented in previous pairwise combinations, similar significant patterns occur. In categories where private label products are not present, performance is expected to be enhanced by a particular situation, suggesting increased role of innovativeness to performance. However, with increasing category sales value in retail, the significant positive moderating effect on performance is found to slightly decrease. On the contrary, if a private label is present in the categories, different performance patterns occur. Presence of a private label is found to significantly suppress the linkage to performance and the effect tends to increase with the increasing sales value of category sales value in retail, thus suggests decreased role of innovativeness to performance.

In addition to an analysis of category sales value effects in different settings, the role of category competitiveness in different settings and its role in new product performance is explored. Retail category competitiveness is paired with category role and presence of a private label. Results are outlined in Table 33.

**Table 32. Effects of retail category competitiveness on performance**

Category competitiveness in retail	Category role	Effect	p-value	Pairwise variance (R)
Low (15)	Destination (1)	0.3487	0.8354	0.3175
Low (15)	Routine (2)	-0.1367	0.8391	0.3175
<b>Low (15)</b>	<b>Seasonal (3)</b>	<b>6.9837</b>	<b>0.0027***</b>	<b>0.3175</b>
Low (15)	Convenience (4)	2.4698	0.1903	0.3175
Medium (39)	Destination (1)	0.3607	0.8173	0.3175
Medium (39)	Routine (2)	-0.1248	0.8444	0.3175
<b>Medium (39)</b>	<b>Seasonal (3)</b>	<b>6.9956</b>	<b>0.0026**</b>	<b>0.3175</b>
Medium (39)	Convenience (4)	2.4817	0.1879	0.3175
High (137)	Destination (1)	0.4095	0.7444	0.3175
High (137)	Routine (2)	-0.0760	0.9359	0.3175
<b>High (137)</b>	<b>Seasonal (3)</b>	<b>7.0444</b>	<b>0.0040***</b>	<b>0.3175</b>
High (137)	Convenience (4)	2.5306	0.2181	0.3175
Category competitiveness in retail	Presence of a private label	Effect	p-value	Pairwise variance (R)
<b>Low (15)</b>	<b>Not present</b>	<b>1.1356</b>	<b>0.0990*</b>	<b>0.2561</b>
Medium (39)	Not present	1.1188	0.0692	0.2561
High (137)	Not present	1.4756	0.1403	0.2561
<b>Low (15)</b>	<b>Present</b>	<b>-3.2481</b>	<b>0.0249**</b>	<b>0.2561</b>
Medium (39)	Present	-3.2650	0.0247**	0.2561
High (137)	Present	-3.3337	0.0423**	0.2561

First, findings in regard to the combination of category competitiveness and category role are presented. As with previously explored combinations with category role, seasonal category role is also found to deliver a significant positive moderating effect to innovativeness – performance linkage. In addition, with increasing category competitiveness in retail, the positive effect of seasonal category role also increases which enhances role of higher innovativeness to performance in particular commercial settings. It was also found that routine category role delivers a negative yet not significant moderating effect to innovativeness – performance link. It is also indicative that the negative moderating effect of routine category role tends to slightly decrease with an increasing level of competition in the category.

Secondly, a combination of category competitiveness in retail and presence of a private label also revealed several significant effects which are found to appear in cases where category competitiveness is low. In cases where a private label is not present in low competitiveness categories, new product performance is accepted to be significantly alleviated which suggests increased role of higher innovativeness to performance. However, in contrary situations, the performance of a new product is expected to be significantly suppressed, suggesting decreased role of innovativeness to performance. In addition, the higher the level of competitiveness in the retail category with the presence of a private label, the more negative the effect on performance is anticipated to be.

The next part of the conditional effects analysis explores the combination of category role and presence of a private label and its impact on innovativeness - new product performance linkage. Table 34 outlines the findings of this pairwise combination. Analysis revealed that, consistent with previous findings, seasonal category role delivers a significant positive moderating effect to innovativeness – performance link. In cases where a private label is missing in the category, the positive moderating effect is relatively stronger in comparison with cases where a private label exists. However, it is indicative that for seasonal categories, private label products do not induce rivalry as in other, previously explored commercial settings, suggesting increased role of higher innovativeness to performance.

**Table 33. Effects of retail category role on performance**

Retailer's category role	Presence of a private label	Effect	p-value	Pairwise variance (R)
Destination (1)	Not present	0.6697	0.5953	0.3187
Routine (2)	Not present	0.1017	0.8791	0.3187
<b>Seasonal (3)</b>	<b>Not present</b>	<b>7.3463</b>	<b>0.0017***</b>	<b>0.3187</b>
Convenience (4)	Not present	2.5743	0.1719	0.3187
Destination (1)	Present	-1.0101	0.5831	0.3187
Routine (2)	Present	-1.5781	0.2996	0.3187
<b>Seasonal (3)</b>	<b>Present</b>	<b>5.6665</b>	<b>0.0318**</b>	<b>0.3187</b>
Convenience (4)	Present	0.8945	0.7103	0.3187

Afterwards, conditional moderating effects are tested with company's characteristics, such as its sales value in retail and trade marketing support. Out of all explored variables that represent company's characteristics, company's sales value in the retail channel and trade marketing support were found to deliver a significant effect, hence it is analyzed further. First, role of company's sales value on performance is outlined, results are presented in Table 35, below. Combinations of company's sales value in retail with category competitiveness in the market, category competitiveness in retail, category role and presence of a private label are presented.

**Table 34. Effects of company's sales value on performance**

Company's sales value in retail	Category competitiveness in the market	Effect	p-value	Pairwise variance (R)
<b>Small (31.1080)</b>	<b>Low (34)</b>	<b>1.3564</b>	<b>0.0345**</b>	<b>0.2619</b>
<b>Small (31.1080)</b>	<b>Medium (95)</b>	<b>1.3629</b>	<b>0.0261**</b>	<b>0.2619</b>
Small (31.1080)	High (513)	1.4073	0.2044	0.2619
Medium (185.8290)	Low (34)	0.5235	0.4126	0.2619
Medium (185.8290)	Medium (95)	0.5300	0.3499	0.2619
Medium (185.8290)	High (513)	0.5744	0.5881	0.2619
Large (330.4730)	Low (34)	-0.2551	0.7103	0.2619
Large (330.4730)	Medium (95)	-0.2486	0.6860	0.2619
Large (330.4730)	High (513)	-0.2043	0.8479	0.2619
Company's sales value in retail	Category competitiveness in retail	Effect	p-value	Pairwise variance (R)
Small (31.1080)	Low (15)	1.1017	0.0955	0.2631
<b>Small (31.1080)</b>	<b>Medium (39)</b>	<b>1.2401</b>	<b>0.0411**</b>	<b>0.2631</b>
<b>Small (31.1080)</b>	<b>High (137)</b>	<b>1.8050</b>	<b>0.0182**</b>	<b>0.2631</b>

Medium (185.8290)	Low (15)	0.2460	0.6942	0.2631
Medium (185.8290)	Medium (39)	0.3843	0.4934	0.2631
Medium (185.8290)	High (137)	0.9492	0.1779	0.2631
Large (330.4730)	Low (15)	-0.5541	0.4121	0.2631
Large (330.4730)	Medium (39)	-0.4157	0.4956	0.2631
Large (330.4730)	High (137)	0.1492	0.8364	0.2631
Company's sales value in retail	Category role	Effect	p-value	Pairwise variance (R)
Small (31.1080)	Destination (1)	1.6992	0.1878	0.3305
Small (31.1080)	Routine (2)	0.6516	0.3316	0.3305
<b>Small (31.1080)</b>	<b>Seasonal (3)</b>	<b>7.3570</b>	<b>0.0015***</b>	<b>0.3305</b>
Small (31.1080)	Convenience (4)	3.1367	0.0960	0.3305
Medium (185.8290)	Destination (1)	0.8870	0.4749	0.3305
Medium (185.8290)	Routine (2)	-0.1607	0.7990	0.3305
<b>Medium (185.8290)</b>	<b>Seasonal (3)</b>	<b>6.5447</b>	<b>0.0047***</b>	<b>0.3305</b>
Medium (185.8290)	Convenience (4)	2.3245	0.2150	0.3305
Large (330.4730)	Destination (1)	0.1276	0.9178	0.3305
Large (330.4730)	Routine (2)	-0.9201	0.1721	0.3305
<b>Large (330.4730)</b>	<b>Seasonal (3)</b>	<b>5.7853</b>	<b>0.0133**</b>	<b>0.3305</b>
Large (330.4730)	Convenience (4)	1.5651	0.4083	0.3305
Company's sales value in retail	Presence of a private label	Effect	p-value	Pairwise variance (R)
<b>Small (31.1080)</b>	<b>Not present (0)</b>	<b>2.1001</b>	<b>0.0009***</b>	<b>0.2760</b>
<b>Medium (185.8290)</b>	<b>Not present (0)</b>	<b>1.1937</b>	<b>0.0368**</b>	<b>0.2760</b>
Large (330.4730)	Not present (0)	0.3463	0.5668	0.2760
<b>Small (31.1080)</b>	<b>Present (1)</b>	<b>-2.8091</b>	<b>0.0518*</b>	<b>0.2760</b>
<b>Medium (185.8290)</b>	<b>Present (1)</b>	<b>-3.7155</b>	<b>0.0102**</b>	<b>0.2760</b>
<b>Large (330.4730)</b>	<b>Present (1)</b>	<b>-4.5629</b>	<b>0.0102**</b>	<b>0.2760</b>

First of all, company's sales value in retail is paired with category competitiveness in the market. This combination is found to deliver several findings. A general tendency exists for small and medium sales value companies - with increasing supplier sales value in retail and increasing category competitiveness in the market, a positive moderating effect to innovativeness – performance link exists yet tends to weaken. A

significant positive moderating effect on innovativeness - performance link exists in the combination of small sales value company and low to medium competition in the market which suggests increased role of higher innovativeness to performance of new products. With increasing competition, the significant moderating effect slightly increases. However, for large sales value companies, increasing competition is found to deliver negative moderating effects on innovativeness – performance linkage. In addition, with increasing competition negative moderating effects tend to weaken, yet not significantly.

Secondly, the combination of company's sales value in retail and category competitiveness in retail is explored. This pairing was found to deliver similar tendencies as the pairing with market competitiveness. Hence, category competitiveness can be associated with market competitiveness as its reflection. Generally, for new products of small sales value companies, regardless of the level of competitiveness, higher innovativeness of new products are important to its commercial success in comparison to medium and large companies. The combination of small and medium sales value suppliers with retail category competitiveness tends to result in enhanced linkage between innovativeness and performance. In addition, the higher the competition for small and medium sales value suppliers, the more positive moderating effect is anticipated to be. A combination of small sales value companies and small to medium competition in the category is found to have a significant positive moderating effect on innovativeness- performance linkage.

As a third combination, company's sales value in retail and category role was explored. This combination also outlined the positive moderating effects of seasonal category role towards innovativeness – performance linkage, which, as discussed, aligns with other positive moderating effects delivered by this type of category role. This pairwise combination revealed that for small value companies, higher level of innovativeness of new products is more important in seasonal category role to reach commercial success in comparison with higher sales value suppliers. The positive moderating effect of the seasonal category role is the largest for small sales value companies, it is also relatively small for medium sales value suppliers and tends to slightly decrease for large companies, yet in all combinations remains significantly positive.

Next, the effects of company's sales value and presence of a private label are outlined. Non-presence of a private label is found to deliver significant positive

moderating effect, with the effect being largest for small sales value companies. There is also a tendency for effect to decrease, however the effect remains positive with an increasing magnitude of company's sales value, also suggesting increased role of higher innovativeness to performance in particular commercial settings. On the contrary, the presence of a private label results in suppressed innovativeness - new product performance linkage, especially for large sales value companies. In addition, with increasing supplier sales value, the magnitude of negative moderating effects tend to increase and remain significant. This finding, as previously, suggests decreased role of higher innovativeness to performance in these commercial settings.

Further analysis, presented in Table 36, outlines the role of trade marketing support to innovativeness – performance linkage. Trade marketing support variable was paired with the following variables, namely category sales value in market, company's sales value in retail, category role and presence of private label. As already acknowledged by previous studies in the field, trade marketing support was found to deliver direct positive effect to new product performance. In addition, several conditional moderating tendencies and significant effects were found by empirical analysis of this dissertation, as presented in Table 36 and discussed below.

**Table 35. Effects of trade marketing support on performance**

Trade marketing support	Category sales value in market	Effect	p-value	Pairwise variance (R)
<b>Small (0.859.0000)</b>	<b>Small (383.9453)</b>	<b>1.6364</b>	<b>0.0475**</b>	0.2498
Small (0.859.0000)	Medium (1.840.2585)	1.0130	0.1570	0.2498
Small (0.859.0000)	Large (4.048.3416)	0.0677	0.9379	0.2498
<b>Medium (8.500.0000)</b>	<b>Small (383.9453)</b>	<b>1.3889</b>	<b>0.0609*</b>	<b>0.2498</b>
Medium (8.500.0000)	Medium (1.840.2585)	0.7654	0.1694	0.2498
Medium (8.500.0000)	Large (4.048.3416)	-0.1799	0.7878	0.2498
Large (18.500.0000)	Small (383.9453)	1.0649	0.3099	0.2498
Large (18.500.0000)	Medium (1.840.2585)	0.4414	0.6150	0.2498
Large (18.500.0000)	Large (4.048.3416)	-0.5039	0.5655	0.2498
Trade marketing support	Company's sales value in retail	Effect	p-value	Pairwise variance (R)
<b>Small (0.859.0000)</b>	<b>Small (31.1080)</b>	<b>1.3567</b>	<b>0.0608*</b>	<b>0.2619</b>

Small (0.859.0000)	Medium (185.8290)	0.5227	0.4685	0.2619
Small (0.859.0000)	Large (330.4730)	-0.2569	0.7463	0.2619
<b>Medium (8.500.0000)</b>	<b>Small (31.1080)</b>	<b>1.3719</b>	<b>0.0211**</b>	<b>0.2619</b>
Medium (8.500.0000)	Medium (185.8290)	0.5379	0.3145	0.2619
Medium (8.500.0000)	Large (330.4730)	-0.2417	0.6769	0.2619
Large (18.500.0000)	Small (31.1080)	1.3918	0.1365	0.2619
Large (18.500.0000)	Medium (185.8290)	0.5578	0.5114	0.2619
Large (18.500.0000)	Large (330.4730)	-0.2218	0.7899	0.2619
Trade marketing support	Category role	Effect	p-value	Pairwise variance (R)
Small (0.859.0000)	Destination (1)	1.1374	0.4288	0.3186
Small (0.859.0000)	Routine (2)	0.3189	0.6815	0.3186
<b>Small (0.859.0000)</b>	<b>Seasonal (3)</b>	<b>7.5045</b>	<b>0.0016***</b>	<b>0.3186</b>
Small (0.859.0000)	Convenience (4)	2.6090	0.1668	0.3186
Medium (8.500.0000)	Destination (1)	0.6569	0.6026	0.3186
Medium (8.500.0000)	Routine (2)	-0.1617	0.7991	0.3186
<b>Medium (8.500.0000)</b>	<b>Seasonal (3)</b>	<b>7.0240</b>	<b>0.0025***</b>	<b>0.3186</b>
Medium (8.500.0000)	Convenience (4)	2.1285	0.2664	0.3186
Large (18.500.0000)	Destination (1)	0.0280	0.9828	0.3186
Large (18.500.0000)	Routine (2)	-0.7906	0.3958	0.3186
<b>Large (18.500.0000)</b>	<b>Seasonal (3)</b>	<b>6.3951</b>	<b>0.0077***</b>	<b>0.3186</b>
Large (18.500.0000)	Convenience (4)	1.4996	0.4813	0.3186
Trade marketing support	Presence of a private label	Effect	p-value	Pairwise variance (R)
<b>Small (0.859.0000)</b>	<b>Not present (0)</b>	<b>1.3374</b>	<b>0.0665*</b>	<b>0.2565</b>
<b>Small (0.859.0000)</b>	<b>Present (1)</b>	<b>-2.9106</b>	<b>0.0653*</b>	<b>0.2565</b>
<b>Medium (8.500.0000)</b>	<b>Not present (0)</b>	<b>1.0768</b>	<b>0.0612*</b>	<b>0.2565</b>
<b>Medium (8.500.0000)</b>	<b>Present (1)</b>	<b>-3.1713</b>	<b>0.0294**</b>	<b>0.2565</b>
Large (18.500.0000)	Not present (0)	0.7357	0.4024	0.2565

<b>Large (18.500.0000)</b>	<b>Present (1)</b>	<b>-3.5124</b>	<b>0.0214**</b>	<b>0.2565</b>
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As presented in Table 36, the analysis outlined the role of trade marketing support, invested into retail channel per product or brand, which suggests several general pairwise effects. First, trade marketing support is paired with category sales value in the market.

It is observed that with increasing category sales value in market, the role of increased trade marketing support value decreases, yet remains positive for small and medium sales value categories. Yet, the effect tends to gain negative effect for large sales value categories in the market. These findings indicates diverse importance of higher innovativeness to performance in different commercial settings. Also, a few significant moderating effects were found. Positive and significant moderating effect was delivered by trade marketing support in combination with small sales value categories in the market which suggests, that the role of higher innovativeness to performance in particular commercial settings. Similar positive and significant moderating effect was observed in combination of medium trade marketing support and small sales value categories which also suggests that innovativeness becomes more important to performance in mentioned settings and these settings tend to deliver positive “lift” effect. Yet, large trade marketing support was not found to have significant moderating effect on innovativeness – performance linkage.

Secondly, trade marketing support was paired with company’s sales value in retail. This pairwise combination also outlined several findings, namely role of trade marketing support tends to decrease with increasing company’s sales value in retail. For small and medium sales value suppliers in retail, trade marketing support tends to deliver positive moderating effect, yet for large sales value suppliers in retail, moderating effect of trade marketing effect is negative. In addition, several significant moderating effects were revealed. First, small trade marketing support is found to deliver significant positive moderating effect towards innovativeness - performance linkage in combination with small sales value suppliers in retail which suggests increased role of innovativeness to performance in particular settings. Also, the same, significant positive moderating effect is observed in combination of medium trade marketing support and small sales value in retail.

Third, combination of trade marketing support and different retail category roles was analyzed. This pairwise combination replicated previous findings which were

related to category roles – similarly, seasonal category role was found to deliver significant positive moderating effect on innovativeness – performance linkage, no matter how high trade marketing support was. In addition, several non-significant, but indicative tendencies were outlined, related to different category roles. For example, with increasing trade marketing support in retail, destination category role and convenience category role tend to deliver positive moderating effect to innovativeness – performance link, yet this effect tends to decrease with increasing value of trade marketing support. However, with increasing trade marketing support, routine category role tends to deliver diverse effects – with increasing trade marketing support which is small to medium, routine category role delivers positive moderating effect which also tends to decrease with growing trade marketing support. In combination with large marketing support, effect of routine category role, becomes negative to innovativeness – performance linkage.

Fourth, as already found in previous pairwise combinations for moderating effects, private label tends to deliver twofold effects on innovativeness – performance linkage. In categories, where private label products are present, trade marketing support has significant negative moderating effect on performance which suggests reduced importance of innovativeness to performance linkage. In addition, with increasing trade marketing support value, negative moderating effect tends to strengthen. On the contrary, in categories where private label products are not present, trade marketing support delivers positive moderating effect which tends to weaken with increasing value of trade marketing support. Small and medium trade marketing support has significant positive moderating effect in combination of non-presence of private label in the category.

Analysis of conditional moderation effects in pairwise combinations was presented and discussed in this chapter. The main findings, which presented significant tendencies or single results, are outlined below.

First, category sales value in the market is a moderating predictor of performance with a general tendency that innovativeness – performance linkage is suppressed. With increasing sales value which suggests that higher innovativeness is less important in categories with higher sales value. Significant moderation was mainly observed in cases where category sales value is relatively small (represents the first percentile): i) in cases where category sales value is small and competition is low to medium, a positive moderating effect is expected, which tends to decrease with

increasing level of competition; ii) in cases where category sales value is small but the retail category sales is over performing, a positive moderating effect is also expected and is found to increase with an increasing level of over performance; iii) in cases where category sales value is small and competitiveness in the retail category is medium to high, a positive moderating effect is also expected and it tends to intensify with an increasing level of competition; iv) in cases where category sales value in the market is small and supplier sales value is also small, positive moderating effect is expected as well, but with increasing category sales value in the market, positive effect to innovativeness – performance linkage is weakly suppressed; v) in cases where category sales value in the market is small and trade marketing investment is small to medium, positive moderating effect to innovativeness – performance link is also observed.

Secondly, company's sales value in retail is also a moderating predictor to innovativeness - performance linkage in diverse patterns. Generally, for smaller sized companies, innovativeness of new product is more important to performance, as the link is enhanced, in comparison to medium to large sized suppliers. Several significant moderating effects were associated with supplier sales value in retail: i) in the combination of small sales value supplier in a medium sized category in the market, a positive moderating effect to innovativeness – performance linkage is expected; ii) for products of small value companies higher innovativeness is more important to commercial success in comparison to new products represented by medium or large sales value companies in low or medium levels of market competitiveness; iii) in the combination of small sales value supplier with small to medium trade marketing investment, a positive moderating effect is also expected which suggests increased role of innovativeness to performance in mentioned commercial environment.

Third, the seasonal category role is strongly associated with positive moderating effect between innovativeness and performance. Several findings were also outlined: i) seasonal category role enhances the link between innovativeness and performance, regardless of the category sales value in the market and in retail. However, the positive moderating effect tends to slightly weaken with increasing sales value of the category in the market, but on the contrary in retail – the positive moderating effect tends to increase with increasing levels of competitiveness in retail; ii) seasonal category role also enhances the link between innovativeness and performance despite the level of competition in the market. A positive moderating effect is anticipated at all levels of

competitiveness, but with increasing levels of competition, the positive moderating effect of the seasonal category role tends to weaken, iii) the seasonal category role enhances the innovativeness - performance linkage, regardless of company's sales value in retail, yet with increasing supplier sales value, the significant moderating effect tends to weaken; iv) the seasonal category role even has a positive significant moderating effect despite presence of a private label in the category, yet if a private label is present, the positive effect is slightly weaker; v) the seasonal category role also has a significant positive moderating effect to innovativeness – performance linkage despite the value of trade marketing investment into retail channel.

Fourth, presence of private label has twofold effects towards innovativeness - performance linkage: if a private label is not present in the category, a positive moderating effect is anticipated, yet if present – it tends to suppress the linkage. This finding outlines diverse effect of innovativeness to performance in different commercial settings. Several significant linkages are found to be associated with the presence of a private label: i) in cases where it is not present in small and medium value categories in the market and retail, a positive moderating effect is delivered, yet tends to slightly weaken with an increase in sales value; ii) in cases where a private label is present in medium and large categories in the market, the linkage is suppressed with a tendency to strengthen the effect with an increase in sales value; iii) for categories in retail, despite the category sales value, if a private label in a category exists, it suppresses the innovativeness – performance linkage of new products in all cases, with a tendency to strengthen the effect as category value in retail increases; iv) similar patterns of performance are observed among different levels of competition in the market and in retail - in all levels of competitiveness and non-presence of a private label in the market, positive moderation is anticipated, but tends to slightly weaken with increasing competitiveness. In retail, a significant moderating effect was only observed for a low level of competitiveness, following the similar pattern – the presence of a private label is a negative moderating predictor of performance which suppresses the linkage between innovativeness and performance; v) the presence of a private label also suppresses the linkage between innovativeness and performance for all levels of supplier sales value and with increasing supplier sales value, the effect tends to strengthen. In cases where a private label is not present, positive moderating effects are observed which tends to weaken with increasing sales value of the company. In addition, the presence of private label is also associated with value of trade marketing

support which is also twofold. If a private label is not present in the category, positive moderating effect of small and medium value trade marketing support is delivered towards innovativeness – performance linkage. However, if a private label is present in the category, effect is adverse – it suppresses the linkage between innovativeness and performance, despite the value of trade marketing investment. Likewise, with increasing value of trade marketing support, negative moderating effect caused by presence of private label, tends to strengthen.

### **3.6. Decision tree modelling**

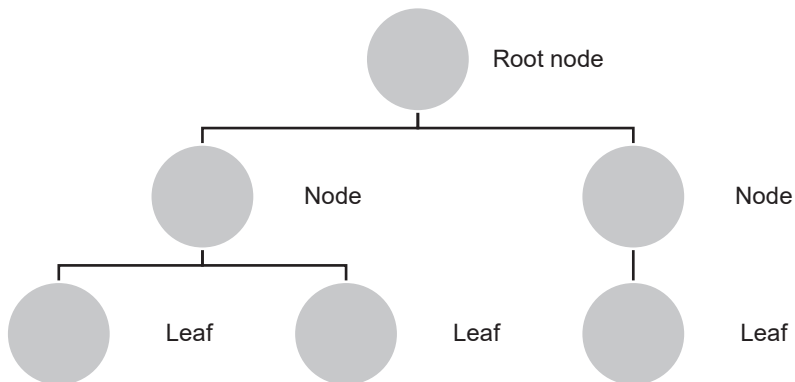
Despite the theoretical contribution to the area of research, this dissertation also aims to provide a forecasting tool for new product evaluation in a given environmental context. As a forecasting tool, a decision tree approach was chosen for this research. Decision tree is a tool that combines both findings of regression analysis and, based on it, enables predictive modeling. The nature of decision trees allows conclusions to be drawn from existing observations. Myles, Feudale, Liu, Woody & Brown (2004) indicate that a decision tree is able to recognize data patterns due to the interpretability of the constructed model. In addition, based on Myles et al. (2004), the simplest way to define decision tree analysis is a divide-and-conquer approach to classification, based on regression, especially with secondary data. This statistical approach is also used in both machine and artificial learning, which, based on Myles et al. (2004), can be successfully applied to recognize and extract patterns in large databases and thus deliver predictive modeling. Consequently, a decision tree is employed in this research due to its eligibility to research set up.

As presented, a decision tree is a hierarchical type of modeling which consists of decision rules in its boundaries. New product performance outcome, based on categorized dependent variables (quantity gain and net sales gain) is used for analysis. Decision boundaries are based on the type of categorized gain, namely positive, balanced and negative, as well as on the moderating covariates that are discussed in this dissertation as commercial environment. The anatomy of the decision tree (as outlined in Figure 18, based on Rokach & Maimon, 2004; Myles et al., 2004) consists of several elements, namely “root”, “node” and “leaves”. The “root” node has no incoming elements, therefore it is the most important element, which starts the tree and represents all of its features. The regular “node” is the decision element which is

created by the “root” or the “root node” and represents the subspace of the original feature. “Nodes” are complemented by “leaves” as decision outcomes on specific criteria. The anatomy of the decision tree is presented in Figure 21. Decision trees are characterized as self-explanatory and are also easy to follow and can be converted to a set of rules for practical use (Rokach & Maimon, 2004). Thus, a decision tree is defined as a comprehensive method for forecasting. In a decision tree, based on Rokach & Maimon (2004), each internal node in a row splits into several alternatives by a certain discrete function and outcome and is assigned to a specific value condition which can represent either nominal or numeric attributes.

Conditions are navigated from the root node to a leaf, based on an outcome along the path towards specific categorized outcome. Gain types are used as classes to which, most appropriate values of variables which are conditioning differentiation along the path, are assigned. Formation of a decision tree considers each attribute based on its predictive power and impact on a dependent variable. However, in the case of numeric attributes, a condition applies to a range. In this research, discrete functions represent the commercial environment as the context for performance development. Then, performance as an outcome is categorized by its type, namely positive, balanced and negative. Consequently, prediction for a specific outcome is forecasted, based on the commercial context and outlined in a decision tree.

**Figure 19. Anatomy of decision tree**



CART (Classification and Regression Trees; Breiman et al., 1984) modeling is used to form the decision tree. CART modeling is constructed using binary trees, where each internal node has two outgoing edges. The split is made by two criteria and the

tree is pruned by cost-complexity pruning. In the process of pruning, CART considers misclassification costs in the tree induction and prior probability distribution, which is able to increase explanatory power and consequently generates a regression tree. Using CART methodology enables the creation of trees that can predict real number outcomes. In the case of regression, CART looks for splits that minimize the prediction squared error (the least-squared deviation). The prediction in each leaf is based on the weighted mean for a node. Consequently, based on the appropriateness of the method to this research, CART growth modeling analysis was performed to identify the importance of the independent variables for the two dependent variables – quantity gain type and net sales gain type, which were categorized as positive, balanced and negative gain.

Initially, classification of predicted cases is provided to identify correctly predicted cases. Later, the importance of the independent variables for the dependent variables is analyzed, and a normalized importance diagram is provided. Finally, decision tree charts are created for Model 1 and Model 2, which consider different performance outcomes. Thus, analysis begins with Model 1a which models quantity gain type. First, classification of correctly predicted cases is provided to ensure eligibility of the test and decision tree results which is a base for predictive analysis (Table 36). Secondly, the Kappa coefficient, which defines the validity of the data, is calculated and discussed. Then, findings concerning the importance of variables that contribute to the performance outcome in quantity growth are provided and discussed. Finally, the decision tree diagrams are prepared, presented and discussed.

**Table 36. Confusion matrix for Model 1a**

Observed	Predicted			
	1, positive	2, balanced	3, negative	Percent correct
1, positive	125	103	55	44.17%
2, balanced	130	435	91	66.31%
3, negative	50	92	157	52.51%
Overall percentage	305	630	303	57.92%

As indicated, classification of correctly predicted cases is provided in Table 36. It is also defined as a confusion matrix. Based on Tan, Steinbach & Kumar (2006), this type of classification is based on the count of a binary model test, which defines records that were correctly or incorrectly predicted by the model. A confusion matrix outlines how well the model is able to perform prediction of correct cases and enables

comparison of the performance of several models. Model 1a provides a 57.92 percent prediction rate, which is considered to be an appropriate measure. To ensure additional validation measures for classification and decision tree application, Cohen's Kappa criterion is employed. Kappa criterion measures the arrangement between variables and evaluates a confusion matrix by evaluating the diagonal of the table and adjusting values for the amount of agreement (Cohen, 1960). Interpretation of the Kappa coefficient is provided by Altman (1991) and is defined in Table 37 (based on Altman, 1991). It is indicated (Altman, 1991) that an acceptable value of Kappa lies above 0.20, which indicates validity of the data and reflects conformity between actual observations and predictions.

**Table 37. Interpretation of Kappa coefficient**

Type of arrangement	Value
Poor arrangement	Less than 0.20
Fair arrangement	0.20 – 0.40
Moderate arrangement	0.40 – 0.60
Good arrangement	0.60 – 0.80
Very good arrangement	0.80 – 1.00

Kappa calculation is performed using Graf Pad Software Quick Calcs. After Kappa calculation was performed, it indicated a level of 0.316 which represents a fair arrangement (weighted Kappa=0.308, 95 percent confidence interval 0.272 – 0.359). Kappa calculation indicated that the number of arranged observations = 717 (57.92 percent of observations), and the number of agreements expected by chance = 477 (38.51 percent of observations).

Consequently, the importance of predictors for the categorization of dependent variables is outlined in Table 38. This information indicates how well the variables contribute to the accuracy of the differentiation and classification and allow discrimination among classes.

**Table 38. Importance of independent variables towards quantity gain differentiation**

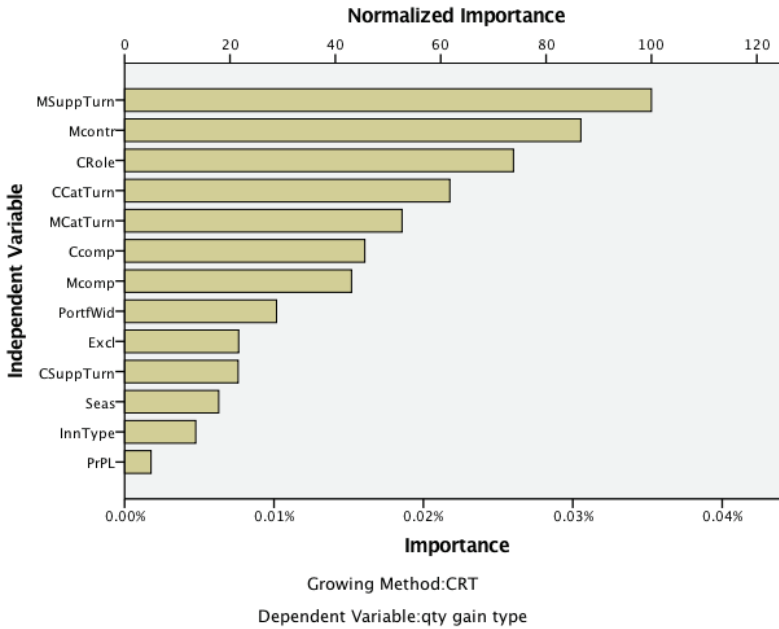
Independent variable	Importance	Normalized importance
Company's sales value in the market	0.035	100%
Trade marketing support	0.031	86.6%
Category role	0.026	73.8%
Category sales value in retail	0.022	61.7%
Category sales value in market	0.019	52.7%

Category competitiveness in retail	0.016	45.6%
Category competitiveness in the market	0.015	43.1%
Company's portfolio width	0.010	28.8%
Supply exclusivity in retail	0.008	21.7%
Company's sales value in retail	0.008	21.5%
Seasonality	0.006	17.9%
Innovativeness	0.005	13.5%
Presence of a private label	0.002	5.0%

Research results suggest that company's sales value in the market, trade marketing investment in the retail channel, and assigned category role are the most important variables that allow discrimination among prediction classes, and thus suggests their importance to the general performance outcome. In Figure 21, below, normalized importance of variables to performance categorization is provided.

As presented in Figure 22, for commercial new product success in quantity, which is usually represented by a high volume products, the most important factor is how big the company's sales value is in the market, which reflects the importance and share of the supplier in particular category, as well as its position in the category. The second most important variable contributing to performance outcome for gain in quantity is trade marketing support for the sales channel. The third most important variable for differentiation for sales gain in quantity is the category role, which once again confirms the importance of retail category management decisions for new product performance.

**Figure 20. Normalized importance of variables, Model 1a**



A similar approach to that used before is applied to Model 2a. Prediction of monetary sales gain was also analyzed using the same CART growth modeling. Initially, statistics on classification of correctly predicted cases is provided (Table 39). Secondly, a confusion matrix is presented. It is observable that Model 2a has a higher prediction rate in comparison to Model 1a (58.8 percent and 57.9 percent, respectively). Thus, it is recognized that the accuracy of measurement and prediction is acceptable to continue with further analysis.

**Table 39. Confusion matrix for Model 2a**

Observed	Predicted			Percent correct
	1, positive	2, balanced	3, negative	
1, positive	134	171	2	43.60%
2, balanced	51	562	7	90.60%
3, negative	39	240	32	10.30%
Overall percentage	224	973	41	58.80%

For justification of Model 2a's validity, the Kappa coefficient is also calculated and interpreted. Calculations indicate the Kappa coefficient = 0.255 (weighted Kappa=0.267, 95 percent confidence interval 0.215 – 0.295) which represents fair arrangement. The Kappa calculation indicates that the number of arranged observations = 728 (58.80 percent of observations), and the number of agreements expected by chance = 553 (44.68 percent of observations). Similarly, the importance

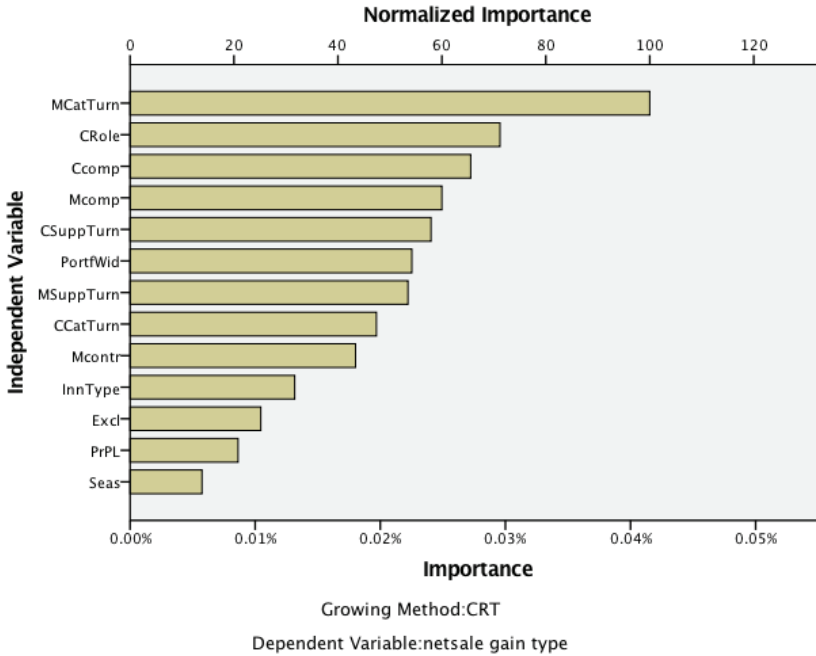
of predictors for dependent variable classification is provided in Table 40, obtained after the CRT modeling procedure.

**Table 40. Importance of independent variables towards positive sales gain in value**

Independent variable	Importance	Normalized importance
Category sales value in market	0.042	100%
Category role	0.030	71.2%
Category competitiveness in retail	0.027	65.6%
Category competitiveness in the market	0.025	60.0%
Company's sales value in retail	0.024	57.9%
Company's portfolio width	0.023	54.2%
Company's sales value in the market	0.022	53.5%
Category sales value in retail	0.020	47.4%
Marketing contribution to retailer	0.018	43.4%
Innovativeness	0.013	31.7%
Supply exclusivity	0.010	25.2%
Presence of a private label	0.009	20.8%
Seasonality	0.006	13.8%

The results, outlined in Table 40, identifies variables that are the most important for discrimination among arranged classes. Results revealed that category sales value in the market, category role and category competitiveness in retail are the most important contributors to differentiate among performance classes, and thus allows conclusion of its importance to general performance outcome. In Figure 23, below, normalized importance as a percentage is provided.

**Figure 21. Normalized importance of variables, Model 2a**



After comparison of the normalized importance of variables towards differentiation among classes of dependent variables, for Model 1a and Model 2a, differences in results were identified. It was observed that the most important contributing variables are different. Hence, this research is able to conclude that performance of new products of low value (high in quantity), as indicated in Model 1a, and high value (high in net sales value), as indicated in Model 2a, are of a different nature.

CART modeling outlined variables that are the major contributors to monetary sales gain. First, the most important performance outcome predictor is category sales value in the market which can also be related to higher consumption – the higher the value of the category, the more it is expected to be consumed, thus demand for the category is higher. Second most important variable is category role in retail. This finding once again confirms the role of retailer category management decisions to new product performance outcome. The third most important factor is how competitive the category is in the market, which can be related to higher consumption, thus attractiveness to new products to be introduced, in a particular category.

Consequently, after analysis of the normalized importance of variables for the dependent variables is provided and discussed, decision tree path modeling for both models is performed and discussed. Decision tree path modeling is also presented

visually with decision matrices. Summary statistics for the decision trees, for both Model 1a and Model 2a are provided in Table 41.

**Table 41. Summary statistics of decision trees for Model 1a and Model 2a**

Characteristics	Model 1a	Model 2a
Dependent variable	Quantity gain type	Net sales gain type
Independent variables	Innovativeness, Market competitiveness, Category competitiveness, Category turnover in the market, Category turnover in retail, Category role, Supplier turnover in retail, Supplier turnover in the market, Supplier portfolio width, Trade support, Seasonality, Exclusivity.	
Growing method	CRT	CRT
Validation	Cross validation	Cross validation
Maximum tree depth	5	5
Minimum cases in parent node	10	10
Minimum cases in child node	5	5
Number of nodes	27	41
Number of terminal nodes	14	21
Depth	5	5

Model 1a with the dependent variable, categorized quantity gain, is presented in Annex 8. The decision tree for Model 2a with the dependent variable, categorized net sales gain, is presented in Annex 9. After decision tree modeling is provided, a discussion of the most important findings follows.

Decision tree for Model 1a (Annex 8) is modeled with dependent variable quantity gain which represents high volume products. Analysis outlined that performance of quantity gain type is dependent on category role as the most important predictor which splits further performance modeling into two scenarios. If new products are assigned to the seasonal category role (node 2), positive performance outcome is much more expected than balanced or negative. If a new product is assigned to the destination, routine and convenience category (node 1), different performance paths are predicted. The mentioned category roles are expected to deliver a more balanced performance in comparison to positive or negative. This might be associated with a stable demand in all category roles except for seasonal category role. For seasonal products, more fluctuations in demand are observed. The two scenario split is followed by assignation to destination, routine and convenience categories and category sales value in the market. Category sales value in the market differentiates performance outcome at the level of two million turnover per year.

The first scenario occurs if category sales value in the market is above the value of two million yearly sales, which is the average value in the sample. However, no material differences in regard to performance output is observed (node 4). Yet differentiation later occurs at different levels of company's sales value in the market, which breaks at the level of 177,000 yearly sales value, mainly differentiating small sales value companies. If company's sales value per year is lower, which represents small suppliers, a balanced performance is anticipated and in the case of higher sales value, no clear differentiation of effects is observed. Next, differentiation is expected based on retail category competitiveness (node 8), which has separate effects at the competition level of 73 sku's in assortment which represents medium to high level of competition. If competition is below 73 sku's, a more balanced output is found, while if above – more positive and balanced outputs are expected. If competition in the category is higher, dependence on marketing contribution to retail (node 14) occurs. It delivers different effects at the investment level of 1143 euros per year per product. On average, trade marketing support variable value average in the sample was 9492 euros investment. If investment is lower than 1142 euros per year per product (which can be defined as “no investment”, compared with the sample), negative performance is expected. This finding is likely related with low marketing activities. Contrarily, if marketing contribution is higher, a more positive and balanced performance is expected. The mentioned value of marketing investment is found to be critical for new product performance maintenance because of higher competition in the category. If competition is below 73 items in the assortment, category sales value in retail plays a role (node 13) – if category turnover in retail is below 395,000 yearly sales (which is much higher than average category value in the sample), no clear differentiation exists. On the contrary, if category sales value is above the mentioned value, a balanced performance for a new product is found.

The second scenario occurs if category sales value is below two million yearly sales (node 3), which is below category value average in the sample, and thus delivers balanced performance expectation. Later, differentiation is found based on trade marketing support. If yearly trade marketing contribution per product is below 1057 (node 5), a balanced performance is observed. Next, output differentiates based on company's sales value in the market. If company's sales value in the market is below yearly sales of 21 thousand euros (which represents average supplier turnover in the market in the sample), a positive or balanced performance is expected, which later

differentiates in a more specific way. If company's turnover is in the range below four thousand yearly sales, which represents very small suppliers, a balanced or negative output is found while in the range between four and twenty one thousand sales value (small to medium companies), a clearly more positive output is anticipated. On the other hand, for products where the supplier's sales value is above 21 thousand euros in yearly sales, representing medium to large companies (node 10), differentiation based on category competitiveness occurs, which breaks at the level of 67 items. If a product is found in the category where competition is below the 67 items, which is medium to high level of competition, a clear balanced effect is observed. While if the product is in a higher competition category, a more balanced and positive effect is found.

Decision tree analysis for Model 1a outlined few important findings. First, performance differentiation occurs based on the category role, which can be associated with increased attention to categories by retail and differences in demand fluctuations. The second most important predictor was found to be category sales value in the market, which can also be associated with higher consumption and demand. Other important predictors were company's sales value in the market and level of competition in the category.

Next, a decision tree matrix is created for Model 2a (Annex 9), which represents modeling with higher value, hence higher sales value products. For net sales gain performance, the most important contributor is found to be trade marketing support, which differentiates at the value level of 8775 yearly investment per product which is a little below the average investment value in the sample. The average investment value in the sample is 9492 euros per product. Respectively, two scenarios are found to appear based on investment level.

The first scenario (node 1) occurs if marketing investment is lower than indicated, meaning lower than the average in the sample. For lower investment products, a more balanced or negative effect is expected in comparison to a positive effect. Next, a distinction appears based on category sales value in the market with lower and higher levels, breaking at the value of seven million yearly sales. Average category sales value in the market value in the sample is around two million. If category sales value is higher (which represents very high sales value categories) than indicated (node 4), a more negative performance is expected. However, performance outcome later differentiates based on the level of product innovativeness (node 9 and node 10). The

results revealed that for lower innovativeness products, a negative output is anticipated, while if a new product is more innovative, a more positive and balanced performance is found to be delivered. For categories with lower sales value in the market, the next predictor is category role (node 3). Again, as observed in Model 1a, the same path of category role differentiation exists – a seasonal category role delivers a different path in comparison to other category roles, namely destination, routine and convenience. If a new product is assigned to a seasonal category, a more positive and negative rather than balanced effect is expected. Consequently, for products assigned to a seasonal category, the next differentiation exists with supplier turnover in the retail channel (node 8), which breaks at the value of 267,950 yearly turnover which represents average supplier turnover in retail channel in the sample. If supplier turnover in the retail channel is below average level, a more positive or balanced effect is expected. Yet if above, a negative performance is anticipated. For other category roles, the next predictor is category turnover in the market, which differentiates at the level of 1.7 million yearly sales. In the sample, average category turnover in the market is around the value of two million. If company's sales value is below the indicated level, retail category competitiveness (node 15) plays a role at the value of 32 sku's in an assortment, which represents medium level of competitiveness. If competition is lower than the boundary, a balanced or negative effect is expected, while if higher – a balanced performance is predicted. For suppliers that have a sales value above 1.7 million yearly sales (below the average in the sample), category sales value in the market (node 16) delivers certain effects at a level of 3.3 million sales, which represents medium to high value categories. If turnover is lower than indicated, more balanced or negative effects are expected, while if higher – positive or balanced.

The second scenario differentiates based on company's sales value in the market (node 2), which differs at 2.8 million yearly sales which is above the average supplier sales value in the sample. If supplier turnover in the market is below this level, a positive or balanced performance is predicted. The next variable that causes differentiation is category role, however delivering a different effect as in previous findings. For net sales gain performance modeling, effect of category roles split into two categories (node 11, node 12) – path for routine and convenience categories, and path for destination and seasonal categories. For products that are assigned to destination or seasonal categories, a more positive and balanced performance is expected, which is later differentiated based on the presence of seasonality. If a new

product is seasonal, a positive performance effect is very much anticipated in comparison to other outputs. If seasonality is not present, a rather smaller positive performance effect is expected. The next predictor, if seasonality does not exist (node 21), is company's sales value in the retail channel, which plays a significant role that breaks at the value of 211,000 yearly turnover. The average supplier turnover in the retail channel in the sample is 221,390 yearly turnover. If turnover is lower than the differentiation value, more balanced and negative effects are predicted and if higher – a more positive effect is anticipated. A different path occurs for products that are assigned to routine or convenience categories (node 11). The next predictor for performance output is company's portfolio width, which differs at the value of 241 products in a portfolio. The average portfolio width value in the sample is 114. For products that have suppliers below this value, a more balanced effect is expected with the next predictor, competition in the category in the market (node 19), differentiating at a level of 49 items in a category which represents low to medium level of competition. If competition is lower than the indicated boundary, a more balanced then a negative effect is predicted, while if higher, a balanced effect is predicted. For products which are represented by companies with a portfolio width of more than 241 items (large suppliers, if compared to average value in the sample), a more positive performance is expected (node 20), followed by the next predictor, category sales value in retail. Category sales value in retail differs at a sales value of 134,800 yearly sales (lower than average category sales value in retail in the sample), delivering the following effects – if below the value (small value or niche categories), a clear positive performance and if above, a clear balanced performance. For products that are represented by companies that have a higher sales value in the market than 8.7 million, which represents larger than average supplier in the sample (node 2), a more balanced output is predicted. The next differentiator is found to be presence of a private label (node 6). If a new product is assigned to a category where a private label exists, a diverse effect is expected – either positive or negative, but not balanced, which can be related to uniqueness and ability to have a positioning difference to other products in a category. However, if a private label is not present in a category, a clear balanced effect is observed (node 13), which later differentiates based on category sales value in the market at a value of 1.7 million yearly sales. The average category sales value in the market in the sample is around two million yearly sales. If sales are below 1.7 million, a new product is expected to deliver a balanced effect. Yet if sales

value is above the mentioned value, a more balanced, then a negative effect is predicted. Next, for new products that are assigned to categories over 1.7 million yearly sales, category turnover in retail is a predictor (node 35, node 36), differing at a value of 95,419 yearly sales value and representing small to medium categories. Products that fall into a lower sales category are forecasted to have a more negative, then a balanced output. However, products in a higher sales value category, are predicted to deliver a balanced effect.

Decision tree analysis for Model 2a revealed that trade marketing support is the most important variable that leads to performance path differentiation, which can be associated with the relevance of marketing support for more expensive new products. The next most important predictor is supplier sales value in the market, similarly to Model 1a, and is associated with higher consumption and demand, hence ensuring stability in sales. Category role is also found to deliver similar effects in comparison to Model 1a. In addition, innovativeness is also found to deliver differentiation effect. More innovative products are associated with enhanced performance in comparison to products that possess lower innovativeness. Also, decision tree analysis for net sales value gain is found to be more sophisticated and involves additional variables that contribute to sales performance output, such as level of innovativeness, or presence of a private label. Other important variables were found to be similar to Model 1's analysis, such as company's sales value in the market, competition in a category and company's portfolio width. Differences in categorization paths for Model 1a and Model 2a were observed, which can be explained by the nature of the products in a sample. Model 1a likely represents high in quantity, cheaper products while Model 2a represents high in net sales value, expectedly more expensive products in comparison with Model 1a. Decision trees for both models represent the same depth of decision path, yet have differences according to the number of leaves, which reveals that Model 2a is of a more significant nature, and thus delivers more diverse performance paths.

### 3.7 Conclusions for empirical research

The empirical research provided in this dissertation employed a quantitative research approach, followed by regression analyses. Initially, regression diagnostics tests were provided for three models, followed by different dependent variables. After regression diagnostics was performed, two models were left for further analysis, Model 1 and Model 2, respectively analyzing sales gain in quantity and sales gain in value. Subsequently, Model 1a and Model 2a were derived with categorized dependent variables (negative, balanced and positive sales gain result). The empirical analysis consisted of two parts. First, OLS regression analysis was used to reveal the linkage among the explored variables, as well as to test the hypotheses. Secondly, Process conditional moderation analysis was performed. Finally, decision tree modeling was performed in order to quantify the results in a prediction model. The main findings that were revealed by empirical research are outlined in this section.

1. Regression analysis was performed, using OLS approach. This part of the analysis outlined direct and moderating significant effects among the variables in Model 1 and Model 2, as well as Model 1a and Model 2a. Consequently, role of moderators was outlined. Regression analysis revealed that innovativeness is not a predictor of performance as this relationship was not proved to be statistically significant. Regression analysis outlined significant direct positive predictors of performance, such as category sales value in the market, retail category competitiveness in retail and company's sales value in retail. It also revealed significant direct negative predictors of performance, such as category competitiveness in the market, company's sales value in the market, category sales value in retail, trade marketing support and category roles destination and convenience.
2. Role of moderators was also outlined and significant moderating effects were identified. Significant moderating effects that enhance the link between innovativeness and performance were found to be category sales value in retail and category role convenience. Significant moderating effects that suppress the link between innovativeness and performance were found to be category sales value in the market, category competitiveness in the

market, company's sales value in retail and presence of a private label. Analysis also confirmed the importance of moderating effects as some of the variables were found to deliver opposite and significant effects to performance, treated direct predictors in comparison with their role as moderators, such as the category role convenience, category sales value in the market and company's sales value in retail.

3. Process conditional moderation analysis was subsequently performed. Hayes Process modeling was employed to reveal conditional moderating effects. For conditional moderation analysis, Model 1 was chosen. All variables that delivered statistically significant effects in OLS regression tests were left for further Hayes process analysis. Process analysis revealed several important findings.

First, category sales value in the market is a moderating predictor of innovativeness – performance linkage with the general tendency that with increasing sales value, the linkage tends to be suppressed, indicating that innovativeness is less important for performance in higher sales value categories.

Secondly, company's sales value in retail is also a moderating predictor of innovativeness – performance linkage in diverse patterns. Generally, for smaller sized companies, innovativeness is more important to commercial success in comparison with medium to large sized suppliers.

Third, seasonal category role is strongly associated with positive moderating effect to innovativeness - performance linkage. Seasonal category role enhances the link between innovativeness and performance, regardless of category sales value in the market and in retail. This finding suggests that innovativeness is more important for successful performance of new products, assigned to seasonal category role.

Fourth, several significant linkages are found to be associated with the presence of a private label: i) in cases where it is not present in small and medium sales value categories in the market and retail, a positive moderating effect is delivered yet tends to slightly weaken with an increase in sales value; ii) in cases where a private label is present in medium and large sales value categories in a market, performance is suppressed with a

tendency to strengthen the effect with an increase in sales value. This finding suggests that in categories, where private label is not present, innovativeness is more important for successful performance, while less important in categories where private label is present.

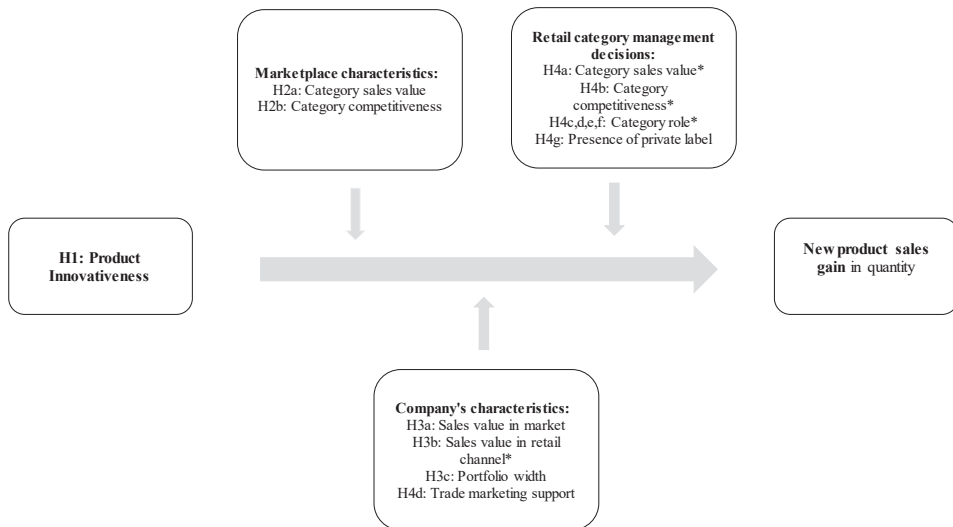
4. A decision tree modeling approach was employed in order to provide predictive performance modeling, based on Model 1a and Model 2a, which outlines the moderating effects of a commercial environment on innovativeness – performance linkage. The predictive modeling results for Model 1a suggest that company's sales value in the market, trade marketing support, and assignment to specific category role are the most important contributors to differentiate performance outcome for sales gain in quantity, also outlines importance to innovativeness – performance linkage. Predictive modeling for Model 2a revealed that category sales value in the market, assignment to specific category role and category competitiveness in the market in terms of products that are present in a respective category, are the most important contributors to differentiate performance outcome for monetary sales gain, also outlines importance to innovativeness – performance linkage. For the decision tree created for Model 1a, the most important findings were as follows – differentiation on the root node occurs based on the category role, which can be associated with increased attention to categories by retail and differences in demand fluctuations. The second most important predictor chosen after the root node was found to be category sales value in the market, which can also be associated with higher consumption and demand. Other important predictors chosen after the root node were company's sales value in the market and level of competition in the category. Decision tree analysis for Model 2a revealed that trade marketing support is the most important variable that leads to differentiation, which can be associated with the relevance of marketing support for more expensive new products. The next most important predictor chosen after the root node is company's sales value in the market, similarly to Model 1a, which is associated with higher consumption and demand, hence ensuring stability in sales. Category role is also found to deliver similar effects in comparison to Model 1a.

## 4. Hypothesis testing and summary

This chapter summarizes findings of the dissertation by providing finalized models and hypotheses, separately for Model 1 and Model 2.

In Figure 24, relations among variables in the conceptual Model 1 are provided. In Model 1, quantity gain was analyzed as a dependent variable. Consequently, in Table 42, the research hypotheses are summarized.

**Figure 22. Finalized Model 1**



**Table 42. Summary of hypothesis for Model 1**

Hypothesis linkage	Proposed direction	Result
H1: Innovativeness to Performance	Positive direct	Rejected
H2a: Category sales value in market to Linkage between Innovativeness and Performance	Positive moderating	Rejected
H2b: Category competitiveness in market to Linkage between Innovativeness and Performance	Positive moderating	Rejected* (opposite direction)
H3a: Company's sales value in market to Linkage between Innovativeness and Performance	Negative moderating	Rejected
H3b: Company's sales value in retail to Linkage between Innovativeness and Performance	Negative moderating	Supported*
H3c: Company's portfolio width to Linkage between Innovativeness and Performance	Negative moderating	Rejected
H3d: Trade marketing support to Linkage between Innovativeness and Performance	Positive moderating	Rejected
H4a: Category sales value in retail to Linkage between Innovativeness and Performance	Positive moderating	Supported*
H4b: Category competitiveness in retail to Linkage between Innovativeness and Performance	Positive moderating	Rejected
H4c: Category role destination to Linkage between Innovativeness and Performance	Positive moderating	Rejected
H4e: Category role seasonal to Linkage between Innovativeness and Performance	Positive moderating	Rejected
H4f: Category role convenience to Linkage between Innovativeness and Performance	Negative moderating	Rejected* (opposite direction)
H4g: Presence of private label to Linkage between Innovativeness and Performance	Positive moderating	Rejected

\* Statistically significant effect

## **5. DISCUSSION OF RESEARCH FINDINGS**

This chapter discusses the main findings of this dissertation and relates them with the current state of research, as well as draws main conclusions. The main findings of this dissertation are structured in the following manner – first, the role of innovativeness and its relation to performance is outlined and discussed. Secondly, findings related to marketplace characteristics in the innovativeness – performance linkage are discussed. Third, the role of supplier characteristics in the new product innovativeness – performance linkage is unveiled. Fourth, the role of category management decisions in the innovativeness – performance linkage is presented and discussed. Finally, limitations and future research directions are outlined.

### **5.1. Conceptualization of innovativeness and its relation to performance**

This dissertation aimed to discuss and conceptualize the essence of product innovation, focusing on the linkage between new product innovativeness and its performance due to contradictive findings in the area. A moderation analysis approach was chosen because classical methodology literature (Baron & Kenny, 1986) recommends this method to be employed in cases where results are inconsistent. Unclear conceptualization of innovativeness and its relation to performance encouraged this research. This study, as well as other newer studies, associates innovativeness with improved performance, but no significant linkage was found.

The theoretical development of this dissertation outlined that the definition of innovation has changed during the development and advancement of the knowledge in this field. Initially, emphasis was put on the essence of a new idea or activity that leads to value creation (Shumpeter, 1939; Robertson, 1967). Consequently, the definition evolved to a broader concept, which unifies the concept of newness among different levels, namely individuals, teams, projects, organizations or markets, depicted as continuous change (Nonaka & Takeuchi, 1995; Drucker, 1999). The spread of innovation in the market and delivery of economic value was also depicted in all previous conceptualizations. However, only studies over the last decade have recognized the crucial importance of innovation in economic systems as it is set to

play a central role in organizations and economies (OECD, 2005), which leads to improvement and growth patterns. It is also inseparable from its spread in the marketplace, which is defined in terms of commercialization as a final outcome of innovation value (Camison-Zornoza et al., 2004).

A stream of product innovation research is a key concept in this dissertation, also combined with its commercialization and performance studies. Part of the currently available research has linked innovativeness to performance on different levels – from new product performance to organizational performance. In addition, based on Garcia & Calantone (2002), organizational innovativeness does not equate to product innovativeness, and thus requires a separate investigation. It is found to depend on many factors, including level of newness as one of the major antecedents that reflects competitive advantage. However, the current state of research (Chang et al., 2014; Garcia & Calantone, 2002; Henard & Szymanski, 2001) indicates that a lack of consistency exists in the area of innovativeness – performance research, as results of previous research differ, ranging from positive to negative or even finding no linkage at all. In addition, several clear research gaps, noted in previous studies, prompted a focus on the innovativeness – performance linkage. First, a study by Rubera & Kirca (2012) highlights unclear relative effects across incremental and radical innovations which are found to follow different performance patterns (Damanpour & Schneider, 2009; Michael, Rochford & Wortruba, 2003). Secondly, a study by Chang et al. (2014) aimed to provoke the understanding of innovation, which should be treated as a continuum, not as a diverse construct as it often is. The lack of a clear classification, as well as contradictive findings on the innovativeness – performance linkage are the core research gaps that have been addressed by this dissertation. Third, inconsistency in the link provoked the question that the innovation – performance linkage cannot be evaluated unilaterally, and may be related to different effects in diverse contexts.

The findings of this research revealed no significant linkage between new product innovativeness and its performance. This result supports previous research by Calantone, Chan & Cui (2006) and Kleinknecht & Cooper (1991), which reported similar findings. This study's result can be explained by several arguments. First, inconsistency in the linkage indicates that it cannot be evaluated unilaterally and a more complex evaluation is required. Secondly, the country in which this study took

place was Lithuania, which based on Global innovation index ranking, does not qualify as a high ranking country for either innovation input or output. This is expected to impact research results. Third, the operationalization and methodology employed in this study to measure innovativeness may be different in comparison with the major body of research in the area. It has been acknowledged by previous research (Henard & Szymanski, 2001) that investigated the innovativeness – performance linkage that diverse findings may be explained by differences in measurement factors, such as use of different item scales or subjective versus objective evaluations or some other contextual factors. For example, previous studies (Song & Montoya-Weiss, 1998; Atuaheme-Gima, 1995), in comparison, have mainly used two-sided, radical and incremental scales to measure innovativeness. Also, other studies have measured innovativeness from a one-sided, usually product owner perspective (Stanko et al., 2015; Molina-Castillo & Munuera-Aleman, 2009; Daneels & Kleinschmidt, 2001) or customer perspective (Molina-Castillo & Munuera-Aleman, 2009; Moreau, Lehman & Markman, 2001), which can be defined as a non-holistic approach and can hardly be comparable. This research, in comparison, employed operationalization, conceptualized by Garcia & Calantone (2002), where a combination of market, technological and marketing perspectives of newness is used.

In addition, the scale by Garcia & Calantone (2002) is defined as influential research on the innovativeness domain (Stanko et al., 2015; Calantone et al., 2006), and thus can be recognized as an objective tool to operationalize this construct. Also, in this research, the level of innovativeness was defined as objective due to the rating, which was performed by retail buyers, responsible for category development and its overall assortment. In comparison, previous studies that aimed to conceptualize innovativeness used a different approach to measure the level of newness, namely from a product owner perspective (Stanko et al., 2015; Molina-Castillo & Munuera-Aleman, 2009) which might have the tendency to be biased. Thus, perceptual disparities may lead to very diverse findings and thus affect the overall findings of the research, which is acknowledged as a common bias in innovativeness – performance research (Henard & Szymanski, 2002). This study also uses real life performance measures, which can be defined as objective, and thus is a major difference in comparison to previous studies that explored perceived

performance as a dependent variable. Perceived performance is measured in similar studies in the field (Stanko et al., 2015; Molina-Castillo & Munuera-Aleman, 2009).

It was also observed that newer studies tend to associate higher innovativeness with improved performance, while older ones have found the opposite effect. This disparity can be explained by the culture of innovation, which has lately been encouraged in all organizations, by such economic institutions as OECD. Also, recently, innovation has been defined as a source of competitive advantage and business growth, both by practitioners and scholars (Le Bas & Scellato, 2014).

This finding leads this dissertation to the assumption that recent innovation culture has emphasized its performance due to a change in the perception of innovation and its importance to society. Empirical research also aimed to test the innovation – performance linkage to fill existing research gaps and bring clarification to the area by i) testing the relationship by using real life transactional data, not subjective views as has mostly been the case in previous research, and ii) applying a classification that treats innovativeness as a continuum, not as two opposites. Subsequently, the performed empirical research also revealed contradictive findings – innovativeness was associated with improved performance, yet the finding was not significant. This finding is similar to previous research findings, by Calantone, Cai & Cui (2006) and Kleinknecht & Cooper (1991). The findings outlined by this research also support the reasoning that was considered as a key question in this research - contradictive findings regarding the role of innovativeness in performance could be caused by other external factors and the linkage cannot be evaluated unilaterally. Thus, the innovativeness and performance linkage should be explored in different settings due to fluctuations in performance, which is caused by diverse commercial environments.

## **5.2. Contribution to marketplace conditions to innovativeness – performance linkage**

Marketplace related conditions are acknowledged to be a direct predictor of innovation performance. The moderating role of marketplace conditions was identified as a research gap and its role was outlined by this dissertation. Previous studies (Tsai, Huang & Tsai, 2013; Cooper & Kleinschmidt, 2007; Carbonell &

Rodriguez, 2006; Henard & Szymanski, 2001; Cooper & Kleinschmidt, 1995 and others, discussed in the theoretical development of this dissertation) have acknowledged that marketplace related conditions, such as market potential, its growth, turbulence, dynamism and competitive intensity are critical to new product performance. These conditions are found to be twofold – they either create a positive economic climate, which leads to opportunities, or a negative economic climate, which induces threat to performance. However, previous studies have extensively explored the direct marketplace conditions – performance linkage and failed to address it as a moderator.

Despite current research that is available on the innovativeness – performance linkage, scholars (Garcia-Zamora, Gonzalez-Benito & Munoz-Gallego, 2013; Tsai, Huang & Tsai, 2013; Szymanski, Kroff & Troy, 2007; Gattington & Xuareb, 1997) argue that validation is needed in regard to the marketplace environment, aiming not only to address the previously explored direct linkage, but also the role of marketplace conditions as a moderator. Consequently, this research gap was addressed in this dissertation. The theoretical development of the dissertation concluded the main findings of previous research, related with the role of marketplace characteristics in new product performance, and thus outlined several findings: i) marketplace characteristics have an effect on performance, but ii) attempts to address the moderating role of marketplace characteristics in performance are rather limited; and iii) this research gap has already been highlighted by previous research as meaningful and relevant to be explored. Only a few studies (Garcia-Zamora et al., 2013; Kohli & Jarowski, 1990) have addressed this topic, hence it can still be defined as rather unexplored and in need of further clarification.

Previous research (Tsai, Huang & Tsai, 2013; Carbonell & Rodriguez, 2006) has conceptualized the role of market attractiveness and performance potential and revealed that it has a positive impact on performance. Marketplace value is associated with potential, which, according to Cooper et al. (1995), is described as a growing and positive economic climate that leads to performance opportunities. The hypothesis on the moderating role of marketplace sales value was associated with previously discussed findings that related higher sales value with higher potential, as well as with higher demand and a need to differentiate. Thus, the linkage

between innovativeness and performance is expected to be enhanced by increased marketplace sales value.

The performed empirical research revealed that category sales value in the marketplace has a significant and positive direct effect on performance. This finding is in line with previous research results, presented by an extensive body of studies (Tsai, Huang & Tsai, 2013; Carbonell & Rodriguez, 2006; Green, Barclay & Ryans, 1995; Cooper et al., 1994; Cooper & Kleinschmidt, 1993; Gatington, Weitz & Bansal, 1990; Green & Ryans, 1990; Cooper & Kleinschmidt, 1987; Cooper, 1979). Yet, as a moderator, category sales value significantly suppresses the link between innovativeness and performance, which is the opposite direction than suggested. This finding is in line with previous findings by Kohli & Jarowski (1990) and Garcia-Zamora, Gonzalez-Benito & Munoz-Gallego (2013) which suggested that marketplace conditions play a significant moderating role. However, the finding also enriched the current state of research by identifying the direction of marketplace as a moderator. Also, it outlined role of marketplace conditions in the relationship between innovativeness and performance. The finding of the empirical research allows the conclusion that higher innovativeness is less important to performance in categories with a higher sales value in the market. As indicated, this finding also allows rejection of the hypothesis that related a higher category sales value with an enhanced linkage between innovativeness and performance. Thus, the role of marketplace conditions can be defined more as a threat than the opportunity, which is opposite to the suggested hypothesis.

In addition to an regression analysis, a conditional moderation analysis allowed the current understanding on the role of category sales value in marketplace to be extended. The moderating role of category sales value in the market on the link between innovativeness and performance is dependent on several conditions, namely i) category competitiveness in the market and retail, ii) category sales value in retail, iii) category role, and iv) presence of a private label. A general association between small value categories and an enhanced linkage between innovativeness and performance was found. Small value categories are significantly and positively associated with an enhanced role of innovativeness in performance. This finding suggests that in relatively small value categories, product innovativeness is more

important to performance, and thus can be associated with performance opportunities.

Also, a tendency was revealed that with an increasing category sales value in the market, the innovativeness – performance linkage becomes suppressed, meaning that innovativeness becomes less important in categories when the category sales value increases. It was also found that for a small sales value, categories in the market, combined with a low to medium competitive situation, tend to deliver a significant and positive moderating effect to the linkage between innovativeness and performance. This finding suggests that for performance of new products, introduced to smaller value categories, innovativeness is more important in comparison to new products introduced to categories with a higher sales value.

The findings, related to the role of marketplace sales value, allowed this research to conclude that, as a direct predictor, category sales value in the market reinforces new product performance, yet as a moderator, it delivers adverse effect. Finding the opposite effect to existing knowledge, suggests the conclusion that the commercial environment plays a significant role in the innovativeness – performance linkage, and the role of innovativeness in this relationship may also have diverse patterns. Furthermore, category sales value in the market was also found to be an important variable, related to performance as with increasing category sales value in the market, innovativeness becomes less important to performance outcome. However, in small and medium sales value categories, the effect is adverse, which can be related to niche or specific categories, where competition is lower and it is easier for a more innovative product to commercialize. Contrarily, in large scale categories, where competition is known to be at a high level, which is considered an obstacle to achieving successful commercialization (Tsai, Huang & Tsai, 2013; Steenkamp & Gielens, 2002; Song & Parry, 1997; Cooper, 1979), the effect is observed to follow a different pattern.

The role of competitiveness in the market on the innovativeness – performance linkage was also explored in this dissertation. Previous research has proven that an intense competitive situation is associated with decreased performance (Tsai, Huang & Tsai, 2013; Steenkamp & Gielens, 2002; Song & Parry, 1997; Cooper, 1979) due to the higher competitive threat it induces, and thus it is more difficult for an innovation to make a breakthrough. Yet, similarly to the current state of research,

which was related to the role of category sales value in the market, previous research has mainly focused on the direct competitiveness – performance linkage. A few studies have addressed competitiveness as a moderator, namely Kohli & Jarowski (1990) and Garcia-Zamora, Gonzalez-Benito & Munoz-Gallego (2013), which mainly associated increased competition with suppressed performance, yet asked for further clarification in the area.

Following the existing conceptualizations in regard to the direct competitiveness – performance linkage, this dissertation hypothesized that competitiveness as a moderator between innovativeness and performance has the opposite effect. It was suggested to enhance the innovativeness – performance linkage due to the increased role of higher innovativeness, which enables a new product to achieve a better performance result, which is associated with a competitive advantage. Competitive advantage was also shown to create a differentiation in the market (Tsai, Huang & Tsai, 2013; Agkun et al., 2007; Szymanski et al., 2007; Nakata et al., 2006; Henard & Szymanski, 2001).

Findings of empirical research revealed that as a direct predictor, category competitiveness in the market delivers a negative effect to performance which is in line with findings presented by previous research (Tsai, Huang & Tsai, 2013; Steenkamp & Gielens, 2002; Song & Parry, 1997; Cooper, 1979). As a moderator, it was also found to deliver a significant negative effect on the innovativeness – performance linkage, suggesting innovativeness is less important to performance in more intense competitive settings. The finding is contrary to suggested, as it was found to suppress the linkage between innovativeness and performance.

Supplementary analysis of conditional moderation allowed several additional findings to be revealed. First, with an increasing level of competition in the category, the innovativeness – performance linkage tends to be more suppressed. However, this finding is not valid for small sales value categories in the market. If the category sales value in the market is defined as small, lower to medium competitiveness is still found to deliver a positive effect on the innovativeness - performance linkage. This finding suggests that innovativeness is more important to performance in smaller sales value categories that might be defined as niche categories. In addition, research findings allowed this dissertation to conclude that competitive situation has no negative effect on the innovativeness – performance linkage for products

assigned to a seasonal category role. The finding of enhanced innovativeness – performance linkage for products assigned to a seasonal category role suggests an increased importance of the role of higher innovativeness on performance in such a commercial environment.

These findings allow the conclusion that, in general, a competitive situation serves as a barrier for the performance of a new product, but the role of a competitive situation differs in diverse commercial settings. For example, in categories with more intense competition, innovativeness is less important for performance, yet for products assigned to a seasonal category role, the innovativeness –performance link is enhanced, which thus suggests an increased role of higher innovativeness. Consequently, these findings underline that the moderating role of a commercial environment is important and can predefine the performance of newly launched products, depending on its newness.

### **5.3. Contribution to company's characteristics to innovativeness – performance linkage**

Companies' characteristics were proven to have a significant moderating effect on the innovativeness – performance link, yet differences in moderation direction exist and depend on companies' size. The theoretical development of this dissertation revealed that the resources and capabilities of a company are important antecedents to product innovation performance. Previous studies (Talke & Hultink, 2010; Ernst, Hoyer & Runsaamen, 2010; Newbert, 2007; Grant, 1996) have concluded that the competitive advantage a company is able to gain in the marketplace depends on its characteristics. Other studies (Augusto & Coehlo, 2009; Wang, 2008; Garrido-Rubio & Polo-Redondo, 2005; Atuahene-Gima, 2001; Hultink & Robben, 1999; Cooper, 1998, and others discussed previously) have also related company characteristics, namely its size, age, width of portfolio, competitive strength and orientation, with a direct impact on new product performance. Previous conceptualizations in the area associated a company's characteristics with its strength in the market, namely its market power, reputation, available resources and capabilities, which is later associated with easier new product acceptance and improved performance of its new introductions. Hence, these variables were

important to address in the dissertation as elements of the commercial environment, related to the company's or supplier's characteristics, in which new product performance evolves. Yet, as discussed previously, existing literature has mainly addressed the direct linkage between a company's characteristics and new product performance.

The moderating role of a company's characteristics on the innovativeness – performance linkage was thus defined as a research gap and was addressed by this dissertation. Previous research by Garcia- Zamora et al. (2013), Augusto & Coehlo (2009), Gatington & Xuareb (1997), Damanpour (1996) and Liu (1995), also encouraged the contribution to this area of research. The theoretical development of the dissertation allowed several variables to be distinguished for further analysis, namely company size in terms of its sales value in the market and retail channel, the company's portfolio width and trade marketing support. These variables were discussed in the dissertation from a theoretical as well as an empirical point of view. This dissertation explored the moderating role of companies' characteristics and, based on previous research, associated it with a suppressed innovativeness – performance linkage due to easier market acceptance of new products, caused by superior reputation, know-how and capabilities.

The empirical research performed in this dissertation also revealed several findings in relation to this association. First, company sales value in the market did not reveal any significant moderating effect on the innovativeness – performance linkage, which allowed the rejection of the hypothesis that suggested an association between a company's sales value in the market and a suppressed linkage.

However, company sales value in the retail channel was found to be a direct positive and significant predictor of performance. Yet, as a moderator, it revealed the opposite effect in the innovativeness – performance link. Company sales value, as a moderator, was found to significantly suppress the innovativeness – performance linkage which supported the hypothesis. Thus, this research concluded that higher innovativeness is less important for new products, represented by larger companies which can be related to easier market acceptance of new products, represented by companies that have a large sales share in retail channel.

In addition, conditional moderation also revealed that the higher the company sales value in a retail channel, the less important innovativeness becomes for new

product performance. Yet, the effect is the opposite for smaller sales value companies. It was found that a positive and significant moderating effect on the innovativeness – performance link is delivered by small sales value suppliers in medium value retail categories, which can be associated with rather medium to high demand in categories that are filled by small niche players for which innovativeness is more important to achieve commercial success. The finding also highlights the importance of higher innovativeness products for smaller companies, which is more important for its performance in comparison with medium to high value companies. For medium to high sales value companies, the innovativeness – performance linkage was suppressed, which suggests better market acceptance of new products, despite their level of innovativeness.

Two more variables, namely a company's portfolio width and its trade marketing support were associated with a moderating role in the innovativeness – performance link. Similarly to a company's sales value, a company's portfolio width was directly associated with higher new product success rates in previous research and was suggested to have a negative moderating effect on the innovativeness – performance link due to better resources and capabilities, which leads to a superior reputation and better new product acceptance. This proposition was explained by the association between large companies and better resources (Garcia-Zamora et al., 2013; Bobrow, 1998; Cooper et al., 1994), which subsequently leads to easier acceptance of their new products in the market, as suggested by Hultink & Robben (1999) and Gatington, Weitz & Bansal (1990). However, empirical research found no significant direct effect on performance, nor a moderating effect on the innovativeness – performance linkage, which allowed the rejection of the hypothesis related to the moderating role of a company's portfolio width.

In addition, trade marketing support has also been associated with improved performance, as a part of a company's resources. Previous studies have acknowledged marketing support as an important antecedent of new product performance (Everdingen et al., 2011; Garrido-Rubio & Polo-Redondo, 2005; Bloom, Gundlach & Cannon, 2000; Di Benedetto, 1999). Also, a study by Everdingen et al. (2011) suggests that higher trade marketing support increases chances to launch a new product more effectively. The theoretical development of this dissertation concluded that there is a direct and positive linkage between marketing support of a

new product and its performance, yet no evidence for a moderating role of trade support was found. Consequently, it was perceived as a research gap. This research suggested trade marketing support to enhance the link between innovativeness and performance due to the need invest more in higher innovativeness products to help to communicate its competitive advantage to potential adopters, which is associated with a longer learning process (Sethi, 2002; Kusunoki, 1997). However, the performed empirical research revealed no significant moderating effect of trade marketing support on the innovativeness – performance link, which allowed the proposed hypothesis to be rejected. Yet, as a direct predictor for new product performance, trade marketing support was found to deliver a direct negative effect on performance; therefore this variable was included in an additional conditional moderation analysis.

Supplementary analysis of condition moderation revealed several findings related to the moderating role of trade marketing support. First, small to medium trade marketing support, in combination with small to medium category sales value in a market was found to enhance the innovativeness – performance linkage. This finding suggests that innovativeness is more important for the performance of new products that are found in small to medium sales value categories and have small to medium trade marketing support. Secondly, small to medium trade marketing support was found to enhance the innovativeness – performance linkage for companies that have relatively small sales value in retail.

#### **5.4. Contribution to retail category management decisions to innovativeness – performance linkage**

Retail category management decisions were found to have a significant moderating effect on the innovativeness – performance linkage which is related with category sales value and a seasonal category role. Significant conditional moderation effects were also delivered by category competitiveness and the presence of a private label. One of the key novelties of this dissertation was the aim to outline the role of retail category management decisions in new product performance during launch. The practice of retail category management is acknowledged as an important driver of performance, mainly due to an association

with the growing importance of retailers in the market (Lamey et al., 2018; Shankar, 2011; Luo, Kannan & Ratchford, 2007; Reynolds et al., 2007). Also, a study by Shankar (2011) concludes that on average, more than half shoppers' decisions in regard to product choice are made in-store, thus many companies become dependent on retailers' strategies and operations because of its control over direct access to the consumer. So-called "gate keepers" to the consumer have internal operations that are expected to have an effect on new product performance, yet this effect is not fully understood to date. Previous studies have also defined the area as under-explored (Lin & Chang, 2012) and highlight the need to contribute to knowledge in the field (Lamey et al., 2018; Lin & Chang, 2012; Shankar, 2011; Dhar, Hoch & Kumar, 2011; Morgan, Kaleka & Gooner, 2007; Glynn, 2007; Steenkamp & Gielens, 2003).

The theoretical development of this dissertation allowed the identification of several important factors that outline retail category management decisions and their role in new product performance. The role of category management decisions forms a commercial environment and is found to directly affect new product performance (Han, Fu & Chen, 2013; Calantone & Griffith, 2007). Retail category management decisions are suggested to form specific environmental settings in which the performance of innovation evolves, so cooperation with retailers becomes twofold as cooperation and competition occur simultaneously. The theoretical development section of this dissertation outlined that category sales value (Tsai, Huang & Tsai, 2013; Carbonell & Rodriguez, 2006), its competitiveness (Tsai, Huang & Tsai, 2013; Carbonell & Rodriguez, 2006; Steenkamp & Gielens, 2002), category role (Dhar, Hoch & Kumar, 2011; Everdingen et al., 2011; Glynn, 2007) and presence of a private label (Lincoln & Thomassen 2008; Baltas & Argouslidis, 2007; Karry & Zaccour, 2006; Ailawadi & Keller, 2004) are the most important category management decisions related to new product performance outcomes.

Category sales value has been associated with a direct positive effect on new product or business performance by previous studies in the field (Carbonell & Rodriguez, 2006; Tsai, Huang & Tsai, 2013; Cooper & Kleinschmidt, 1993; Cooper & Kleinschmidt, 1987; Cooper, 1979; Gatington, Weitz & Bansal, 1990; Green & Ryans, 1990; Cooper et al., 1994; Green, Barclay & Ryans, 1995; Carbonell &

Rodriguez, 2006) due to its relation with a positive economic climate which leads to growth opportunities.

Following studies by Garcia-Zamora et al. (2013) and Steenkamp & Gielens (2002), this research suggests that a higher category sales value is related with higher category demand. In addition, higher category demand is also associated with higher competitiveness inside the category which induces more intense rivalry. Thus, this research suggested that higher category sales value in retail should enhance the linkage between innovativeness and performance. The importance of higher new product innovativeness was related with a competitive advantage which has been acknowledged to contribute to better performance (Tsai, Huang & Tsai, 2013; Agkun et al., 2007; Szymanski et al., 2007; Nakata et al., 2006; Henard & Szymanski, 2001). The results of the empirical research supported this hypothesis which is in line with previous conceptualizations (Garcia-Zamora et al., 2013; Kohli & Jarowski, 1990).

Contrary to the impact of category sales value, category competitiveness in retail is associated with a direct negative effect on performance, as already acknowledged by an extensive body of research (Cooper, 1979; Cooper & Kleinschmidt, 1993; Frazier & Lassar, 1996; Song & Parry, 1997, Steenkamp & Gielens, 2002; Carbonell & Rodriguez, 2006; Augusto & Coehlo, 2009; Tsai, Huang & Tsai, 2013; Garcia-Zamora et al., 2013) due to its relation with a negative economic climate which leads to imposed competitive threat in the category. Consequently, this research suggested that competitive intensity in a retail category should enhance the link between innovativeness and performance due to the competitive advantage of more innovative products which leads to better differentiation among competition and thus to improved performance. As already outlined, previous conceptualizations also associate new product competitive advantage with improved performance (Agkun et al., 2007; Szymanski et al., 2007; Tsai, Huang & Tsai, 2013; Nakata et al., 2006; Henard & Szymanski, 2001). The findings of this research revealed that category competitiveness in retail has no significant moderating effect between innovativeness and performance, and thus the suggested hypothesis was rejected.

This research also explored the impact of different retail category roles on the innovativeness – performance linkage. A theoretical conceptualization of category role assignment by industry studies (Nielsen, 2006) was employed to discuss the rationale behind propositions of this research. Previous research by Glynn (2007)

has concluded that the importance of category roles for retailers has a direct impact on the performance of products that are assigned to a specific category. Category roles, namely destination, routine and seasonal, were suggested to enhance the linkage between innovativeness and performance due to reasons related to the strategic purposes and essence of the respective category roles.

By definition, the destination category role is conceptualized as a key category role for the retailer, which helps it to be differentiated in the market, as well as attract customers. Various tools are used by retailers to enhance the performance of destination category, namely assortment, pricing, promotions, increased visibility and others (Nielsen, 2006). Consequently, destination category role was proposed to enhance the linkage between innovativeness and performance, suggesting that innovativeness is more important to achieve commercial success in this category role due to differentiation among competition and the competitive advantage of more innovative products. However, no significant moderating linkage was found in relation to destination category role, which allowed the hypothesis to be rejected.

Seasonal category role was also associated with improved performance due to its demand peaks and retailers' willingness to exploit seasonal demand. Industry studies (Nielsen, 2006) associate seasonal categories with retailers' willingness to create excitement, generate customer flow and profit. The seasonal category role, due to its nature, is also associated with unstable demand, which is related to seasonal peaks that also encourage retailers to take specific actions in order to achieve their commercial goals during the demand peaks. Empirical research revealed no significant moderating impact on performance which allowed this research to reject the hypothesis that proposed that the seasonal category role should reinforce the link between innovativeness and performance.

Yet a conditional moderation analysis revealed an interesting effect of seasonal category role on the innovativeness – performance link. It was found that seasonal category role enhances the innovativeness – performance linkage, despite the sales value and competitive intensity in categories. In addition, the seasonal category role also significantly enhances the linkage between innovativeness and performance, despite the presence of a private label, while in all other settings, the presence of a private label is associated with a suppressed innovativeness – performance link. Furthermore, the seasonal category role was found to have a significant enhancing

effect on the innovativeness – performance link despite the size of the company. In general, higher sales value companies were associated with a decreased role of innovativeness on performance, yet if the product is assigned to a seasonal category, a positive and significant moderating effect on the innovativeness – performance link was found. Findings related with the impact of seasonal category role suggest that the role of innovativeness is enhanced in specific environmental conditions. It can be related to the specifics of seasonal categories, which are used to cover demand peaks of specific products in order to generate turnover, profit and customer flow. To develop and achieve specific targets of seasonal categories, retailers need to form dynamic assortments and promotions properly, as well as adjust pricing and visibility to exploit and stimulate demand of limited term products and categories. This increased attention to specific demands is suggested to cause a positive moderating effect on the innovativeness – performance link, also making innovativeness more important to commercial success due to more intense competition.

On the contrary, new product assignment to the convenience category role was suggested to have a suppressing effect on the linkage between innovativeness and performance. A proposition related to impact of convenience category role suggested that innovativeness is less important for the convenience category role. The rationale behind this hypothesis was the strategic purpose of convenience categories, which are used to build more transactions and generate profits, using such tools as increased prices and convenient locations that encourage spontaneous purchases. However, empirical research revealed that the convenience category role positively and significantly enhance the linkage between innovativeness and performance. This finding allowed the hypothesis related to the role of convenience categories to be rejected as it was found to run in the opposite direction than suggested.

In addition to the impact of different category roles on performance, the role of a private label was also empirically explored in this dissertation. It is widely acknowledged that retail category management decisions include increased consideration to private labels in diverse concepts, such as everyday low price, medium pricing, premium pricing which is reflected in different forms of assortment and quality. Previous research has concluded (Burt & Sparks, 2002; Ailawadi,

Gedenk & Nelsin, 2001; Corstjens & Laj, 2000; Richardson, 1997; Hoch & Banjeri, 1993) that private labels contribute to retail business in many ways. On the contrary, it has also been acknowledged (Karry & Zaccour, 2006; Ailawadi & Keller, 2004) that private labels create threat to branded products due to an increased emphasis on the development of own products by retailers. Thus, based on previous conceptualizations, it was suggested that private labels enhance the linkage between innovativeness and performance, making innovativeness more important in order to differentiate and thus achieve commercial success.

An empirical analysis revealed a significant negative moderating effect on the innovativeness – performance link which allowed the previously proposed hypothesis to be rejected. This finding stimulated further analysis of conditional moderation, which also revealed several significant findings. The general finding revealed a twofold effect of a private label as a moderator on the innovativeness – performance link. In the categories where a private label is present, the innovativeness – performance link is suppressed, suggesting a decreased role of more innovative products. While in categories where a private label is not present, the innovativeness - performance link is enhanced, suggesting an increased role of more innovative products. This finding can be explained by the general importance of private labels to retailers and respective actions that are performed by retailers in order to successfully develop their own brands.

In addition, several conclusions related to the role of private labels were also made. First of all, in the categories where a private label is not present, with an increasing category sales value in both the market and retail channel, the innovativeness – performance link tends to weaken, yet remains positive. Secondly, for both small and medium sales value categories, the non presence of a private label in the assortment enhances the innovativeness – performance linkage significantly. The effect is the strongest for small sales value categories, which can be associated with niche products, suggesting an increased role of innovativeness in performance in smaller categories.

On the contrary, in the categories where a private label is present, its moderating effect tends to strengthen the linkage with the increasing sales value of the category. For the combination of medium and large sales value categories and the presence of a private label, a negative moderating effect appears. A negative moderating

effect on innovativeness - performance is the strongest in large sales value categories. This particular finding can also be related to the importance of private labels in large value categories. The larger the category, the more it is consumed, hence the higher the sales and profit potential it has from both the supplier's and retailer's point of view. In this situation, a retailer is perceived to have more power, and hence adjusts its private label strategies with various actions in-store, at the same time inducing rivalry to branded products. Also, the role of a private label is associated with a competitive situation in the categories. In the categories where a private label is not present, the positive effect on the innovativeness - performance link tends to weaken with increasing competition, yet remains positive at all levels of competitiveness. Yet in the categories where a private label is present, the negative effect of a private label on the innovativeness – performance link tends to strengthen with increasing competition. Third, for the suppliers whose new products are present in the categories where a private label is not present, the enhancing innovativeness – performance effect tends to strengthen with the decreasing turnover of the supplier. This finding indicates that for smaller suppliers, the role of innovativeness in performance is significantly more important to performance in the categories where a private label is not present. However, for companies whose products are present in categories where a private label is also present, the negative moderating effect tends to strengthen with the increasing sales value of the company, suggesting good acceptance of new products despite its level of innovativeness. A negative moderating effect on the innovativeness – performance link is the strongest for large value companies which, as suggested, can be related with better new product acceptance due to their resources, capabilities and superior reputation.

The findings related to the presence of private label can also be associated with private label strategies, as retailers tend to target high value categories where consumption potential can be exploited. In addition, private labels often employ copy-cat strategies that follow top selling brands, which tend to be less profitable for retailers. For example, top selling brands are often owned by large companies that invest heavily in the development of innovations and are later copied by retailers who aim to replace these brands with more profitable own substitutes. Despite the general finding that the presence of private labels was found to deliver a negative moderating effect on the innovativeness – performance link, a private label has no

negative effect on performance in seasonal categories. As discussed before, seasonal categories are formed and used to exploit unstable demands of specific categories with the aim to bring more profits. Hence, it is expected that dynamic assortments are present in these categories and due to unstable demand not worth developing an own private label for this type of category.

## **6. CONCLUSIONS AND RECOMMENDATIONS FOR FUTURE RESEARCH**

This chapter aims to conclude the content of this dissertation and summarize it by providing theoretical and managerial contribution. It also provides limitations of the study and future research directions.

### **6.1. Theoretical contribution**

The link between product innovativeness and performance, as well as the role of commercial environment to the link in context of retail was explored in this dissertation. This research has addressed research gaps, such as inconsistent and even contradictory findings in regard to the linkage between innovativeness and performance. Role of newness was explored in performance and thus concluded that inconsistency might be associated with the previously addressed direct linkage, yet moderation was suggested to play an important role in defining performance antecedents. The findings of this research allowed to outline several points of theoretical contribution, which advanced the knowledge in the marketing literature, specifically the area of new product development and performance studies.

1. First, this dissertation contributes to the extension of understanding towards innovativeness – performance linkage. Theoretical development of this dissertation allowed the conclusion that findings of previous research in the area is rather inconsistent and even contradictory. This research also concluded that inconsistency can be conditioned by several factors that ultimately lead to intricacy, related to incomparability of previous results, namely i) differences in methodological approach; ii) diverse contexts of previous studies; such as industry or country specifics, iii) lack of more complex evaluation of the linkage, related to the needed consideration of other external factors. This research thus concludes that the innovativeness – performance linkage cannot be evaluated unilaterally and a more complex evaluation of the linkage is needed to bring clarity to the area of research.
2. Theoretical development of this dissertation also allowed contributing to the unification of existing theories that outline an integral view on new product

performance predictors. This research thus allowed a conclusion that rapid changes in economic and business environments condition and require continuous advancement of knowledge in the areas of new product development and new product performance. Also, this research has presented a holistic view on new product performance predictors and distinguished four major groups of them, namely product characteristics and other external predictor groups, such as marketplace, company's and other counterparts' (distributors and retailers) activities. The integral framework that outlines the complexity of external environment was developed and defined as commercial environment.

3. Findings of this research also provided a scientific justification on the moderating role of the commercial environment to the innovativeness – performance linkage. The new theoretical propositions allowed the advancement of existing knowledge on the role of moderators, which was rather limited previously. The research confirmed the importance of commercial environment as a moderator to innovativeness – performance linkage. Commercial environment, as a group of moderators, was associated with favourable and non-favourable economic climate that leads to performance related opportunities or barriers in the marketplace. Whereas product innovativeness was associated with competitive advantage, thus differentiation among competition, which leads to improved performance. Role of innovativeness to performance concerning diverse commercial environment was conceptualized.
4. Linkage between new product innovativeness and its performance in relation to the role commercial environment was redefined by this research. The context of commercial environment was suggested to moderate the linkage between innovativeness and performance, and thus condition inconsistency in current state of research. A synthesis of innovativeness – performance and new product success research areas has enabled this dissertation to develop a conceptual model, which outlined and justified the moderating role of commercial environment to the innovativeness – performance linkage. Three major groups of variables that contribute to performance linkage were distinguished, namely marketplace related, retail

category management decisions and company's characteristics – related variables.

5. Empirical evidence outlined the role of innovativeness to performance. Although in this research more innovative products were associated with improved performance due to competitive advantage, which creates additional value in comparison to other offerings in the market, this was not proven by the empirical research, as no significant linkage was found. This finding also supported inconsistency in innovativeness – performance linkage studies, similarly to previous research in the area. Yet, this research proved the role of commercial environment to innovativeness – performance linkage to be existant. A commercial environment was found to deliver significant moderating effects on the innovativeness – performance linkage. Analysis also confirmed the importance of moderating effects as some of the variables were found to deliver opposite effects to performance, treated as direct predictors in comparison with their role as moderators, such as company sales value in retail, category sales value in retail and category role convenience. This finding suggests that the role of innovativeness in performance can have different effects that depend on various commercial environments.

Empirical research revealed several significant moderating effects on the innovativeness – performance link. Significant moderators that enhance the link between innovativeness and performance are found to be category sales value in retail and convenience category role, which suggest an increased role of more innovative products in performance in the indicated commercial conditions. Significant moderators that suppress the link between innovativeness and performance, making a higher level of innovativeness less important to commercial success, were found to be category sales value in the market, category competitiveness in the market and company sales value in retail.

6. Empirical evidence also confirmed a significant presence of conditional moderation effects in relationship between innovativeness and performance. This thus again exposes a significant role of moderators that contribute the linkage, which was explored in this research. In addition,

conditional moderation allowed to conclude that more specific regions of significant moderation exist in the innovativeness – performance linkage.

In relation to the role of marketplace characteristics to innovativeness – performance linkage, employment of conditional moderation analysis proved that a general tendency exists – with increasing sales value in the category, the negative moderating effect on the link tends to strengthen. This finding suggests that the role of higher innovativeness becomes less important with an increasing category sales value in the market. Significant moderation was mainly observed in cases where category sales value was relatively small: i) in cases where category sales value is small and competition level low to medium, a positive moderating effect is expected, which tends to weaken with increasing competition level; ii) in cases where category sales value is small but retail category is over performing, a positive moderating effect is also expected and is found to strengthen with increasing levels of over performance which suggests increased category importance to the retailer; iii) in cases where category sales value is small and competition level in the retail category is medium to high, a positive moderating effect is expected and tends to intensify with increasing levels of competition; iv) in cases where category sales value in the market is small and company sales value is also small, a positive moderating effect is expected as well.

Conditional moderation analysis also outlined a more specific moderating role of supplier's (company's characteristics) to innovativeness – performance linkage. Company's sales value in retail is also a significant moderator for the innovativeness – performance link, yet in diverse patterns. Generally, a negative moderating effect on the linkage was delivered by company sales value. However, a conditional moderation analysis revealed more detailed conditions for the moderation to appear. Several significant moderating effects were associated with company's sales value in retail: i) in the combination of a small sales value supplier in a medium sized category value in the market, a positive moderating effect is expected; ii) for products of small suppliers, innovativeness is more important for performance in comparison with medium or large sales value suppliers in low or medium levels of market competitiveness, thus a positive moderating

effect is anticipated; with increasing competitiveness in retail, the positive moderating effect tends to strengthen.

Conditional moderation empirically proved that retail category management decisions have twofold moderating effects on the innovativeness – performance link. The seasonal category role is strongly associated with an enhanced link between innovativeness and performance, which suggests an increased importance of higher innovativeness: i) the seasonal category role enhances the innovativeness – performance link, despite the category sales value in the market and in retail. However, the effect tends to slightly weaken with the increasing sales value of the category in the market. On the contrary, in retail, the positive moderating effect tends to strengthen with an increasing level of competition; ii) seasonal category role also enhances the link despite the level of competition in the market. A positive moderating effect is anticipated at all levels of competition, but with an increase in the level of competition, the positive moderating effect of the seasonal category tends to weaken, iii) the seasonal category role enhances the innovativeness – performance link regardless of the company's sales value in retail; with increasing company's sales value, the effect tends to weaken; iv) the seasonal category role has a positive significant moderating effect despite the presence of a private label in the category, yet if a private label is present, the positive moderating effect is slightly weaker.

7. This research also developed a forecasting pattern that allows the prediction of product innovation performance on the basis of specific commercial environment. A decision tree, a hierarchical type of modeling was created for practical use, which provides a set of rules that are found contribute to performance outcome. It was empirically proved that company's sales value in the marketplace, category competitiveness in the market, trade marketing support and category role are the most important new product performance predictors.

## 6.2. Managerial implications

Along with theoretical contribution, this study provides several managerial implications that can be valuable to the practitioners of the industry. This chapter provides general managerial implications together with more specific, adapted to retail managers and products' manufacturers.

1. This research explored role of commercial environment to the linkage between product innovativeness and its performance. Findings of the research proved that the role of commercial environment to the innovativeness – performance linkage is significant. This finding thus demonstrates that industry practitioners should not neglect and adjust their product and category marketing strategies to specific commercial settings. This consequently would allow companies' to address potential risks, as well as exploit positive impact of commercial environment to performance. A holistic approach, used in this research allows a comprehensive evaluation of performance predictors, which can be employed for the evaluation of new products by the industry practitioners.
2. Findings of this research can be also valuable to retail managers that are responsible for assortment and category management, as well as supplier relations. First, findings of this study reveal that commercial environment moderates the linkage between innovativeness – performance linkage, thus impact commercial environment should be taken into consideration when forming strategies for specific products' groups as well as categories. Secondly, findings of this research prove that performance patterns of new products depend on product newness in specific settings, thus this can be considered during assortment formation and launches of new products. Third, based on findings of this research, a new product performance forecast tool (decision tree) is provided, that can be employed for evaluation of new products' potential.
3. Findings of this research can be likewise valuable to manufacturing firms, which either develop new products or represent it in the marketplace. First, research results prove that role of product innovativeness is twofold – it only contributes to performance result in specific environments thus cannot be

evaluated unilaterally during new product development. Secondly, this research reveals that more complex evaluation of marketplace and specific adjustments concerning commercial environment is important during the new product launch strategy development. Third, this research provides valuable insights how new product opportunities can be exploited in respect to specific retail assortment and categories.

### **6.3. Limitations and future research directions**

Despite the findings that were outlined by this dissertation, several limitations exist. Limitations, however, can be addressed as potential research gaps which can be explored by future research. First, this research was conducted in the commercial environment of only one pharmaceutical retailer and based on real life data, which is both a limitation, and a direction for further research. As a limitation, the results of this research are hardly generalizable as the study was conducted in only one retail pharmacy chain. It is recommended that the study be replicated in several ways: first, it can be replicated with several pharmaceutical retailers, so the findings can be generalized. Second, this research would also encourage the study to be repeated in the sector of fast-moving consumer goods, so the findings between different types of retailers can be compared and differences outlined. Third, it is indicated that moderating variables that were explored in this research were of a constant nature, while performance was measured at changing time periods. Hence, it is recommended that future research should explore both performance and commercial environment variables to be measured during changing time periods. This study used a list of moderators that were outlined after an extensive theory review. However, it is highly suggested to explore the moderating effects of more variables. Variables, such as intensity of promotions, pricing, in-store elements and many more are important to be explored so the impact of the commercial environment is understood more comprehensively.

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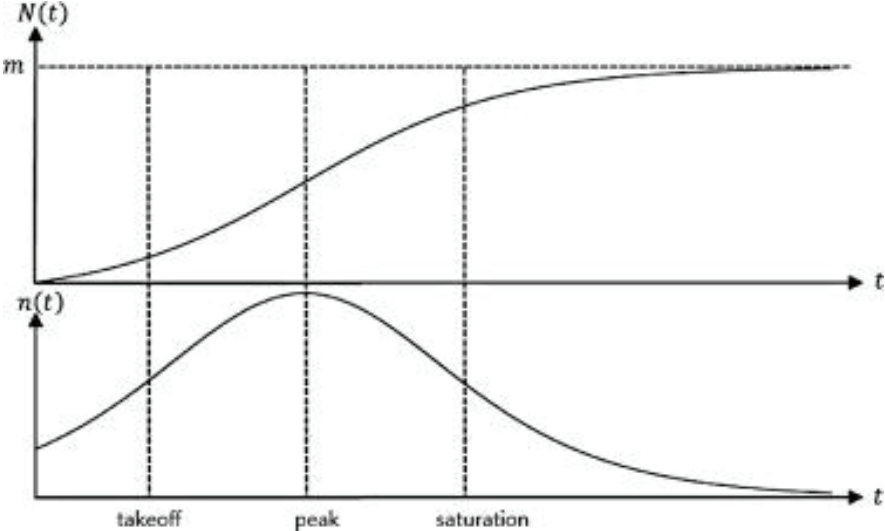
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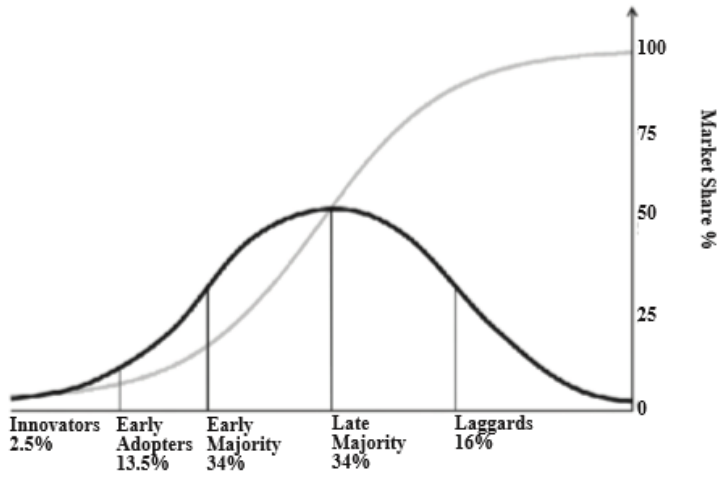
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ANNEX 1. The Bass Model



Source: Bass, 1969

## ANNEX 2. The Rogers Model



Source: Rogers, 1983

ANNEX 3. OLS regression analysis for Model 1, not mean centered

Dependent variable: quantity sales gain	$\beta$ -coefficient	p-value
Main effects:		
<b>Innovativeness =&gt; Performance</b>	<b>0.022</b>	<b>0.095*</b>
<b>Category turnover in market =&gt; Performance</b>	<b>5.979</b>	<b>0.000***</b>
Category competitiveness in market => Performance	0.001	0.201
Seasonality of the product => Performance	0.046	0.297
Company's sales value in market => Performance	-5.499	0.242
<b>Company's sales value in retail =&gt; Performance</b>	<b>0.001</b>	<b>0.000***</b>
Company's portfolio width => Performance	-0.001	0.250
Trade marketing support => Performance	-4.133	0.840
Supply exclusivity => Performance	0.039	0.360
<b>Category sales value in retail =&gt; Performance</b>	<b>-0.001</b>	<b>0.000***</b>
<b>Category competitiveness in retail =&gt; Performance</b>	<b>0.001</b>	<b>0.003***</b>
Category role destination => Performance	-0.018	0.700
<b>Category role convenience =&gt; Performance</b>	<b>-0.392</b>	<b>0.000***</b>
Category role seasonal => Performance	-0.034	0.271
Presence of private label => Performance	0.020	0.684
Moderating effects:		
<b>Category sales value in market × Innovativeness =&gt; Performance</b>	<b>-1.238</b>	<b>0.014**</b>
<b>Category competitiveness in market × Innovativeness =&gt; Performance</b>	<b>-0.001</b>	<b>0.003***</b>
Seasonality of the product × Innovativeness => Performance	-0.016	0.271
Company's sales value in market × Innovativeness => Performance	3.163	0.857
<b>Company's sales value in retail × Innovativeness =&gt; Performance</b>	<b>-6.244</b>	<b>0.001***</b>
Company's portfolio width × Innovativeness => Performance	0.001	0.179
Trade marketing support × Innovativeness => Performance	-1.865	0.801
Supply exclusivity × Innovativeness => Performance	-0.005	0.757
<b>Category sales value in retail × Innovativeness =&gt; Performance</b>	<b>-0.001</b>	<b>0.000***</b>
<b>Category competitiveness in retail × Innovativeness =&gt; Performance</b>	<b>0.001</b>	<b>0.002***</b>
Category role destination × Innovativeness => Performance	-0.002	0.887
<b>Category role convenience × Innovativeness =&gt; Performance</b>	<b>0.074</b>	<b>0.006***</b>
Category role seasonal × Innovativeness => Performance	0.015	0.464
Presence of private label × Innovativeness => Performance	-0.015	0.410

ANNEX 4. OLS regression analysis for Model 2, not mean centered

Dependent variable: net sales gain	$\beta$ -coefficient	p-value
Main effects:		
Innovativeness => Performance	0.017	0.216
<b>Category sales value in market =&gt; Performance</b>	<b>6.358</b>	<b>0.000***</b>
Category competitiveness in market => Performance	0.001	0.350
Seasonality of the product => Performance	0.058	0.198
Company's sales value in the market => Performance	-2.892	0.548
<b>Company's sales value in retail =&gt; Performance</b>	<b>0.001</b>	<b>0.039**</b>
Company's portfolio width => Performance	-0.001	0.118
Trade marketing support => Performance	-3.005	0.151
Supply exclusivity => Performance	-0.018	0.675
<b>Category sales value in retail =&gt; Performance</b>	<b>-0.001</b>	<b>0.000***</b>
<b>Category competitiveness in retail =&gt; Performance</b>	<b>0.001</b>	<b>0.001***</b>
Category role destination => Performance	-0.070	0.149
<b>Category role convenience =&gt; Performance</b>	<b>-0.338</b>	<b>0.000***</b>
Category role seasonal => Performance	-0.080	0.168
Presence of private label => Performance	0.051	0.314
Moderating effects:		
<b>Category sales value in market × Innovativeness =&gt; Performance</b>	<b>-1.087</b>	<b>0.034**</b>
<b>Category competitiveness in market × Innovativeness =&gt; Performance</b>	<b>-0.001</b>	<b>0.008***</b>
Seasonality of the product × Innovativeness => Performance	-0.022	0.154
Company's sales value in market × Innovativeness => Performance	-1.753	0.922
<b>Company's sales value in retail × Innovativeness =&gt; Performance</b>	<b>-3.438</b>	<b>0.074*</b>
Company's portfolio width × Innovativeness => Performance	0.001	0.229
Trade marketing support × Innovativeness => Performance	4.879	0.519
Supply exclusivity × Innovativeness => Performance	0.012	0.462
<b>Category sales value in retail × Innovativeness =&gt; Performance</b>	<b>0.001</b>	<b>0.080*</b>
Category competitiveness in retail × Innovativeness => Performance	Omitted due to exact collinearity	
Category role destination × Innovativeness => Performance	0.014	0.426
<b>Category role convenience × Innovativeness =&gt; Performance</b>	<b>0.063</b>	<b>0.022**</b>
Category role seasonal × Innovativeness => Performance	0.027	0.205
<b>Presence of private label × Innovativeness =&gt; Performance</b>	<b>-0.031</b>	<b>0.091*</b>

ANNEX 5. Logistic regression analysis for Model 1a

Dependent variable: sales gain in quantity, categorized	$\beta$ -coefficient	Standard error	z-value	p-value
Main effects:				
Innovativeness	0.149	0.128	1.165	0.2440
<b>Category sales value in market</b>	<b>0.001</b>	<b>0.001</b>	<b>3.732</b>	<b>0.0002***</b>
Category competitiveness in market	0.001	0.001	1.082	0.2794
Seasonality of the product	0.273	0.428	0.6379	0.5235
Company's sales value in the market	-0.001	0.001	-1.525	0.1274
<b>Company's sales value in retail</b>	<b>0.002</b>	<b>0.001</b>	<b>3.381</b>	<b>0.0007***</b>
Company's portfolio width	-0.002	0.002	-0.9132	0.3612
Trade marketing support	-0.001	0.001	-0.1653	0.8687
Supply exclusivity	0.071	0.420	0.6189	0.8658
<b>Category sales value in retail</b>	<b>-0.009</b>	<b>0.002</b>	<b>-4.296</b>	<b>0.0000***</b>
<b>Category competitiveness in retail</b>	<b>0.006</b>	<b>0.002</b>	<b>2.987</b>	<b>0.0028***</b>
Category role destination	-0.137	0.464	-0.2953	0.7678
<b>Category role convenience</b>	<b>-4.035</b>	<b>0.858</b>	<b>-4.704</b>	<b>0.000***</b>
Category role seasonal	-0.535	0.529	-1.010	0.3125
Presence of private label	0.354	0.484	0.7311	0.4647
Moderating effects:				
<b>Category sales value in market × Innovativeness</b>	<b>-0.001</b>	<b>0.001</b>	<b>-2.015</b>	<b>0.0439**</b>
<b>Category competitiveness in market × Innovativeness</b>	<b>-0.001</b>	<b>0.001</b>	<b>-2.843</b>	<b>0.0045***</b>
Seasonality of the product × Innovativeness	-0.134	0.143	-0.9408	0.3468
Company's sales value in market × Innovativeness	0.001	0.001	0.7622	0.4459
<b>Company's sales value in retail × Innovativeness</b>	<b>-0.001</b>	<b>0.001</b>	<b>-2.976</b>	<b>0.0029***</b>
Company's portfolio width × Innovativeness	0.001	0.001	1.234	0.2170
Trade marketing support × Innovativeness	0.001	0.001	0.1588	0.8738
Supply exclusivity × Innovativeness	0.094	0.160	0.5930	0.5532
<b>Category sales value in retail × Innovativeness</b>	<b>0.002</b>	<b>0.001</b>	<b>2.559</b>	<b>0.0105**</b>
<b>Category competitiveness in retail × Innovativeness</b>	<b>-0.001</b>	<b>0.001</b>	<b>-2.843</b>	<b>0.0045***</b>
Category role destination × Innovativeness	-0.022	0.174	-0.1312	0.8955
<b>Category role convenience × Innovativeness</b>	<b>0.813</b>	<b>0.293</b>	<b>2.769</b>	<b>0.0056***</b>
Category role seasonal × Innovativeness	0.181	0.191	10.9461	0.3441
Presence of private label × Innovativeness	-0.196	0.180	-1.084	0.2782

ANNEX 6. Logistic regression analysis for Model 2a

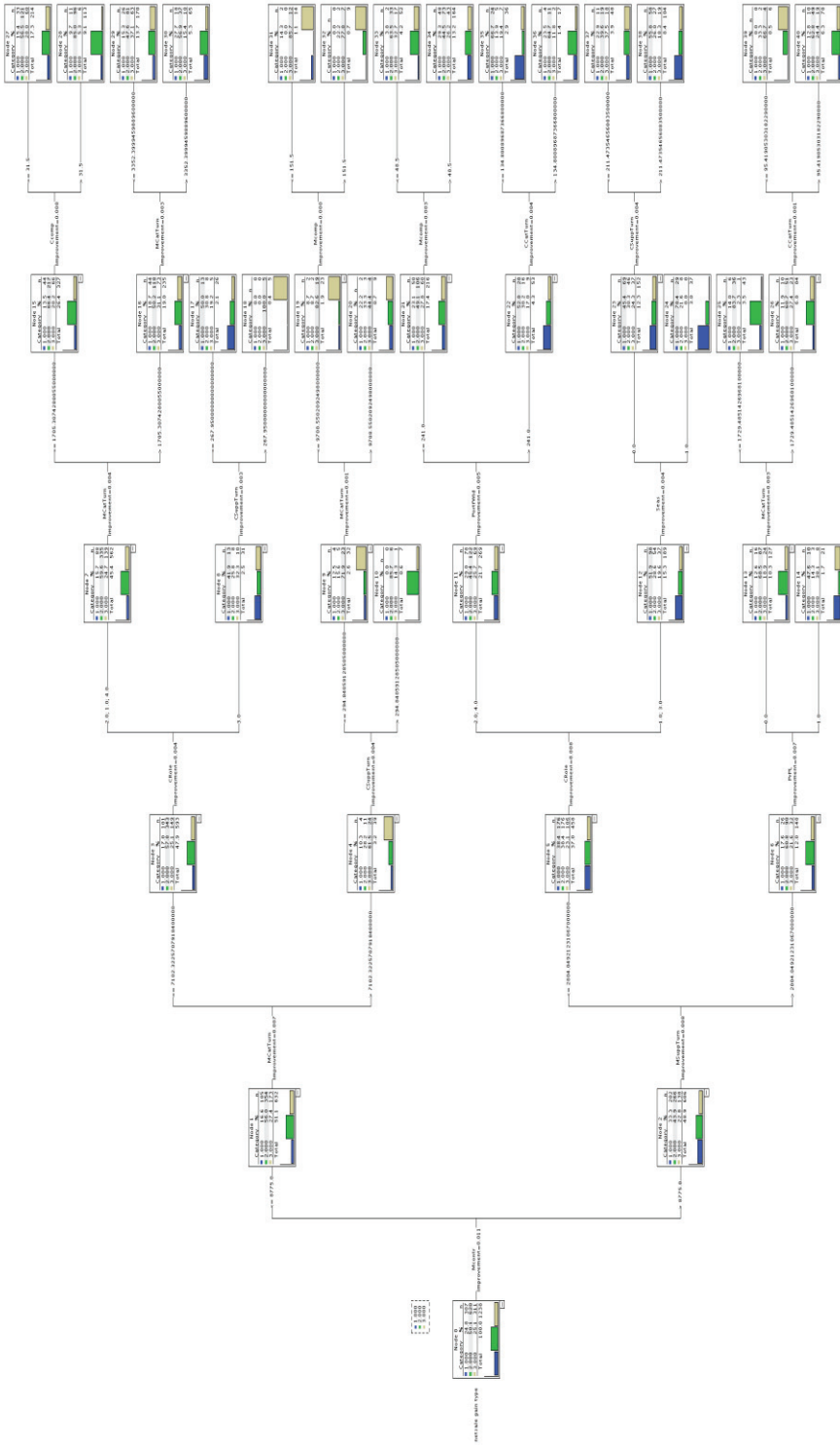
Dependent variable: sales gain in net sales, categorized	$\beta$ -coefficient	Standard error	z-value	p-value
Main effects:				
Innovativeness	0.112	0.129	0.863	0.388
<b>Category sales value in market</b>	<b>0.001</b>	<b>0.001</b>	<b>3.951</b>	<b>0.000***</b>
Category competitiveness in market	0.001	0.001	0.938	0.348
Seasonality of the product	0.428	0.424	0.424	0.313
Company's sales value in the market	-0.001	0.001	-0.519	0.604
Company's sales value in retail	0.001	0.001	1.285	0.199
Company's portfolio width	-0.004	0.002	-1.476	0.140
Trade marketing support	-0.001	0.001	-1.057	0.291
Supply exclusivity	-0.003	0.420	-0.008	0.993
<b>Category sales value in retail</b>	<b>-0.007</b>	<b>0.002</b>	<b>-3.535</b>	<b>0.001***</b>
<b>Category competitiveness in retail</b>	<b>0.007</b>	<b>0.002</b>	<b>3.573</b>	<b>0.001***</b>
Category role destination	-0.687	0.461	-1.488	0.137
<b>Category role convenience</b>	<b>-3.371</b>	<b>0.820</b>	<b>-4.114</b>	<b>0.001***</b>
<b>Retailer category Seasonal</b>	<b>-1.070</b>	<b>0.538</b>	<b>-1.988</b>	<b>0.046**</b>
Presence of private label	0.199	0.486	0.410	0.682
Moderating effects:				
<b>Category sales value in market × Innovativeness</b>	<b>-0.001</b>	<b>0.001</b>	<b>-1.798</b>	<b>0.072*</b>
<b>Category competitiveness in market × Innovativeness</b>	<b>-0.001</b>	<b>0.001</b>	<b>-2.341</b>	<b>0.019**</b>
Seasonality of the product × Innovativeness	-0.141	0.143	-0.988	0.324
Company's sales value in market × Innovativeness	0.001	0.001	0.192	0.848
Company's sales value in retail × Innovativeness	-0.001	0.001	-1.084	0.279
Company's portfolio width × Innovativeness	0.001	0.001	1.029	0.303
Trade marketing support × Innovativeness	0.001	0.001	0.463	0.644
Supply exclusivity × Innovativeness	0.061	0.158	0.385	0.701
Category sales value in retail × Innovativeness	0.001	0.001	1.476	0.140
Category competitiveness in retail × Innovativeness	Omitted due to exact collinearity			
Category role destination × Innovativeness	0.137	0.171	0.801	0.423
<b>Category role convenience × Innovativeness</b>	<b>0.713</b>	<b>0.286</b>	<b>2.491</b>	<b>0.013**</b>
<b>Category role seasonal × Innovativeness</b>	<b>0.349</b>	<b>0.195</b>	<b>1.784</b>	<b>0.074*</b>
Presence of private label × Innovativeness	-0.207	0.182	-1.145	0.252

ANNEX 7. Matrix for pairwise combinations for conditional effects of moderation, Model 1

Variable	1	2	3	4	5	6	7	8
1. Category sales value in the market		0.0657	0.2495	0.0126	0.0360	0.1518	0.0411	0.6131
2. Category competitiveness in the market	0.2495		0.9679	0.9806	0.1523	0.0247	0.0031	0.4115
3. Supplier sales value in retail	0.2638	0.2619		0.0007	0.0004	0.0007	0.0002	0.9755
4. Category sales value in retail	0.2541	n/a	0.2620		0.2280	0.8580	0.0041	0.4534
5. Category competitiveness in retail	0.2513	n/a	0.2631	n/a		0.9478	0.0059	0.3271
6. Category role in retail	0.3198	0.3197	0.3305	0.3175	0.3175		0.0058	0.3267
7. Presence of private label in a retail category	0.2579	0.2576	0.2760	0.2571	0.2561	0.3187		0.5890
8. Trade marketing support	0.2498	0.2453	0.2619	0.2453	0.2460	0.3186	0.2565	



# ANNEX 9. Decision tree for Model 2a



## CURRICULUM VITAE



Indrė Brazauskaitė (born 1987-01-23) completed her Bachelor studies in Public Health in 2009 and earned a Bachelor of Science in Public Health at Lithuanian University of Health Sciences. In 2011 she obtained a Master of Business Management at Vytautas Magnus University. In 2012 she obtained a second Master of Science in Public Health Management at Lithuanian University of Health Sciences. In 2013, she started her PhD studies at ISM University of Management and Economics. Indrė presented findings of her research at international conferences such as The International Conference of Economics and Management (ICEM) international scientific conference in Riga, Latvia and The European Marketing Academy Regional Conference (EMAC regional) conference in Timisoara, Romania. During her PhD studies, she published three articles in peer-reviewed scientific journals.

Since 2008 Indre has been working in pharmaceutical business area and has more than 10 years practice in pharmaceutical wholesale and retail, distribution, sales and marketing. Since the year of 2014, she has been Head of Sales Tamro Lithuania, one of the major pharmaceutical distributors in the Baltics.

Indrė Brazauskaitė

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Daktaro disertacija

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