Diversification Strategies in the Global Retailing Industry: Essays on the Dimensions and Performance Implications

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The President:

Prof. Dr. Thomas Bieger

For my parents
Elisabeth and Peter Sohl

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Summary

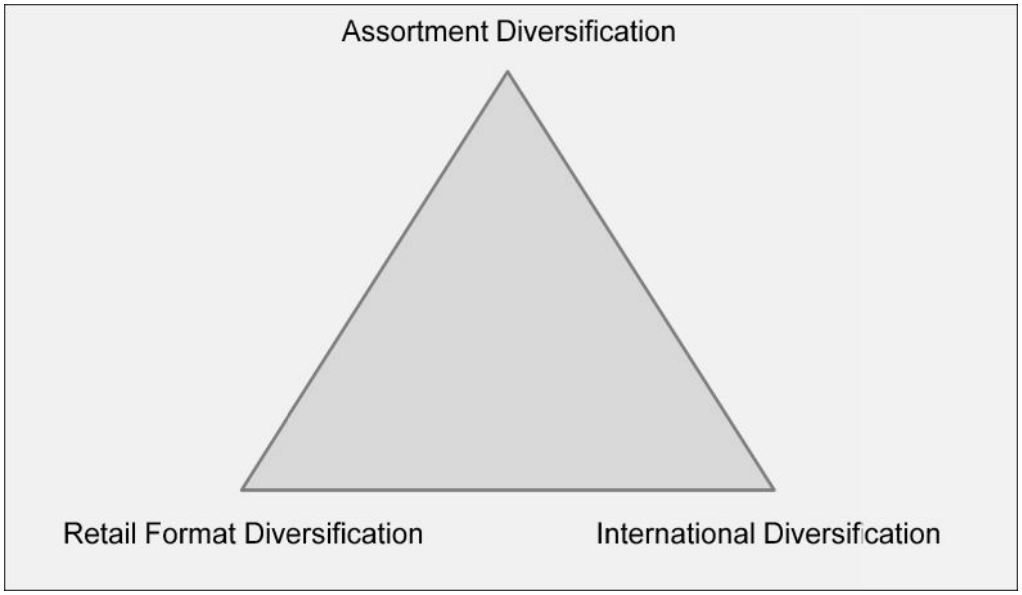
Over the last decades, corporate strategy research on cross-industry diversification has typically perceived industries as homogeneous. This view downplays a firm's strategic options of diversification within its base industry. As a result, little research is available to conceptualize the diversification strategies of multiunit firms within a single industry and empirically investigate why diversified firms in the same industry perform differently. This thesis addresses this research gap by focusing on the diversification behavior of multiunit firms in the global retailing industry over a time period of thirteen years (from 1997 to 2009). Specifically, this thesis explores in three essays how a parent retailer's assortment diversification, retail format diversification, and international diversification decisions are linked to its firm performance. Essay 1 shows that corporate-level assortment diversification into food and non-food retailing increases a corporate parent's costs more than its sales, which in turn decreases its profits over time. In addition, this essay indicates that the relationship between corporate-level assortment diversification into food and non-food retailing and profit variability is an inverted U-shaped curve. Essay 2 conceptualizes related and unrelated retail format diversification based on the similarity of the retail formats' value chains and finds that parent retailers are able to outperform competition by concentrating more intensively on related retail format diversification. In contrast, the results suggest that diversification into unrelated retail formats destroys firm value. In addition, this essay indicates when parent retailers are able to develop implementation capabilities for synergy creation, which in turn enables them to create super-additive value at the corporate level. Essay 3 investigates the relationship between international diversification and firm performance. In particular, this essay examines how a retailer's ownership structure moderates the effects of intra-regional, inter-regional, and total international diversification on firm performance. The findings suggest that public firms are especially well equipped to spread their boundaries more intensively across world regions. In the last section, this thesis develops an actionable plan that can be used by corporate retail managers to develop a thoughtful diversification strategy.

A. INTRODUCTION

The retailing industry has undergone major changes during the past decades. Saturated markets, intensive rivalry, and the tumultuous macroeconomic environment have forced retailers to rethink their scope of retail operations. As a result, most leading retailers have diversified into new assortments, retail formats, and geographical markets. For example, more than half of the 2008 worldwide leading 250 retailers have owned more than one retail format. In addition to the assortment diversification activities at the retail store level, those parent retailers' format portfolio configurations have also affected their assortment diversity at the corporate level. Furthermore, the 250 leading retailers have operated in seven different countries on average, with a recent increase in the number of cross-continental market entries. The foreign operations of the leading European retailers even accounted for more than one-third of their overall sales (Deloitte, 2010).

Against this background, researchers have proposed that diversification in the retailing industry includes the assortment diversification, retail format diversification, and international diversification (Gielens & Dekimpe, 2001: 236). This thesis distinguishes between those areas of diversification as the three dimensions of corporate diversification in the retailing industry (see Figure A.1).

Figure A.1: The Corporate Diversification Dimensions in the Retailing Industry

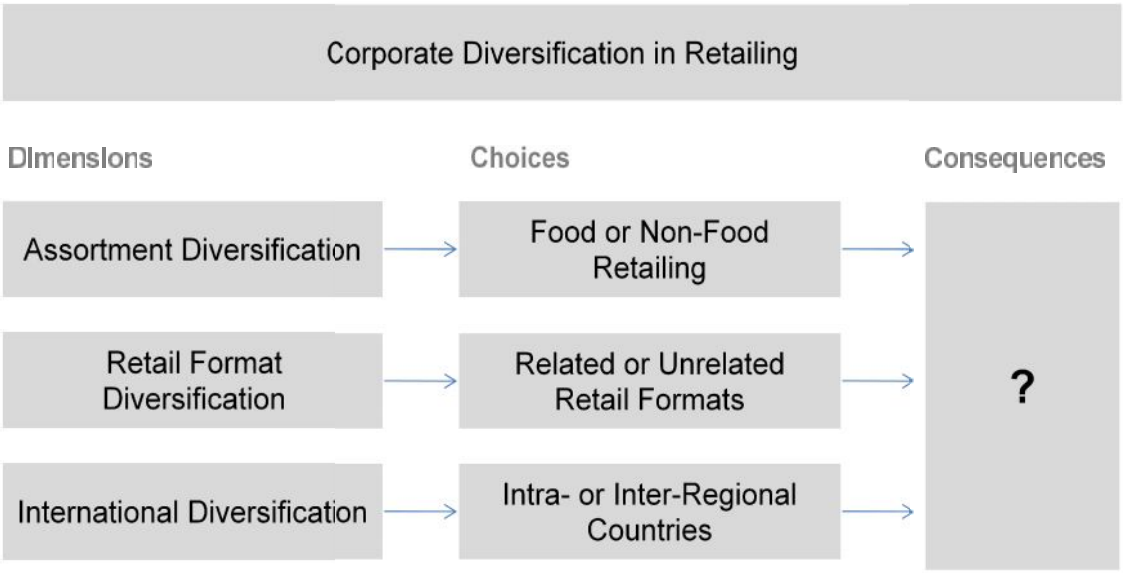


Source: Own illustration

Figure A.2 relates the corporate diversification dimensions in retailing with different strategic choices of diversification. The choice of a diversification strategy is not a simple task. It is fraught with uncertainty and complexity. Unfortunately,

academic research on the choices and consequences of corporate diversification in the retailing industry is limited so far. This thesis aims to extent our understanding of how different diversification strategies are linked to firm performance by investigating the world's leading retailers' diversification behavior over a period of thirteen years (from 1997 to 2009). Specifically, this research aims to support chief executives and managers at a retailer's headquarter in their development of a diversification strategy, which can substantially increase their opportunities of achieving profits that are far above the industry average.

Figure A.2: Dimensions, Choices, and Consequences of Corporate Diversification in the Retailing Industry



Source: Own illustration

According to the three dimensions of corporate diversification in retailing, this thesis is divided into three essays. The first essay investigates how parent retailers' assortment diversification into food and non-food retailing affects their firm performance. The second essay provides empirical evidence on the performance implications of related and unrelated retail format diversification. This essay also explores whether and when parent retailers develop implementation capabilities for synergy creation over time. The third essay examines how intra-regional and inter-regional diversification affects firm performance. In addition, this essay investigates how different ownership structures moderate the international diversification-performance relationship. The last section of this thesis synthesizes the findings of the three essays and develops an actionable plan to guide corporate retail managers in their development of an appropriate diversification strategy.

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Gielens, K., & Dekimpe, M. G. (2001). Do international entry decisions of retail chains matter in the long run?. *International Journal of Research in Marketing*, 18 (3), 235-259.

B. THE ASSORTMENT DIVERSIFICATION DIMENSION

1. Essay: The Performance Implications of Parent Retailers' Assortment Diversification into Food and Non-Food Retailing

Authors
Timo Sohl and Thomas Rudolph

Abstract
This study examines the performance implications of the world's leading retailers' assortment diversification strategies over a period of thirteen years (from 1997 to 2009). The results support the resource-based view of diversification by showing that assortment diversification into food and non-food retailing increases a parent retailer's costs more than its sales, which in turn decreases its profits over time. In addition, we found that the relationship between assortment diversification and profit variability is an inverted U-shaped curve. Thus, profit variability increases as corporate parents start to diversify into food and non-food retailing, but it decreases as they diversify more heavily into food and non-food retailing.

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1.1 Introduction

Over the last few decades, many of the world's leading retailers have started to explore the benefits of owning and marketing more than one retail format (Gauri, Trivedi, & Grewal, 2008; Gielens & Dekimpe, 2008; Kumar, 1997). As a result, most of the leading retailers now compete with one another in their retail format portfolios. Retail formats, such as hypermarkets, supermarkets, discount stores, warehouse clubs, and department stores, traditionally carry different assortments of food and non-food retailing. For example, department stores offer consumers primarily apparel and other non-food products, whereas supermarkets and convenience stores carry a large share of grocery products in their merchandise (Levy & Weitz, 2008). Given the different types of retail formats with respect to their assortment compositions of food and non-food retailing, many leading retailers pursue one of two somewhat opposite retail format portfolio strategies.

For example, leading parent retailers, such as Carrefour, Safeway, Sears, Tesco, the Otto Group, and Kroger, have diversified more heavily into either food or non-food retail formats. These parent retailers may be motivated to diversify into retail formats whose assortments have a close "fit" to the assortment of their established format. Previous research has suggested that retail firms are likely to develop certain superior resources and capabilities in managing their core assortment during their idiosyncratic evolutionary paths (Barney, 1991; Teece, Pisano, & Shuen, 1997). The theoretical logic of the resource-based view of diversification indicates that retailers are able to redeploy such superior resources and capabilities more successfully across retail formats that carry similar assortments, which in turn enables them to achieve sustainable competitive advantage (Markides & Williamson, 1994).

In contrast, other leading parent retailers, such as Aeon, Target, Tengelmann, the Coles Group, the Co-Operative Group, and the Metro Group, have diversified to a greater extent across both food and non-food retail formats. The previous literature has proposed that these retailers may achieve superior firm performance by matching and fulfilling broader consumer needs of different market segments (Blackwell & Talarzyk, 1983; Brown, 2010; Mason, Mayer, & Wilkinson, 1993). Moreover, from a portfolio theory perspective, more diversified portfolios containing food and non-food retail formats may outperform more specialized portfolios over time by spreading the risks generated by the economic development of the food and non-food retail formats (Lang & Stulz, 1994; Lubatkin, 1987).

Against this background, understanding which of the two corporate-level assortment diversification strategies to concentrate on when evaluating acquisitions

(internal developments) of new retail formats and investments in (divestments of) existing formats is not straightforward. However, senior and marketing managers at a retailer's headquarter may have to make major strategic decisions about the most appropriate shares of food and non-food retailing in their retail format portfolios to achieve their long-term performance objectives. Put differently, if a parent retailer's decision to diversify into food and non-food retailing has a significant impact on its long-term firm performance, then neglecting this effect might be detrimental to its success in today's highly competitive retail environment. Despite the potential importance of this decision for the majority of the leading retail firms and the fundamental role that assortment plays in retail strategy (Simonson, 1999), there is little or no empirical evidence to advise parent retailers in their decisions of whether and to what extend to diversify into food and non-food retailing.

Previous research has extensively examined how product categories (e.g., Bandyopadhyay, 2009; Chen, Hess, Wilcox, & Zhang, 1999), assortment variety (e.g., Broniarczyk, Hoyer, & McAllister, 1998; Hoch, Bradlow, & Wansink, 1999; Louviere & Gaeth, 1987), and assortment size (e.g., Briesch, Chintagunta, & Fox, 2009; Chernev & Hamilton, 2009; Fox, Montgomery, & Lodish, 2004) affect consumers' store choices and the performance of (single) retail stores. Moreover, a retail store's assortment of food and non-food products has been recognized as an important part of retail differentiation (Levy & Weitz, 2008). An empirical study by Kumar and Karande (2000) showed that a higher degree of assortment diversification into food and non-food retailing is positively related to a grocery store's sales. Furthermore, retail theorists have observed cyclic patterns of assortment specialization and diversification (also called "scrambled merchandising") among retail stores over time (Hollander, 1966).

Unfortunately, the topic of assortment diversification at the corporate level has received far less academic attention (Hollander, 1979; Keep, Hollander, & Calantone, 1996). Specifically, empirical research on the relationship between firm performance and a parent retailer's diversification into food and non-food retailing is still sparse. This represents a significant research gap, as somewhat competing logics of the benefits of corporate-level assortment diversification exist in both the literature and in managerial practices. The purpose of this study is to address this research gap by investigating the performance implications of the world's leading parent retailers' assortment diversification behavior over a period of thirteen years (from 1997 to 2009). The longitudinal data enable us to investigate how the changes in the degree of a parent retailer's assortment diversification affect the changes in the firm's current and subsequent performance. Moreover, our analysis of the

longitudinal data allows us to derive implications that are less influenced by short-term environmental effects.

The contributions of this study are twofold. First, we contribute to the literature by examining the links between a corporate parent's decision to diversify into food and non-food retailing and the firm's sales, costs, and profits. Although we find that assortment diversification has a positive impact on sales growth, our results show that costs grow faster than sales, which in turn decreases profits over time. Interestingly, our finding of increased sales and decreased profits is contradictory to the retailers' "ultimate aim of operating a portfolio of retail formats [...] to increase sales *and* profit growth" (Brown, 2010: 20, emphasis added). Thus, our study derives important implications for practitioners by challenging common managerial practices that believe configuring food and/or non-food retail formats will maximize sales-based *and* profit-based firm performance.

Second, we attempt to extend our understanding of how a corporate-level assortment diversification strategy might induce parent retailers to reduce their companies' risks in terms of profit variability. Our study suggests that the relationship between assortment diversification and profit variability is an inverted U-shaped curve. Thus, profit variability increases as retailers start to diversify into food and non-food retailing. However, as they diversify more heavily into food and non-food retailing, they can also reduce profit variability. Given the high uncertainty that retailers face in today's tumultuous economic environment, corporate strategies to reduce retailer risk may become increasingly important. Because many of today's retail firms are publicly owned, managers can also increase shareholder value by lowering the variability of their profits and cash flows (Srivastava, Shervani, & Fahey, 1998).

The remaining study is organized as follows. We begin with a review of the relevant studies in strategic management, finance, and retailing. We then develop hypotheses to predict the performance implications of a parent retailer's assortment diversification into food and non-food retailing. The empirical part of the paper introduces the econometric model, tests the hypotheses, and presents the results of our analysis. In the last section, we derive implications for both academics and practitioners and discuss the limitations of our study.

1.2 Literature Review

In this section, we review three streams of literature. First, we review the strategic management research on the diversification-performance relationship. Second, we integrate modern portfolio theory from the finance literature into our review. Finally, we review the relevant literature on retailing research.

The question of what type of diversification strategy yields the highest performance outcomes has historically attracted tremendous attention in the strategic management literature (for reviews, see Palich, Cardinal, & Miller, 2000; Ramanujan & Varadarajan, 1989). Diversification has been defined as "the entry of a firm or business unit into new lines of activity" (Ramanujan & Varadarajan, 1989: 525). Because firm diversification into multiple businesses or product lines directly influences firm performance, portfolio configuration has become an area of important strategic interest (e.g., Bettis, 1981; Rumelt, 1982). However, researchers have developed competing arguments to explain whether a related or unrelated diversification strategy is linked to above-average firm performance (Palich, Cardinal, & Miller, 2000).

On the one hand, the resource-based view of diversification states that firms can exploit synergies arising from resource relatedness (e.g., Chatterjee & Wernerfeld, 1991; Chatterjee, 1986), such as product relatedness (Rumelt, 1982), technology relatedness (Robins & Wiersema, 1995), marketing relatedness (Capron & Hulland, 1999), and customer and managerial knowledge relatedness (Tanriverdi & Venkatraman, 2005). In general, synergy can be generated by the relatedness of tangible (e.g., products) and intangible (e.g., managerial knowledge) resources across business units; this synergy creates an added value at the corporate level that is more than the sum of each individual business unit's value creation (Porter, 2004). The famous advice to "stick to the knitting" follows from the logic of the resource-based view of diversification (Peters & Waterman, 1982). In contrast, unrelated diversification is expected to decrease firm performance "because it takes firms to unfamiliar settings where they lack expertise, encouraging an arm's length financial control mentality among top managers rather than a deep understanding of customers, operations, and competitors" (Stern & Henderson, 2004: 487). Consequently, diversification that is related to a firm's core business and core competences enables the firm to utilize a wider stock of strategic assets and develop new ones faster and at lower costs than its rivals, which in turn leads to sustainable competitive advantage (Markides & Williamson, 1994).

On the other hand, researchers have suggested that increased degrees of unrelated diversification are linked to increased degrees of firm performance

because of market power and internal market advantages (Palich, Cardinal, & Miller, 2000). Furthermore, finance scholars have argued that "whenever the cash flows of the individual units are not perfectly correlated, the total risk, as measured by variability of consolidated cash flows, is reduced by diversification" (Amit & Livnat, 1988: 100). A reduction of a firm's risk, in turn, decreases its capital costs and probability of bankruptcy while increasing its debt capacity (Palich, Cardinal, & Miller, 2000). Thus, drawing from modern portfolio theory, researchers have argued that firms pursuing an unrelated diversification strategy can reduce corporate risks by "putting all of one's eggs in different baskets", which in turn has a "salutary effect on performance" (Datta, Rajagopalan, & Rasheed, 1991; Lang & Stulz, 1994; Lubatkin & Chatterjee, 1994; Michel & Shaked, 1984; Palich, Cardinal, & Miller, 2000: 158).

In summary, some empirical studies have found that related diversifiers outperform unrelated diversifiers (e.g., Rumelt, 1982; Singh & Montgomery, 1987), but other studies have found the opposite (e.g., Lubatkin, 1987; Michel & Shaked, 1984). Thus, little agreement exists concerning the generalizability of the diversification-performance relationship (e.g., Datta, Rajagopalan, & Rasheed, 1991; Gary, 2005; Markides & Williamson, 1996; Palich, Cardinal, & Miller, 2000). Moreover, previous strategic management and finance research has investigated product diversification "almost exclusively in the manufacturing sectors" of the U.S. market (Tanriverdi & Venkatraman, 2005: 98).

In the retailing literature, a small number of empirical studies have addressed the relationship between the diversification strategy of corporate parents and firm performance. For example, Keep, Hollander, and Calantone (1995) investigated diversification in the U.S. retailing industry according to the industry-group-related Standard Industry Classification (SIC) codes. They analyzed six parent retailers that became less diversified over a five-year time period and twenty-six parent retailers that maintained a level of diversification during the same time period. Their results indicate that most of the retail formats for both types of parent retailers exhibited a higher profit-to-sales ratio than the industry average. Furthermore, Colgate and Alexander (2002) studied retailers that diversify behind their core businesses by offering financial services. They argued that a major problem for these retailers seems to be their lack of skill in the financial services business. Colgate and Alexander (2002) concluded that retailers might value the marketing information that they receive from operating financial services more than the direct profits provided by these services. Moreover, Brown (2010) applied modern financial portfolio theory to investigate how parent firms in the hotel industry can maximize

their overall portfolio return for a given level of risk by channeling investments into their retail format portfolio.

Regarding "conglomerate merchandising", Hollander (1979) suggested that the degree of a parent retailer's product diversification should be measured in terms of the firm's assortment diversity. Unlike a manufacturing firm's business units that produce certain industry-related product lines, a parent retailer's retail formats carry more complex product assortments that often consist of hundreds of different product lines from various manufacturers operating in different industries. Following this logic, Levy and Weitz (2008) argued that applying the SIC code system may mislead investigations of diversification in the retailing industry. Pellegrini (1994) suggested that related product diversification refers to a parent retailer's diversification into food or non-food retail formats, whereas unrelated product diversification refers to a firm's diversification into food and non-food retail formats. Given the different assortment diversification strategies utilized by the leading retailers and the significant resources that these retailers spend on retail format development, acquisition, and portfolio management, it is surprising that this topic has received little scholarly attention to date. Accordingly, Gonzáles-Benito, Muñoz-Gallego, and Kopalle (2005: 60) argued that "because many retailers diversify product offers through different store formats [...], they also must take into account the effects these varied store formats have on sales." In the following sections of this study, we theoretically and empirically explore how a parent retailer's assortment diversification strategy is linked to its firm performance.

1.3 Hypotheses

1.3.1 Parent Retailers' Assortment Diversification and Sales Growth

Confronted with intensive competition and saturated markets, parent retailers may pursue a retail format diversification strategy to achieve some form of corporate-level differential advantage and increase their sales growth. Previous research has suggested that parent retailers are able to serve the diverse needs of different market segments by diversifying more heavily into retail formats that offer different assortments, which in turn increases their sales growth (Blackwell & Talarzyk, 1983; Brown, 2010; Hollander, 1979; Mason, Mayer, & Wilkinson, 1993). Moreover, Fox, Montgomery, and Lodish (2004) found that consumers substitute retail formats within food retailing rather than across food and non-food retailing. Because consumers often purchase the same products from a parent retailer's different formats (e.g., Bhatnagar & Ratchford, 2004; Fox, Montgomery,

& Lodish, 2004; Mantrala et al., 2009), retail managers may diversify more heavily into food and non-food retail formats to decrease assortment competition and cannibalization within their retail format portfolio. As a result, a parent retailer's reduction of assortment competition and demand cannibalization will likely increase its sales growth. Based on these arguments, we hypothesize the following:

> *Hypothesis 1. A parent retailer's assortment diversification into food and non-food retailing will have a positive effect on its sales growth.*

1.3.2 Parent Retailers' Assortment Diversification and Cost Growth

Markides and Williamson (1996) proposed that the opportunity to redeploy superior resources and capabilities across business units contributes to a corporate parent's cost advantages. Such synergistic cost reductions occur when parent retailers are able to share some similar and cost intensive supply-side and demand-side merchandise activities across their retail formats (Porter, 2004). For example, De Brentani and Dröge (1988) argued that marketing synergy is a direct determinant of corporate synergy. However, food and non-food retail assortments largely differ with regard to purchasing, supply chain/distribution, inventory, in-store logistics, and marketing operations (Mantrala et al., 2009). Drawing from the resource-based view of diversification, we propose that superior merchandise management skills are capabilities that may be successfully used across different product lines within food or non-food assortments but may be difficult to leverage across both food and non-food assortments (Rumelt, 1982).

Thus, parent retailers that diversify into food or non-food retail formats likely benefit from scope and scale economies, such as a deeper understanding of consumer needs, increased bargaining power vis-à-vis suppliers, increased distribution efficiency, cross-merchandising of private label products, decreased inventory and advertising costs, and centralized merchandise and vendor management systems (Capron & Hulland, 1999; Kumar, 1997). In contrast, corporate firms that diversify more heavily into food and non-food retail formats forgo the ability to leverage such cost advantages. Moreover, these firms have to learn about supplier relationships, competition, operations, and consumer shopping behavior in their new market segments.

Accordingly, transaction cost theory predicts that unrelated diversification can increase a retailer's transaction costs, internal governance costs, and internal coordination costs (Jones & Hill, 1988; Williamson, 1979). Thus, parent retailers that diversify more heavily into food and non-food assortments have to make higher

task-specific investments in human capital and capital-intensive administrative and governance systems than their more focused rivals (Mantrala et al., 2009). Furthermore, previous research has suggested that diseconomies, such as organizational complexity, increase with unrelated diversification, which in turn rapidly increases the marginal costs of diversification as unrelated diversification "hits high levels" (Palich, Cardinal, & Miller, 2000: 159).

Based on the resource-based and transaction cost perspectives, we propose that higher degrees of assortment diversification into food and non-food retailing are linked to increasing cost growth. Accordingly, we hypothesize the following:

> *Hypothesis 2. A parent retailer's assortment diversification into food and non-food retailing will have a positive effect on its cost growth.*

1.3.3 Parent Retailers' Assortment Diversification and Profits

Because sales and cost growth determine the degree of a firm's profits, a parent retailer's assortment diversification into food and non-food retailing will increase or decrease its profits depending on the magnitude of the effects of assortment diversification on sales and cost growth. Given the intuitively appealing arguments of the strategic management (e.g., Markides & Williamson, 1994) and finance literature (e.g., Lang & Stulz, 1994) and the contradictory empirical findings of previous diversification-performance research (e.g., Datta, Rajagopalan, & Rasheed, 1991; Gary, 2005; Markides & Williamson, 1996; Palich, Cardinal, & Miller, 2000), we develop three competing hypotheses about the assortment diversification-performance relationship. Then, we empirically test this relationship to examine the following points. First, if parent retailers that diversify into food and non-food retailing are able to increase their sales more than their costs, then their profits will increase over time. Second, if their cost growth exceeds their sales growth, then their profits will decrease over time. Finally, the assortment diversification-performance relationship will be in curvilinear form (U-shaped or inverted U-shaped) if the cost and benefit curves cross each other along the assortment diversification continuum.

Based on this discussion, we propose three competing hypotheses:

Hypothesis 3a. A parent retailer's assortment diversification into food and non-food retailing will have a positive effect on its profits.

Hypothesis 3b. A parent retailer's assortment diversification into food and non-food retailing will have a negative effect on its profits.

Hypothesis 3c. The relationship between a parent retailer's assortment diversification into food and non-food retailing and its profits will be curvilinear.

1.3.4 Parent Retailers' Assortment Diversification and Profit Variability

Retailers have recognized that they must deal with the cyclic patterns of macroeconomic booms and downturns (Mantrala et al., 2009). Tanriverdi and Venkatraman (2005: 102-103) argued that "by forming a portfolio of counter-cyclical businesses, a multibusiness firm can smooth out fluctuations in its income and minimize negative impacts of external economic conditions." Thus, senior managers may be motivated to diversify into food and non-food retail formats to reduce their firm's exposure to cyclical and other environmental uncertainties by spreading their firm's risk (Lubatkin & Chatterjee, 1994). Previous research has argued that a firm can reduce its risk by reducing the variability of its profits (Amit & Livnat, 1988). Moreover, profits and cash flows that are more stable and predictable over time can create more shareholder value (Srivastava, Shervani, & Fahey, 1998). Furthermore, Barney (1997) stated that unrelated diversifiers achieve a higher risk reduction than related diversifiers. Building on those arguments, we propose that a parent retailer's increased levels of diversification into food and non-food retailing are linked with decreased levels of its profit variability. Thus, we hypothesize the following:

Hypothesis 4. A parent retailer's assortment diversification into food and non-food retailing will reduce its profit variability.

1.4 Research Design

1.4.1 Sample

To test these hypotheses, we obtained longitudinal data on the leading retailers' assortment diversification behavior over a period of thirteen years (from 1997 to 2009) from the database of Planet Retail, a leading private retail research company. We restricted our sample to the 60 leading parent retailers that own and market at least two retail formats. The Planet Retail database has been used in previous academic research to investigate strategic retail marketing topics (Gielens & Dekimpe, 2007, 2001). Planet Retail provides time series data on a parent retailer's sales distribution of food and non-food retailing (across all retail formats), operating countries, and retail formats as well as its key performance data. Additionally, we obtained time-varying macroeconomic data on the retailers' countries of origins (COO) from the World Bank database and the IMD's World Competitive database. Finally, we combined each retailer's assortment, retail format, and country diversification data with its key performance data and its COO's key indicators. Our study covered the years from 1997-2009 in the form of a cross-sectional time-series panel data set.

1.4.2 Dependent Variables

We used annual financial information about a parent retailer's sales growth, cost growth, profits, and profit variability to evaluate the performance outcomes of its assortment diversification strategy.

Sales growth. A fundamental objective of retail strategy is to increase sales volumes (Bloom & Perry, 2001). Achieving sales growth is especially important for firms that operate in environments characterized by saturated markets and intensive competition. Moreover, sales growth is a widely accepted performance measure of diversification strategies (Palich, Cardinal, & Miller, 2000; Tanriverdi & Lee, 2008) and is frequently used by industry analysts to evaluate the performances of retailers. We calculated a corporate parent's sales growth by taking the difference between its net sales (across all of its retail formats) in year $t+1$ and its net sales in year t divided by its sales in year t (i.e., $[\text{sales}_{t+1}/\ \text{sales}_t] - 1$) (Weinzimmer, Nystrom, & Freeman, 1998).

Cost growth. Similarly, we measured cost growth by taking the difference between a corporate parent's costs in year $t+1$ and its costs in year t divided by its costs in year t (i.e., $[\text{costs}_{t+1}/\ \text{costs}_t] - 1$).

Profits. We accounted for a parent retailer's profits by using the annual data on its EBIT (earnings before interests and taxes). The world's leading parent retailers have diverse capital structures (Pentina, Pelton, & Hasty, 2009) and tax requirements that vary according to their countries of origin. Because EBIT excludes a firm's capital structure and taxes, EBIT is an appropriate measure for comparing the operating profits of the world's leading retailers. Therefore, EBIT is widely used by financial investors to evaluate and compare these retailers' profits based on their ongoing operations. To examine how the changes in a retailer's assortment diversification behavior affect the changes in its current and subsequent profits, we included the profit data of the current year *t* and the one-year lagged profit data of the following year *t* + 1.

Profit variability. We measured the inter-temporal variability in profits for a retailer *i* at a point in time *t* as the absolute deviation of the retailer's EBIT at a point in time from its mean EBIT for a time period with at least two observations, as shown by the following equation:

$$v_{it} = \left| \mathrm{EBIT}_{it} - \frac{1}{n} \sum_{t=1}^{n} \mathrm{EBIT}_{it} \right|, \text{with } n = 2 \ldots 13$$

A low value of the profit variability v_{it} indicates that a retailer's EBIT in a given year is close to its mean value of EBIT for the time period under investigation ($t = 1 \ldots 13$), whereas a high value indicates the opposite. Thus, the absolute value of the profit deviation from its mean is a measure for profit variability and risk (Granger & Ding, 1995). In accordance with the EBIT data, we examined profit variability in the current year *t* and the subsequent year *t* + 1.

1.4.3 Independent Variable

Assortment diversification. A parent retailer's assortment diversification into food and non-food retailing is the independent variable of this study. Most of the recent studies in the strategic management and finance literature have considered diversification to be a variable that can fluctuate continuously over time (Chatterjee & Wernerfelt, 1991). We followed that approach and measured the degree of assortment diversification into food and non-food retailing by applying the entropy index, which can vary continuously over time. Moreover, the entropy index is the most widely used continuous diversification measure in strategy research (Palepu, 1985).

Accordingly, the assortment diversification (*Ass_Div*) is measured by the following equation:

$$Ass\_Div_{itq} = \sum_{q=1}^{2} P_{itq} * ln\left(\frac{1}{P_{itq}}\right)$$

In this equation, P_{itq} = proportion of sales for retailer i at a point in time t in assortment q, with $q = 1$ for food retailing and $q = 2$ for non-food retailing. Thus, the more diversification into food and non-food retailing, the higher is the assortment diversification entropy index.

1.4.4 Control Variables

We controlled for various firm-specific and country-of-origin-specific variables that may influence a parent retailer's assortment diversification behavior and firm performance.

Firm size. Previous diversification research has found that firm size can affect both the degree of relatedness and the firm performance of corporate parents (e.g., Tanriverdi & Lee, 2008). Following the previous research, we controlled for firm *i*'s size in year *t* with net sales at the corporate level. We performed a common natural log transformation of the sales data to improve normality, reduce outliers, and improve the homoscedasticity of the distributions (Pinches, Mingo, & Carruthers, 1973).

Prior sales growth. Because lower rates of prior sales growth have been identified as drivers of (unrelated) diversification, parent retailers can diversify into food and non-food retail formats if they experience lower rates of prior sales growth (Ramanujan & Varadarajan, 1989). This finding suggests that lower firm performance is not necessarily an effect of assortment diversification into food and non-food retailing but rather a result of a retailer's lower rates of prior growth (Chang & Thomas, 1989; Tanriverdi & Lee, 2008). To account for the potential endogeneity problems of firm performance, we controlled for each parent retailer's sales growth rate from the preceding year $t - 1$ to the current year t (i.e., [$sales_t$ / $sales_{t-1}$] – 1).

International diversification. We controlled for each parent retailer's international extent of its operations, as most leading corporate parents market their assortments on a global basis. A huge body of prior research has found that international diversification affects a retailer's firm performance (e.g., Gielens & Dekimpe, 2001). We measured the degree of international diversification by using

the above mentioned entropy index of diversification for retailer *i* at a point in time *t*; P_{itq} = proportion of sales in country *q*, and *q* = 1…*N* different countries (e.g., Hit, Hoskisson, & Kim, 1997).

Retail format scope. The scope of a parent retailer's retail formats can have implications for both the degree of diversification and the firm's performance (e.g., Palepu, 1985; Tanriverdi & Lee, 2008). Thus, we controlled for the number of retail formats that a parent retailer *i* owns at a point in time *t*.

Market share. Previous research has found that market share can influence firm profits (Prescott, Kohli, & Venkatraman, 1986). Because the retailers' domestic countries usually account for a large share of their overall sales, we controlled for a parent retailer's market share in its home country in the equations where profits and profit variability are the dependent variables.

Profits. Because previous research has suggested that the degree of profits is likely to be linked to the degree of profit variability (Ueda & Yoshikawa, 1986), we controlled for the absolute degree of profits in the equations where profit variability is the dependent variable.

Country of origin. As argued above, retailers usually sell most of their merchandise in their domestic markets. Thus, the economic environment of a parent retailer's COO influences its diversification behavior and firm performance (Mayer & Whittington, 2003). Accordingly, we controlled for the macroeconomic indicators of each retailer's COO to remove the location-specific advantages of the home market. Previous studies on manufacturing firms have controlled, among other factors, for a firm's gross domestic product (GDP) growth and GDP per capita, but we obtained four time-varying macroeconomic indicators that are especially relevant for retailers, such as the levels of private consumption growth, private consumption per capita, and wholesale prices (from the Word bank database) as well as the quality of the distribution infrastructure (from the IMD's World Competitive database).

Table B.1 shows the means, standard deviations, and correlations for the dependent, independent, and control variables.

Table B.1: Means, Standard Deviations, and Correlations

Variables	Mean	SD	X1	X2	X3	X4	X5	X6	X7
X1. Sales growth$_{t+1}$	0.07	0.18	1.00						
X2. Cost growth$_{t+1}$	0.07	0.19	0.99*	1.00					
X3. Profits$_{t+1}$	1,072.17	2,070.79	0.03	0.02	1.00				
X4. Profit variability$_{t+1}$	309.28	577.73	0.02	0.03	0.60*	1.00			
X5. Profits$_t$	1,066.79	2,043.61	-0.01	0.01	0.97*	0.61*	1.00		
X6. Profit variability$_t$	328.43	653.82	0.01	0.01	0.57*	0.80*	0.56*	1.00	
X7. Assortment diversification$_t$	0.46	0.23	-0.07	-0.04	0.17*	0.19*	0.17*	0.18*	1.00
X8. Firm size$_t$	9.62	1.02	-0.26*	-0.16*	0.57*	0.51*	0.57*	0.48*	0.34*
X9. Sales growth$_t$	0.07	0.18	0.29*	0.21*	0.05	0.04	0.04	0.01	-0.09*
X10. International diversification$_t$	0.65	0.69	-0.06	-0.04	0.13*	0.04	0.13*	0.04	-0.03
X11. Retail format scope$_t$	7.75	5.68	-0.10*	-0.07	0.03	-0.07	0.04	-0.05	0.49*
X12. Market share$_t$	0.10	0.09	-0.04	-0.02	0.04	-0.03	0.04	-0.02	0.45*
X13. Private con. growth$_t$	0.03	0.02	0.30*	0.26*	0.03	0.08	0.01	0.06	-0.08*
X14. Private con. per capita$_t$	16,651.69	6,403.81	-0.24*	-0.17*	0.22*	0.23*	0.25*	0.22*	-0.07
X15. Wholesale price index$_t$	97.35	10.00	-0.12*	-0.07	-0.10*	-0.16*	-0.07	-0.17*	-0.12*
X16. Distribution infrastructure$_t$ [a]	7.63	1.27	-0.18*	-0.12*	0.10*	0.11*	0.10*	0.10*	-0.03

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Variables	X8	X9	X10	X11	X12	X13	X14	X15	X16
X1. Sales growth$_{t+1}$									
X2. Cost growth$_{t+1}$									
X3. Profits$_{t+1}$									
X4. Profit variability$_{t+1}$									
X5. Profits$_t$									
X6. Profit variability$_t$									
X7. Assortment diversification$_t$									
X8. Firm size$_t$	1.00								
X9. Sales growth$_t$	-0.13*	1.00							
X10. International diversification$_t$	0.22*	-0.06	1.00						
X11. Retail format scope$_t$	0.26*	-0.02	0.09*	1.00					
X12. Market share$_t$	0.16*	0.03	0.02	0.54*	1.00				
X13. Private con. growth$_t$	-0.30*	0.35*	-0.13*	-0.22*	-0.03	1.00			
X14. Private con. per capita$_t$	0.31*	-0.26*	-0.26*	-0.18*	-0.31*	-0.24*	1.00		
X15. Wholesale price index$_t$	-0.02	-0.12*	0.12*	0.07	0.04	-0.37*	-0.01	1.00	
X16. Distribution infrastructure$_t$ [a]	0.37*	-0.21*	0.17*	0.15*	0.05	-0.28*	0.36*	0.08*	1.00

Notes: Profits (EBIT) and profit variability in million Euro; Private consumption per capita in constant 2000 USD;
[a] from 1 = not good to 10 = very good; * significant at $p < .05$ (pairwise correlation)

1.4.5 Method

This study used econometric models to investigate the performance implications of a parent retailer's assortment diversification behavior over time. We had to decide whether to use fixed effects or random effects to estimate the coefficients (Wooldridge, 2002). We chose fixed effects regression analysis because the results of the Hausman test rejected the randomness of the residuals hypothesis for our dependent variables (Hausman, 1978). The fixed firm effects controlled for all of the observed and unobserved differences between the retailers that are stable over time. Thus, the fixed effects estimator controlled for the variables that are not included in our equations, but may have an impact on our dependent and independent variables. The equation explaining the performance implications of assortment diversification strategy is expressed as follows:

$$Y_{it} = \beta_0 + \beta_1 * ass\_div_{it} + \beta_2 * ass\_div^2_{it} + \gamma X_{it} + v_i + \varepsilon_{it}$$

In this equation, Y_{it} is the vector of the performance observations (i.e., sales growth, cost growth, profits, and profit variability) for retailer i (i = 1,…,60) and time t (t = 1,…,13); ass_div_{it} and $ass\_div^2_{it}$ represent the assortment diversification and its squared term, respectively (i.e., the independent variable); and X_{it} is the vector of the control variables in the respective equations. Furthermore, $v_i + \varepsilon_{it}$ is the residual, and v_i is the unit-specific residual that differs between the retailers but is constant over time for each retailer (i.e., in the fixed effects model, v_i are fixed and have no distribution). In accordance with previous diversification research, we controlled for each firm's prior sales growth rate in our fixed effects regression, which also includes subsequent sales growth as a dependent variable (e.g., Tanriverdi & Lee, 2008). We controlled for the signs and magnitudes of the predictor and control variables as well as the changes in their error terms by removing the prior sales growth control variable. We found no material differences from those we reported in Table B.2.

Furthermore, we mean centered the assortment diversification variable and its squared term as well as the international diversification variable to reduce the potential problems caused by multicollinearity. In addition, we examined the correlation matrix of the predictor and control variables and considered a threshold of 0.8 for the Pearson correlation coefficients (Mason & Perreault, 1991). All correlation coefficients of the predictor and control variables that are estimated simultaneously in our models were below this threshold (see Table B.1). Finally, we performed pooled estimates of our models and applied the variance inflation factor

(VIF) in accordance with Baum (2006) as an additional robustness check. Again, all of the variables showed a VIF far below the threshold of 10 (i.e., maximum VIF = 1,63 for the sales and cost growth measures, maximum VIF = 2,03 for the profits, and maximum VIF = 4,04 for the profit variability measure). Thus, the correlation tests between the variables used in our models indicated that multicollinearity is not a significant concern.

1.5 Results

Tables B.2a, B.2b, B.3a, B.3b, B.4a and B.4b present the results from the fixed-effects regressions of our respective firm performance measures. Model 1 presents the base model and includes only the control variables. Models 2 and 3 test the respective hypotheses; Model 2 uses the linear term of assortment diversification to test for a linear assortment diversification-performance relationship, and Model 3 uses its quadratic term to test for potential curvilinear relationships (U-shaped or inverted U-shaped) between the assortment diversification and the firm performance.

Tables B.2a and B.2b present the results for the three sales growth and cost growth models used to test hypotheses 1 and 2, respectively. The results of the control variables in Model 1 can be reasonably interpreted and remain stable across all of the sales and cost growth models. For example, we found that larger firms have lower rates of sales and cost growth than smaller firms. Moreover, higher levels of private consumption growth are linked to higher levels of subsequent sales and cost growth. Furthermore, the F statistics indicate that all of the models are significant. The results of Model 2 show that the linear effect of assortment diversification on subsequent sales growth is positive and significant (b = .11, p < .01). Moreover, R-square increased by eight percent when we added the assortment diversification variable into the regression. In Model 3, we tested if the assortment diversification-performance relationship is curvilinear. By including the quadratic term, we found that the linear term remained positive but became insignificant (b = .06, p > .10). Moreover, we found that the quadratic term was insignificant (b = .06, p > .10) and that no additional variance in sales growth was explained, which indicates that the relationship between assortment diversification and sales growth is positive and linear. Thus, hypothesis 1 is fully supported. Next, we tested hypothesis 2. Again, the linear term (Model 2) was found to be positive and significant (b = .28, p < .05), and its inclusion increased R-square by eight percent. When we added the quadratic term (Model 3), we found that the linear term

remained positive but became insignificant (b = .67, p > .10) and that the quadratic term was insignificant (b = -.35, p > .10). Thus, we found support for hypothesis 2. Finally, we compared the magnitudes of the effects of assortment diversification on sales and cost growth. The results show that a parent retailer's assortment diversification into food and non-food retailing has a stronger positive effect on cost growth (b = .28, p < .05) than on sales growth (b = .11, p < .01), which suggests that the parent retailer's subsequent profits decrease under assortment diversification.

Table B.2a: Results of Fixed-Effects Panel Regressions for Sales Growth

	Sales growth$_{t+1}$		
	Model 1	**Model 2**	**Model 3**
Predictor:			
Assortment diversification$_t$		.11***	.06
		(.04)	(.24)
Assortment diversification squared$_t$			.06
			(.25)
Firm-specific controls:			
Firm size$_t$	-.31***	-.33***	-.33***
	(.04)	(.04)	(.04)
Sales growth$_t$	.10**	.12***	.13***
	(.05)	(.05)	(.05)
International diversification$_t$	.13***	.13***	.13***
	(.04)	(.04)	(.04)
Retail format scope$_t$	.02	.02	.03
	(.03)	(.03)	(.03)
COO controls:			
Private consumption growth$_t$	.06***	.06***	.06***
	(.01)	(.01)	(.01)
Private consumption per capita$_t$	.05	.08	.08
	(.08)	(.08)	(.08)
Wholesale price index$_t$	.01	.01	.01
	(.02)	(.02)	(.02)
Distribution infrastructure$_t$	.02	.02	.02
	(.02)	(.02)	(.02)
Constant	3.04***	3.26***	3.26***
	(.35)	(.35)	(.35)
Observations	469	469	469
Unique companies	58	58	58
R-squared	.24	.26	.26
Δ R-squared	0%	8%	0%
F-value	16.46***	15.85***	14.24***

Notes: Standard errors in parentheses;
* significant at $p < 0.10$; ** significant at $p < 0.05$; *** significant at $p < 0.01$

Table B.2b: Results of Fixed-Effects Panel Regressions for Cost Growth

	Cost growth$_{t+1}$		
	Model 1	**Model 2**	**Model 3**
Predictor:			
Assortment diversification$_t$		.28**	.67
		(.13)	(.54)
Assortment diversification squared$_t$			-.35
			(.46)
Firm-specific controls:			
Firm size$_t$	-.40***	-.40***	-.41***
	(.05)	(.05)	(.05)
Sales growth$_t$	.13**	.15**	.15**
	(.06)	(.06)	(.06)
International diversification$_t$	.11*	.12**	.13**
	(.06)	(.06)	(.06)
Retail format scope$_t$	.04	.05	.05
	(.04)	(.04)	(.04)
COO controls:			
Private consumption growth$_t$	.08***	.07***	.07***
	(.02)	(.02)	(.02)
Private consumption per capita$_t$	.18	.17	.18
	(.12)	(.12)	(.12)
Wholesale price index$_t$	.01	.01	.01
	(.02)	(.02)	(.02)
Distribution infrastructure$_t$	.02	.03	.03
	(.02)	(.02)	(.02)
Constant	3.92***	3.86***	3.92***
	(.52)	(.52)	(.52)
Observations	327	327	327
Unique companies	44	44	44
R-squared	.25	.27	.27
Δ R-squared	0%	8%	0%
F-value	11.65***	11.02***	9.96***

Notes: Standard errors in parentheses;
* significant at $p < 0.10$; ** significant at $p < 0.05$; *** significant at $p < 0.01$

Table B.3a and B.3b show the results of our tests for the competing hypotheses 3a, 3b, and 3c. We tested the effect of assortment diversification on both current and subsequent profits. The results of the linear terms indicate that a parent retailer's assortment diversification into food and non-food retailing decreases its current profits (b = -.74, p < .01). Moreover, the results confirm the above mentioned negative effect on subsequent profits (b = -.55, p < .05). The inclusion of the linear term increased R-square by ten percent for the current profit measure and by fourteen percent for the one-year lagged profit measure. Furthermore, when we included the quadratic terms, the linear terms remained negative but became insignificant for a parent retailer's current profits (b = -1.05, p > .10) and future profits (b = -.73, p > .10), and the quadratic terms were also insignificant for both current profits (b = .27, p > .10) and future profits (b = .16, p > .10). Consequently, the results fully support hypothesis 3b, which indicates that a parent retailer's current and subsequent profits decrease with higher degrees of assortment diversification into food and non-food retailing. Finally, the control variables in Tables B.3a and B.3b are reasonable, and the F statistics are significant for the respective models. For example, the baseline model shows that, compared to the positive and significant effect of private consumption *growth* on sales and cost growth in Tables B.2a and B.2b, the effect of private consumption *per capita* on profits is positive and significant in Tables B.3a and B.3b. This finding supports the structure of our dataset, as we obtained our dependent and control variables from different databases.

Table B.3a: Results of Fixed-Effects Panel Regressions for Current Profits

	$EBIT_t$		
	Model 1	**Model 2**	**Model 3**
Predictor:			
Assortment diversification$_t$		-.74***	-1.05
		(.26)	(1.11)
Assortment diversification squared$_t$			.27
			(.94)
Firm-specific controls:			
Firm size$_t$	.15	.10	.09
	(.13)	(.13)	(.13)
Sales growth$_t$	.12	.14	.14
	(.13)	(.13)	(.13)
International diversification$_t$	.48***	.47***	.47***
	(.11)	(.11)	(.11)
Retail format scope$_t$	-.05	-.10	-.09
	(.09)	(.09)	(.09)
Market share$_t$	.01	.02	.02
	(.01)	(.01)	(.01)
COO controls:			
Private consumption growth$_t$	-.01	-.02	-.02
	(.04)	(.04)	(.04)
Private consumption per capita$_t$	.55**	.56**	.56**
	(.22)	(.22)	(.22)
Wholesale price index$_t$	-.02	-.02	-.01
	(.05)	(.05)	(.05)
Distribution infrastructure$_t$	-.03	-.05	-.06
	(.04)	(.05)	(.05)
Constant	-1.56	-.94	-.93
	(1.16)	(1.17)	(1.18)
Observations	365	365	365
Unique companies	44	44	44
R-squared	.21	.23	.23
Δ R-squared	0%	10%	0%
F-value	8.96***	9.05***	8.21***

Notes: Standard errors in parentheses;
* significant at $p < 0.10$; ** significant at $p < 0.05$; *** significant at $p < 0.01$

Table B.3b: Results of Fixed-Effects Panel Regressions for Subsequent Profits

	$EBIT_{t+1}$		
	Model 1	**Model 2**	**Model 3**
Predictor:			
Assortment diversification$_t$		-.55**	-.73
		(.24)	(1.03)
Assortment diversification squared$_t$			.16
			(.87)
Firm-specific controls:			
Firm size$_t$	.06	.02	.02
	(.12)	(.12)	(.12)
Sales growth$_t$	.22*	.23*	.23*
	(.12)	(.12)	(.12)
International diversification$_t$	.45***	.44***	.44***
	(.10)	(.10)	(.10)
Retail format scope$_t$	-.07	-.11	-.11
	(.08)	(.09)	(.09)
Market share$_t$	.02	.03**	.03*
	(.01)	(.01)	(.01)
COO controls:			
Private consumption growth$_t$	.00	.00	-.00
	(.04)	(.04)	(.04)
Private consumption per capita$_t$	.46**	.48**	.48**
	(.21)	(.21)	(.21)
Wholesale price index$_t$	-.06	-.06	-.05
	(.04)	(.04)	(.04)
Distribution infrastructure$_t$	.01	.01	-.01
	(.04)	(.04)	(.04)
Constant	-.72	-.27	-.26
	(1.12)	(1.13)	(1.13)
Observations	362	362	362
Unique companies	44	44	44
R-squared	.14	.16	.16
Δ R-squared	0%	14%	0%
F-value	5.98***	5.97***	5.41***

Notes: Standard errors in parentheses;
* significant at $p < 0.10$; ** significant at $p < 0.05$; *** significant at $p < 0.01$

Tables B.4a and B.4b operationalize parent retailers' current and subsequent profit variability and include the models used to test hypothesis 4. Because the F tests for the models with the subsequent profit variability as the dependent variable were weakly significant or insignificant, we decided to report only the results for parent retailers' current profit variability. Hypothesis 4 is tested in Model 2. Although we found that the coefficient of the linear assortment diversification term is negative, it is not significant (b = -.39, p > .10). However, when we included the quadratic term into the regression, the linear term became positive and weakly significant (b = 3.21, p < .10) and the quadratic term was negative and significant (b = -3.14, p < .05). The results show that the inclusion of the quadratic assortment diversification term accounts for an additional five percent of the variation in profit variability across all parent retailers. Thus, our findings suggest that the relationship between assortment diversification and profit variability is an inverted U-shaped curve. At low levels of assortment diversification, increases in assortment diversification induce increases in profit variability, but after a certain threshold point at moderate levels, increases of assortment diversification lead to decreases in profit variability. As a result, hypothesis 4 is partly supported, as only the retailers that diversify beyond the moderate levels (i.e., at higher levels) of assortment diversification experience decreases in profit variability. From the regression function in Model 3 (Table B.4a), we estimated this threshold point to be 0.511 within the assortment diversification continuum (minimum = 0, maximum = 1.12). In Figure B.1, we also graphed the estimated relationship between assortment diversification and profit variability.

Table B.4a: Results of Fixed-Effects Panel Regressions for Current Profit Variability

	EBIT Variability$_t$		
	Model 1	**Model 2**	**Model 3**
Predictor:			
Assortment diversification$_t$		-.39	3.21*
		(.45)	(1.86)
Assortment diversification squared$_t$			-3.14**
			(1.57)
Firm-specific controls:			
Firm size$_t$	.23	.20	.24
	(.21)	(.22)	(.22)
Sales growth$_t$	.04	.05	.05
	(.22)	(.22)	(.22)
International diversification$_t$	.02	.02	.03
	(.18)	(.18)	(.18)
Retail format scope$_t$	.04	.02	.01
	(.14)	(.15)	(.15)
Market share$_t$	-.02	-.01	-.03
	(.02)	(.02)	(.02)
Profits$_t$	-.80***	-.82***	-.81***
	(.09)	(.10)	(.10)
COO controls:			
Private consumption growth$_t$	-.05	-.06	-.02
	(.07)	(.07)	(.07)
Private consumption per capita$_t$	-.16	-.15	-.16
	(.37)	(.37)	(.37)
Wholesale price index$_t$	.07	.07	.05
	(.08)	(.08)	(.08)
Distribution infrastructure$_t$	.07	.06	.10
	(.07)	(.08)	(.08)
Constant	-1.94	-1.64	-1.77
	(1.94)	(1.97)	(1.96)
Observations	364	364	364
Unique companies	43	43	43
R-squared	.22	.22	.23
Δ R-squared	0%	0%	5%
F-value	8.57***	7.86***	7.60***

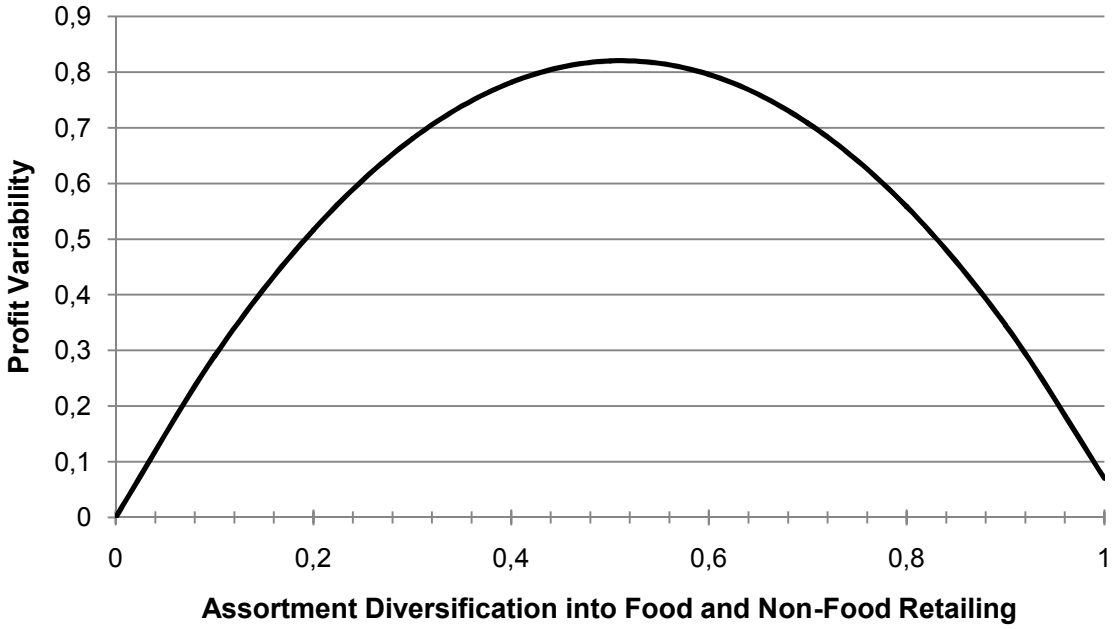
Notes: Standard errors in parentheses;
* significant at $p < 0.10$; ** significant at $p < 0.05$; *** significant at $p < 0.01$

Table B.4b: Results of Fixed-Effects Panel Regressions for Subsequent Profit Variability

	EBIT Variability$_{t+1}$		
	Model 1	**Model 2**	**Model 3**
Predictor:			
Assortment diversification$_t$		.61	2.29
		(.50)	(2.10)
Assortment diversification squared$_t$			-1.46
			(1.78)
Firm-specific controls:			
Firm size$_t$	.51**	.51**	.57**
	(.25)	(.25)	(.25)
Sales growth$_t$	.33	.31	.32
	(.25)	(.25)	(.25)
International diversification$_t$	.27	.26	.27
	(.21)	(.21)	(.21)
Retail format scope$_t$	-.26	-.21	-.22
	(.17)	(.17)	(.17)
Market share$_t$	-.01	-.02	-.03
	(.02)	(.02)	(.03)
Profits$_t$	-.29***	-.26**	-.26**
	(.11)	(.11)	(.11)
COO controls:			
Private consumption growth$_t$	-.08	-.07	-.06
	(.08)	(.08)	(.08)
Private consumption per capita$_t$	-.62	-.65	-.67
	(.43)	(.43)	(.43)
Wholesale price index$_t$	.04	.04	.04
	(.09)	(.09)	(.09)
Distribution infrastructure$_t$	.08	.10	.12
	(.08)	(.08)	(.09)
Constant	-4.65**	-5.10**	-5.16**
	(2.26)	(2.29)	(2.29)
Observations	354	354	354
Unique companies	43	43	43
R-squared	.05	.06	.06
Δ R-squared	0%	20%	0%
F-value	1.65*	1.64*	1.56

Notes: Standard errors in parentheses;
* significant at $p < 0.10$; ** significant at $p < 0.05$; *** significant at $p < 0.01$

Figure B.1: The Relationship between Assortment Diversification into Food and Non-Food Retailing and Profit Variability



1.6 Discussion

The purpose of this study was to investigate the relationship between a parent retailer's execution of an assortment diversification strategy and its financial performance. In general, parent retailers can choose to concentrate on assortment consistency among their retail formats or differentiate their assortments through their retail format portfolio. For example, UK-based Tesco has diversified into retail formats that are similar to its core business in food retailing. Today, Tesco owns and markets all of the major food retail formats, such as Tesco extra hypermarkets, Tesco superstores, Tesco metro supermarkets, Tesco express convenience stores, and Fresh & Easy neighborhood markets. In contrast, the German-based Metro Group has diversified heavily into food and non-food retail formats. Although Metro has divested itself from Praktiker DIY stores, Adler clothing stores, Divi and Roller furniture stores, Kaufhalle variety stores, Reno footwear stores, Vobis computer stores, and Tip office suppliers, Metro's format portfolio still consists of Metro and Makro cash & carries, Real and Extra supermarkets, Media-Saturn consumer electronics stores, and Kaufhof department stores. Consequently, the Metro Group yields more balanced sales shares of food and non-food retailing. According to the German business press, Metro's CEO, Eckard Cordes, also aims to divest the Kaufhof department store format and thereby further increase the food share within Metro's retail format portfolio. In the following, we discuss the implications of our study that are relevant for both academics and practitioners alike.

1.6.1 Implications

Our study has two major contributions. First, our results reveal that increased levels of assortment diversification into food and non-food retailing are linked to decreased levels of current and subsequent profits. Thus, we found that parent retailers that concentrate on either food or non-food retail formats attain the profit maximum, whereas retailers that diversify almost equally into food and non-food retailing realize the profit minimum. Consequently, our empirical findings suggest that Metro's ongoing corporate restructuring processes may be motivated by the retailer's recognition that its corporate-level assortment diversification into food and non-food retailing decreased its profits compared with its rivals. Interestingly, our study shows that the decreased firm performance of diversified parent retailers is only related to their cost growth that exceeded their sales growth. Unlike previous retail diversification research, which assumed that configurations of retail format

portfolios can increase both sales-based and profit-based firm performance (e.g., Brown, 2010), we show that a parent retailer can either increase its sales or profits as a result of its assortment diversification strategy. Accordingly, in the 2009 sales-based ranking list of the world's leading retailers, Metro was ranked at third place and Tesco at fourth place, but Tesco's profits exceeded those of Metro by five times (Deloitte, 2011).

Because attaining sales growth is an important financial objective of many retailers (and their corporate marketing departments in particular) and profit maximization is a prerequisite for attaining a sustainable competitive advantage, focusing primarily on sales-based financial objectives while evaluating retail format portfolio configurations can result in misleading (and long-reaching) strategic decisions. Given that "strategy, by definition, involves a substantial, largely irreversible precommitment of capital" (Lubatkin & Chatterjee, 1994: 119), retail managers must also consider how assortment diversification into food and non-food retailing affects their costs over time.

Drawing from the resource-based view of diversification, one explanation for our findings is that parent retailers may develop sophisticated know-how in managing their core assortment over time (Teece, Pisano, & Shuen, 1997). As a result, corporate parents are able to leverage economies of scope by deploying and redeploying superior resources and capabilities across the retail formats that carry similar or identical assortments. In addition, these corporate parents are able to decrease their costs by leveraging economies of scale (e.g., through higher purchasing volumes). Such opportunities for synergy creation, in turn, enable parent retailers to add value at the corporate level that leads to sustainable competitive advantage (Markides & Williamson, 1994). Consequently, our findings are consistent with the resource-based view of diversification and support its applicability to the retailing industry. Because Srivastava, Fahey, and Christensen (2001) argued that previous research has devoted little attention to the linkage between the resource-based view and marketing, our study attempts to contribute to the development of strategy theory in the marketing literature by doing so.

Second, our results suggest that at lower levels of assortment diversification into food and non-food retailing, an increase in a parent retailer's assortment diversification increases its profit variability. However, after a certain threshold point at the medium levels of assortment diversification, a parent retailer's profit variability decreases with increasing levels of assortment diversification. Thus, the profit variability is minimal for parent retailers with very low and very high levels of assortment diversification and maximal for parent retailers with more medium levels of assortment diversification.

Following modern portfolio theory, we expected that increases in the degree of assortment diversification into food and non-food retailing would decrease profit variability along the assortment diversification continuum (Amit & Livnat, 1988). Thus, our finding of increasing profit variability at the lower levels of assortment diversification is somewhat surprising. It is important to note that our results only explain how the changes in a parent retailer's assortment diversification affect the changes in its current profit variability (i.e., its profit variability in the same year). One possible explanation for this finding is that parent retailers that start to diversify into food and non-food retail formats may lack experience in the new market segment, which, in turn, can increase their current profit variability. Moreover, unrelated diversification likely exerts a risk-reducing influence that might only take effect after the parent retailers achieve a certain level of uncorrelated cash flows among their retail formats. Thus, in line with the predictions of modern portfolio theory, the study shows that a parent retailer's profit variability decreases beyond moderate levels of assortment diversification.

In summary, a parent retailer is able to maximize its profits and minimize its corporate risk in terms of profit variability by implementing a retail format portfolio strategy that focuses on assortment consistency among its retail formats. Furthermore, a parent retailer's chief executive, financial, and marketing officers should be aware of the conflicts between the financial objectives of sales and profit maximization that are inherent to the execution of a corporate-level assortment diversification strategy.

1.6.2 Limitations and Future Research

The findings of this study have several limitations that can be addressed by future research. For example, this study used accumulated data on assortment diversification into food and non-food retailing at the corporate level, which includes the assortment diversification behavior of each retail format within a parent retailer's portfolio. Although we controlled for the scope of each parent retailer's retail formats, our findings are more likely to be related to retail format acquisitions and divestitures than to changes in the degree of assortment diversification in single retail formats. If sufficient assortment diversification data are available at the retail format level, then future research can explicitly investigate the relationship between the assortment diversification of different retail formats and their sales, costs, and profits. In addition, we could not control if a parent retailer's primary retail format operates in food or non-food retailing because of the fixed-effects regressions used in this study. Although the fixed firm effects controlled for such firm-specific

differences and many retailers configure more diversified or focused retail format portfolios regardless of their primary format's focus in food or non-food retailing, this inability to control for the primary format represents a limitation in our study. Furthermore, according to previous retail diversification research and industry analysts, we examined a parent retailer's assortment diversification with respect to its degree of food and non-food retailing (Deloitte, 2011; Hollander, 1979; Pellegrini, 1994; Planet Retail, 2009), which averaged the differences within food and non-food retailing.

Overall, we encourage future retailing and marketing research to focus more intensively on the intersection between strategic management and marketing. The combination of the strategic management and marketing literature provides a promising avenue towards extending our understanding of topics that consider marketing variables as determinants of firm performance and, therefore, the metrics that matter most for senior management.

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C. THE RETAIL FORMAT DIVERSIFICATION DIMENSION

2. Essay: Within-Industry Diversification and Firm Performance - Synergy Creation and the Development of Parent Implementation Capabilities

Authors

Timo Sohl and Thomas Rudolph

Abstract

Different from previous research that traditionally views within-industry diversification as a form of related diversification, this study proposes that diversification within a service industry can be regarded as related or unrelated depending on the resource overlap between a corporate parent's units. The study tests the performance outcomes of related and unrelated within-industry diversification using a unique dataset of the world's leading retail firms' diversification behavior over thirteen years (from 1997 to 2009). Results show that there is a U-shaped relationship between related within-industry diversification and firm performance. Moreover, the study finds suggestive evidence that unrelated within-industry diversification has a negative effect on firm performance. In addition, we contribute to the literature by examining whether and when a corporate parent develops implementation capabilities through its experience with a within-industry diversification strategy. Our findings indicate that the combination of related within-industry diversification and implementation capabilities enables a corporate parent to outperform competition over time.

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2.1 Introduction

The question about performance implications of diversification pursued by firms out of their base industry has historically received huge attention in the strategic management literature (for reviews, see Palich, Cardinal, & Miller, 2000; Ramanujan & Varadarajan, 1989). In contrast, little research attention has focused on the diversification-performance relationship within a single industry. The few existing studies have examined firms' within-industry diversification in regard to product lines in the computer manufacturing industry (Stern & Henderson, 2004), product-market niches in the insurance industry (Li & Greenwood, 2004), and production (product platforms) and/or consumption (product-markets) in the software industry (Cottrell & Nault, 2004; Tanriverdi & Lee, 2008).

This study builds on previous findings of the emerging within-industry diversification literature in two ways. First, the study challenges the perspective that within-industry diversification is necessarily a "form of *related* diversification that is especially prevalent in *high-tech industries*" (Tanriverdi & Lee, 2008: 381) by proposing that within-industry diversification of multiunit firms in more *traditional service industries*, such as the retail, hotel, restaurant, and auto service industry, can be regarded as *related* or *unrelated* depending on the resource overlap between a corporate parent's units. Drawing from the resource-based view of diversification, we argue that the overlap of resources is likely based on the similarity of the units' value chain activities (Markides & Williamson, 1994; Robins & Wiersema, 1995). The opportunity to create synergies through the coordination and (re-) deployment of superior resources across units might enable corporate parents that pursue a related within-industry diversification strategy to outperform unrelated diversifiers (Hill, Hitt, & Hoskisson, 1992).

Second, the study combines the resource-based view of diversification with the literature on the capabilities framework by examining whether and when a corporate parent is able to develop "implementation capabilities" (Parmigiani & Holloway, 2011) to fully exploit its opportunities or potential for synergy creation (Winter, 2003). We define parent implementation capabilities as a corporate parent's ability to acquire, integrate, coordinate, and reconfigure bundles of superior resources to increase the value of the overall corporation (Eisenhardt & Martin, 2000; Teece, Pisano, & Shuen, 1997). Previous research has suggested that a firm's accumulated experience with such value-creating activities is an important antecedent of its development of capabilities (Eisenhardt & Martin, 2000; Parmigiani & Holloway, 2011; Pennings, Barkema, & Douma 1994; Teece, Pisano, & Shuen, 1997; Winter, 2003). However, the potential benefits of implementation

capabilities that a corporate parent might develop through its accumulated experience with related diversification have not been sufficiently explored by previous studies. We address this gap by empirically examining whether and when *combinations* of related within-industry diversification (which increases the potential for synergy creation) and the development of parent implementation capabilities (which enable firms to exploit its synergies) might enable corporate parents to outperform competition over time. Specifically, we propose that more heavily related diversifiers *with more experience* will outperform both heavily related diversified parents *with less experience* and all forms of *unrelated diversifiers*.

In summary, we contribute to the literature by developing a relatedness construct according to the similarity between a corporate parent's lines of value chain activities and examining how related and unrelated within-industry diversification and the development of parent implementation capabilities is linked to firm performance. The results show that the relationship between related within-industry diversification and firm performance is a U-shaped curve. Moreover, the study indicates that unrelated within-industry diversification destroys firm value. We also find evidence that related diversifiers with more experience outperform competition after they have achieved a certain minimum level of relatedness in their unit portfolio, while unrelated diversifiers are not able to benefit from their experience with unrelated diversification.

The study is organized as follows. The next section introduces the retailing industry as the empirical context for testing several hypotheses of the within-industry diversification-performance relationship. In the development of the hypotheses, we draw from theoretical arguments of the resource-based view of diversification. Furthermore, the section conceptually develops the construct of a multiunit retail firm's related and unrelated within-industry diversification. The empirical part of the paper introduces the econometric model, tests the hypotheses, and presents the results of the analysis. The study concludes with a discussion of our findings and derives implications for academics and practitioners.

2.2 Theory and Hypotheses

2.2.1 Context

Previous empirical research on cross-industry diversification has perceived industries as homogeneous and largely averaged the specificity of within-industry diversification. However, many diversified firms compete with one another only in a single industry. For example, firms that own and market multiple units are prevalent in most service industries, which are characterized by direct contact between customers and firms (Ingram & Baum, 1997). Multiunit firms have been defined as "organizations, such as restaurants, hotels, retail chains, and multinationals that operate in multiple markets through several distinct units" (Vroom & Gimeno, 2007: 902). Engaging the debate on the question why firms *in the same industry* perform differently (Zott, 2003), we suggest that differences in firm-specific within-industry diversification strategies can explain some of the variation in firm performance.

We chose the global retailing industry for the empirical setting of this study. The retailing industry belongs to the service sector and is mature in all developed economies. Moreover, within-industry diversification in the retailing industry has many similarities to other service industries, such as the hotel, restaurant, and auto service industries. Many of the world's leading retail firms have configured a portfolio of business units (hereafter: retail formats[1]) (Gauri, Trivedi, & Grewal, 2008; Gielens & Dekimpe, 2008; Kumar, 1997). Nowadays, more than 80 percent of the top 30 grocery retailers own and market multiple retail formats (Planet Retail, 2009). Although most of the world's leading retail firms still have one dominant format that accounts for the majority of their overall sales, the format-mix that they operate in has grown in recent years. For example, UK-based Tesco owns and markets all major food retail formats and has recently entered the U.S. market with its new convenience format "Fresh & Easy". Subsequently, the world's largest retailer Wal-Mart launched its convenience format "Marketside" in the U.S. and moved further away from its established "big box" formats, such as supercenters and hypermarkets. Furthermore, French-based Carrefour's investments in its hard discount format "Dia" indicate the traditionally hypermarket focused retailer's ambitions to fulfill consumer needs in the fast growing discount segment (Euromonitor International, 2009). As a result, most leading retail firms compete

[1] According to Parmigiani & Holloway (2011), we equate retail formats with business units, as they have diverse corporate parentage and are generally managed independently.

with one another not only in one retail format but in portfolios of different more or less related retail formats.

A retail format has been referred to as a *specific retail-mix* of the nature of assortment and service offered, pricing policy, advertising and promotion programs, store design and visual merchandising, and location (Kahn & McAlister, 1997). Each retail format aims at matching specific consumer segments and shopping situations (Gonzales-Benito, Munoz-Gallego, & Kopalle, 2005). Several retail formats, such as supermarkets, hypermarkets, superstores, warehouse clubs, department stores, discount stores, and convenience stores, have been distinguished in the retailing literature. For example, department stores typically have higher prices because of higher costs due to broader assortments, higher inventories, better personal services, more appealing store environments and expensive locations. Conversely, discount stores can compete on everyday low prices due to limited assortments, inventories, and services, as well as rather unexciting store environments (Levy & Weitz, 2008).

Given the different types of retail formats, many retailers pursue one of two somewhat opposite retail format diversification strategies. For example, retailers such as Kroger, Morrisons, Safeway, and the Otto Group concentrate more heavily on retail formats that have a close "fit" to one another. They might utilize their knowledge in the development of their core format to diversify into new *related formats*. Accordingly, these retailers seem to seek for growth opportunities with formats that are close in nature to their established operations. In contrast, retailers such as Aeon, Casino, the Metro Group, and Rewe have configured retail format portfolios composed of retail formats that target at different consumer segments and shopping situations. These retailers might diversify to a greater degree into *unrelated formats* to meet different shopping needs while spreading their risk of being dependent on a single market segment (Mason, Mayer, & Wilkinson, 1993).

Previous research has distinguished related and unrelated diversification as the two directions of any diversification strategy (Betties, 1981; Robins & Wiersema, 2003; Rumelt, 1982). Related diversification has been mainly conceptualized as the type of diversification resulting from a firm's operations within a two-digit SIC industry group, whereas unrelated diversification has been conceptualized as a firm's type of diversification arising from operations between two-digit industry groups (Hoskisson, Hitt, Johnson, & Moesel, 1993). In an attempt to extend the product-based SIC code measures of relatedness, researchers have focused on the relatedness of firms rather than products. With this regard, Robins and Wiersema (1995) have developed a relatedness measure that captures the opportunity to share intangible resources such as technological and R&D know-

how across business units of manufacturing firms, which is closer to the logic of the resource-based view of diversification.

However, the applicability of previous relatedness measures to service sectors has been questioned (e.g., Tanriverdi & Lee, 2005). Regarding within-industry diversification in the retailing industry, Levy and Weitz (2008) propose that a more useful approach might be to group related formats based on the degree of overlap among their retail-mixes (i.e., assortment and service offered, pricing policy, advertising and promotion program, store design, and location). The overlap across formats' retail-mixes, in turn, largely determines the overlap of the formats' tangible and intangible resources that they share across their value chain activities on the supply side (i.e., purchasing and supply chain) and demand side (i.e., marketing, such as pricing, advertising and promotion).

We follow the theoretical conceptualization of Levy and Weitz (2008) and the American Food Marketing Institute when we classify the relatedness of retail formats, as described in the following. First, supermarkets carry from 15,000 to 60,000 mainly grocery stock keeping units (SKUs) and may offer a service deli, a service bakery, and/or a pharmacy. Superstores are supermarkets that are larger (20,000 to 50,000 square feet) with expanded bakery, seafood, and nonfood sections. Because of their similar retail-mixes, supermarkets and superstores can be described as related formats. Second, the stores of the supercenter format average more than 170,000 square feet and typically devote as much as 40 percent of the space to grocery items (e.g., Walmart Supercenters, Super Target, Meijer, and Fred Meyer). Hypermarkets are often larger than supercenters but carry fewer items (e.g., Carrefour Hypermarkets). Both retail formats are designed for consumers' main, one-stop weekly shopping trip and can be characterized as related formats. Third, unlike the other formats, both cash & carry markets and warehouse clubs aim at matching the shopping needs of business customers, such as restaurants and hotels, and have large stores in industrial areas. Moreover, they offer little services to their customers (Bhatnagar & Ratchford, 2004). Thus, they can be regarded as closely related formats. Fourth, convenience, neighborhood, liquor/beverage, forecourt, and variety store formats are related to each other because all offer limited assortments (between 600 and 1,500 items) at a convenient location and target on impulse purchases enabling consumers to make fast shopping trips. Fifth, with regard to non-store formats, the mail order and e-commerce formats have similar value chain activities and can be regarded as related formats. Finally, both discount stores and department stores are unrelated to any other format due to their specific retail-mixes and business models.

In their study on within-industry diversification in the software industry, Tanriverdi and Lee (2008: 383) have developed a platform relatedness construct "to capture the extent to which an independent software vendor pursues a related diversification strategy across OS platforms." In this study, we propose that our construct of retail format relatedness accounts for the extent to which a parent retailer pursues a related diversification strategy depending on the similarity of the retail formats' value chains.

2.2.2 Related Within-Industry Diversification and Firm Performance

The resource-based view of diversification has proposed that multiunit firms are able to create synergies by sharing common tangible and intangible resources across related units, which in turn creates value at the corporate level that exceeds the value creations of the single business units (Chatterjee & Wernerfeld, 1991; Rumelt, 1982; Tanriverdi & Venkatraman, 2005). Specifically, resource redeployment across related units can enable firms to increase *effectiveness* (sales-based synergies) and *efficiency* (cost-based synergies) (Chatterjee, 1986). As a result, superior firm performance can be seen as a function of the pool of superior resources and capabilities that a corporate parent can deploy and redeploy across its unit portfolio to increase effectiveness and efficiency (Markides & Williamson, 1994).

According to Porter (2004), a multiunit firm is able to develop interrelationships among its related units at any value activity of the unit's value chains to create synergies. For example, superior sales and marketing capabilities, such as customer knowledge, customer services, advertising, and visual merchandising, of one retail format may be redeployed to *increase effectiveness* and *stimulate sales* across related formats, which target at similar consumer segments and shopping situations (Capron & Hulland, 1999). Furthermore, superior in-store logistic, inventory, and supply chain management capabilities might be redeployed to *increase efficiency* and *reduce costs* across related formats, which have similar physical store environments (e.g., store layout designs, shelf spaces) and similar variability of demand (Prahalad & Bettis, 1986). Finally, previous research has suggested that firms can only exchange such strategic resources and capabilities across their own unit portfolio as they are not transferrable through the open market (Wernerfelt, 1984).

In summary, the pool of superior resources and capabilities and the opportunity for *sales-based* and *cost-based synergy creation* likely increases as a corporate parent focuses more heavily on related diversification (Markides &

Williamson, 1994; Penrose, 1959), which in turn increases its firm performance (Barney, 1991; Bettis, 1981; Goold & Luchs, 1993; Rumelt, 1982). Based on this discussion, we hypothesize that:

Hypothesis 1. Related within-industry diversification will have a positive effect on firm performance.

2.2.3 Unrelated Within-Industry Diversification and Firm Performance

Conversely to related diversification, previous research has found that unrelated units "with dissimilar customer needs and behaviors have minimal opportunity to exploit cross-business customer knowledge synergies" (Tanriverdi & Venkatraman 2005: 102). Attempts to mix customer knowledge across unrelated units might even decrease firm performance (Ramaswamy, 1997). Besides the decreasing opportunity to exploit *economies of scope*, a corporate parent might also not be able to leverage *economies of scale* across unrelated units. For example, convenience stores are usually located in the city center and have to be delivered several times a day with small replenishment quantities, whereas warehouses clubs require less shipments but in large quantities (Bahtnagar & Ratchford, 2004). Thus, a retailer's distribution efficiency of its core format might be difficult to leverage across unrelated formats.

Consequently, the higher the level of unrelated within-industry diversification, the lower might be the opportunity to exploit sales-based and cost-based synergies. Moreover, retail firms have to learn about competition, operations, and consumer trends in the new market segments, which can be costly and result in sub-optimal decision-making. Furthermore, transaction cost theory proposes that control and coordination costs increase rapidly with higher degrees of unrelated diversification (Williamson, 1979). Moreover, diseconomies such as organizational complexity might increase with higher levels of unrelated diversification (Palich, Cardinal, & Miller, 2000). Building on this argumentation, we hypothesize that:

Hypothesis 2. Unrelated within-industry diversification will have a negative effect on firm performance.

2.2.4 The Moderating Effect of Within-Industry Diversification Experience

While the above developed hypotheses propose from a *static perspective* that superior resources and capabilities can be deployed and redeployed by corporate parents to create synergies, the study argues form a *dynamic perspective* that a parent retailer can develop implementation capabilities for synergy creation over time. Capabilities are embedded in managerial and organizational processes or routines to address complex and repeated problems (Schreyögg & Kliesch-Eberl, 2007) such as sharing best practices and, more general, creating synergies across units. A firm's capabilities evolve over time and are path dependent (Teece, Pisano, & Shuen, 1997). Thus, a firm can develop such processes and routines from its experience that it has gained with organizational actions (McCann & Vroom, 2010). Accordingly, we investigate *experience with related within-industry diversification* as an important antecedent of the development of parent implementation capabilities. For example, a firm's organizational processes and routines for synergy creation might result from its historical experiential learning about the most beneficial ways to share common resources across units. As a result, parent implementation capabilities may lead to superior and sustainable firm performance because of two important characteristics. First, they enable corporate parents to coordinate, integrate, reconfigure, and transform best practices, superior resources, and unit capabilities within the firm (Eisenhardt & Martin, 2000). Second, they may enable parents to acquire or develop those new units that increase the pool of superior resources and capabilities within the firm in the most favorable way.

The combination of higher levels of related within-industry diversification (which increases the pool of superior resources and capabilities) and the development of parent implementation capabilities (which enable the firm to leverage the pool of superior resources capabilities), in turn, may lead to the creation of super-additive value and/or sub-additive costs (Tanriverdi & Venkatraman, 2005). We hypothesize accordingly that:

> *Hypothesis 3. The positive effect of related within-industry diversification on firm performance will be stronger for corporate parents with longer related within-industry diversification experience.*

Although unrelated diversifiers are not able to create synergy in form of super-additive value and/or sub-additive costs from their experience with their diversification activities, experience with strategy execution might be beneficial to firms per se (Nath & Sudharshan, 1994). Thus, we hypothesize that the

accumulation of experience with unrelated diversification may weaken the negative effect of unrelated-within industry diversification on firm performance:

> *Hypothesis 4. The negative effect of unrelated within-industry diversification on firm performance will be weaker for corporate parents with longer unrelated within-industry diversification experience.*

2.3 Methodology

2.3.1 Sample

We tested our hypotheses using the world's leading 70 retailers' within-industry diversification behavior and their key performance data over a period of thirteen years (from 1997 to 2009). We obtained the data from the database of Planet Retail. In addition, we obtained time varying macroeconomic data of the retailers' countries of origins (COO) from the World Bank database and the IMD world competitive database. Finally, we created a cross-sectional time-series data set for the years from 1997 to 2009 consisting of the single retailers' diversification data and their key performance data as well as their COO's key macroeconomic indicators.

2.3.2 Dependent Variable

The dependent variable is parent retailers' profits (and a unit's profits in the infrequent case of single-format retailers).

Firm profits. We accounted for a parent retailer's profits by using annual data on its EBIT (a retailer's overall performance before interests and taxes). Since the sample contains many privately held parent retailers, ROA data from the COMPUSTAT database were only available for 33 of the 70 retail firms. In contrast, the specialized database of Planet Retail provides EBIT data also for many privately held retailers. As ROA (the ratio of net profit to total assets) is a similar profit measure as EBIT (profit before interest and taxes), we found similar results in regard to the direction and magnitude of the coefficient estimates for EBIT and ROA as dependent variables. We decided to report only the results of EBIT because of the higher sample size and the inclusion of privately held parent retailers' within-industry diversification behavior, which provides a more realistic picture of the firms' within-diversification strategies in the retailing industry.

2.3.3 Independent Variables

Retail format diversification. Most recent literature considers diversification as a degree which is continuously variable (Chatterjee & Wernerfelt, 1991). Accordingly, we transferred an established diversification measure (i.e., the entropy index) to a novel context to measure the degree of related and unrelated diversification of a retail firm based on its format's retail-mix similarity (as described above). We modified the components of the entropy index to fit the needs of the current research. Total entropy (DT) is measured by:

$$DT = \sum_{i=1}^{N} P_i \ln(1 / P_i)$$

where P_i = Proportion of sales in format *i* and $\ln(1/ P_i)$ is the weight for each format *i* (the logarithm of the inverse of its sales), for a retail firm with *N* different formats. Thus, the entropy index encompasses the degree of format diversification in terms of both scale (number of formats in which a retailer operates) and scope (relative importance of each format in sales) (Jacquemin & Berry, 1979; Palepu, 1985). We computed unrelated format diversification with the unrelated entropy (*DU*) measure, where P_i = Proportion of sales in unrelated format *i*, for a retail firm with *N* different unrelated formats. Finally, related format diversification can be estimated as related entropy (*DR*) with $DR = DT - DU$ (Robins & Wiersema, 2003).

Diversification experience. Related (unrelated) diversification experience is a count of the number of years that a firm has exceeded the sample's mean value of the related (unrelated) diversification measure during the thirteen year time period. If a firm has not exceeded the mean value, the experience with related (unrelated) diversification remains zero. We chose the mean value as threshold because a minimum level of related (unrelated) diversification may be necessary before a firm can start to develop capabilities through related (unrelated) diversification activities. In the case that a firm exceeded the mean of related (unrelated) diversification and falls behind the mean in a subsequent year of the thirteen year time period, the count of the achieved years of learning remains stable over a three year period and then becomes less with every subsequent year. With this specification, we account for the fact that firms may remain previous developed capabilities only for a distinct time period after the source of the capabilities diminished (i.e., before the phenomenon of organizational forgetting occurs).

2.3.4 Control Variables

Firm specific controls. First, we controlled for the retail firms' extend of international operations. Most leading retailers are internationally diversified and previous research indicates that retailers' extend of international diversification has an important effect on firm performance (Geringer, Beamish, & daCosta, 1989). We measured the degree of international diversification with the entropy index, where P_i = Proportion of sales in country i, for a retailer with N different countries (Hit, Hoskisson, & Kim, 1997).

Second, this study controlled for product diversification. In the retailing industry, product diversification can be equated with assortment diversification. Assortment diversification into food and non-food retailing is an important control variable of this study for the following reason. For example, retail formats like department stores offer consumers mainly apparel and other non-food products, whereas supermarkets and convenience stores usually carry a large share of food products in their merchandise (Levy & Weitz, 2008). Thus, acquisitions (internal development) of new retail formats and divestitures of existing formats can have direct effects on the assortment diversity (in terms of food and non-food retailing) within the retail format portfolio. Through the diversification into food and non-food retailing, corporate parents may experience decreased economies of scale which likely influences firm performance. We applied the entropy index to measure the degree of assortment diversification in the retail format portfolio where P_i = Proportion of sales in assortment category i, with i = food or non-food, for a retailer with up to two different assortment categories ($N=2$). Thus, the more unrelated the assortment, the higher the assortment entropy diversification index.

Third, we controlled for firm size with corporate parents net sales. We performed a common natural log transformation of the sales data to improve normality, reduce outliers, and improve the homoscedasticity of the distributions (Pinches, Mingo, & Carruthers, 1973). Fourth, we controlled for sales growth according to the study of Tanriverdi and Lee (2008). A corporate parent's sales growth was calculated as the logarithm of the sum over all unit sales in year t divided by the sum over all unit sales in year $t - 1$. Finally, market share controls for a firm's market power and can influence the subsequent firm performance (Tanriverdi & Lee, 2008).

Country of origin controls. The country of origin (COO) data reflects location-specific advantages of a retail firm's home country (Peterson & Jolibert, 1995; Wan & Hoskisson, 2003). Moreover, time-varying macroeconomic indicators control for the influence of worldwide economic cycles and other contemporaneous

correlations. Specifically, we controlled for time-varying conditions in supply and demand of a firm's COO. To control for supply variations, we included the wholesale price index of each firm's COO. Moreover, we included a measure of the quality of the COOs distribution infrastructure to control for differences in supply chain/logistics efficiencies, which can affect firm performance especially in the retailing industry. To control for variations in demand between the COOs, we included the indicators of private consumption growth and private consumption per capita as they are more relevant to the retailing industry than the respective GDP measures. Finally, we controlled for the COOs inflation rates in consumer prices. We obtained the measures for the wholesale price index, private consumption growth, private consumption per capita, and inflation from the World Bank database and the measure for the distribution infrastructure from the IMD world competitive database. Table C.1 shows descriptive statistics and correlations between the variables of this study.

Table C.1: Means, Standard Deviations, and Correlations

Variable	Mean	SD	X1	X2	X3	X4	X5	X6	X7
X1. Profit (EBIT)	1,041.36	1,945.11	1.00						
X2. Market share	9.34	9.38	0.05	1.00					
X3. Related diversification	0.22	0.25	0.36*	0.27*	1.00				
X4. Unrelated diversification	0.66	0.56	-0.03	0.63*	0.33*	1.00			
X5. Related div. experience	2.59	3.66	0.22*	0.31*	0.68*	0.37*	1.00		
X6. Unrelated div. experience	3.17	3.86	-0.10*	0.41*	0.22*	0.70*	0.47*	1.00	
X7. International diversification	0.64	0.70	0.12*	0.04	0.10*	0.06	0.12*	0.16*	1.00
X8. Product diversification	0.44	0.23	0.16*	0.43*	0.17*	0.54*	0.19*	0.36*	-0.07*
X9. Firm size[a]	9.62	0.99	0.57*	0.12*	0.24*	0.15*	0.31*	0.12*	0.14*
X10. Sales growth	0.06	0.14	0.03	0.04	-0.01	-0.06	-0.15*	-0.15*	-0.03
X11. Private con. Growth	2.81	1.77	-0.01	-0.02	0.08*	-0.18*	-0.08*	-0.20*	-0.18*
X12. Private con. per capita	17,302.14	6,504.47	0.21*	-0.39	-0.13*	-0.32*	-0.08*	-0.27*	-0.30*
X13. Inflation[b]	1.89	1.58	0.06	-0.04	-0.06	-0.08*	-0.03	-0.04	-0.03
X14. Wholesale price index	96.98	10.41	-0.03	0.06	0.03	0.11*	0.26*	0.34*	0.12*
X15. Distribution infrastr.[c]	7.71	1.22	0.08	-0.01	0.04	-0.01	0.17*	0.00	0.12*

Notes: EBIT in million Euro; Private consumption per capita in constant 2000 USD;
* significant at $p < .05$ (pairwise correlations); [a] natural logarithm; [b] in consumer prices; [c] from 1 = not good to 10 = very good

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Variable	X8	X9	X10	X11	X12	X13	X14	X15
X1. Profit (EBIT)								
X2. Market share								
X3. Related diversification								
X4. Unrelated diversification								
X5. Related div. experience								
X6. Unrelated div. experience								
X7. International diversification								
X8. Product diversification	1.00							
X9. Firm size[a]	0.35*	1.00						
X10. Sales growth	-0.11*	-0.12*	1.00					
X11. Private con. growth	-0.04	-0.24*	0.34*	1.00				
X12. Private con. per capita	-0.09*	0.29*	-0.21*	-0.15*	1.00			
X13. Inflation[b]	-0.02	0.03	0.02*	0.26*	0.01	1.00		
X14. Wholesale price index	-0.09*	0.01	-0.12*	-0.40*	-0.03	-0.01	1.00	
X15. Distribution infrastr.[c]	-0.04	0.36*	-0.19*	-0.25*	0.37*	-0.09*	0.08*	1.00

Notes: EBIT in million Euro; Private consumption per capita in constant 2000 USD;
* significant at $p < .05$ (pairwise correlations); [a] natural logarithm; [b] in consumer prices; [c] from 1 = not good to 10 = very good

2.3.5 Method

This study used econometric models to investigate performance implications of within-industry diversification strategy over time. We had to decide whether to use fixed effects or random effects for coefficient estimation (Wooldridge, 2002). We chose fixed effects regression analysis because the results of the Hausman test rejected the randomness of residuals hypothesis (Hausman, 1978). The equation explaining performance implications of within-industry diversification strategy is expressed as:

$$\boldsymbol{Y}_{it} = \alpha + \beta\, \boldsymbol{X}_{it} + \gamma\, \boldsymbol{Z}_{it} + v_i + \varepsilon_{it}$$

where $\boldsymbol{Y}_{it}$ is the vector of performance observations for firm i (i = 1,…,70) and time t (t = 1,…,13); $\boldsymbol{X}_{it}$ is the vector of the two within-industry diversification strategies (i.e., related and unrelated diversification); and $\boldsymbol{Z}_{it}$ is the vector of control variables. Furthermore, $v_i + \varepsilon_{it}$ is the residual with v_i as the unit specific residual that differs between firms but is constant over time for each single firm (i.e., in the fixed effects model v_i are fixed and have no distribution). Table C.1 illustrates descriptive statistics and indicates that the bivariate correlations do not show problems of multicollinearity. Moreover, the variance inflation factor (VIF) indicates that the independent and control variables have a VIF lower than 4.03, which is far below the suggested critical limit of 10 (Baum 2006).

2.4 Results

Tables C.2a and C.2b present the results of our analysis. Model 1 presents the base model and includes only the control variables. The results of control variables remain stable across all models and their interpretation is plausible. Furthermore, F statistics indicate that all models are significant. We added the independent variables one by one to test the hypotheses.

Hypothesis 1 suggested that related within-industry diversification will have a positive effect on firm performance. Results of Model 2 show that the linear term is positive, but not significant (b = .12, p > .10). Through the inclusion of the squared term in Model 3, the linear term becomes negative and significant (b = -.49, p < .01) and the squared term shows a positive and significant coefficient (b = .80, p < .01). Thus, we find a U-shaped relationship between related within-industry diversification and profits. The hypothesized positive effect is only supported as

firms exceed a distinct level of relatedness, while firm profits decrease before that threshold (i.e., at lower levels of relatedness). Based on the linear and quadratic coefficients in Model 3, we calculated the threshold to be 0.30625 at the related within-industry diversification continuum (min = 0 and max = 1.18).

Hypothesis 2 stated that unrelated within-industry diversification will have a negative effect on firm performance. The results of Model 4 indicate that the linear term of unrelated within-industry diversification is weakly significant (b = -.15, p < .10), while the inclusion of the squared term in Model 5 is not significant. Thus, we find suggestive evidence that unrelated within-industry diversification decreases firm profits. The weakly significant negative effect is further supported in the regressions that include the interaction effect with unrelated within-industry diversification experience (Model 7 in Table C.2b).

Table C.2a: Fixed Effects Regressions for Profits (Main Effects)

	Model 1	Model 2	Model 3	Model 4	Model 5
Predictors:					
Related diversification		.12	-.49***		
		(.09)	(.15)		
Related diversification^2			.80***		
			(.15)		
Unrelated diversification				-.15*	-.13
				(.08)	(.17)
Unrelated diversification^2					-.03
					(.17)
Firm-specific controls:					
Related diversification	.03**	.03**	.03**	.04***	.04***
experience	(.01)	(.01)	(.01)	(.01)	(.01)
Unrelated diversification	-.05***	-.05***	-.05***	-.05***	-.05***
experience	(.01)	(.01)	(.01)	(.01)	(.01)
International	.58***	.54***	.53***	.60***	.59***
diversification	(.10)	(.11)	(.10)	(.10)	(.10)
Product diversification	-.56**	-.54**	-.61***	-.70***	-.70***
	(.23)	(.24)	(.23)	(.25)	(.25)
Firm size[a]	.15	.16	.13	.15	.15
	(.12)	(.12)	(.11)	(.12)	(.12)
Sales growth	.19	.20	.18	.20	.20
	(.15)	(.15)	(.15)	(.15)	(.15)
Market share	.02	.01	.01	.03**	.03**
	(.01)	(.01)	(.01)	(.01)	(.01)
COO controls:					
Private consumption	-.02	-.01	-.01	-.03	-.03
growth	(.04)	(.04)	(.04)	(.04)	(.04)
Private consumption per	.48**	.50**	.46**	.47**	.47**
capita	(.19)	(.19)	(.19)	(.19)	(.20)
Inflation[b]	-.01	-.01	.00	-.00	-.00
	(.02)	(.02)	(.02)	(.02)	(.02)
Wholesale price index	-.01	-.01	.04	-.00	-.00
	(.04)	(.04)	(.04)	(.04)	(.04)
Distribution	-.02	-.02	-.03	-.02	-.02
infrastructure[c]	(.04)	(.04)	(.04)	(.04)	(.04)
Constant	-1.48	-1.50	-1.10	-1.47	-1.50
	(1.08)	(1.08)	(1.04)	(1.07)	(1.09)
Observations	408	408	408	408	408
Unique companies	49	49	49	49	49
R^2	.27	.27	.32	.27	.27
F-value	10.41***	9.76***	11.64***	9.92***	9.18***

Notes: Standard errors in parentheses;
* significant at $p < 0.10$; ** significant at $p < 0.05$; *** significant at $p < 0.01$;
[a] natural logarithm; [b] in consumer prices; [c] from 1 = not good to 10 = very good

Table C.2b: Fixed Effects Regressions for Profits (Interaction Effects)

	Model 6	Model 7	Model 8
Predictors:			
Related diversification	.16		.08
	(.15)		(.17)
Related diversification^2	-.24		-.17
	(.17)		(.18)
Unrelated diversification		-.15*	.08
		(.08)	(.15)
Unrelated diversification^2			-.03
			(.15)
Related diversification x	-1.03***		-.99***
related div. exp.	(.17)		(.17)
Related diversification^2 x	1.66***		1.64***
related div. exp.	(.20)		(.20)
Unrelated diversification x		-.02	-.04**
unrelated div. exp.		(.02)	(.02)
Firm-specific controls:			
Related diversification	.10***	.04***	.09***
experience	(.04)	(.01)	(.03)
Unrelated diversification	-.01	-.02	.05*
experience	(.01)	(.03)	(.03)
International	.47***	.60***	.49***
diversification	(.09)	(.10)	(.09)
Product diversification	-.71***	-.71***	-.71***
	(.20)	(.25)	(.21)
Firm size[a]	.14	.16	.17*
	(.10)	(.11)	(.10)
Sales growth	.26**	.21	.28**
	(.13)	(.15)	(.13)
Market share	.00	.03**	.00
	(.01)	(.01)	(.01)
COO controls:			
Private consumption	-.02	-.03	-.01
growth	(.03)	(.04)	(.03)
Private consumption per	.09	.44**	.01
capita	(.17)	(.20)	(.17)
Inflation[b]	-.01	-.00	-.01
	(.02)	(.02)	(.01)
Wholesale price index	.03	-.00	.02
	(.04)	(.04)	(.04)
Distribution	-.03	-.03	-.04
infrastructure[c]	(.04)	(.04)	(.04)
Constant	-1.28	-1.59	-1.52*
	(.90)	(1.08)	(.92)
Observations	408	408	408
Unique companies	49	49	49
R^2	.49	.27	.50
F-value	20.90***	9.27***	18.00***

Notes: Standard errors in parentheses;
* significant at $p < 0.10$; ** significant at $p < 0.05$; *** significant at $p < 0.01$;
[a] natural logarithm; [b] in consumer prices; [c] from 1 = not good to 10 = very good

Hypothesis 3 proposed that the positive relationship between related within-industry diversification and firm performance will be stronger for corporate parents with longer related within-industry diversification experience. The inclusion of the interaction term between related within-industry diversification and accumulated experience with related diversification in Model 6 (Table C.2b) strengthens the above reported U-shaped relationship. The linear term shows a negative and significant coefficient (b = -1.03, p < .01) and the squared term is positive and significant (b = 1.66, p < .01). This finding indicates that accumulated experience with related diversification leads to super-additive value creation as firms exceed a distinct level of related within-industry diversification. After that threshold, firms are likely able to leverage the increasing common base of superior resources through their development of implementation capabilities for synergy creation, which in turn increases firm performance at an increasingly higher level. Compared with the 0.30625 threshold for related within-industry diversification, the threshold for the interaction effect is 0.31024 at the related within-industry diversification continuum (min = 0 and max = 1.18). Moreover, the linear and squared main effects of related within-industry diversification on firm performance in Model 6 become insignificant with the interaction terms in the model. Therefore, at *zero* experience with related within-industry diversification, the effect of related within-industry diversification on firm performance becomes insignificant.

Finally, hypothesis 4 anticipated that the profits of unrelated within-industry diversifiers can also benefit from their experience with unrelated diversification. However, Model 7 shows that this interaction effect is not significant (b = -.02, p > .10), which suggests that a firm's experience with its execution of an unrelated within-industry diversification strategy has no salutary effect on its firm performance.

Overall, the evidence shows that corporate parents that focus more heavily on related diversification within an industry are able to achieve superior firm performance. Moreover, the study indicates that a multiunit firm's accumulated experience with related within-industry diversification is likely an important antecedent for the development of parent implementation capabilities, which in turn enable them to outperform competition over time.

To illustrate the relationship between related and unrelated within-industry diversification and profits, we graph the estimated relationships in Figure C.1. Moreover, Figure C.2 illustrates the related within-industry diversification-performance relationship at different levels of firm experience with related within-industry diversification (i.e., for a relatively experienced firm versus a relatively inexperienced firm). Figure C.2 shows that the relatively inexperienced firms are

not able to create synergies to benefit from increasing degrees of related within-industry diversification.

Figure C.1: Within-Industry Diversification and Profits (EBIT)

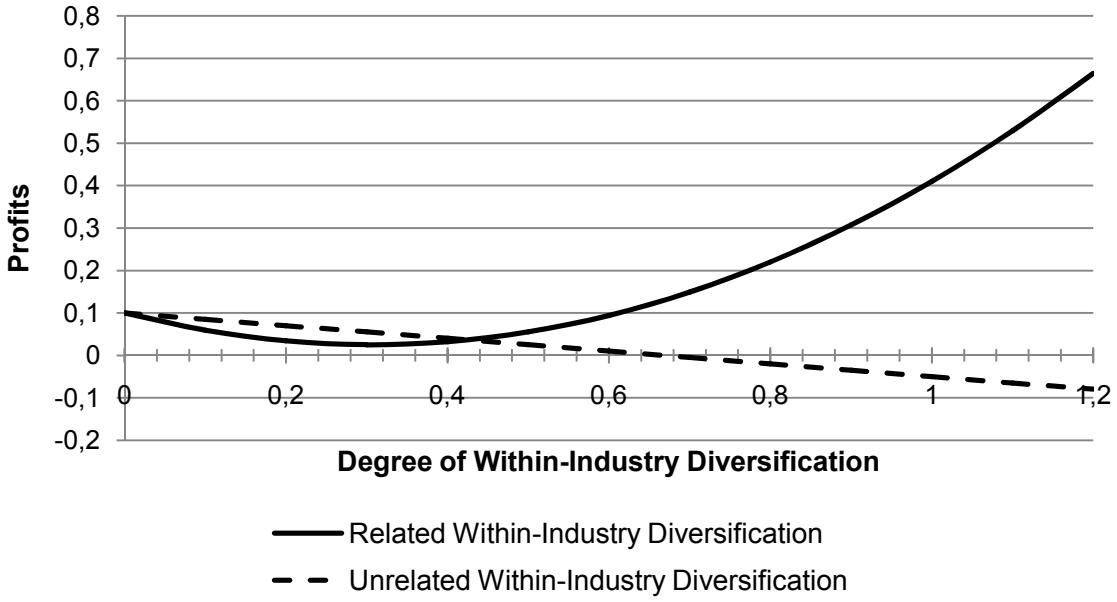
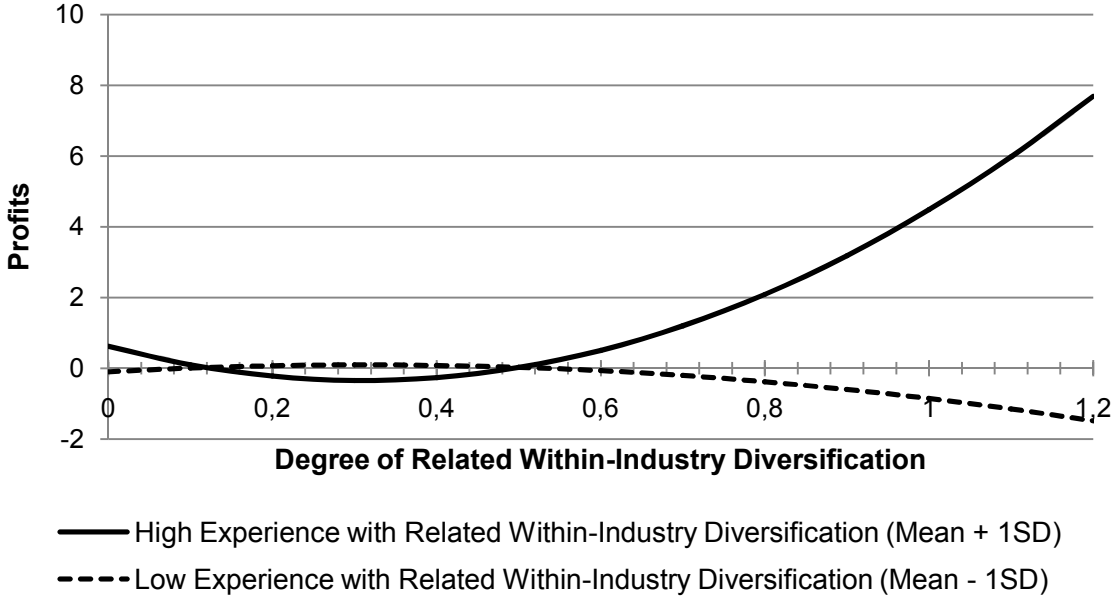


Figure C.2: The Relationship between Related Within-Industry Diversification and Firm Performance at Different Firm Experience Levels



2.5 Discussion

The findings of this study have several important implications for academics and practitioners. First of all, our conceptualization of the related within-industry diversification construct captures the resource relatedness within a corporate parent's unit portfolio. Thus, this conceptualization might be closer at the core arguments of the resource-based view of diversification than previous conceptualizations, which have been mainly based on the similarity of industry groups according to the product-based SIC code system.

Second, our results support the theoretical rationale of the resource-based view of diversification in a single industry context. As expected, our results show that a corporate parent that exceeds a minimum level of related resource bundles in its unit portfolio can benefit over proportionally from its further related diversification activities. More specifically, corporate parents of multiunit firms that focus more heavily on related unit diversification within an industry and grow with units that have a close "fit" to their established operations are able to outperform competition. As a result, the opportunity for value creation through scale and scope economies by creating interrelationships among the units likely leads to superior performance. In contrast to our expectations, the study indicates that a firm must achieve a minimum level of relatedness in its unit portfolio before it can benefit from related within-industry diversification. One possible explanation for the decreasing profits at low levels of relatedness is that attempts to share activities along the units' value chains require investments (Porter, 2004). For example, the development of parent implementation capabilities for resource integration, coordination, and reconfiguration can be costly for a corporate parent (Winter, 2003). With this regard, Tanriverdi and Venkatraman (2005: 100) argued that "it is costly to create and exploit common knowledge resources across multiple business units." At low levels of relatedness, such costs likely outweigh the benefits, because synergies that arise from related within-industry diversification are limited. As a result, the attempt to create synergies can lead to decreasing firm performance at low levels of resource relatedness.

Third, this study found supportive evidence that a firm's diversification into unrelated units decreases its profits. Thus, multiunit firms that are heavily diversified into unrelated units should divest those units where there is no potential to leverage cost-based and sales-based synergies across the units. This recommendation is especially important because an unrelated diversified corporate parent's accumulated experience with unrelated diversification does not enable the firm to significantly improve its profits.

Finally, we aimed to extend our understanding of how within-industry diversification strategy execution or implementation capabilities affect firm performance over time, a heretofore understudied relationship. Our results indicate that a corporate parent's accumulated experience with related within-industry diversification is an important antecedent for its development of parent implementation capabilities. However, a firm must again exceed a distinct (minimum) level of relatedness in its unit portfolio to benefit from its experience to leverage synergies. As a firm exceeds that threshold, the combination of the firm's increasing pool of superior resources (resulting from its related diversification strategy) and its development of implementation capabilities for synergy creation (resulting from its experience with related diversification) enables the firm to outperform competition over time. Facing saturated, slow growth markets, a firm's effective implementation is critical in many service industries to achieve superior firm performance (Parmigiani & Holloway, 2011).

Overall, we found that variation in firm-specific within-industry diversification strategies explains considerable differences in profits between firms that compete with one another in the same industry.

2.6 Limitations and Future Research

The findings of this study are limited in several directions. First, we did not control for entry mode decisions (i.e., internal development versus mergers & acquisitions) and exit mode decisions (i.e., spin-off, sell-off, total closure etc.). However, previous research showed that the choice of entry and exit modes can have an impact on the performance implications of a diversification strategy (Gwendolyn & Lieberman, 2010; Brauer, 2006). Second, all of the sample firms' COOs are in North America, Western Europe, and Asia-Pacific (Japan, Australia, and China), widely neglecting within-industry diversification strategies of firms from emerging countries. Finally, we did not control whether the retail firms pursue a single-brand versus multi-brand strategy to market their retail formats, because the fixed effects regression model does not allow the inclusion of time-invariant dummy variables. Accordingly, we did not control for ownership form as it predominantly does not change over the time period under investigation.

Future research can address these limitations. In addition, future research could build on this study by investigating antecedents of within-industry diversification strategies (see e.g., Doving & Gooderham 2008). The investigation of the drivers of diversification can lead to a better understanding of industrial and

firm specific contextual factors under which specific within-industry diversification strategies are recommendable. Moreover, future research could expand the findings by investigating other single industry samples, for example, in other service-intensive industries. In summary, we encourage future research to contribute to the nascent literature stream on within-industry diversification.

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D. THE INTERNATIONAL DIVERSIFICATION DIMENSION

3. Essay: International Diversification and Firm Performance - The Moderating Role of Ownership Structure

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Abstract
Previous research found mixed empirical results of the international diversification-performance relationship (i.e., linear, inverted U-shaped, and S-shaped). This study develops a theoretical framework to address this inconsistency in the literature. Specifically, this study proposes that a multinational enterprise's (MNE) ownership structure (i.e., public vs. private) moderates the effect of international diversification on firm performance. Based on a longitudinal sample (1997-2009) of the leading 70 MNEs from the global retailing industry, the paper shows that the relationship between international diversification and firm performance is inverted U-shaped and moderated by a MNE's ownership structure. When a firm is publicly owned, increased levels of international diversification are positively related to firm performance. In addition, the study indicates that intra-regional diversification has a positive effect on firm performance and inter-regional diversification has an inverted U-shaped relationship with firm performance. The moderating effect of public firm ownership accentuates the positive performance effect of intra-regional diversification on firm performance and leads to a positive and linear relationship between inter-regional diversification and firm performance. Overall, the empirical results support the proposed theoretical framework.

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3.1 Introduction

The question about the appropriate level of international diversification has attracted significant attention at the intersection of strategic management and international business research (see Hitt *et al.*, 2006a; Werner, 2002 for reviews). However, previous research found somewhat contradictory relationships (i.e., linear and nonlinear) between the degree of international diversification and firm performance (Capar & Kotabe, 2003; Glaum & Oesterle, 2007). Although most recent research widely agrees that this relationship is nonlinear, some studies have identified an inverted U-shaped relationship (e.g., Hitt, Hoskisson, & Kim, 1997; Quin *et al.*, 2010), while others found an S-shaped relationship (e.g., Contractor *et al.*, 2003; Lu & Beamish, 2004).

Ruigrok, Amann, and Wagner (2007) state that the essence of quadratic (inverted U-shaped) and cubic (S-shaped) models is that they propose different benefit-cost trade-offs along the international diversification continuum, which in turn explain the different shapes of the curves. The inverted U-shaped relationship between international diversification and firm performance follows from the fact that the costs of participating in foreign countries may outweigh the benefits when firms spread their boundaries more extensively across world regions (Hitt, Hoskisson, & Kim, 1997; Quin *et al.*, 2010). More precisely, the net performance benefits start to decrease as multinational enterprises (MNEs) diversify beyond moderate levels of internationalization (Fang *et al.*, 2007). In contrast, the horizontal S-curve suggests that firm performance decreases at very low levels of international diversification, because of MNEs' lack of experience with internationalization. Between low and high levels of international diversification, increases in the level of international diversification will result in increasing firm performance as MNEs' experience with internationalization increases. Finally, at very high levels of international diversification, increases in international diversification will decrease firm performance, because governance, coordination, and transaction costs will outweigh the benefits of internationalization (Lu & Beamish, 2004). In conclusion, previous research agrees that lower to moderate levels of international diversification increase firm performance. However, inconsistent findings exist for the performance implications of very low and especially higher levels of international diversification.

This inconsistency in the literature raises the question if some MNEs might have characteristics that allow them to perform better than other MNEs as they spread their boundaries more extensively across global regions and countries, suggesting the need to consider yet unidentified moderating variables. This study

aims to resolve some of the inconsistencies in the literature by developing a theoretical framework that considers MNEs' ownership structure as an important moderator of the relationship between international diversification and firm performance. Specifically, the study argues that differences between public and private (or family-owned) MNEs may explain why previous studies found different performance outcomes of international diversification.

Since the possession of certain assets has been identified as the basis for successful international diversification (Delios & Beamish, 1999; Lu & Beamish, 2004; Hitt *et al.*, 2006b), the study's main argument is that public MNEs have better access to important assets such as financial capital (Gelos & Werner, 2002; Maherault, 2000; Van Auken & Holman, 1995) and human capital (Werner *et al.*, 2005). This might allow public MNEs to outperform private MNEs especially at higher levels of international diversification or inter-regional diversification when those assets become increasingly important for successful internationalization.

Given the fact that the prevalence of public and private MNEs largely differs between industries and home countries, the lack of consensus in the literature may be related to the different empirical research contexts of previous studies. Neglecting potential effects of MNEs' ownership structure may therefore represent a significant gap in our understanding of the international diversification-performance relationship. This study is the first to conceptually and empirically address this important research gap by investigating the moderating effect of ownership structure on the international diversification-performance relationship. The contributions of this study are twofold. First, the study finds an inverted U-shaped relationship between international diversification and firm performance. However, when a firm is publicly owned, increased levels of international diversification are positively related to firm performance. Accordingly, the decreasing firm performance beyond moderate levels of international diversification, as suggested by the inverted U-shaped curve, can be related to the performance of private MNEs. As a result, the varying distributions of public and private MNEs in research samples of previous studies likely explain why these studies reported inconsistent findings. Second, this study builds on the research of Qian *et al.* (2010) by examining the specific performance outcomes of intra- and inter-regional diversification and the moderating influence of a MNE's ownership structure on these relationships. The results suggest that public ownership has a positive moderating effect on intra-regional and especially on inter-regional diversification.

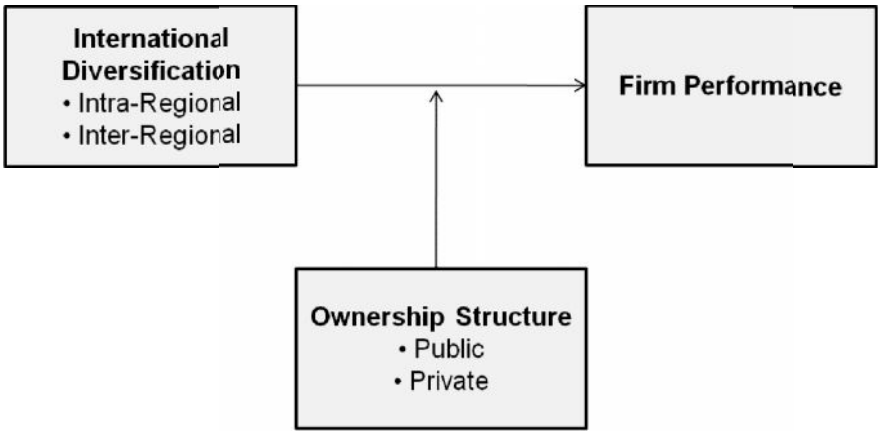
The remaining sections of the paper are organized as follows. In the next section, I first describe the key constructs of this study. Then, I develop arguments about the specific relationships between the key constructs. In the development of the hypotheses, I aim to explain why public MNEs might be especially well equipped to access the resources that MNEs need to successfully expand their international scope more intensively. In the next section, I describe the empirical context in which I tested the hypotheses and the methodological approach of the data analysis. In the last sections, I discuss the findings and derive implications for academics and practitioners.

3.2 Theoretical Framework and Hypotheses

Figure D.1 illustrates the theoretical framework of this study. One of the key constructs is that of international diversification. Recent research suggests that international diversification consists of two additive components (Qian *et al.*, 2010). First, international diversification can be examined in terms of *intra-regional* diversification, which is related to the diversification across countries within one of the four world regions (i.e., Africa, Asia-Pacific, Europe, and the Americas). A second dimension is the *inter-regional* diversification across two or more world regions. Lower degrees of international diversification have been thought to consist mainly of intra-regional diversification, while higher levels consist rather of inter-regional diversification (Palich, Cardinal, & Miller, 2000; Qian *et al.*, 2010).

Ownership structure is the other key construct in the proposed framework. The study distinguishes between public (manager-controlled) and private (owner-controlled) firms (Tosi & Gomez-Meija, 1994). Private firms are typically owned and managed by family members, whereas ownership and control is separated in public firms (Amihud & Lev, 1999). Generally, more than 50 percent of the shares of public firms are traded at stock markets and can be owned by different stockholders, such as private and institutional investors (Ramaswamy, Li, & Veliyath, 2002).

Figure D.1: Theoretical Framework



As argued above, previous research found different nonlinear relationships between international diversification and firm performance (i.e., inverted U-shaped and S-shaped). In their study of international diversification, Qian *et al.* (2010) found a positive, linear effect of the degree of *intra-regional* diversification on firm performance and an inverted U-shaped relationship between the degree of *inter-regional* diversification and firm performance. Their results imply that the relationship between *total* international diversification (i.e., the sum of intra- and inter-regional diversification) and firm performance is an inverted U-shaped curve. Because this study builds on the conceptualization of Qian *et al.* (2010), I expect to find similar main effects of intra-regional, inter-regional, and total international diversification on firm performance. I hypothesize accordingly that:

Hypothesis 1. Intra-regional diversification will have a positive effect on firm performance.

Hypothesis 2. The relationship between inter-regional diversification and firm performance will be an inverted U-shaped curve.

Hypothesis 3. The relationship between total international diversification and firm performance will be an inverted U-shaped curve.

This study aims to extent the findings of Qian *et al.* (2010) by investigating if the possession of critical resources that are required for successful international expansions differs across ownership structures and how ownership structure

moderates the relationship between intra-regional, inter-regional, and total international diversification and firm performance.

Previous research has stated that the possession and sharing of firm-specific resources and capabilities is an important determinant of successful internationalization (Buckley, 1988; Hitt *et al.*, 2006b). For example, Lu and Beamish (2004: 602) have identified management skills as an important intangible asset for internationalization and argued that "one way to exploit an intangible asset to its full value is to deploy it in a broad range of markets, such as in a geographic diversification strategy." Put differently, MNEs that are able to leverage existing superior resources and capabilities to exploit foreign market opportunities and imperfections might be better equipped to benefit from international diversification (Caves, 1971). Thus, the differences in firm performance that result from internationalization suggest that MNEs differ on their internal resources and capabilities (e.g., Hitt, Hoskisson, & Kim, 1997; Lu & Beamish, 2004). Drawing from this argument, I propose that the relationship between international diversification and firm performance is likely to vary with the ownership structure of MNEs. Specifically, international diversification may increase firm performance more for public firms than for private firms because of two reasons.

First, previous research states that public MNEs have superior access to financial capital than private MNEs (Gelos & Werner, 2002; Van Auken & Holman, 1995), which in turn likely enables them to internationalize more successfully (Maherault, 2000). Second, public MNEs may be able to attract more internationally experienced top managers than private MNEs (Werner, Tosi, & Gomez-Mejia, 2005). Because international diversification is complex and difficult to manage (Hitt, Hoskisson, & Kim, 1997), elite educated and internationally experienced top managers might be more successful in exploiting foreign market opportunities and imperfections. Moreover, greater management experience with international diversification may reduce the uncertainty that companies face undergoing internationalization (Hitt *et al.*, 2006a). Less uncertainty, in turn, might decrease the likelihood of costly expansion failures. Furthermore, a firm's ability to create value enhancing scope and scale economies through its exploitation of interrelationships between its units across different geographical markets (Porter, 1985) is likely higher for firms with more experienced top managers. Accordingly, Hitt *et al.* (2006b) found that human capital positively moderates the relationship between international diversification and firm performance. As a result, the superior access to experienced top managers might enable public MNEs to accumulate the human capital that is needed for generating abnormal high returns from international expansions.

Since the costs and uncertainty of internationalization may significantly increase as firms spread their boundaries more extensively across world regions (Hitt *et al.*, 2006a; Qian *et al.*, 2010), the superior access to those two assets (i.e., financial and human capital) may become especially important for MNEs that diversify at higher levels of inter-regional diversification. Based on this discussion, I hypothesize that public MNEs might outperform private MNEs at increasing levels of intra-regional diversification and that the difference in firm performance between public and private MNEs will be especially significant for higher degrees of inter-regional diversification:

Hypothesis 4. The positive effect of intra-regional diversification on firm performance will be stronger for public MNEs.

Hypothesis 5. Public firm ownership will have a positive and linear moderating effect on the relationship between inter-regional diversification and firm performance.

To be comparable with previous research and directly address some of the inconsistencies in the literature, I also examine the moderating role of ownership structure on the relationship between *total* international diversification and firm performance. Since intra-regional and inter-regional diversification are additive components of total international diversification and the above hypothesized performance outcomes of inter-regional diversification may affect total international diversification especially beyond moderate levels of international diversification (Palich, Cardinal, & Miller, 2000; Qian *et al.*, 2010), I propose that the international diversification-performance relationship will be positive and linear for public MNEs.

Hypothesis 6. Public firm ownership will have a positive and linear moderating effect on the relationship between total international diversification and firm performance.

3.3 Data and Methodology

Hitt *et al.* (2006b: 1144) argued that a single-industry sample is desirable to test for changes in the international diversification-performance relationship because "relationships between firm resources and strategy vary by industry as the critical resources tend to vary." In this study, I examined the performance implications of international diversification strategies in the global retailing industry. I chose the retailing industry for the empirical setting because of three reasons. First, the retailing industry is characterized by intensive international diversification activities during the last decades. Second, several private MNEs are among the worldwide leading retail firms. Third, the leading retail firms have various countries of origin in different world regions. I collected cross-sectional time-series data of the worldwide 70 leading retailers' international diversification behavior for a time period of thirteen years (1997-2009). The source of this company information was the Planet Retail database. Previous research has used this data to investigate international expansions in the retailing industry (Gielens & Dekimpe, 2007). I have cross-validated the data with publicly available data sources such as annual reports and retailers' websites. In addition, I obtained the information about the MNEs' ownership structure from Planet Retail company reports. During the thirteen year period, 83 percent of the leading 70 retailers in the sample were publicly owned and 17 percent were privately owned, resulting in 387 firm-year observations for public MNEs and 78 firm-year observations for private MNEs.

3.3.1 Dependent and Independent Variables

Firm performance. The dependent variable of this study was profits at the corporate level. Because the firms in the sample have different capital structures and tax requirements that vary across their countries of origins, I chose EBIT (earnings before interests and taxes) as profit measure. I lagged the profit data for one year ($t + 1$) to facilitate causal inference (Lu & Beamish, 2004).

International diversification. According to previous research, I operationalized the international diversification of a MNE based on its foreign country sales data in a given year. Recent research has suggested using a multidimensional approach to assess the international diversification of a MNE (e.g., Lu & Beamish, 2004). The multidimensional measure reflects both the breath (number of foreign countries) and depth (degree of commitment to each country) of a MNE's international diversification (Hitt *et al*., 2006b). Thus, I measured the

degree of international diversification in each year by applying the entropy measure. Furthermore, I chose the regional classification according to the four world regions (1) Africa, (2) Asia and Pacific, (3) Europe, and (4) the Americas consistent with Hitt, Hoskisson, and Kim (1997), Wiersema and Bowen (2008), and Qian *et al.* (2010). Following Quin *et al.* (2010), I operationalized total international diversification as well as intra-regional and inter-regional diversification. Intra-regional diversification captures a MNE's international diversification across countries within a region and inter-regional diversification captures a MNE's international diversification across two or more of the four world regions.

The entropy measure for total international diversification is expressed by the following equation:

$$Total\ International\ Diversification = \sum_{i=1}^{N} P_i \ln(1 / P_i)$$

Here, P_i = proportion of sales in country i and $\ln(1/ P_i)$ is the weight for each country i, for a firm with N different countries. Accordingly, the entropy measure captured a firm's degree of international diversification in terms of breath (number of foreign countries) and depth (relative importance of each country). Furthermore, inter-regional diversification was captured by the entropy measure with P_i = proportion of sales in world region i, for a firm with sales in N different world regions (i.e., N = 2…4). Intra-regional diversification was estimated by the difference between total international diversification and inter-regional diversification.

3.3.2 Control Variables

Ownership structure. I chose dummy coding for the moderating ownership variable because comparisons with the base group are required in this study (i.e., comparisons of the mean of private with the mean of public firms) (Frazier, Tix, & Barron, 2004). Accordingly, I coded ownership structure as a dummy variable with 0 = "private firm ownership" and 1 = "public firm ownership" for the respective time periods.

Product and unit diversification. Prior research suggested that the degree of a firm's product and unit diversification can influence firm performance (e.g., Palich, Cardinal, & Miller, 2000). I accounted for a retail firm's product diversification into

food and non-food retailing and unit diversification into different retail formats by applying the entropy measure.

Firm size. Larger (parent) firms are expected to possess more resources and capabilities that are critical for its (units') entry and competitiveness in a foreign market (Sharma & Kesner 1996). Following previous research, I accounted for firm size with the natural logarithm of a firm's sales in year *t*.

Sales growth. Lower prior sales can influence both a MNE's international diversification strategy and its subsequent firm performance. To control for potential endogeneity problems of firm performance, I accounted for a MNE's sales growth from the previous year $t - 1$ to the current year *t*.

Region of origin dummies. Location-specific advantages of a region can impact a firm's international diversification strategy and its performance. To control for such advantages, I included dummy variables for each firm's region of origin.

Year dummies. I also included dummy variables for each year to control for unobserved seasonal and macroeconomic trends in a world region and in the world economy.

Table D.1 illustrates the descriptive statistics and the correlation matrix of the variables used in this study. The yearly reported profits (EBIT) of the public MNEs in the sample (387 firm-year observations) ranged from a minimum of -3,487 million Euro to a maximum of 16,337 million Euro, with a mean of 1,239 million Euro and a standard deviation of 2,191 million Euro. The profits (EBIT) of private MNEs (78 firm-year observations) ranged from a minimum of 32 million Euro to a maximum of 1,293 million Euro with a mean of 433 million Euro and a standard deviation of 311 million Euro.

Table D.1: Means, Standard Deviations, and Correlations

Variables	Mean	SD	X1	X2	X3	X4	X5	X6	X7
X1. Profits (lag)	1,072.17	2,070.79	1.00						
X2. International Diversification	.640	.700	.127*	1.00					
X3. Intra-Regional Diversification	.445	.532	.090	.939*	1.00				
X4. Inter-Regional Diversification	.175	.267	.165*	.730*	.462*	1.00			
X5. Ownership	.660	.473	.154*	-.081*	-.137*	.066	1.00		
X6. Product Diversification	.441	.226	.166*	-.076*	-.092*	-.013	.066	1.00	
X7. Unit Diversification	.870	.693	.101*	.089*	.078*	.071*	-.077*	.510*	1.00
X8. Firm Size	9.62	.99	.562*	.142*	.117*	.150*	.128*	.350*	.214*
X9. Sales Growth	.065	.146	.038	-.031	-.024	-.064	.016	-.111*	-.059
X10. Americas	.357	.479	.193*	-.280*	-.290*	-.110*	.321*	-.156*	-.374*
X11. Europe	.471	.499	-.074	.333*	.360*	.154*	-.480*	.172*	.357*
X12. Asia	.157	.364	-.121*	-.102*	-.108*	-.104*	.207*	-.038	.020

Notes: Profits in million Euro; * significant at $p < 0.05$

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Variables	X8	X9	X10	X11	X12
X1. Profits (lag)					
X2. International Diversification					
X3. Intra-Regional Diversification					
X4. Inter-Regional Diversification					
X5. Ownership					
X6. Product Diversification					
X7. Unit Diversification					
X8. Firm Size	1.00				
X9. Sales Growth	-.121*	1.00			
X10. Americas	.175*	-.018	1.00		
X11. Europe	.114*	-.046	-.703*	1.00	
X12. Asia	-.298*	.089*	-.321*	-.407*	1.00

Notes: Profits in million Euro; * significant at $p < 0.05$

3.3.3 Method

I used cross-sectional time-series regressions to investigate performance implications of international diversification and the interaction effects with ownership structure over time. Because the Hausman test suggested that random effects are appropriate for coefficient estimation, I used random effects general linear squares (GLS) to test the hypotheses of this study. In the pooled time series data, the GLS method corrects for autocorrelation and heteroscedasticity (Lu & Beamish, 2004). Furthermore, I standardized the predictor variables which were measured on a continuous scale and used in the interaction with the dichotomous moderating variable (Frazier, Tix, & Barron, 2004). The correlations presented in Table D.1 indicate that multicolinearity is not a significant concern. The equations explaining performance implications of international diversification strategy (total, intra-regional, and inter-regional) and ownership structure for firm i (i = 1,…,70) and time t (t = 1,…,13) are expressed as:

(1) $\textbf{Profit}_{i,t+1} = \beta_0 + \beta_1$ x $\textbf{total international diversification}_{it} + \beta_2$ x $\textbf{total international diversification}_{it}$ x $\textbf{ownership structure}_{it} + \beta_3$ x $\textbf{ownership structure}_{it} + \beta_4$ x $\textbf{product diversification}_{it} + \beta_5$ x $\textbf{unit diversification}_{it} + \beta_6$ x $\textbf{firm size}_{it} + \beta_7$ x $\textbf{sales growth}_{it} + \beta_8$ x $\textbf{region of origin dummies}_{it} + \beta_9$ x $\textbf{year dummies}_{it} + v_i + \varepsilon_{it}$.

(2) $\textbf{Profit}_{i,t+1} = \beta_0 + \beta_1$ x $\textbf{intra-regional diversification}_{it} + \beta_2$ x $\textbf{intra-regional diversification}_{it}$ x $\textbf{ownership structure}_{it} + \beta_3$ x $\textbf{ownership structure}_{it} + \beta_4$ x $\textbf{product diversification}_{it} + \beta_5$ x $\textbf{unit diversification}_{it} + \beta_6$ x $\textbf{firm size}_{it} + \beta_7$ x $\textbf{sales growth}_{it} + \beta_8$ x $\textbf{region of origin dummies}_{it} + \beta_9$ x $\textbf{year dummies}_{it} + v_i + \varepsilon_{it}$.

(3) $\textbf{Profit}_{i,t+1} = \beta_0 + \beta_1$ x $\textbf{inter-regional diversification}_{it} + \beta_2$ x $\textbf{inter-regional diversification}_{it}$ x $\textbf{ownership structure}_{it} + \beta_3$ x $\textbf{ownership structure}_{it} + \beta_4$ x $\textbf{product diversification}_{it} + \beta_5$ x $\textbf{unit diversification}_{it} + \beta_6$ x $\textbf{firm size}_{it} + \beta_7$ x $\textbf{sales growth}_{it} + \beta_8$ x $\textbf{region of origin dummies}_{it} + \beta_9$ x $\textbf{year dummies}_{it} + v_i + \varepsilon_{it}$.

3.4 Results

The results of the main effects (Hypotheses 1-3) are illustrated in Table D.2a and the results of the interaction effects (Hypotheses 4-6) are reported in Table D.2b. Model 1 is the baseline model that included the control variables used in this study. The control variables were consistent in all of the Models. Furthermore, the Wald chi-square tests indicated that the inclusion of each additional variable in Models 2-15 resulted in a significant model fit.

First, I tested Hypothesis 1 using Models 2-4. Hypothesis 1 proposed that intra-regional diversification will have a positive effect on firm performance. The results of Model 2 indicated that the coefficient of the linear term was positive and significant (b = .17, p < .05). In Model 3, I included the squared term. The coefficient of the linear term remained positive and was weakly significant (b = .31, p < .10) and the coefficient of the squared term was not significant (b = -.15, p > .10). I also tested for a potential S-curve signature by including the cubic term of intra-regional diversification in Model 4. The results of Model 4 indicated that all coefficients became insignificant by including the cubic term. Thus, Hypothesis 1 was fully supported by the data.

Next, I tested Hypothesis 2 which suggested that the relationship between inter-regional diversification and firm performance will be an inverted U-shaped curve. As shown in Model 5, the coefficient of the linear term was positive and significant (b = .32, p < .01). By including the squared term in Model 6, the linear term remained positive and significant (b = .80, p < .01) and the squared term was negative and significant (b = -.50, p < .01). Model 7 shows that the inclusion of the cubic term resulted in insignificant coefficients of the linear (b = .24, p > .10) and squared (b = .88, p > .10) terms and a weakly significant and negative coefficient of the cubic term (b = -.90, p < .10). In sum, I found strong support for Hypothesis 2. This finding suggests that at lower to moderate levels of inter-regional diversification, firm performance increases with increased levels of inter-regional diversification. However, after a certain threshold at moderate levels of inter-regional diversification, increases in inter-regional diversification are linked to decreased firm performance.

Hypothesis 3 stated that the relationship between total international diversification and firm performance will be an inverted U-shaped curve. I tested Hypothesis 3 with Models 8-10. The coefficient of the linear term in Model 8 was positive and significant (b = .31, p < .01) and remained positive and significant in Model 9 (b = .59, p < .01). The squared term in Model 9 was negative and weakly significant (b = -.28, p < .10). I included the cubic term in Model 10. The

coefficients of the cubic term was insignificant (b = .23, p > .10). Thus, the results suggested that the relationship between total international diversification and firm performance is inverted U-shaped.

In Figure D.2, I graphed the relationships which have been proposed by Hypotheses 1-3 and tested in Models 2-10. Figure D.2 illustrates the positive and linear effect of intra-regional diversification and firm performance and the curvilinear relationships (inverted U-shaped) between inter-regional and total international diversification and firm performance.

Hypothesis 4 anticipated that the positive effect of intra-regional diversification on firm performance will be stronger for public MNEs. Model 11 tested Hypothesis 4 and showed a positive and weakly significant coefficient (b = .30, p < .10) of the interaction term between ownership structure (0 = "private firm" and 1 = "public firm") and intra-regional diversification. Therefore, I found weak support for Hypothesis 4.

I tested Hypothesis 5 in Models 12 and 13. Hypothesis 5 proposed that public firm ownership will have a positive and linear moderating effect on the relationship between inter-regional diversification and firm performance. In Model 12, the coefficient of the linear interaction variable of ownership structure and inter-regional diversification was positive and significant (b = .36, p < .05). The inclusion of the squared term in Model 13 resulted in insignificant linear (b = .65, p > .10) and squared (b = -.29, p > .10) coefficients. Consequently, the results fully support Hypothesis 5.

Finally, I tested Hypothesis 6, which predicted that public firm ownership will have a positive and linear moderating effect on the relationship between total international diversification and firm performance. As shown in Models 14 and 15, the coefficient of the linear interaction term of ownership structure and total international diversification was positive and significant (b = .40, p < .05). The inclusion of the squared interaction term in Model 15 resulted in insignificant linear (b = .48, p > .10) and squared (b = -.13, p > .10) coefficients. As a result, the regressions fully support Hypothesis 6.

To better compare and evaluate the interaction effects, I graphed the estimated relationships. Figure D.3 illustrates the interaction effects as estimated in the regressions of Table D.2b with private firm ownership being the omitted variable. Figure D.3 shows that public firms can benefit most from inter-regional diversification (as compared to intra-regional diversification) and that the inter-regional diversification-performance relationship as well as the total international diversification-performance relationship are positive and linear for public firms. Furthermore, to get a better understanding of the data in the sample, Figures D.4-6

show group comparisons based on an analysis of variance (ANOVA) between private and public firms at different levels of international diversification. Low levels of intra-regional, inter-regional, and total international diversification include all firms which were below the respective mean value of diversification in a given year and high levels represent the firms which were above the respective mean value of diversification in a given year. As shown in Figures D.4-6, public firms can significantly increase their firm performance by expanding intra- and inter-regionally, whereas private firms may improve their firm performance insignificantly. Furthermore, at low levels of intra-regional, inter-regional, and total international diversification, there are low differences in the performance of public and private MNEs. However, at high levels of intra-regional, inter-regional, and total international diversification, there are significant differences between the firm performance of public and private MNEs. As already shown in Figure D.3, the comparison of Figures D.4-6 indicates that, on average, public firms are able to achieve the highest performance outcomes by focusing more heavily on international diversification.

Because the proportions of public and private firms were skewed in the sample (83 percent public firms versus 17 percent private firms), the power was about .40 (Stone-Romero, Alliger, & Aguinis, 1994). However, the results indicated that the total sample size was sufficient to detect significant interaction effects despite the skewed proportions of public and private firms in the sample.

Table D.2a: Random Effects GLS Regression Results for Profits

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Predictors							
Intra-Regional Div.		.17**	.31*	.27			
		(.08)	(.16)	(.17)			
Intra-Regional Div.^{2}			-.15	-.11			
			(.15)	(.15)			
Intra-Regional Div.^{3}				.05			
				(.07)			
Inter-Regional Div.					.32***	.80***	.24
					(.07)	(.16)	(.35)
Inter-Regional Div.^{2}						-.50***	.88
						(.15)	(.79)
Inter-Regional Div.^{3}							-.90*
							(.51)
Total Intern. Div.							
Total Intern. Div.^{2}							
Total Intern. Div.^{3}							
Controls							
Ownership	.11	.11	.11	.13	.14	.10	.07
	(.24)	(.24)	(.24)	(.25)	(.24)	(.24)	(.24)
Product Div.	-.01	.01	.01	.02	.01	-.01	.01
	(.11)	(.11)	(.11)	(.11)	(.11)	(.11)	(.11)
Unit Div.	.17***	.15**	.13*	.14**	.18***	.17***	.16**
	(.06)	(.07)	(.07)	(.07)	(.06)	(.06)	(.06)
Firm Size	.18**	.16**	.17**	.17**	.14*	.10	.10
	(.08)	(.08)	(.08)	(.08)	(.08)	(.08)	(.08)
Sales Growth	-.11	-.11	-.11	-.11	-.08	-.08	-.06
	(.14)	(.14)	(.14)	(.14)	(.14)	(.14)	(.14)
Region of Org. Dummies	YES	YES	YES	YES	YES	YES	YES
Year Dummies	YES	YES	YES	YES	YES	YES	YES
Constant	-1.88*	-1.77	-1.91*	-1.93*	-1.98*	-1.85*	-1.83
	(1.11)	(1.12)	(1.13)	(1.15)	(1.12)	(1.11)	(1.12)
Observations	404	403	404	403	399	399	399
Companies	53	53	53	53	52	52	52
R^2	.23	.23	.24	.24	.21	.24	.23
Wald chi^2	49.32***	49.98***	51.00***	51.57***	70.42***	83.40***	86.93***

Notes: Standard errors in parentheses;
* significant at $p < 0.10$; ** significant at $p < 0.05$; *** significant at $p < 0.01$

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	Model 8	Model 9	Model 10
Predictors			
Intra-Regional Div.			
Intra-Regional Div.^{2}			
Intra-Regional Div.^{3}			
Inter-Regional Div.			
Inter-Regional Div.^{2}			
Inter-Regional Div.^{3}			
Total Intern. Div.	.31*** (.08)	.59*** (.17)	.74** (.29)
Total Intern. Div.^{2}		-.28* (.14)	-.65 (.61)
Total Intern. Div.^{3}			.23 (.38)
Controls			
Ownership	.11 (.24)	.09 (.24)	.09 (.24)
Product Div.	.03 (.11)	.03 (.11)	.03 (.11)
Unit Div.	.15** (.06)	.12* (.06)	.12* (.07)
Firm Size	.14* (.08)	.15* (.08)	.16* (.08)
Sales Growth	-.09 (.14)	-.09 (.14)	-.09 (.14)
Region of Org. Dummies	YES	YES	YES
Year Dummies	YES	YES	YES
Constant	-1.74 (1.12)	-1.92* (1.12)	-1.98* (1.12)
Observations	404	404	404
Companies	53	53	53
R^2	.20	.21	.22
Wald chi^2	64.69***	68.73***	69.09***

Notes: Standard errors in parentheses;
* significant at $p < 0.10$; ** significant at $p < 0.05$; *** significant at $p < 0.01$

Table D.2b: Random Effects GLS Regression Results for Profits

	Model 11	Model 12	Model 13	Model 14	Model 15
Predictors					
Intra-Regional Div.	-.07 (.17)				
Inter-Regional Div.		.03 (.16)	.26 (.43)		
Inter-Regional Div.^{2}			-.25 (.44)		
Total Intern. Div.				-.01 (.16)	.14 (.44)
Total Intern. Div.^{2}					-.12 (.34)
Owner x Intra-Regional Div.	.30* (.18)				
Owner x Inter-Regional Div.		.36** (.18)	.65 (.46)		
Owner x Inter-Regional Div.^{2}			-.29 (.46)		
Owner x Total Intern. Div.				.40** (.18)	.48 (.46)
Owner x Total Intern. Div.^{2}					-.13 (.38)
Controls					
Ownership	.17 (.25)	.20 (.24)	.19 (.24)	.22 (.24)	.21 (.26)
Product Div.	-.00 (.11)	-.03 (.11)	-.05 (.11)	.00 (.11)	-.00 (.11)
Unit Div.	.14** (.07)	.17*** (.06)	.16*** (.06)	.14** (.06)	.12* (.07)
Firm Size	.16** (.08)	.12 (.08)	.08 (.08)	.14* (.08)	.14* (.08)
Sales Growth	-.12 (.14)	-.05 (.14)	-.06 (.14)	-.10 (.14)	-.10 (.14)
Region of Org. Dummies	YES	YES	YES	YES	YES
Year Dummies	YES	YES	YES	YES	YES
Constant	-1.84 (1.12)	-2.01* (1.11)	-1.90* (1.11)	-1.85* (1.11)	-1.98* (1.13)
Observations	403	399	399	404	404
Companies	53	52	52	53	53
R^2	.22	.21	.24	.21	.22
Wald chi^2	52.90***	75.15***	89.29***	70.43***	72.65***

Notes: Standard errors in parentheses;
* significant at $p < 0.10$; ** significant at $p < 0.05$; *** significant at $p < 0.01$

Figure D.2: Main Effects of Intra-Regional Diversification, Inter-Regional Diversification, and Total International Diversification on Profits (EBIT)

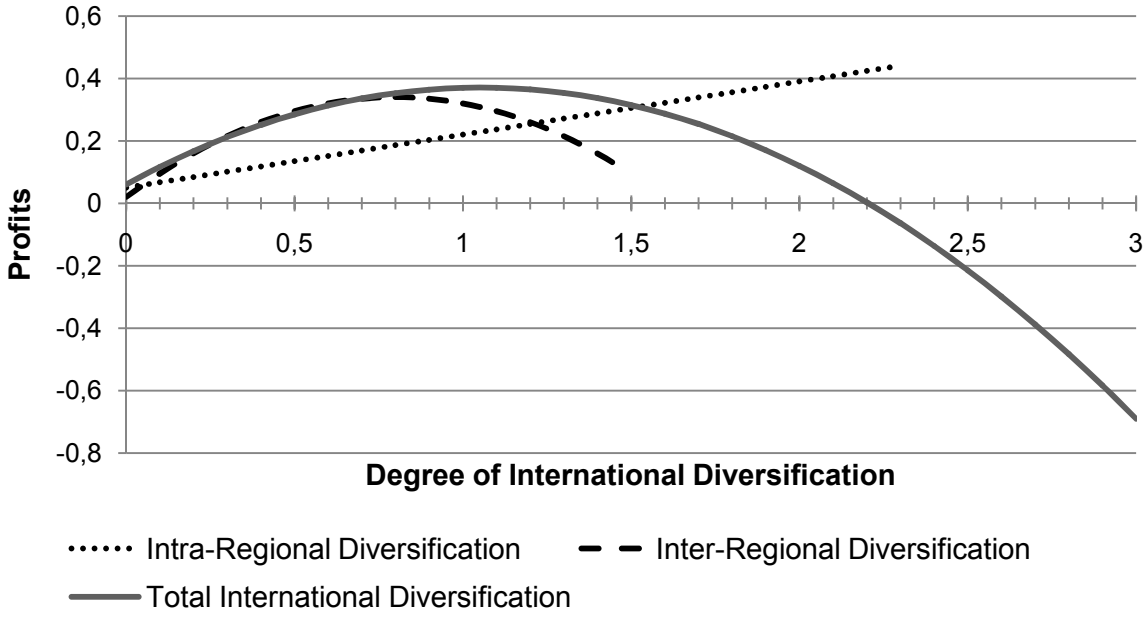
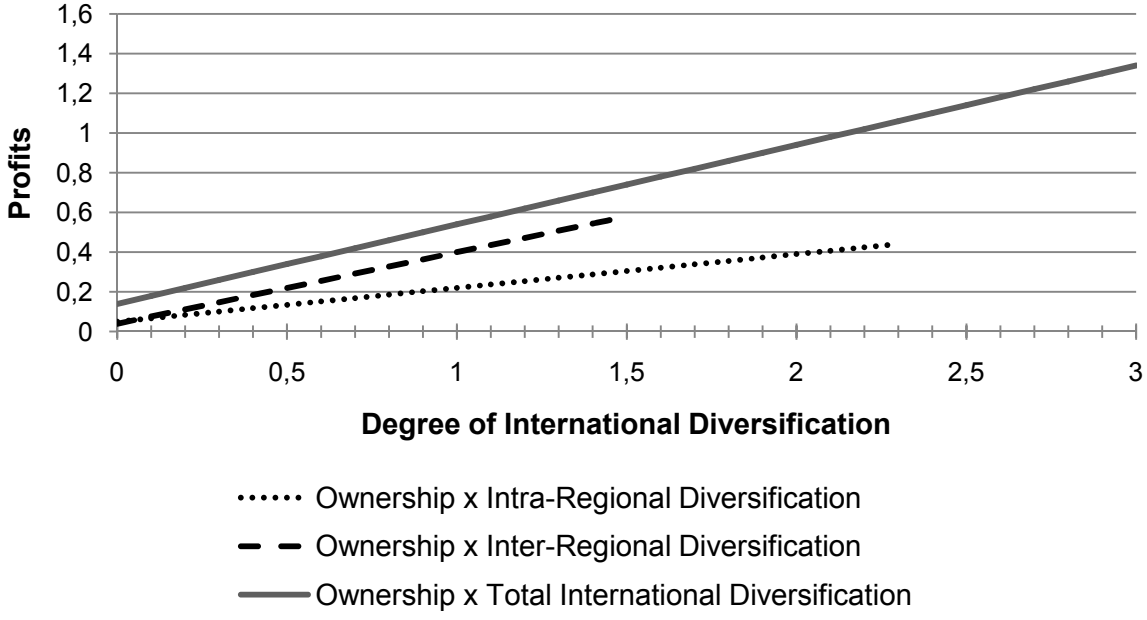


Figure D.3: Interaction Effects between Ownership Structure and Intra-Regional Diversification, Inter-Regional Diversification, and Total International Diversification on Profits (EBIT)



Note: Private firm ownership is the omitted variable
(i.e., "private firms" coded 0, "public firms" coded 1)

Figure D.4: Intra-Regional Diversification, Ownership Structure, and Profits

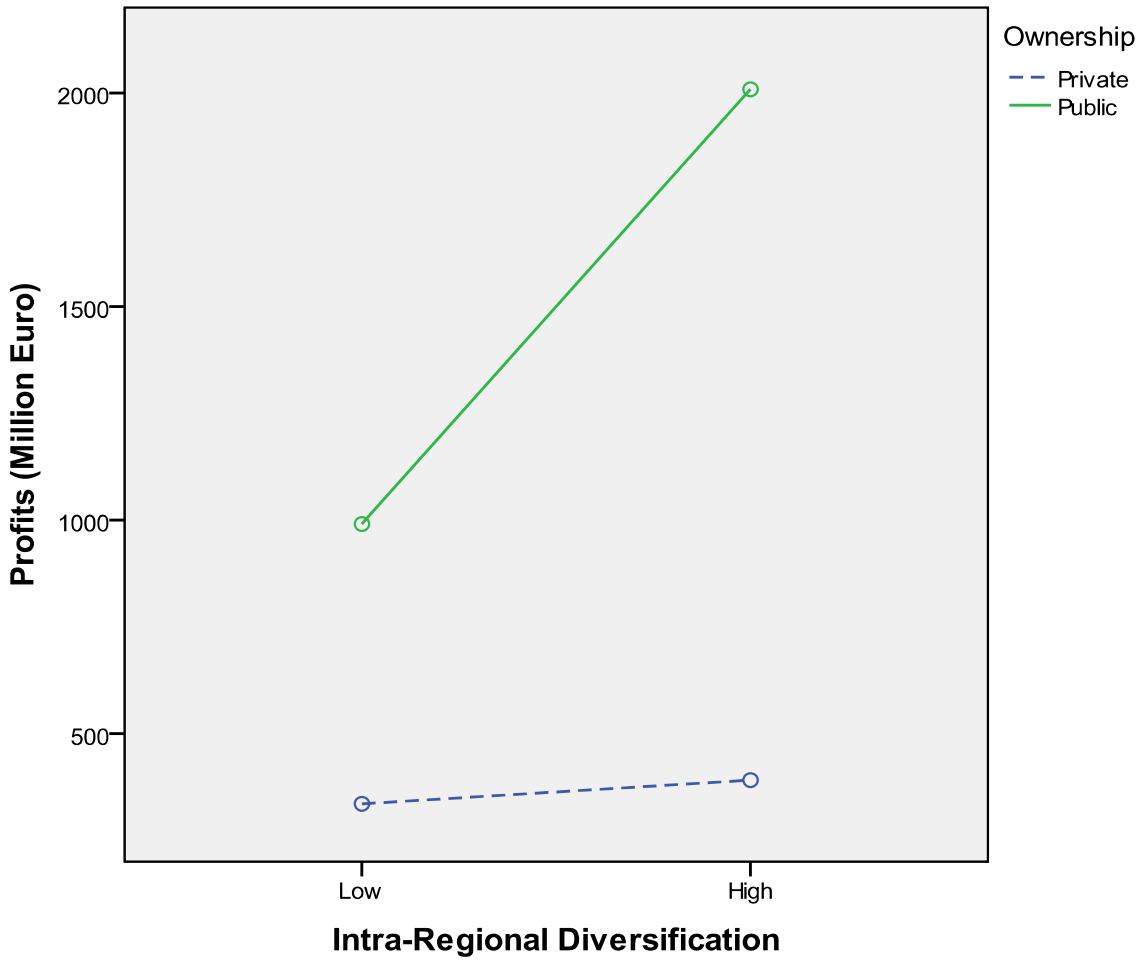


Figure D.5: Inter-Regional Diversification, Ownership Structure, and Profits

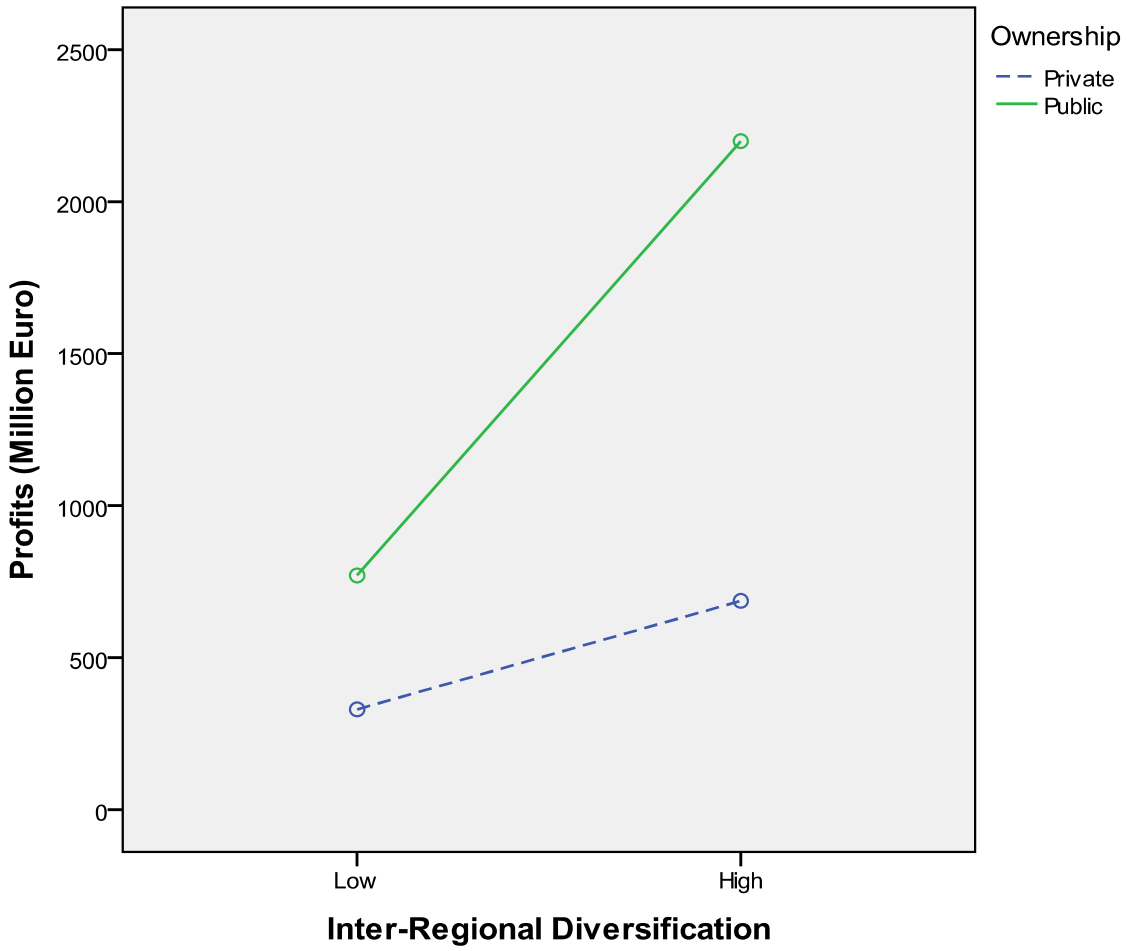
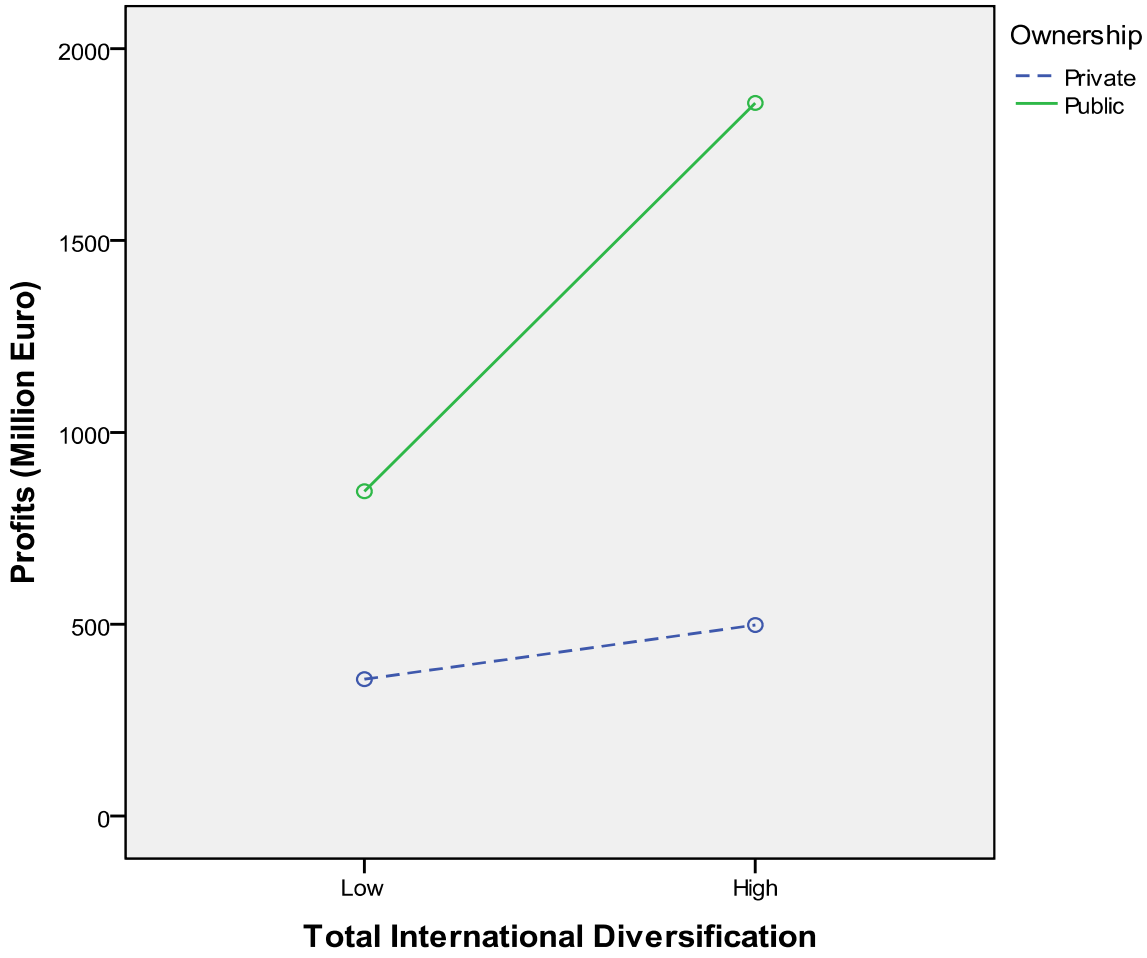


Figure D.6: Total International Diversification, Ownership Structure, and Profits



3.5 Discussion and Conclusions

Firms that expand into foreign markets need to consider if their internationalization strategy will be profitable. Thus, understanding whether and to what extent international diversification results in superior firm performance is important for practitioners and has attracted significant research attention at the intersection of strategic management and international business. However, previous research found mixed results on the international diversification-performance relationship. Given the inconsistency in previous research, this study has two major contributions to the literature and managerial practice.

First, I examined the performance implications of intra-regional, inter-regional, and total international diversification in a sample that included the leading retail firms which are headquartered in different world regions (i.e., Asia-Pacific, Europe, and the Americas). As shown in the results (Table D.2a and Figure D.2), this study confirmed the relationships found by Quin *et al.* (2010) although their sample consisted of large manufacturing firms that were headquartered in the United States. Thus, this study contributes to the literature by providing support for the generalizablity of Quin *et al.*'s (2010) findings.

Second, and more importantly, the study contributes to the literature by resolving some of the inconsistent findings generated by previous research. In their review article, Hitt *et al.* (2006a) have argued that the sampling frame of previous studies may have caused the inconsistent findings on the relationship between international diversification and firm performance. Building on that argument, I suggested that the different performance outcomes of international diversification may be largely caused by the different ownership structures (i.e., public vs. private) of MNEs. The results of this study showed that public MNEs are able to outperform private MNEs as intra-regional and especially inter-regional and total international diversification reaches higher levels.

Consequently, this study confirmed the proposed theoretical framework outlined in Figure D.1. Therefore, the study is able to provide firm-specific advice on the performance outcomes of intra-regional, inter-regional, and total international diversification. Over the last decade (1997-2009), public retail firms that yielded sales at high levels of intra-regional diversification or increased their intra-regional diversification from low to high levels (with the mean of intra-regional diversification as the threshold between low and high levels) have exceeded the profits of public retail firms at low levels of intra-regional diversification by almost 1 billion Euro on average (see Figure D.4). Accordingly, the profits of public retail firms at high levels of inter-regional diversification

exceeded those of their publicly owned rivals at low levels of inter-regional diversification by more than 1 billion Euro on average (see Figure D.5). Thus, public retail MNEs with an high sales share derived from foreign countries have realized superior firm performance. Conversely, on average, private retail firms have not been able to significantly increase their profits by diversifying more heavily into different countries within one world region or across world regions (see Figures D.4 and D.5). Overall, there was a low difference in profits between public and private retail firms at low levels of intra-regional, inter-regional, and total international diversification, whereas public retail firms yielded significantly higher profits at high levels of intra-regional, inter-regional, and total international diversification (see Figures D.4-6).[2]

In conclusion, the superior access to financial capital and experienced top-managers might be a prerequisite for diversifying more intensively within and across world regions, which in turn explains why public MNEs outperform private MNEs at higher levels of international diversification. Therefore, the findings of this research contribute to our understanding when and why firms can expect abnormal performance outcomes from spreading their firm boundaries more intensively across foreign countries and world regions.

This study has several limitations that can be addressed by future research. First, although the interaction effects between ownership structure and international diversification on firm performance have been significant, the proportions of public and private firms were skewed in the sample (83 percent public firms versus 17 percent private firms). Future research can examine the proposed theoretical framework (Figure D.1) by investigating samples that consist of more equal proportions of public and private firms. Second, the empirical context of this study was the retailing industry. Future research can investigate cross-industry samples to generalize the findings of this study. Finally, in the theoretical section, the study identified two resources, financial and human capital, which differ among public and private MNEs and are critical for successful internationalization. Future research can uncover additional firm characteristics that might explain differences in the performance outcomes of MNEs' international diversification strategies. Studies that investigate moderating variables on the relationship between international diversification and firm performance are important for academics and

[2] Note that the results presented in Figures 4-6 are based on group comparisons (ANOVAS), while the regression results presented in Table 2a and 2b indicate how changes in a MNE's diversification strategy (e.g., a marginal increase in intra-regional diversification) affect changes in its subsequent profits.

managers alike because they are able to provide context-specific advice for a firm's development and implementation of an international diversification strategy.

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E. IMPLICATIONS

4. How to Develop a Successful Diversification Strategy in Retailing?

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Abstract
The most successful retail firms have developed and implemented a corporate strategy that enables them to create and capture super-additive value by diversifying more intensively into assortments and retail formats that are related to one another, while expanding into their home regions and carefully spreading their geographical boundaries across world regions. This study synthesizes the findings of this thesis and provides an actionable plan for corporate retail managers to (1) diagnose the current degree of diversification in their corporate retail portfolio, (2) compare their degree of diversification with the long-term industry average and their main competitors, (3) assess how different diversification strategies might affect their firm performance, and (4) develop a diversification and divestment strategy to optimize their corporate retail portfolio, which in turn can substantially increase their chances to outperform competition in the long run.

Note
The data and company information used in this study have been obtained from the Planet Retail database.

Retail firms are confronted with an intensive multimarket rivalry across assortments, retail formats, and countries. In this highly competitive retail environment, senior managers are challenged to choose and implement the right corporate strategy. Confronted with this difficult decision, chief executives typically ask questions such as: To what extent should we diversify into different assortments, retail formats, and countries? How can we measure the degree of (un-) relatedness in our corporate retail portfolio? And, is it at all possible to outperform competition in the retailing industry by focusing more intensively on related or unrelated diversification?

This thesis aimed to answer such questions by investigating the performance implications of diversification strategies in the global retailing industry over a thirteen year period ending in 2009. The objective of this study is to provide an actionable guideline that can be used by chief executives and managers at the corporate headquarter to structure the complex task of corporate retail portfolio evaluation and configuration. The guideline consists of four steps.

4.1 Step 1: Diagnose Your Current Degree of Diversification

Corporate-level diversification in the retailing industry can be related to three dimensions: (1) the assortment diversification into food and non-food retailing, (2) the retail format diversification into retail formats such as convenience stores, supermarkets, discount stores, hypermarkets, warehouse clubs, and department stores, and (3) the international diversification into foreign countries. Retailers can easily identify their degree of diversification in each dimension at a given point in time by applying the entropy index. The entropy index captures both the breath (number of different assortment categories, retail formats, and countries) and depth (relative importance of each assortment category, retail format, and country, which is measured in sales relative to the firm's overall sales).[3]

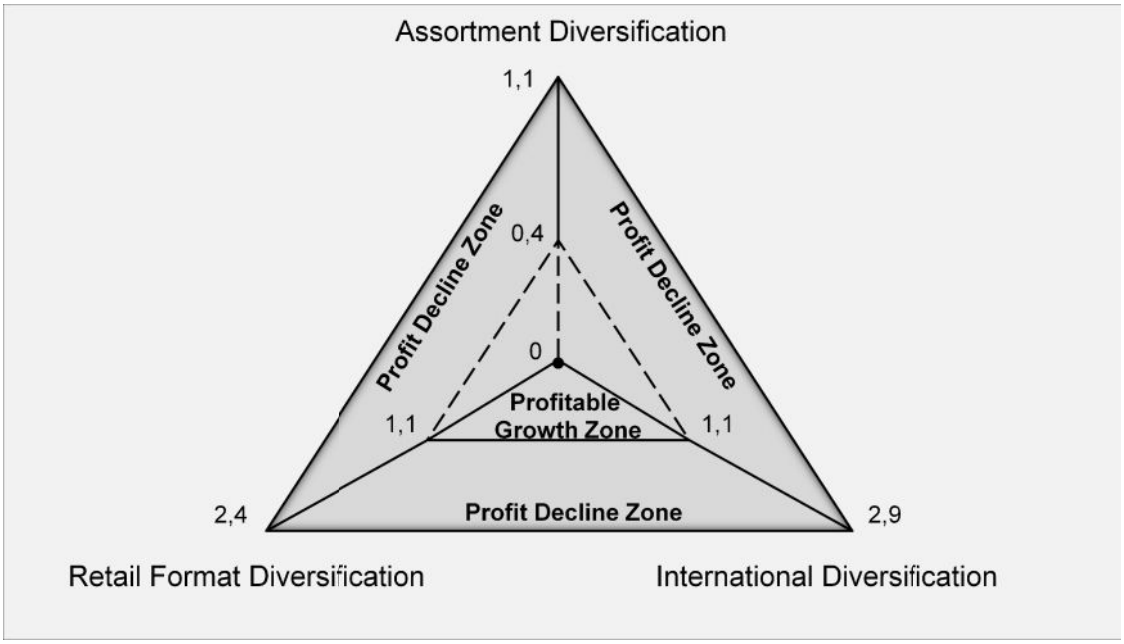
[3] For a formal description of measuring assortment, retail format, and international diversification with the entropy index see Essays 1-3.

4.2 Step 2: Compare Your Degree of Diversification with the Industry Average and Your Main Competitors

When corporate retail managers have identified their firm's degree of diversification in each dimension, they can compare their degree of diversification with the long-term industry average of the relationship between diversification and firm performance. This thesis investigated if there is an optimum degree of diversification in the retailing industry. While the results indicated that assortment diversification into food and non-food retailing has a negative effect on firm performance, both retail format and international diversification have an inverted U-shaped relationship with firm performance. At lower levels of retail format and international diversification, increases in retail format and international diversification increase a retailer's profits. However, beyond moderate levels of retail format and international diversification, increases in retail format and international diversification decrease a retailer's profits. Researchers have proposed that at higher degrees of diversification, diseconomies such as rapidly increasing transaction, governance, and coordination costs as well as increasing organizational complexity might outweigh the benefits of diversification (e.g., Palich, Cardinal, & Miller, 2000).

As a result, a retailer can increase its firm performance by diversifying into retail formats and foreign countries up to a certain threshold which indicates the profit maximum. After this threshold, its profits likely start to decline. In contrast, increases in assortment diversification decrease a retailer's firm performance, i.e., retailers that focus on consistent assortments in their retail format portfolio are able to achieve the profit maximum. Against this background, Figure E.1 illustrates an *integrative portfolio planning and management model* to support chief executives and managers at the corporate headquarter in their diversification decisions.

Figure E.1: An Integrative Portfolio Planning and Management Model



Source: Own illustration

By calculating their degree of assortment, retail format, and international diversification according to the entropy index, retail managers are able to diagnose if their current extent of diversification is within the "profitable growth" zone or within the "profit decline" zone as outlined in Figure E.1. The longitudinal analysis of the 70 leading retail firms over thirteen years shows that the profit maximum can be reached at the line between a degree of approximately 1,1 at the retail format diversification continuum (minimum = 0 and maximum = 2,4) and a degree of approximately 1,1 at the international diversification continuum (minimum = 0 and maximum = 2,9) and a minimum degree of 0 at the assortment diversification continuum. This line marks the outer edge of the "profitable growth" zone (i.e., consistent assortments and moderate levels of retail format and international diversification). Retailers can increase their profits by extending their degree of diversification up to this threshold, while further diversification activities likely decrease their profits as they enter the "profit decline" zone. Accordingly, retailers reach the profit minimum at the outer edge of the "profit decline" zone (i.e., at very high levels of assortment, retail format, and international diversification). Combinations of moderate levels of assortment, retail format, and international diversification are illustrated by dashed lines because of the unfavorable effect of increased degrees of assortment diversification on firm profits. If profits grow or

decline in this area depends on the relative degrees of assortment, retail format, and international diversification.

Retail firms can also track their historical yearly changes of the degree of diversification in the three dimensions and compare those changes with changes in their subsequent firm performance. Such comparisons can help retail managers to gain a deeper understanding of their firm's idiosyncratic diversification-performance path compared to the long-term industry average. In addition, when corporate retail managers evaluate acquisitions (internal developments) or divestitures of retail formats and expansions into foreign countries, they can use this model to estimate how such activities will change their degree of diversification within or across the "profitable growth" and "profit decline" zones.

After having compared their degree of diversification with the long-term industry average, corporate retail managers can compare their degree of diversification with their main competitors' diversification behavior. Take, for example, leading European retailers such as Carrefour, the Metro Group, Auchan, and Sainsbury's. All four retailers started in grocery retailing. As illustrated in Table E.1, French-based Carrefour was ranked at number two, German-based Metro Group at number three, French-based Auchan at number fifteen, and U.K.-based Sainsbury's at number twenty-eight according to Deloitte's 2009 sales-based ranking of the worldwide leading retailers. However, Auchan and Sainsbury's yielded higher profits than Carrefour and the Metro Group (Deloitte, 2011). Put differently, Carrefour and the Metro Group operate at far higher costs than Auchan and Sainsbury's. The results of this thesis suggest that this might be related to the former two retailers' higher degrees of diversification activities (see Table E.1). Consequently, Auchan's and Sainsbury's diversification strategy appears to be superior: Both retailers are closer to the "profitable growth" zone as outlined in Figure E.1.

Table E.1: The Diversification Dimensions of Leading Retailers 2009

Name of retailer	Retail sales rank	Assortment diversification	Retail format diversification	International diversification	Net income (USD, mil)
Carrefour	2	0,53	1,54	2,16	609
Metro	3	0,70	1,27	2,47	724
Auchan	15	0,62	0,94	1,75	971
Sainsbury's	28	0,56	0,75	0	934

Source: Deloitte (2011) and Planet Retail

For example, Sainsbury's divested its U.S. retail business in 2004 which decreased its degree of international diversification to zero (today, all of Sainsbury's activities are in the U.K.). As a result, the retailer yielded approximately four times higher profits in subsequent years. Sainsbury's still markets a retail format portfolio that consists of superstores, hypermarkets, supermarkets, and neighborhood stores. Sainsbury's can now reinvest its additional profits into its U.K.-based operations, such as aggressively expanding through multiplication of its existing retail formats and focusing on innovation and marketing-mix actions, to challenge Tesco, the market leader in the U.K.

4.3 Step 3: Assess How Different Diversification Strategies Can Affect Your Performance

Related and unrelated diversification are the two types of diversification strategies (e.g., Ramanujan & Varadarajan, 1989). Similarly, intra-regional and inter-regional diversification are different types of international diversification (Qian *et al.*, 2010). Corporate retail managers can measure their degree of related versus unrelated retail format diversification and intra- versus inter-regional diversification with the entropy index.[4] Researchers have proposed that low to moderate levels of diversification are highly correlated with related or intra-regional diversification, while moderate to high levels of diversification mainly consist of unrelated or inter-regional diversification (e.g., Palich, Cardinal, & Miller, 2000). Consequently, the "profitable growth" zone in Figure E.1 mainly consists of diversification activities into related retail formats and intra-regional countries, whereas the "profit decline" zone can be referred to unrelated retail format and inter-regional diversification. Since the assortment diversification index consists of two assortment categories (food and non-food), unrelated assortment diversification increases along the whole assortment diversification continuum.

As shown in this thesis, not all diversification strategies lead to superior firm performance. While the results indicate that increased degrees of unrelated assortment and retail format diversification destroy firm value, the thesis suggests that the most successful retailers have diversified more intensively into assortments and retail formats where they have a sound knowledge about the business processes, competitors, and customer needs. These retailers grow with assortments and retail formats that have a close "fit" to their skills, core competences, and established operations, which they have developed over long periods of experimental learning.

[4] See Essays 2 and 3 for a formal description and a suggested grouping of related retail formats.

As a result, a parent retailer's ability to exploit synergies by sharing superior intangible and tangible resources across its retail format portfolio can be regarded as a critical success factor in today's highly competitive retail environment.

A similar concept applies to a retailer's diversification into foreign countries within and across world regions. Successful retailers have understood that they can reap the benefits of diversifying into foreign countries as long as they are able to leverage their superior resource base. In particular, retailers have to be cautious when they spread their boundaries more intensively across world regions. While publicly owned retailers are especially well equipped to access the financial and human capital that is required for successfully expanding their international scope more intensively, privately owned retailers often struggle to yield profits from their activities at higher degrees of inter-regional diversification.

4.4 Step 4: Develop a Diversification Strategy to Optimize Your Corporate Retail Portfolio

The implementation of a diversification strategy requires a largely irreversible amount of capital and results in high sunk costs (Lubatkin & Chatterjee, 1994). Consequently, the choice of the right diversification strategy is fundamental for a retailer to achieve superior firm performance. Executives have to make smart choices when they decide about their companies' future by evaluating acquisitions (internal developments) and divestitures of retail formats (which also have direct implications for a firm's degree of assortment diversification) and international market entries and exits. Confronted with such difficult decisions, corporate retail managers can use the *integrative portfolio planning and management model* as described in the previous steps 1-3 of this guideline. The *integrative portfolio planning and management model* suggests that retailers can extent their boundaries through related diversification until they reach the limits of the "profitable growth" zone, while they should evaluate divestments of unrelated company parts if they are diversified at high levels within the "profit decline" zone. Of course, this decision should be made after an intensive analysis of the retail firm's individual characteristics (e.g., its historically evolved businesses, competences, internal processes, and ownership structure) and its competitive environment. Figure E.1 also suggests that it can be a superior strategy to reinvest a firm's profits into the existing retail format and country portfolio, especially when a retailer is close to the optimum level of diversification (i.e., at the outer edge of the "profitable growth" zone). With this regard, chief executives can use their retail firm's profits to foster

innovations in their existing corporate retail portfolio instead of expanding at increasingly higher levels into new retail formats and foreign countries.

In conclusion, executives and managers at the corporate headquarter can use the proposed *integrative portfolio planning and management model* as a tool that supports them in their choice of a thoughtful diversification strategy, which in turn substantially increases their chances of achieving superior firm performance in the long run.

4.5 References

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F. APPENDIX

Development of Key Variables from 1997 to 2009 (Sample of the 70 Retail Firms)

Figure F.1: Average Sales in 1000 EURO (1997-2009)

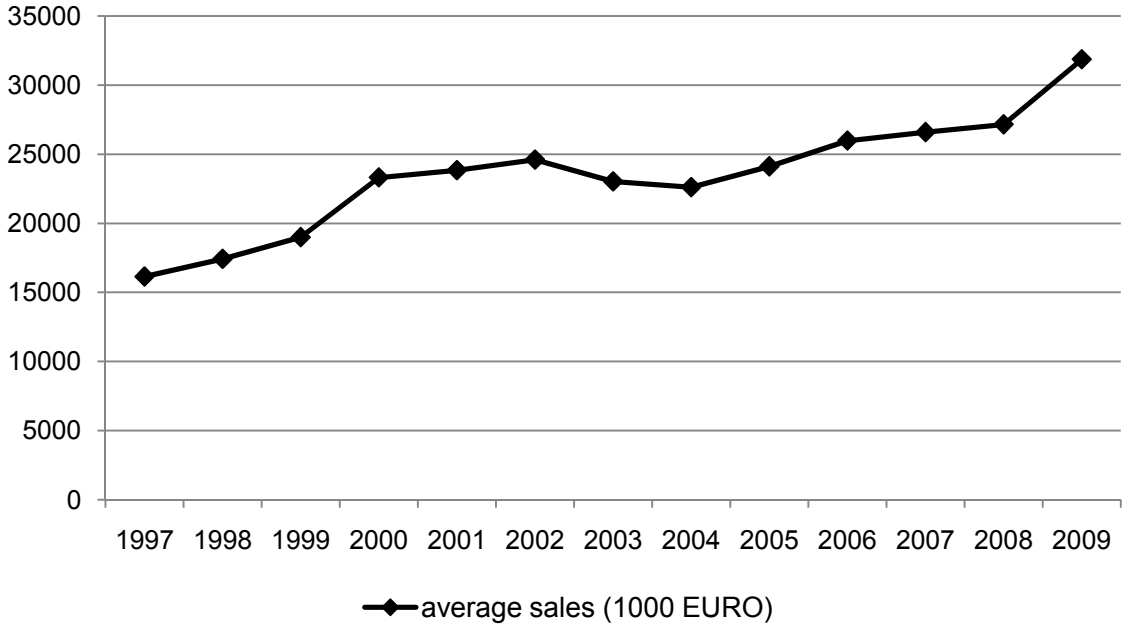


Figure F.2: Average Profits in 1000 EURO (1997-2009)

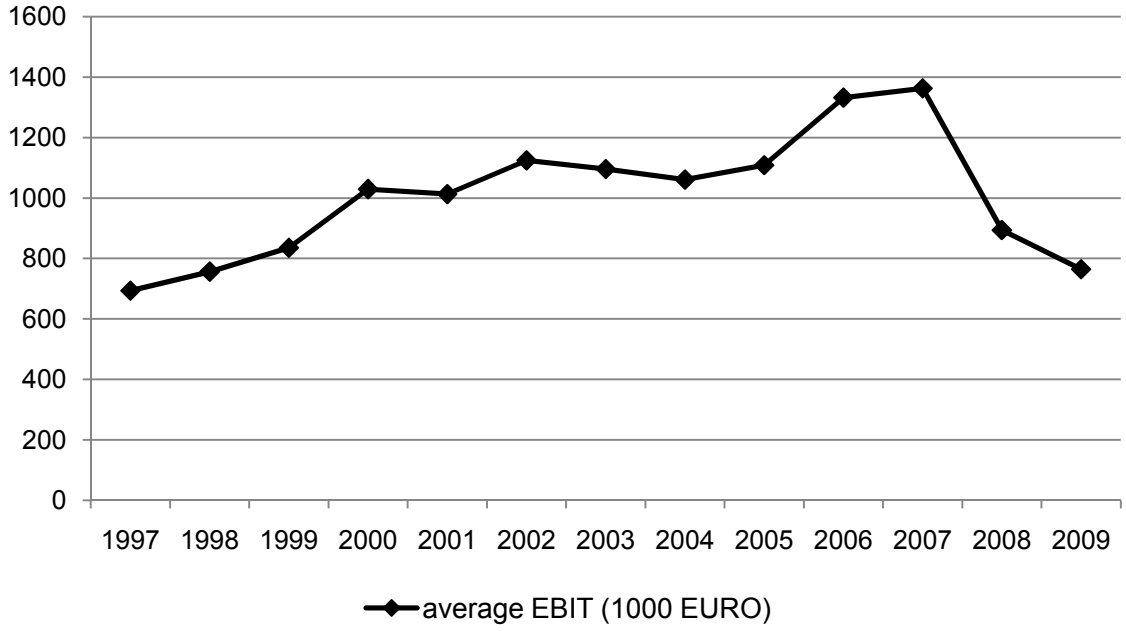


Figure F.3: Average Assortment Diversification into Food and Non-Food Retailing (1997-2009)

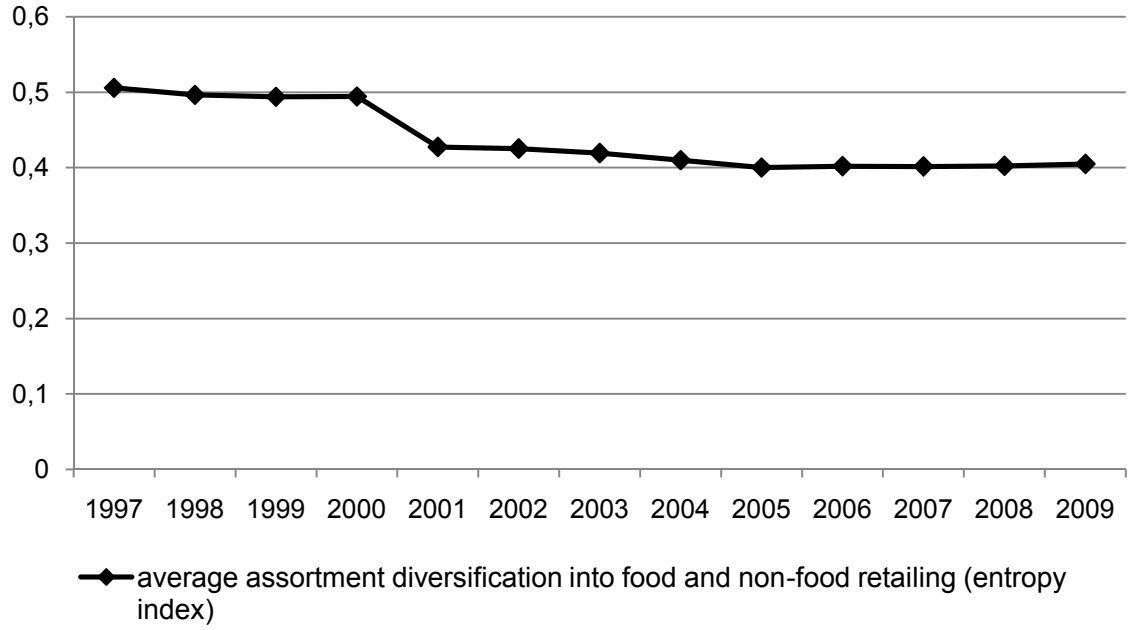


Figure F.4: Average Retail Format Diversification (1997-2009)

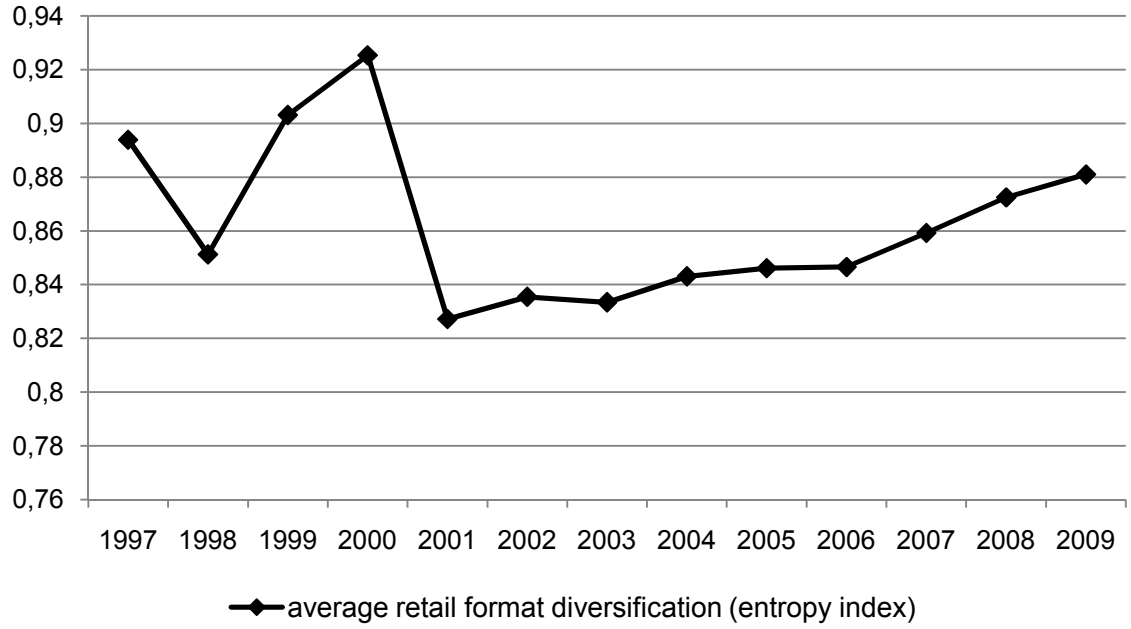
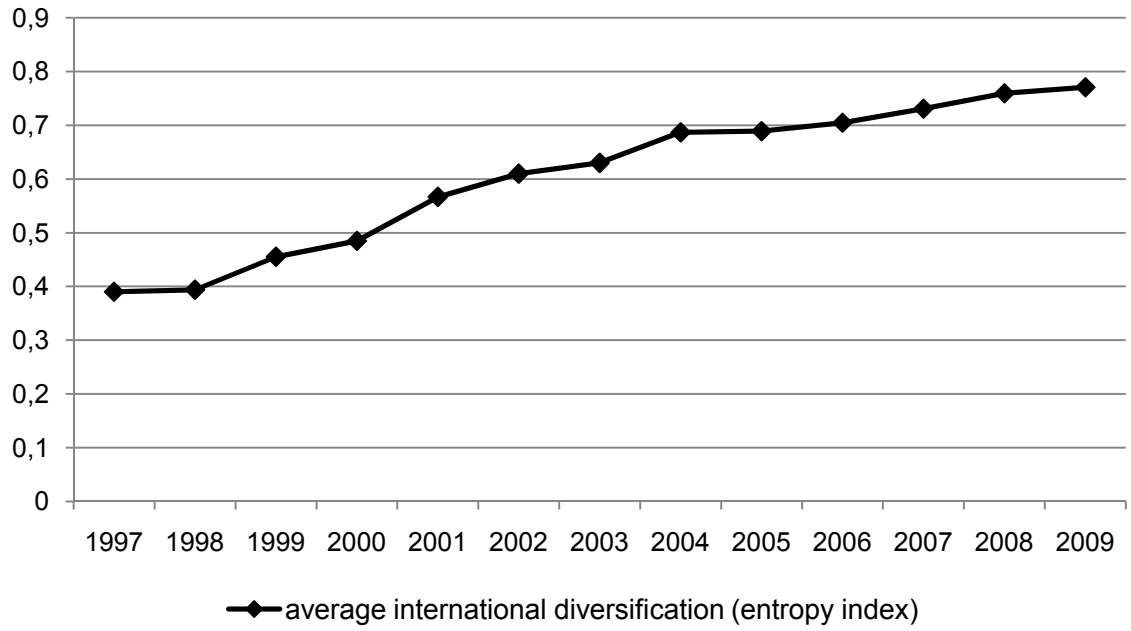


Figure F.5: Average International Diversification (1997-2009)



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Since Nov. 2011	**IESE Business School** Postdoctoral research fellow in the Strategic Management Department	Barcelona, Spain

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