THREE ESSAYS IN BRAND MANAGEMENT: A MULTI-METHOD APPROACH

by

Svetlana Tokareva

A Dissertation

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Dedication

I dedicate this dissertation to my husband Stan Tokarev and our kids: Tatiana, Nikita, and Victoria.
Acknowledgments

It is a great pleasure to acknowledge the support I have received throughout my Ph.D. journey from a number of people. First, I would like to express my sincere appreciation to my advisor, Dr. George D. Deitz for his support, guidance, and understanding throughout my Ph.D. program. Dr. Deitz, encouraged me to follow my own research interests from the beginning of the program and supported me every step of the way. I am also thankful to my committee members, Dr. Mehdi Amini, Dr. James Vardaman, Dr. Susy Jaramillo for their support and helpful comments on my dissertation. Their feedback helped to improve the quality of my dissertation. In addition, I am thankful to my fellow doctoral students in the program for making my Ph.D. journey memorable. I would like to thank my friend and the best cohort partner Priyanka Singh. You are one of the most supportive, nice and kind people I have ever met. My Ph.D. journey would not have been the same without you. Thank you for making my Ph.D. years much better and more enjoyable for me.

Lastly and most importantly, I reserve distinct gratitude for my parents and my husband Stan Tokarev, who supported me in my academic journey of pursuing my educational goals. I especially want to say thanks to my parents for their understanding and unconditional support. My deepest gratitude to my husband who has always been a source of love, inspiration, belief in me, and support through difficult times of Ph.D. program. Finally, I would like to thank IISSO for providing partial funding for my dissertation data collection.
Abstract

This three-essay dissertation is centered on brand management. The first essay applies a bibliometric approach and analyzes 761 brand extension articles published between 1990 and 2022 using data from Scopus and Web of Science databases and citations from Google Scholar. Systematically exploring key themes, contributions, and citation patterns, the results demonstrate the evolution of research themes for the last three decades by examining central and emerging themes as well as their transformation. Based on the performance analysis and science mapping, the study identifies several gaps in brand extension research and suggests future research opportunities.

The second essay employs an event study to investigate the spillover effect of the product recall at one U.S. food retailer on the shareholder value of other U.S. rival food retailers. Using the AMC framework, the essay examines how rival firms’ following motivational factors: awareness of the crisis (media coverage), a rival firm’s capability to respond (organizational slack), and motivation to respond (hazard severity, prior recalls history) influence the direction and magnitude of the rival firm’s shareholder value after a product recall. My results show a negative and significant effect of a product recall on rival food retailers. The results of cross-sectional regression demonstrate that product recall’s high media coverage can mitigate the negative effect of a product recall for rival food retailers. Furthermore, rivals with high resource slack have more opportunities to absorb the negative consequences of a product recall. Finally, recalls with high hazards result in greater investors’ disapproval. The essay has theoretical and managerial implications by demonstrating that a product recall at one food retailer can result in a negative spillover effect, managers of rival retailers should take steps to ensure product safety as
early as possible, pay attention to the rivals’ product recall announcements, and use resource slack to mitigate this negative effect.

The third essay examines the impact of extension similarity, individuals self-regulatory focus, and brand logo symmetry on brand extension evaluation. The results of an experimental study have confirmed prior findings that near extensions are evaluated more positively than distant extensions. In addition, the essay has revealed that promotion-focused individuals have a more favorable attitude toward distant brand extensions than prevention-focused individuals, whereas they are equally responsive to near brand extensions. The essay concludes with theoretical and managerial implications as well as recommendations for future research.

Keywords: brand extensions, bibliometric, product recall, spillover effect, shareholder value, regulatory focus
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I. INTRODUCTION AND OVERVIEW OF RESEARCH

This three-essay dissertation is focused on two important topics in brand management: brand extensions and product recalls. Brand extension strategy is widely used by firms to extend a brand into new product category. According to the statistics, 70% of all new products are related to brand extensions, however, only 30% of them survive during the first two years (Peng et al., 2023). Therefore, it is essential to analyze the current state of the literature in this area and provide a conceptual framework for future research. In addition, managers must gain a deeper understanding of what drives brand extension success.

Product recall is another important area for consideration in brand management. Food producers recall their products from the marketplace when the food may present a serious health hazard to consumers or when the product is mislabeled. Between 2017 and 2021, the FDA announced almost 800 recalls, 500 of which were related to food products (www.fda.gov). Product recalls are not only dangerous for consumers, they can also have negative consequences for the brand, a focal company, and rivals. Prior research has studied the impact of the product-harm crisis and product recall on the firm value (Chen et al., 2009; Hsu and Lawrence, 2016; Liu et al., 2017, Gao et al., 2015), however, the studies investigating interorganizational spillover effect are rare. Much of the evidence of spillover effects from product harm crises is contradictory. The limited empirical research that exists offers mixed findings. Therefore, additional research is required to gain a better understanding of this topic.
Overview of Essays

Essay I, titled “Three Decades of Academic Research on Brand Extensions. A Bibliometric Approach” provides a longitudinal analysis of the scientific output for the period 1990–2022 and covers the most influential publications. In addition, it provides a summary of the thematic evolution of research for the last three decades by examining central and emerging themes, their transformation and presents a conceptual framework for future research. The findings from this research will be beneficial for scholars who are interested in the brand extension field to rapidly understand its current status and capture potential research gaps.

Essay II, titled “How do Product Recalls Affect Rival Brands? Interorganizational Spillover Effect of a Product Recall on Shareholder Value. Evidence from Food Retailers” examines how product recall at a focal food retailer affects the financial performance of rival food retailers. In this Essay I employ a recent AMC framework (Shi et al., 2022), which demonstrates that rival firms’ competitive actions are driven by the following: (1) awareness of focal firms’ events, (2) a rival firm's capability to respond, (3) a rival firm motivation to respond. This research includes 112 product recalls at the U.S. publicly traded food retailers collected from the FDA website. An event study methodology coupled with a cross-sectional regression was used to analyze 669 observations related to the effect of a product recall at a focal food retailer on the financial performance of rival food retailers. This research contributes to the product-harm crisis and product recall literature on the interindustry spillover effect, extends the evidence of product recall from the vehicles industry to food retailers, and provides new insights with respect to how crisis-related and firm-related factors impact investors’ reaction to rival firms after product recall announcement at a focal firm.
Essay III, titled “What drives brand extension success? Effects of product category similarity, brand logo symmetry, and self-regulatory focus on attitude toward brand extensions” investigates how extension similarity affects attitude toward brand extensions as well as the moderating role of individuals regulatory focus and brand logo symmetry. More specifically, the study addresses the following research questions: (1) How does extension similarity affects consumers’ attitude toward brand extensions? (2) How does regulatory focus influence consumers’ attitude toward distant (dissimilar) brand extensions? (3) How does brand logo symmetry influence consumers’ attitude toward near (similar) brand extensions? The results of the experimental study confirm that extension similarity and individual regulatory focus play an important role in brand extensions evaluation. The findings also provide the linkage between regulatory focus and brand extension literature and demonstrate that an individual’s regulatory focus consideration is vital for the success of distant brand extensions.

Taken together, these three essays investigate unexplored areas and fill important gaps in the brand extension and product recall literature.
II. ESSAY I

THREE DECADES OF ACADEMIC RESEARCH ON BRAND EXTENSIONS.

A BIBLIOMETRIC APPROACH
Introduction

The strategy of brand extension has become popular with companies with strong brand equity to introduce new products into the market. In order to gain a competitive advantage, companies use existing brand names to launch products in new categories. A variety of studies have found that extending brands leads to savings in development and marketing costs and allows to increase revenue (Lane and Jacobson, 1995; Keller and Sood, 2003). However, another stream of research found that developing brand extensions can also have negative consequences for a parent brand and negatively affect consumer perceptions (Aaker and Keller, 1990; Loken and John, 1993; Martinez and Pina, 2003; Martinez and Chernatony, 2004; Sharon, 2010; Sood and Keller, 2012; Volckner et al., 2008; Milberg et al., 2021).

Since the 1960s, brand extension strategy has received significant scholarly attention. The first articles mentioning brand extensions put an emphasis on semantic generalization and attempted to explore the transferability between the parent brand and possible extended products based on the similarity between the core brand and new extension. (Osgood, 1963). This perspective was enriched in the 1980s by Boush et al. (1987), who introduced the categorization-based theory and schema congruence. The study found that the more similar a brand and its new product are, the greater the likelihood that positive or negative effects will be transferred to this new product. Research interest in the area of brand extensions has increased since 1990 due to studies related to the representation of the concepts stored in human memory based on a similarity-based approach and a theory-based approach.

In the 2000s, research on brand extensions has received a surge. Scholars have paid more attention to the drivers of brand extension success (Moreau et al., 2001; Barone and Miniard, 2002; Zhang and Sood, 2002; Volckner and Sattler, 2006; Fedorikhin et al., 2008). The research
has also explored the effect of brand extensions on brand personality (Diamantopoulos et al., 2005) and brand image (Martinez and Pina, 2003; Martinez et al., 2008; Martinez and Pina, 2009; Arslan and Altuna, 2010). Starting in 2010, the scholars addressed questions related to brand extensions authenticity (Spiggle et al., 2012), corporate social responsibility (Wang et al., 2015), cross-culture (Sharon, 2010; Torelli and Ahluvalia, 2012), social media (Chang et al., 2013), luxury (Margariti et al., 2019; Phau et al., 2021; Boisvert and Ashill, 2022; Katyal et al., 2022), neuromarketing (Wang et al., 2012). This growing body of literature and its thematic diversity demand an in-depth analysis of its evolution, key publications, past, present, and future research trends.

To obtain a deeper understanding of the scientific contributions in the field of brand extensions, the present study employs a bibliometric approach by studying literature published up to date. Bibliometric analysis has been applied recently to a wide range of disciplines to help academics gain a deeper understanding of a topic and identify possible future research directions. In the field of branding, bibliometric studies have been implemented in areas such as brand positioning (Sciasi et al., 2012), brand personality (Lara-Rodriguez et al., 2019), brand experience (Zha et al., 2020), and brand equity (Rojas-Lamorena et al., 2022). However, there is still a lack of understanding of the literature in the brand extension area. This study intends to close this gap by applying a full-scale bibliometric analysis, which employs techniques such as performance analysis, science mapping, and network analysis (Donthu et al., 2021). These tools provide a comprehensive overview of the field’s nature and scope. Performance analysis can be used to evaluate the performance of articles, authors, countries, and journals based on the number of publications and citations. The following performance analysis techniques are commonly implemented: publication-related analysis, which describes the productivity of articles, authors,
countries, and journals based on the number of publications, and citation analysis, which provides insights into the most impactful and influential articles, authors, countries, and journals based on the number of citations (Baier-Fuentes et al., 2019; Donthu et al., 2021). Science mapping can be used to show how these constituents are related based on the articles’ features. Among the most widely used science mapping methods are co-word analysis and co-authorship analysis (Van Raan, 2005; Donthu et al., 2021). In addition, network analysis can be used to enrich the accuracy of the bibliometric analysis. The most commonly used network analysis techniques include cluster analysis and visualization techniques using Bibliometrix R and VosViewer software (Donthu et al., 2021).

The present review follows the bibliometric analysis structure of prior reviews, and it is aimed at responding to a series of the following research questions:

- How is the field evolving scientifically, and what is its current status?
- Which journals published the highest number of articles in the area of brand extensions?
- Who are the most influential authors in the field?
- What papers are the most cited?
- What institutions are the most productive on the topic?
- What are the motor and emerging themes in each of the time periods studied?

A number of contributions will be made to the literature by this study. First, it employs a longitudinal analysis of the scientific output for the period 1990–2022, covering the most influential publications including all citations from the Google Scholar database. Second, the results demonstrate the evolution of research themes for more than three decades by examining
central and emerging themes as well as their transformation. Finally, scholars interested in the brand extension domain would benefit from a rapid understanding of the field's current status and possible research gaps.

**Methodology**

**Bibliometric analysis: Data collection and analysis**

In order to identify relevant articles, I followed a five-step procedure, presented in Figure 1. First, the data was downloaded from the Scopus database for the period 1990–2022, using the following search query: “Brand extension” or “Brand extended” in the largest subject areas such as Business, Economics, Social Science, Psychology, Decision Science, and Neuroscience. The results initially obtained a total of 676 items in Scopus. Second, using the same search query, the articles were downloaded from the Web of Science (WoS) database, resulting in 465 papers. Third, the results were screened to detect and eliminate duplications. This step resulted in 801 scientific articles. Fourth, additional articles were identified by checking the citations of high-impact articles using the Google Scholar database, this resulted in a total of 813 publications. Finally, I examined the abstract and excluded 52 articles. As a result, my total sample includes 761 papers.

Following prior research (e.g., Rojas-Lamorena et al., 2022), I looked at the distribution of publications per year and divided all articles into four decades to employ the longitudinal analysis of the relevant themes for the following time periods: 1990-2003, 2004-2011, 2012-2018, 2019-2022. These periods correlate to the initial emerging phase of brand extension research (130 articles), the second phase of area growth (217 articles), the third mature phase of extensive research output (288 articles), and the final phase of the “new era” in brand extension research (170 articles).
Fig. 1. Search procedure

Analytical tools used

A list of items was obtained by using the Scopus Analyze Search Results and WoS Analyze Results tools. In addition, to identify the most influential authors and the most cited papers, the number of citations was collected using the Google Scholar database. VOSviewer
(Van Eck and Valtman, 2010), a bibliometric mapping tool, was employed to demonstrate
mapping analysis of thematic networks and co-authorship analysis.

**Results**

**Current status of the topic of brand extensions**

To respond to the first research question, I examine the evolution of scientific articles in
the area of brand extensions by year (see Figure 2). Results show that the field slowly evolved
during the first decade (1990-1999) and the first half of the second decade (2000-2003). Since
the second half of the 2000s, brand extension research has attracted considerable attention,
appearing in 46 publications in 2010. Following a decline in scholarly interest in 2011, the field
has seen a scientific burst in 2012, a significant drop in 2016, and reached a major peak in 2017,
with over 50 articles published. The topic's popularity has increased again since 2019.

![Fig.2. Evolution of publications and citations in the field of brand extensions from 1990 to 2022](image)
In terms of journals publishing brand extension-related research (the second research question), *the Journal of Product and Brand Management* leads the way with 70 articles, followed by *the Journal of Business Research* (38 articles) and *the Journal of Brand Management* (29 articles). Table 1 demonstrates the top 15 journals in the field of brand extensions, which together account for 331 or 43.5% of all articles. The data shows that although some journals, such as *the Journal of Marketing, the Journal of Consumer Psychology*, and *the Journal of Consumer Research*, have published fewer articles, they have achieved a great number of citations.

To answer research questions related to the author’s contribution and key cited papers I also analyzed the authors with the largest publication output; however, the number of articles alone may not be sufficient to reveal the author's contribution. Therefore, it is important to identify authors who contribute more to the field by including the total number of citations from the Google Scholar database. The total number of authors who have published on this topic is 1,231. Table 2 exhibits the top 15 influential authors identified by their citations, and Table 3 lists the 10 most cited papers. Among the top 15 authors with the greatest number of citations (15,034 and 10,476 accordingly) Kevin Keller and David Aaker are the most prolific authors in the field. Their work “Consumer Evaluations of Brand Extensions,” published in the Journal of Marketing in 1990, where they proposed insights on how consumers form attitudes toward brand extensions, served as the basis for many other articles in the area of brand extensions. The authors explored three basic dimensions of similarity: complementarity, substitutability, and transferability, and found that transferability is the only dimension of similarity, that directly impacts brand extension evaluation. In addition, a perceived difficulty has a positive effect on
Table 1. Top 15 journals in the field of brand extensions

<table>
<thead>
<tr>
<th>Rank</th>
<th>Journal</th>
<th># Articles</th>
<th>% of total sample</th>
<th># Cites (Google Scholar)</th>
<th>% of total sample</th>
</tr>
</thead>
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<tr>
<td>1</td>
<td>Journal of Product and Brand Management</td>
<td>70</td>
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<td>8,072</td>
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<td>2</td>
<td>Journal of Business Research</td>
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<td>3</td>
<td>Journal of Brand Management</td>
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<td>4</td>
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<tr>
<td>5</td>
<td>Journal of Consumer Psychology</td>
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<td>6</td>
<td>European Journal of Marketing</td>
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<td>8</td>
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<td>14</td>
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<td>15</td>
<td>Journal of Retailing and Consumer Marketing</td>
<td>8</td>
<td>1.1%</td>
<td>518</td>
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<td></td>
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<td>43.5%</td>
<td>69,256</td>
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brand extensions evaluation as well as perceived quality when there is a fit between product categories. Another contribution is Keller and Aaker’s publication demonstrating the effect of sequential introduction of brand extensions on consumer evaluation of a proposed extension and parent brand based on the 1) perceived quality of the parent brand and 2) success, similarity, and a number of intervening brand extensions (Aaker and Keller, 1992). The other authors, who have also made a significant contribution to the field of brand extensions and hold the top positions by
Table 2. Top 15 influential authors by a number of citations in Google Scholar

<table>
<thead>
<tr>
<th>Rank</th>
<th>Name</th>
<th>Affiliation</th>
<th># Articles in Google Scholar</th>
<th># Cites in Google Scholar</th>
<th>% of total sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Keller K.L.</td>
<td>Dartmouth College (USA)</td>
<td>11</td>
<td>15,034</td>
<td>16%</td>
</tr>
<tr>
<td>2</td>
<td>Aaker D.</td>
<td>University of California (USA)</td>
<td>5</td>
<td>10,476</td>
<td>11%</td>
</tr>
<tr>
<td>3</td>
<td>Park C.W.</td>
<td>University of Southern California (USA)</td>
<td>10</td>
<td>6,648</td>
<td>7%</td>
</tr>
<tr>
<td>4</td>
<td>Lehmann D.</td>
<td>University of Columbia (USA)</td>
<td>5</td>
<td>4,502</td>
<td>5%</td>
</tr>
<tr>
<td>5</td>
<td>Loken B.</td>
<td>University of Minnesota (USA)</td>
<td>3</td>
<td>3,782</td>
<td>4%</td>
</tr>
<tr>
<td>6</td>
<td>John D.R.</td>
<td>University of Minnesota (USA)</td>
<td>5</td>
<td>3,420</td>
<td>4%</td>
</tr>
<tr>
<td>7</td>
<td>Milberg S. J.</td>
<td>The Adolfo Ibáñez University (Chile)</td>
<td>8</td>
<td>3,274</td>
<td>4%</td>
</tr>
<tr>
<td>8</td>
<td>Martinez E.</td>
<td>University of Zaragoza (Spain)</td>
<td>10</td>
<td>2,882</td>
<td>3%</td>
</tr>
<tr>
<td>9</td>
<td>Smith D.C.</td>
<td>Indiana University</td>
<td>3</td>
<td>2,454</td>
<td>3%</td>
</tr>
<tr>
<td>10</td>
<td>Del Rio A.B.</td>
<td>University of Oviedo (Spain)</td>
<td>3</td>
<td>2,314</td>
<td>2%</td>
</tr>
<tr>
<td>11</td>
<td>Low G. S.</td>
<td>Georgia Gwinnett College (USA)</td>
<td>3</td>
<td>1,978</td>
<td>2%</td>
</tr>
<tr>
<td>12</td>
<td>Boush D.M.</td>
<td>University of Oregon</td>
<td>3</td>
<td>1,935</td>
<td>2%</td>
</tr>
<tr>
<td>13</td>
<td>Pina J. M.</td>
<td>University of Zaragoza (Spain)</td>
<td>13</td>
<td>1,927</td>
<td>2%</td>
</tr>
<tr>
<td>14</td>
<td>Sattler H.</td>
<td>University of Hamburg (Germany)</td>
<td>8</td>
<td>1,902</td>
<td>2%</td>
</tr>
<tr>
<td>15</td>
<td>Volckner F.</td>
<td>University of Cologne (Germany)</td>
<td>5</td>
<td>1,891</td>
<td>2%</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td></td>
<td>131</td>
<td>64,419</td>
<td>69%</td>
</tr>
</tbody>
</table>

a number of publications, are C. Whan Park and Donald Lehmann. Park is the third author by a number of citations after Keller and Aaker, who contributed to the field by investigating the role of brand concept consistency and product feature similarity in brand extension evaluation (Park et al., 1991), along with the effectiveness of a composite brand in brand extension context (Park et al., 1996). Donald Lehmann contributed to the field by co-authoring with Kevin Keller by publishing the seminal paper that highlights some of the influential work in the branding area
and identifies some gaps that exist in the research of branding, including the brand extensions area (Keller and Lehmann, 2006). While Barbara Loken has a low number of publications, she ranks among the top authors based on the total number of citations. Loken and John (1991) measured the fit between the original brand and brand extension in terms of typicality and provided evidence that negative brand extensions hurt brand image dilution. For a high-typical-rating extension, the negative information can be discounted when consumers’ prior beliefs are based on their own brand experiences. In the case of a low-typical-rating extension, the distance at the attribute level does not influence attitude toward brand extension. Boush and Loken (1991) also examined the relationship between brand extension typicality and the process of brand extension evaluation.

Table 4 illustrates the top ten organizations sorted by the number of publications in the area of brand extensions. The results show that research was conducted around the world, including the United States, China, Spain, and Norway. University of Zaragoza stands out (13 publications) followed by Dartmouth College due to Keller’s publications (12 publications), Zhejiang University (11 publications), which contributed to brand extensions from the neuroscience perspective, the University of Southern California, and University of Minnesota.
Table 3. Top 15 articles by total citations in Google Scholar

<table>
<thead>
<tr>
<th>Authors</th>
<th>Title</th>
<th>Journal</th>
<th>Year</th>
<th>Citations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Park C.W., Milberg S., Lawson R.</td>
<td>Evaluation of brand extensions: The role of product feature similarity and brand concept consistency</td>
<td>Journal of Consumer Research</td>
<td>1991</td>
<td>2,194</td>
</tr>
<tr>
<td>Low G.S., Lamb C.W.</td>
<td>The measurement and dimensionality of brand associations</td>
<td>Journal of Product and Brand Management</td>
<td>2000</td>
<td>1,978</td>
</tr>
<tr>
<td>Broniarczyk S.M., Alba J.W.</td>
<td>The importance of the brand in the brand extensions</td>
<td>Journal of Marketing Research</td>
<td>1994</td>
<td>1,773</td>
</tr>
<tr>
<td>Boush D.M., Loken B</td>
<td>A process tracing study of brand extension evaluation</td>
<td>Journal of Marketing Research</td>
<td>1991</td>
<td>1,671</td>
</tr>
<tr>
<td>Smith D.C., Park C.W.</td>
<td>The effects of brand extensions on market share and advertising efficiency</td>
<td>Journal of Marketing Research</td>
<td>1992</td>
<td>1,420</td>
</tr>
<tr>
<td>Loken B., John D.R.</td>
<td>Diluting brand beliefs: when do brand extensions have a negative impact?</td>
<td>Journal of Marketing Research</td>
<td>1993</td>
<td>1,389</td>
</tr>
<tr>
<td>Park C.W., Jun C.Y., Shocker A.D.</td>
<td>Composite branding alliances: An investigation of extension and feedback effects</td>
<td>Journal of Marketing Research</td>
<td>1996</td>
<td>1,168</td>
</tr>
<tr>
<td>Volckner F., Sattler H.</td>
<td>Drivers of brand extension success</td>
<td>Journal of Marketing Research</td>
<td>2006</td>
<td>1,039</td>
</tr>
<tr>
<td>Dacin P. A., Smith D.C.</td>
<td>The effect of brand portfolio characteristics on consumer evaluations of brand extensions</td>
<td>Journal of Marketing Research</td>
<td>1994</td>
<td>979</td>
</tr>
<tr>
<td>Aaker D.A.</td>
<td>Brand extensions: the good, the bad, the ugly</td>
<td>MIT Sloan Management Review</td>
<td>1990</td>
<td>978</td>
</tr>
<tr>
<td>Pitta D.A., Katsanis L.P.</td>
<td>Understanding brand equity for successful brand extensions</td>
<td>Journal of Consumer Marketing</td>
<td>1995</td>
<td>935</td>
</tr>
</tbody>
</table>
**Table 4.** Top 10 organizations based on a number of publications

<table>
<thead>
<tr>
<th>Rank</th>
<th>Affiliation</th>
<th>Total number of articles</th>
<th>Country</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>University of Zaragoza</td>
<td>13</td>
<td>Spain</td>
</tr>
<tr>
<td>2</td>
<td>Dartmouth College</td>
<td>11</td>
<td>United States</td>
</tr>
<tr>
<td>3</td>
<td>Zhejiang University</td>
<td>10</td>
<td>China</td>
</tr>
<tr>
<td>4</td>
<td>University of Southern California</td>
<td>10</td>
<td>United States</td>
</tr>
<tr>
<td>5</td>
<td>University of Minnesota</td>
<td>10</td>
<td>United States</td>
</tr>
<tr>
<td>6</td>
<td>Norwegian School of Economics and Business Administration</td>
<td>10</td>
<td>Norway</td>
</tr>
<tr>
<td>7</td>
<td>Indiana University</td>
<td>9</td>
<td>United States</td>
</tr>
<tr>
<td>8</td>
<td>University of Florida</td>
<td>9</td>
<td>United States</td>
</tr>
<tr>
<td>9</td>
<td>Columbia University</td>
<td>8</td>
<td>United States</td>
</tr>
<tr>
<td>10</td>
<td>University of Hamburg</td>
<td>8</td>
<td>Germany</td>
</tr>
</tbody>
</table>

**Thematic analysis**

To conduct a thematic analysis in each period, a thematic map was generated based on centrality and density, divided into four topological regions (see Figure 3). The density of the keywords is measured by their internal strength, while the centrality of the networks is measured by their degree of interaction. The high-density and high-centrality quadrant represents “motor themes,” the primary research themes that are most attractive to researchers. The low-density and low-centrality quadrant exhibits emerging or declining themes. In the upper left quadrant (high-density and low centrality), we will find highly developed and isolated themes. Finally, the lower right-hand quadrant (low-density and high-centrality) contains essential basic themes. In this diagram, each bubble represents a network cluster of keywords, where the bubble name corresponds to the word in the cluster with the greatest occurrence value. The proportion of the
bubble size defines the cluster word occurrences. The bubble's position is set based on its centrality and density dimensions.

First period 1990-2003

In the early stage of brand extension research (1990–2003), the cluster “Brand Extension” including keywords such as “Brand Equity” and “Brand Image,” as well as the cluster "Brands" with keywords such as “Consumer Behavior” and “Marketing Strategy” stand out among others and are positioned as a basic theme (see Figure 4). The cluster "Advertising" including “Brand Communications” occupies a “motor theme” in the strategic diagram. It was studied largely in the context of advertising slogans (e.g., Pryor and Brodie, 1998) and corporate branding (Keller and Aaker, 1998). Among other motor themes, there are “Product Variety”, “Corporate Image”, and “Brand Reputation”. Corporate image has been studied for service brand extensions (Ruyter and Wetzels, 2000) as well as the effect of corporate marketing activities on
brand extension evaluation (Keller and Aaker, 1998). The research related to product variety has assessed how the vertical structure of a product line relates to brand equity (Randall et al., 1998). Cost savings and spillover effects have been discussed in relation to brand reputation (DeGraba and Sullivan, 1995).

Fig. 4. Strategic diagram for the period 1990-2003

Second period 2004-2011

In the second period (2004–2011), in addition to the largest “Brand Extension” cluster, new themes appeared in brand extension research (see Figure 5). The clusters “Branding” including “Decision Making’ and “Perceived Fit” represent motor themes on the strategic diagram with high centrality and high density. “Branding” moved from an emerging theme in the
first period to a motor theme in the second, while “Perceived Fit” appeared only in the second period. In terms of “Branding” theme, the research presented in different areas, and the most influential papers were focused on celebrity brands and the role of implicit theories in brand extensions evaluation (Luo et al., 2010; Yorkston et al., 2010). The scholars also examined the fit of the brand extension with the parent brand. Specifically, studies explored product-level or brand-image fit (Zimmer and Bhat, 2004). In addition, the notable theme “Advertising”, which started as a motor theme in the first period slightly moved to a basic theme.

Fig. 5. Strategic diagram for the period 2004-2011

**Third period 2012-2018**

In the third period (2012-2018) the cluster “Semiotics” stands out as a motor theme demonstrating high internal strength and close interaction with other themes (see Figure 6).
Semiotics was used in market research to understand how and why consumers use symbols and signs to make decisions related to brand extensions. In the literature, a semiotic analysis was mainly conducted for luxury brands (e.g. Veg-Sala and Roux, 2014; Dallabona, 2015). Gender appears as an emerging topic due to studies that investigated the role of mating mindsets (Monga and Zeynep, 2012), and masculinity (Ulrich and Tissier-Desbordes, 2018). Themes such as “Luxury Brands” and “Service Quality” appear for the first time. The scholars devoted attention to evaluation of brand extensions for luxury and premium brands (Dall’Olmo et al., 2015; Wang et al., 2015, Magnoni and Roux, 2012) as well as in the service channel context (Yang et al., 2013). In addition, “Perceived Fit” and “Innovation” topics have moved to basic and transversal themes.

Fig. 6. Strategic diagram for the period 2012-2018
Fourth period 2019-2022

In the final period (2019-2022) the keywords related to “Brand equity”, “Brand Personality” appear frequently in the literature serving as the main motor themes in this period (see Figure 7). The scholars actively investigated the role of brand equity for brand extensions in the tourism industry (e.g. Hultman et al., 2021; del Barrio-Garcia and Prados Pena). “Social media” is another motor theme last four years, and brand extension literature was mainly related to social media networks (e.g. Bertschy et al., 2020) and brand alliance opportunities (e.g. Malhotra and Bhattacharyya, 2022).

Furthermore, in the fourth period, there are emerging themes, that can be interesting for future research in the field of brand extensions such as “Brand Extension Authenticity” and “Masstige” (e.g. Osorio et al., 2021; Katyal et al., 2022; Park et al., 2022). “Masstige” research direction has evolved from “Luxury Brands” and “Service Quality” themes and has been mainly studied from a consumer perspective (Katyal et al., 2022) while “Brand Extension Authenticity” has emerged as a new theme and has been researched as an antecedent and predictor for a successful brand extension launch (Osorio et al., 2022). In addition, the topic "Brand Performance" occupies a central position in the diagram, but is neither considered highly developed nor a motor theme.
Fig. 7. Strategic diagram for the period 2019-2022

**Thematic network**

From the database of the articles, 1,396 keywords were extracted and analyzed using VOS Viewer. Figure 8 demonstrates the co-occurrence network of keywords in the field of brand extensions for the period 1990–2022. From these keywords, 50 words were selected for the thematic network analysis. The size of the circle represents the occurrence of the keyword, the links between the nodes represent the co-occurrence between keywords, the thickness of the link represents the number of times that the keywords can occur or co-occur together. Each color represents a thematic cluster where the nodes and links can explain the cluster’s coverage of
topics (nodes) and the relationships between them (links). As a result of the analysis, three clustered groups were obtained.

Cluster 1, in red, can be referred to as “Brand Management” and it consists of the articles related to the examination of brand extensions in the context of brand management, marketing strategy, and consumer behavior. The most frequently occurring words include “Brand Image”, “Brand Equity”, “Brand Management”. Cluster 2, in green, which I can label “Neuromarketing”, includes the articles from the neuroscience field with keywords such as “Neuromarketing”, “Electroencephalography”, “Human”. Cluster 3, in blue, mainly investigates the role of advertising in brand extension evaluation as well as the role of brand personality in brand extensions and incorporates the following keywords: “Advertising”, “Brand Personality”, “Branding”. Therefore, this cluster can be identified as “Advertising”. The results of the analysis of the thematic network demonstrate that brand extension research demonstrates a high degree of cohesion in terms of scientific fields such as marketing, neuroscience, psychology, and social science.

Fig. 8. Thematic network of keywords
**Co-authorship**

To further answer the final research question and obtain a visual representation of the co-authorship network of the brand extension research, VOS viewer software was used. Out of 1301 authors, only 39 authors are connected to each other. As a result, seven clustered groups were obtained, where the nodes represent the articles while the links symbolize bibliographic couplings (see Figure 9). Cluster 1, in red, focuses on articles investigating the fit between the parent brand and extension (Milberg et al., 2010, 2013) as well as alternative brand extension strategies (Milberg et al., 1997). Cluster 2, in green, includes articles by C. Whan Park that examine the role of brand concept consistency and similarity in brand extension evaluation (Park et al., 1991), composite branding alliances (Park et al., 1996), the effect of brand logos on firm performance (Park et al., 2013). In addition, it includes studies focused on emotional attachment to brand extensions (Fedorikhin et al., 2008). Cluster 3, in dark blue, incorporates articles investigating the effects of technological hierarchy (Jun et al., 1999) and nostalgia marketing (Jun et al., 2022) on brand extension evaluation. The authors from Cluster 4, in yellow, actively collaborated with scholars from Cluster 2 to investigate the strategic benefits of low fit brand extensions (Chun et al., 2015). Cluster 5, in light blue, is presented by researchers focused on the differences in brand extension evaluation between children and adults (Zhang and Sood, 2002) and extending corporate brands in B2B and B2C markets (Liu et al., 2018). Cluster 6, in orange, exhibits studies by Sanjay Sood published in collaboration with Kevin Keller that explored the effects of brand name structure on brand extension evaluations (Sood and Keller, 2012) and brand equity dilution (Keller and Sood, 2003). Finally, Cluster 7, in purple, includes the most influential authors in the area of brand extensions and their seminal studies in different domains,
such as the sequential introduction of brand extensions (Keller and Aaker, 1993), corporate branding (Keller and Aaker, 1998), distant brand extensions (Parker et al., 2018).

Fig. 9 Co-authorship

**Main conclusions**

Current bibliometric research shows the evolution of the area of brand extensions, presents the evolution of the topic, and identifies motor and emerging themes using performance analysis and science mapping. The results of the analysis of the literature status demonstrate that since 2003 research interest in the area of brand extensions has increased significantly with peaks in publication in 2010, 2012, 2017. After 2018 the field of brand extensions has seen a growing trend in terms of a number of published articles. Based on the distribution publication data, I divided the whole timeframe into four periods (1990-2003, 2004-2012, 2013-2018, 2019-2022). In response to the research question related to the source productivity, the highest number of articles was published in the Journal of Product and Brand Management (70 articles), however,
the most cited works appeared in the Journal of Marketing and the Journal of Marketing Research. In terms of the most influential authors and the most cited papers, the results provide evidence for the heterogeneity of publications with an emphasis on the seminal Keller and Aaker works (Aaker and Keller, 1990; Keller and Aaker, 1992) as well as Park (Park et al., 1991; Park et al., 1996), Lehman (Keller and Lehmann, 2006), and Loken (Loken and Boush, 1991; Loken and John, 1993). There are also authors who have published a smaller number of articles, however, they have received a high number of citations (e.g. Loken and John, 1993; Del Rio et al., 2001, Low and Lamb, 2000). Related to the institution's productivity, research in the brand extension area has attracted scholars worldwide. Scholars from universities located in the United States, China, Spain, India, and Norway have published the largest number of articles in the brand extension field.

Science mapping analysis has been conducted to identify the core research themes and their evolution from 1990 to 2022 in each period. Before 1990 the research was mainly focused on semantic generalization and affect transfer derived from the concept of long-term memory. Since 1990 the concept of brand extensions has been studied mainly with emphasis on brand equity and brand image (Rangaswamy et al., 1993; Low and Lamb, 2000) from a consumer perspective as well as marketing strategy, which are referred to basic and transversal themes in the strategic diagram. In addition, scholarly attention has been given to "Advertising" (Pryor and Brodie, 1998), "Corporate Image", "Brand Reputation" and "Product Variety"(Randall et al., 1998), all of which occupy a motor theme role in the diagram.

The second period has seen an increasing number of articles in brand management area related to the role of “Advertising” and “Brand Communication” in brand extension research (Martinez et al., 2009; Montaner and Pina, 2009), which becomes a basic and transversal theme.
As the second period progresses, new motor themes appear such as “Perceived Fit” (Nkwocha et al., 2005; Song et al., 2010) and “Decision Making” (Henry, 2008). In the third period, the scholars’ attention has been devoted to “Perceived Fit”, which becomes a basic theme (Shen, 2014; Arikan et al., 2016; Tripathi et al., 2018). Meanwhile, semiotics for luxury brands appeared as a notable motor theme (Veg-Sala and Roux, 2014; Dallabona, 2015).

Brand extension research has experienced a diversification of themes since 2019. Themes related to “Brand Equity” and “Brand Personality” have been motor themes in terms of keywords frequency. Brand equity for brand extensions in tourism has been the subject of studies (Kim and Lee, 2019; Prados-Pena and Del Barrio-Garcia, 2021), and brand personality has been studied for luxury brand extensions (Phau et al., 2021; Royo-Vela and Sanchez, 2022). Another motor theme” Social Media” is related to the role of brand communication in brand extensions and can be a potential future direction for scholars interested in brand extensions research. Thematic analysis and science mapping have also identified “Brand Extension Authenticity”, “Masstige” and “CSR” as emerging themes in the field. If these topics are developed further, they can become motor themes in the future.

The results of the thematic network have revealed three clusters related to using brand extensions in different fields: “Brand Management”, “Neuroscience”, “Advertising”. Results demonstrate the heterogeneity of interests in the brand extensions area from different perspectives. For example, based on these findings, neuroscience can be helpful in developing new insights for consumer behavior in terms of attitude towards brand extensions. Finally, co-authorship analysis has concluded that there is a lack of networking between authors.
Research gaps and future research opportunities

The purpose of this section is to discuss current research gaps and highlight potential future research opportunities in the field of brand extensions based on conducted bibliometric analysis and introduce the framework for prospective authors including three key clusters: brand marketing, advertising, neuromarketing (see Figure 10). Scholars interested in the field of brand extensions may find interesting to capture the following emerging research themes in their future studies. Future studies related to brand extensions may find it valuable to capture some of the following emerging research themes.

Brand marketing

- Brand equity. The concept of brand equity has been a fundamental topic in marketing extensively studied since 1990 both from the consumer and firm perspectives. According to longitudinal analysis and science mapping, this topic has appeared as a basic and transversal theme in the three first examined periods (1990-2003; 2004-2012; 2013-2018), however, it has become a motor theme recently due to its adaptation to new industries such as tourism and hospitality. Therefore, brand equity can be further studied for destination brand extensions cross-culturally and in post COVID-19 contexts.

- Brand Personality. The role of brand extensions on brand personality has been investigated based on implicit theories of personality (Yorkston et al., 2010; Batra et al., 2010; Mathur et al., 2012) and has been a motor theme in second (2004-2012) and third period (2013-2018). Since 2019 brand personality research has been devoted to luxury brand extensions. To further develop this field more research is needed to examine the role of brand personality in brand extensions for different product categories. In addition, research interests can be extended to celebrity endorsement (Koo, 2022).
The Masstige concept is a way to extend luxury brands to lower price points (Truong et al., 2009). The studies featuring this emerging theme can examine the role of individual consumer characteristics on consumption of masstige brand extensions (Katyal et al., 2022).

Brand extension authenticity is a recent concept in brand extension research and it reflects a cultural connection between the parent brand and the extended product (Spiggle et al., 2012). Future studies can address the role of brand extension authenticity on brand extension evaluation.

**Advertising**

Social media is a motor theme not yet extensively researched that applies to brand extensions. There is a call for research in this area due to the increasing growth of social media networks. Therefore, future avenues can include the exploration of the role of social and brand networks to identify new opportunities for brand extensions (Malhotra and Bhattacharya, 2022).

Leveraging existing brand equity is crucial for managers launching low-fit brand extensions. Thus, research on the effect of different types of presentation of benefits on brand extension evaluation will enrich the field (Mathur et al., 2022).

**Neuromarketing**

Event-related potential (ERPs) studies can be further implemented to investigate cognitive processes and enhance the understanding of neural mechanisms during the evaluation of brand extensions (Song et al., 2020).

Brand associations and their role in brand extensions can be examined using studies employing multichannel EEG or magnetoencephalographic imaging to study the brain origin of brand and marketing associations (Gorin et al., 2022).
Contributions, limitations, and future research

The current bibliometric analysis provides a systematic quantitative overview and has made a series of significant contributions to the brand extensions field. First, it investigated the contributions of influential journals, authors, institutions, and publications from 1990 to 2022. Second, it presented a longitudinal thematic analysis of keywords and science mapping identifying motor and emerging themes in each period. Finally, it proposed potential research topics that can be helpful for scholars interested in further development of brand extensions area.

The current study has a few limitations. First, the thematic analysis has been conducted based on a series of articles derived from the Scopus database. Therefore, future research can use a list of articles collected from other databases merged with Scopus (Web of Science and Google Scholar). Second, the study focuses only on scientific articles, and additional publication sources such as conference proceedings, and book chapters can be incorporated into future studies. Third, the number of affiliations in the documents was used to count the number of documents for each
country. As a result, a document published by several authors affiliated with the same country was counted once for that country while a document with two authors affiliated with two different countries was counted once for each. It has increased some countries' research output with increased international collaboration even if they were not the primary or corresponding authors. Finally, this study can be enhanced by using additional bibliometric techniques such as bibliometric coupling, co-citation networks, and visualization tools such as CiteSpace and HitSite to analyze citations and references co-cited with each other.
III. ESSAY II

HOW DO PRODUCT RECALLS AFFECT RIVAL BRANDS?
INTERORGANIZATIONAL SPILLOVER EFFECT OF A PRODUCT RECALL ON SHAREHOLDER VALUE. EVIDENCE FROM FOOD RETAILERS
Introduction

A product-harm crisis occurs “when a product is found to be defective or even dangerous to at least part of the product’s customer base” (Cleeren et al., 2017). It usually involves a large group of customers being affected by a well-publicized situation (Dawar and Pillutla 2000). According to statistics from the U.S. Consumer Product Safety Commission, product crises result in more than $1 trillion in property damage, injuries, and deaths each year (www.cpsc.gov). In some cases, product recalls are required when a company’s product is unsafe for consumers or does not meet industry standards. Between 2017 and 2021, the FDA announced almost 800 recalls, 500 of which were related to food (www.fda.gov). Firms in various industries, such as food, toys, electronics, furniture, and vehicles, have experienced multiple product recalls (Borah and Tellis, 2016; Hsu and Lawrence, 2016). The examples include Jack in the Box’s contaminated beef in 1993, tire recalls by Firestone in 2000, and Toyota’s problem with unintended acceleration in 2014.

A considerable amount of research has studied the impact of the product-harm crisis and product recall on the firm value (Chen et al., 2009; Hsu and Lawrence, 2016; Liu et al., 2017, Gao et al., 2015). For example, based on evidence from the automotive industry, Liu et al. (2017) have reported that high recall volume has a damaging effect on a focal firm’s market value within a few days after the recall and one year later. Hsu and Lawrence (2016) have demonstrated not only a negative impact of a product recall on abnormal returns of focal firms, but also that this negative effect is exacerbated by the valence, volume, and growth rate of online word-of-mouth. Furthermore, according to Chen et al.’s (2009) study, proactive strategies of focal firms that experience product recalls have a greater negative impact on their financial value than passive strategies. While there is a significant body of research investigating the effects of
product-harm crises and recalls on financial performance of the offending firm, there is relative
dearth of research that has looked at spillover effects of these events upon the performance of
competitors and business partners (Cleeren et al., 2017; Li et al., 2022).

Much evidence of spillover effects from product harm crises is contradictory. The
limited empirical research that exists offers mixed findings. For instance, using data on
automobile recalls, Jarrell and Peltzman (1985) have suggested that product recall at a focal firm
has a negative spillover effect on rival firms. However, Barber and Darrough (1996) argue that
product recall announcement that affect focal firm does not significantly influence the
shareholder value of rival firms. Recently, Liu and Varki (2021) have shown that the negative
spillover effect is weaker for rivals with higher corporate product reliability. In addition,
evidence from consumer packaged goods industry reveals inconsistent results. Mackalski and
Belislie (2015) report that the negative spillover effect occurs only within the same brand
industry, and does not affect rival brands. Furthermore, Zhao et al. (2011) state that rival firms
can benefit from a product-harm crisis. Therefore, the spillover effect of focal firms on rivals is
more complicated than expected, and additional research is needed to gain a better understanding
of this phenomenon.

Using the event study methodology, the present study extends the knowledge in this area
by analyzing the stock market reaction to the rivals after the product recall and investigating
boundary conditions under which a spillover effect is likely to occur. Specifically, the study will
address the following research questions:

1. Is a product recall at one U.S. food retailer likely to decrease the shareholder value of
   other U.S. food retailers?
2. If so, how firm--related factors influence the magnitude and direction of
   shareholder value of rival U.S. food retailers after the product recall announcement?
If so, how crisis-related factors influence the magnitude and direction of shareholder value of rival U.S. food retailers after the product recall announcement?

Drawing from the accessibility-diagnosticity theory, the present study argues that a product recall announcement at one U.S. food retailer is likely to affect the shareholder wealth of other U.S. food retailers, resulting in an interindustry spillover effect. Based on expectancy violations theory, the study proposes that high media coverage of the product-harm crisis prior to its official announcement, will mitigate this effect. In addition, using the resource-based view (RBV), I suggest that firm slack resources will be positively associated with abnormal returns of rival food retailers. I calculated abnormal stock returns following the announcement of a product recall implementing an event study design. According to recent AMC framework (Shi et al., 2022), rival firms’ competitive actions are driven by the following motivational factors: awareness of focal firms’ events, rival firm motivation to respond, and its capability to respond. Therefore, using a regression model this study examined how awareness of the crisis (i.e., media coverage), a rival firm capability to respond (i.e., slack resources), and motivation to respond (i.e., hazard severity, prior recalls history) influence the direction and magnitude of shareholder value.

The research makes several key contributions to existing marketing strategy literature on product-harm crises. First, it expands previous findings of the interindustry spillover effect and demonstrates that product recall at the U.S. firm can hurt rival brands’ financial performance. Although prior research has investigated the interorganizational spillover effect, these studies demonstrate inconsistent findings (Jarrell and Peitzman, 1985; Barber and Darrough, 1996; Liu et al., 2021). Thus, this essay aims to gain a better understanding of the spillover effect on rival firms’ shareholder value.
Second, the study findings will contribute to media and crisis literature. Previous studies have mainly examined factors related to product quality and pre-announcement of new products (Liu et al., 2021), brand dominance and origin of the brand (Borah and Tellis, 2016), brand equity (Seo, 2021). This work will shed light on the process of how investors react to product recall announcements depending on the product recall’s media coverage, level of hazard severity, and rival firm’s slack resources. Specifically, this essay will examine the effect of a focal firm’s product recall’s media coverage on the shareholder wealth of rival firms. In addition, it provides valuable insights into how investors react to recall announcements for products with different levels of hazard. Furthermore, this research will highlight the financial benefits of rival firms’ high resource slack.

Finally, this study extends prior work on product-harm crisis and product recall literature on the interindustry spillover effect by extending the evidence from the automotive, hospitality, and toy industries to food retailers and examining its unique characteristics. It is one of the first studies with a focus on investigating the interorganizational spillover effect in food retailers. In recent years, product recalls have shaken public confidence in retailers’ ability to ensure product safety (Lyles, 2008). In contrast to the manufacturing-based product recall, the spillover effect on retailers may be different because of their proximity to consumers (Ni et al., 2014). Therefore, it is important to enrich the current literature by providing additional evidence of the effect of product recall on rival food retailers.

**Literature review**

During a product-harm crisis, a product fails to meet safety standards or contains defects that could pose a fire, chemical, electrical, or medical hazard, causing injuries or death to the consumer (Cleeren et al., 2017). As a result, the consequences of the crisis can be very devastating.
First, it often leads to product recalls from the distribution system, and during the prolonged out-of-stock situation, consumers may switch to competing brands or even quit the product category. A product recall seeks to withdraw the product from the market as it was sold. The recall process typically entails an official announcement outlining the reason for the recall and a remedy offered to the consumer. The reasons include issues with product quality such as lack of effectiveness (i.e., the product does not meet its performance standard), lack of durability, and lack of safety (Daughety and Reinganum, 1995; Beamish and Bapuji, 2008; Lyles et al., 2008).

Previous research on product crises and product recalls has been focused on estimating the effect of the crisis on consumer behavior characteristics, such as awareness of the crisis (Dawar and Pillutla, 2000), consumer attitude (Germann et al., 2014), consumption of product categories (Pennings et al., 2002), and brand sales (van Heerde et al., 2007). Another research stream has been focused on spillover effects, by exploring negative spillovers within brand portfolios, such as spillovers from an extended brand to a parent brand within the same category (Balachander and Ghose, 2003) or spillovers from umbrella brands across different product categories (Erdem, 1998; Erdem and Sun, 2002).

The spillover effect occurs when consumer beliefs about one brand are influenced by consumer perceptions about another brand (Janakiraman et al. 2009). It refers to the situation “in which information influences beliefs that are not directly addressed in a communication” (Roehm and Tybout, 2006). The magnitude of this effect depends on how strongly the crisis and the brand are associated (Lei et al., 2008). A considerable number of studies have examined the spillover effect from one brand to another or between a parent brand and an extended brand within the same category (Aaker, 1991). For instance, Balachander and Ghose (2003), using scanner panel data on two product categories and in two geographical markets, found evidence
for a significantly higher reciprocal spillover effect (from extended brand to parent brand) than a forward effect (from parent brand to extended brand). Another research stream has demonstrated the spillover effect of an umbrella brand within a brand family. For example, Erdem and Sun’s (2002) study has acknowledged that an umbrella brand’s performance in one product category can impact its performance in a second product category. Janakiraman (2009) found that the spillover effect from one brand to another likely occurs when these two brands are perceived similarly.

In the context of product recalls, previous studies mainly examined the spillover effect within the recalling company. This stream of literature focuses on the spillover effect between brand attributes. (e.g., Ahluwalia et al., 2001), between products within a brand family (e.g., Lei et al., 2008), between brands in the same product category (e.g., Roehman and Tybout, 2006, Zhou et al., 2019), and between product categories (e.g., Erdem and Sun, 2002). For example, Ahluwalia et al.’s (2001) study has revealed that negative information can spill over from one product attribute to another when consumers are not familiar with the brand. Lei et al. (2008) have demonstrated that product recalls associated with a sub-brand can negatively spill over to its parent brand when there is a strong association between the sub-brand and its parent brand. Roehm and Tybout (2006) have also provided evidence that a scandal is likely to spill over when the scandal-affected company is typical of the category and the scandal relates to a highly associated attribute within the category.

Previous studies have investigated the spillover effect in food industry, however, they demonstrate inconsistent results. A study by Mackalski and Belisle (2015) examined the Land O'Lakes product recall case using grocery store panel data and found that a negative spillover effect only affects private label brands within the same brand industry and does not spread to
competitive brands. However, Zhao et al. (2011), using a scanner panel data set that includes consumer purchase history affecting the Kraft Foods peanut butter recall in June 1996, found that rival brands can benefit from the product-harm crisis. Findings from studies, examining the spillover effect across rival brands in the same product category, also demonstrate mixed findings. Based on the evidence from the automobile industry, Jarrell and Peltzman (1985) demonstrated a negative spillover effect on the stock market. However, Barber and Darrough (1996) did not find a spillover effect on shareholder value when analyzing product recalls from 1973 to 1992. In addition, in a recent study, Liu and Varki (2021) found that a negative spillover effect occurs when a recalling firm has high corporate product reliability. Thus, there is no conclusive evidence about the relationship between a product recall announcement and abnormal stock returns for rivals. Furthermore, inconsistent findings require investigation of additional boundary conditions that affect rivals’ shareholder value.

Although prior studies have investigated boundary conditions moderating the effect of a product recall on competitive brands’ shareholder value, such as corporate product reliability (Liu and Varki, 2021), similarity with the crisis-affected brand (Janakiraman et al., 2009; Seo et al., 2014; Trump and Newman, 2017), the similarity between the brands on a scandal attribute (Roehm and Tybout, 2006), similarity when the brands are from the same country (Borah and Tellis, 2016), none of these have considered a rival firm’s competitive actions, which are driven by awareness of the product recall, a firm’s motivation to respond, and capability to respond (Shi et al., 2022). Table 1 illustrates the summary of findings from the research stream related to the brand spillover effect to demonstrate the intended contribution of the present study. These studies largely rely on evidence from the automotive and hospitality industries and mainly investigate the consumers’ response to a rival brand after a product recall.
<table>
<thead>
<tr>
<th>Authors</th>
<th>Context</th>
<th>Industry</th>
<th>Outcome Variable</th>
<th>Key Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jarrell and Peltzman</td>
<td>Product recall</td>
<td>Drugs, automotive</td>
<td>Shareholder wealth</td>
<td>Product recall has a negative spillover effect on competitor firms.</td>
</tr>
<tr>
<td>(1985)</td>
<td></td>
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</tr>
<tr>
<td>Barber and Darrough</td>
<td>Product recall</td>
<td>Automotive</td>
<td>Shareholder wealth</td>
<td>Product recall announcement does not significantly affect the shareholder value of competitor firms.</td>
</tr>
<tr>
<td>(1996)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Roehm and Tybout</td>
<td>Brand scandal</td>
<td>Athletic shoes,</td>
<td>Brand attitude</td>
<td>A scandal will spill over and influence beliefs about a product category when the scandal affected company is typical of the category and the scandal touches on an attribute that is strongly associated with the category. Attitudes and beliefs toward the brand will be more favorable if a competing brand denies a scandal spillover.</td>
</tr>
<tr>
<td>(2006)</td>
<td></td>
<td>Restaurant</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lei, Dawar, and Lemmink</td>
<td>Product-harm</td>
<td>CPG</td>
<td>Brand evaluation</td>
<td>A brand's association strength and direction determine the magnitude of spillover between brands.</td>
</tr>
<tr>
<td>(2008)</td>
<td>crisis</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Zhao, Zhao, and Helsen</td>
<td>Product-harm</td>
<td>CPG</td>
<td>Brand choice</td>
<td>During and after a product-harm crisis consumer are more sensitive to quality and less sensitive to advertising and price. Competing brands can benefit from a product-harm crisis.</td>
</tr>
<tr>
<td>(2011)</td>
<td>crisis</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Seo et al. (2014)</td>
<td>Food crisis</td>
<td>Restaurant</td>
<td>Shareholder wealth</td>
<td>Negative spillover effect is stronger if the crisis occurred closer in time, similar in nature, and accompanied with no recall execution.</td>
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</tr>
<tr>
<td>Authors</td>
<td>Context</td>
<td>Industry</td>
<td>Outcome Variable</td>
<td>Key Findings</td>
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<tr>
<td>Mackalski and Belisle (2015)</td>
<td>Product recall</td>
<td>CPG</td>
<td>Sales</td>
<td>Negative spillover effect occurs within the same brand industry ad to private label brands, but does not affect competing brands.</td>
</tr>
<tr>
<td>Borah and Tellis (2016)</td>
<td>Product recall</td>
<td>Automotive</td>
<td>Online chatter, shareholder wealth</td>
<td>Negative online chatter on a product recall spills over to rival brands, affects stock market performance and brand sales. The halo effect is stronger from a dominant brand to a less dominant one, between brands of the same country, and higher when apology advertising is being used.</td>
</tr>
<tr>
<td>Liu and Varki (2021)</td>
<td>Product recall</td>
<td>Automotive</td>
<td>Shareholder wealth</td>
<td>A firm with higher corporate product reliability more hurts the market value of its competitor. The negative spillover effect is weaker for competitors with higher corporate product reliability. Product recalls made by firms with higher corporate product reliability exert a negative spillover on the competitor’s market value in the event of the competitor’s new product pre-announcement after the recall. This effect is attenuated by the strength of the competitor’s corporate product reliability. The recalling firm’s reputation is hurt by recall frequency and recall volume.</td>
</tr>
<tr>
<td>Giannetti and Srinivasan (2021)</td>
<td>Product recall</td>
<td>Automotive</td>
<td>Sales volume</td>
<td>Brand-level (country-level) recalls hurt (benefit) the sales of non-recalled products. Higher advertising and price of non-recalled products weaken the negative effect of brand-level recalls, while lower advertising and price strengthen the positive effect of country-level recalls. Finally, firm-level recalls result in positive spillovers when advertising is high.</td>
</tr>
</tbody>
</table>
Table 1 (Continued)

<table>
<thead>
<tr>
<th>Authors</th>
<th>Context</th>
<th>Industry</th>
<th>Outcome Variable</th>
<th>Key Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seo et al. (2021)</td>
<td>Food crisis</td>
<td>Restaurant</td>
<td>Perceived risk, visit attention</td>
<td>Stronger negative spillover effect was found among high equity brands (High to High compared to Low to Low) and when association strength was high rather than low.</td>
</tr>
<tr>
<td>Wu et al. (2021)</td>
<td>Product-harm crisis</td>
<td>Mobile phones</td>
<td>Brand attitude</td>
<td>When the brands’ perceived similarity is high, the spillover effect of a product-harm crisis is greater for consumers with interdependent self-construal.</td>
</tr>
<tr>
<td>Present study</td>
<td>Product recall</td>
<td>Food retailers</td>
<td>Shareholder wealth</td>
<td>Negative spillover effect is mitigated by pre-recall media announcements, rival’s resource slack. The effect is stronger for recalls with high hazard severity.</td>
</tr>
</tbody>
</table>
This study contributes to the literature examining spillover effect after product recall by providing evidence that the food retailer’s product recall announcement decreases the shareholder value of other food retailers. However, product recall high media coverage prior its official announcement and rival food retailer’s resource slack mitigate this negative effect. In addition, product recalls with high hazard severity have a negative effect on the financial value of rival food retailers.

**Theoretical foundation and hypotheses development**

The accessibility–diagnosticity framework (Feldman and Lynch 1988) explains the impact of any piece of information stored in an individual’s memory on any evaluation that individual makes. A theory proposes that if an individual perceives brand A as a diagnostic of brand B, the individual will infer perception of brand B from brand A evaluation. This inference occurs only when both brands and their quality perceptions are accessible at the same time (i.e., recalled from memory). In addition, the effect is stronger when there is strong associations’ strength between brand A and brand B as opposed to when the associations are weak. Prior studies have adopted the accessibility-diagnosticity framework to explain the negative spillover effect during product-harm crises (e.g., Roehm and Tybout, 2006; Borah and Tellis, 2016).

According to the efficient market hypothesis, stock prices reflect all publicly available information about a company's future earnings (Mackinlay, 1997). In other words, when a firm experiences a product recall, investors may update their expectations and the firm’s stock price after receiving the news. They also publish their expectations about future cash flows, which reflect firm value (Srivastava et al., 1998).
The results of prior research suggest that a product crisis affecting a rival firm can impact market value of firms perceived by investors to be similar to the crisis-affected firm, such as firms in similar industries (Zuckerman, 2012). The literature defines two types of effects depending on the crisis perception. If investors perceive a negative event as unique, a competition effect is likely to take place (Roehm and Tybout 2006). In this case, investors will not expect similar negative events at rival firms. Furthermore, some rival firms can experience growing demand for their products. On the contrary, if a negative event is perceived as systematic, a contagion effect takes place (Kashmiri et al., 2017). Due to the industry-wide problem, investors are likely to expect a similar negative event at rival firms, resulting in their market value decline (Seo et al., 2014). For example, the Volkswagen recall in 2015 due to violated emissions standards affected other German automakers such as Mercedes Benz and BMW. Thus, the spillover effect may affect investors’ attitude towards rival food retailers after the product recall announcement. Based on the preceding discussion, I hypothesize:

**H1:** A food retailer’s product recall announcement will diminish the shareholder value of rival U.S. food retailers.

**Impact of pre-recall media coverage on abnormal returns of rival food retailers**

Media plays an important role in disseminating information, and investors mostly receive information about product recall from the news media. Expectancy violations theory states that violations of an expectation attract greater attention because of their salience and deviance (Floyd and Voloudakis, 1999). Consequently, shareholders are more likely to pay attention to product recalls that receive high media coverage. Furthermore, grounded in the accessibility-diagnosticity perspective, expectations from an offending firm performance can spill over to rivals and impact their shareholder value.
According to federal law, a company that conducts a product recall has to issue a press release in the news media (www.grocerydive.com). However, the Center for Science in the Public Interest states that only a small number of recalls receive media attention. Product recall low media coverage is viewed as a lack of motivation and capability to deal with product safety problems, resulting in a loss of more value for the firm (Eilert et al., 2017). By contrast, proactive recall announcements associated with high media coverage signal to the stock market that the recalling firm is attentive to safety concerns and cares about the well-being of its consumers. Therefore, investors of rival retailers may perceive these product recalls more favorably than recalls not announced in the media. So, I can propose the following:

H2: The greater the media coverage of a focal food retailer’s product recall prior to its official announcement, the lower is the decrease in the rival food retailer’s shareholder value surrounding a focal firm’s product recall announcement.

Impact of slack resources on abnormal returns or rival food retailers

According to the resource-based view (RBV), firms can gain a competitive advantage by utilizing resources that are rare, valuable, and difficult to duplicate (Barney 2001, 2014). Organizational slack is defined as a “cushion of actual or potential resources, which allows an organization to adapt successfully to internal pressures for adjustment or to external pressures for change in policy as well as to initiate changes in strategy with respect to the external environment”. (Bourgeois, 1981 p. 30). Resources in excess of the amount necessary for the firm’s focal activities provide a greater ability to absorb any variation in the environment (Thompson, 1967). In addition, slack serves both as a stabilizing and adaptive mechanism by absorbing environmental variability (Cyert and March, 1963).
Prior literature has investigated a role of resource slack on firm performance. Findings demonstrate that slack have a positive, linear relationship with firm performance (Bromiley, 1991; Chang and Singh, 1999, Daniel et al., 2004), contributes to firm innovation (Cyert and March, 1963), and positively correlated with risk-taking (Singh, 1986). As a result, in case of a product recall, rival firms possessing higher levels of resource slack have more opportunities to mitigate the negative consequences of a product recall. Therefore, I propose:

**H3:** The rival food retailer’s resource slack will be positively associated with its shareholder value surrounding a focal firm’s product recall announcement.

*Interaction effect of product recall hazard severity and media coverage*

Recall severity refers to the degree of seriousness of its consequences from the consumer safety perspective. Investors may react differently to recalls where products pose a risk of serious health complications or even death to consumers compared to recalls where there is little chance of harm. The prospect theory, and specifically the loss aversion perspective, states that “the response to losses is stronger than the response to corresponding gains” (Kahneman and Tversky, 1979). In addition, “a change for the worse looms larger in people's minds than an equivalent change for the better” (Kahneman and Tversky, 1979). High levels of hazard lead to serious personal injury or death, resulting in losses in market share and profitability, damage to reputation, and lengthy legal proceedings (Zhao et al., 2013). Prior research has shown that severe recalls result in negative shareholders reaction (Chen et al., 2009; Liu and Shankar, 2015), while food recalls that involve less severe hazards are not strongly associated with shareholder value loss (Thomsen and McKenzie, 2001). Research findings also suggest that a product recall announcement linked to a serious hazard is more likely to gain media attention (Ni et al., 2014). In addition, recalls that cause serious injuries or deaths are more likely to be reported by the
media due to their newsworthiness (Barber and Odean, 2008). However, investors may consider product recall’s media coverage less important when recall is associated with high level of hazard. Therefore, I expect that recall announcements for more severe product safety issues result in greater shareholder disapproval. Based on accessibility-diagnosticity perspective this effect will spillover on rival food retailers. Thus, I hypothesize:

**H4:** A focal firm’s product recall hazard severity will moderate the relationship between media coverage and the rival food retailer’s shareholder value surrounding a focal firm’s product recall announcement, such that the positive relationship is weaker for product recalls with high hazard severity.

**Interaction effect of prior recalls history and product recall media coverage**

According to the accessibility-diagnosticity framework (Feldman and Lynch 1988), investors make evaluations based on the information stored in their memory. In the event of a product recall announcement, investors evaluate a rival firm’s performance based on the information they know about it to determine whether a firm meets their expectations. Knowledge about past crises is an important consideration for shareholders (Coombs, 2007). Specifically, if the rival firm has experienced a recent product recall, investors may view it as more vulnerable to the same problems experienced by focal firm.

Media coverage of the focal firm’s recall makes it more accessible in the minds of investors and public. The fact that rival firm had history of recent recall makes the focal firm’s recall event more diagnostic. As a result, investors are more likely to grow concerned that the same issue will impact the rival firm. Therefore, focal firm’s recall event with high media coverage will affect the rival’s firm having recent recalls and worsen its shareholder value.
Therefore, I hypothesize:

**H5:** A rival food retailer’s history of prior recent product recalls moderates the relationship between media coverage and rival food retailer’s shareholder value surrounding a focal firm’s product recall announcement, such that the positive relationship is weaker for rival food retailers experiencing recent product recalls.

Figures 1 and 2 illustrate the conceptual framework of current research that examines the spillover effect of a focal firm’s product recall announcement on rivals’ shareholder value as well as how rival firm-related and crisis-related factors impact the direction of shareholder value of rivals.

**Methodology**

**Sample**

The sample of the firms affected by the product recall is generated by using the product recalls announced by the Food and Drug Administration (FDA), the U.S. federal agency, which is responsible for the safety of food and medical-related products at any time between 2016 and 2021. Using the Occupational Safety and Health Administration (OSHA) classification, I included publicly listed food retailers within the 5411 Standard Industrial Classification (SIC) code. The total sample consists of 11 publicly-owned U.S. food retailers. Table 2 presents a list of retailers as well as number of product recalls per retailer. Following the guidelines for event study methodology (e.g., Srinivasan and Bharadwaj, 2004; Borah and Tellis, 2014) the study controlled for confounding events such as dividend payouts, a filing of a large damage suit, an announcement of earnings, and a change in a key executive around the window of interest. After removing confounding events, the final dataset used for the event study analysis was composed of 112 individual product recalls and 669 final observations.
Fig. 1 Conceptual model (event study)
Motivation to Respond
- Hazard Severity
- Prior Recalls History

Control Variables:
- Firm Size
- Financial Leverage
- Year

Shareholder Value of other Food Retailers

H2 (+)  H4-5 (-)

H3 (+)

Fig. 2 Conceptual model (spillover effects)
Table 2. Number of product recalls by retailer

<table>
<thead>
<tr>
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<td>Kroger</td>
<td>5</td>
<td>11</td>
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<td>2</td>
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<td>Albertsons</td>
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<td>1</td>
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<tr>
<td>Urban Tea</td>
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<td>0</td>
<td>1</td>
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<td>Whole Foods Market</td>
<td>9</td>
<td>13</td>
<td>8</td>
<td>9</td>
<td>13</td>
<td>5</td>
</tr>
<tr>
<td>Weis Market</td>
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<td>1</td>
<td>3</td>
<td>0</td>
<td>0</td>
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<td>Sprouts Farmers Market</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
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<td>Village Super Market</td>
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<td>2</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>21</strong></td>
<td><strong>35</strong></td>
<td><strong>14</strong></td>
<td><strong>14</strong></td>
<td><strong>16</strong></td>
<td><strong>12</strong></td>
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</table>

Data measures and sources

**Dependent variable**

The event study methodology estimates the abnormal movement in stock price associated with product recall at the food retailer. Our dependent variable is abnormal returns for the rival retailer associated with a focal food retailer’s recall announcement.

**Independent variables**

**Media Coverage.** A dummy variable is set to 1 if the product recall was mentioned in media before the official FDA announcement. If there was no media mention of the firm experiencing product recall prior to the official announcement, the variable was coded as 0.

**Hazard Severity.** Hazard severity is dummy coded based on a classification of recalls by the FDA. The product recall takes the value of 1 if it refers to dangerous or defective product that can cause temporary health problems, serious health problems or death. The product recall value is set to 0 if it unlikely causes any adverse health reaction, but violates FDA labeling or manufacturing laws.
**Prior Crises.** History of prior crises is coded as a dummy when the value 1 is set for the firms that experienced a product recall in a previous year, and 0 for the firms that did not recall products in a previous year.

**Slack Resources.** Having slack resources allows an organization to absorb environmental variations better (Cyert and March, 1963; Thompson, 1967). It is measured as the ratio of net cash flow to total sales.

**Control variables**

The study controlled for firm size as large firms are usually associated with greater return stability, it is measured as the natural logarithm of total assets (Woodroof et al., 2019). A firm’s leverage shows a firm’s ability to repay debt and any financial distress (Bagwhat et al., 2020), and it is measured by the ratio of long-term debt to total assets. Year dummies were added to control for unobserved time-specific factors and yearly variations. Table 3 provides an overview of all measures and their associated data sources.

**Table 3. Measurement Details**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Operationalization</th>
<th>Data Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAR</td>
<td>Standardized cumulative abnormal returns over event window</td>
<td>CRSP</td>
</tr>
<tr>
<td>Media coverage</td>
<td>Coded 1 if product recall was mentioned in media before official announcement; 0 if product recall was not mentioned in media before official announcement</td>
<td>Ravenpack</td>
</tr>
<tr>
<td>Resource slack</td>
<td>Net cash flow as a percentage of total sales (lagged 1 year)</td>
<td>COMPUSTAT</td>
</tr>
<tr>
<td>Hazard severity</td>
<td>Coded 1 if recalled product causes serious health problems (e.g., salmonella); 0 if the product violates FDA labelling</td>
<td>FDA</td>
</tr>
<tr>
<td>Prior recalls history</td>
<td>Coded 1 if food retailer experienced product recall in previous year; 0 if not</td>
<td>FDA</td>
</tr>
<tr>
<td>Firm size</td>
<td>Natural log of total assets (lagged 1 year)</td>
<td>COMPUSTAT</td>
</tr>
<tr>
<td>Leverage</td>
<td>Ratio of long-term debt to total assets (lagged 1 year)</td>
<td>COMPUSTAT</td>
</tr>
</tbody>
</table>
**Event study methodology**

For this study, the event study methodology was implemented, which is widely used in marketing research to assess the event effect of a particular event on a firm’s financial value. In marketing research, event studies have examined the effect of a firm’s announcements (e.g., new product releases, sponsorships, data breaches) and other external (e.g., product recalls, new competitors entering the market) events (Sorescu et al. 2007; Chen et al. 2009). According to this approach, an event is observed to generate a significant abnormal stock return (AR) that reflects the market’s estimate of a firm’s value in the future. The value of the abnormal return (AR) is assessed as the difference between actual stock return and expected return around the time of the event. Cumulative abnormal return (CAR) indicates the cumulative effect of the firm-specific event.

The event date was treated as the day of the recall announcement. Abnormal stock returns (ARs) of a firm i on day t were calculated as follows:

\[ AR_{it} = R_{it} - E(R_{it}) \]  

where \( R_{it} \) is the return realized by firm i on day t, and \( E(R_{it}) \) is the predicted return of the firm i on day t. The event date is marked as \( t = 0 \). In line with recent recommendations for conducting the event study, (Sorescu et al. 2017) the Fama-French-Carhart (FF4) four factor model was selected. According to this model, expected abnormal returns are calculated considering four distinct risk factors. FF4 includes \( \beta_1 \) (the estimated risk factor), factor for size, value, and momentum:

\[ E(R_{it}) = R_{ft} + \beta_1 (R_{mt} - R_{ft}) + \beta_2 (SMB_t) + \beta_3 (HML_t) + \beta_4 (UMD_t), \]  

(2)
where $R_{mt}$ is the average return of all stocks trading at time $t$, $R_f$ is the risk-free rate of return at time $t$, $SMB_t$ is the difference between rate of returns of small- and large-market capitalization stock portfolios on day $t$ (i.e., size factor), $HML_t$ is the difference between returns of high and low book-to-market stock portfolios on day $t$, $UMD_t$ is the momentum factor. Dependent variable to test the model was obtained by aggregating abnormal returns to create cumulative abnormal returns (CARs) over time windows surrounding the event ($t_1, t_2$).

$$\text{CAR} (t_1, t_2) = \sum_{t=t_1}^{t_2} AR_{it},$$

(3)

The significance and magnitude of effects are often examined across several time windows because information may reach some investors earlier and relevant information may be released over time. Scholars typically examine the relative significance of various event windows using parametric and non-parametric significance tests to determine the appropriate window as a dependent variable in cross-sectional regressions, with a preference for shorter event windows to minimize confounding variables. For the analysis, all stock returns were collected from the Center for Research in Security Prices (CRSP).

Next, abnormal returns for the day of the announcement (AR) and cumulative abnormal returns (CARs) for event windows within 2 days prior to the recall announcement and 2 days after the announcement day were examined to include potential information leakage. In some cases, the information may not be available on the day of the announcement causing investors to adjust their expectations. Table 4 presents the results of abnormal returns for different event days and windows. The results suggest that window $(0, +1)$ is the most appropriate for further cross-sectional regression analysis.
As shown in Table 4, study results indicate product recall announcement at the U.S. food retailer leads to significant shareholder value losses for other U.S. food retailers. The average abnormal stock return for the sample of food retailers on one day after the event is negative (AR = -0.34%) and it is significant for both the non-parametric Patel Z-test \((z = -4.37, p < .01)\) as well as the parametric cross-sectional t-test \((t = -3.25, p < .01)\). In addition, the results for several other windows within 2 days of the product recall announcement are also negative. It supports the premise that information might be leaked before the announcement, and it can take several days before investors are aware of the product recall. As results are negative, significant and consistent for both Patel Z-test and t-test, for the selected window \((0,1)\), there is an evidence that rival food retailers’ shareholder value diminishes during the two days including product recall announcement date. Thus, H1 is supported.

Next, I examine hypothesized predictors of the magnitude of the spillover effect using a cross-sectional panel regression model. Table 5 presents descriptive statistics and correlations for all study measures.
Table 5. Correlations with means and standard errors

<table>
<thead>
<tr>
<th></th>
<th>M</th>
<th>SD</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>CAR Window (0, +1)</td>
<td>-0.03</td>
<td>0.03</td>
<td>1.00</td>
<td>0.01</td>
<td>-0.09*</td>
<td>-0.06</td>
<td>0.04</td>
<td>0.07</td>
</tr>
<tr>
<td>2</td>
<td>Media Coverage</td>
<td>0.18</td>
<td>0.38</td>
<td>0.01</td>
<td>1.00</td>
<td>0.03</td>
<td>0.33**</td>
<td>-0.05</td>
<td>0.02</td>
</tr>
<tr>
<td>3</td>
<td>Slack</td>
<td>0.04</td>
<td>0.02</td>
<td>0.13**</td>
<td>0.03</td>
<td>1.00</td>
<td>0.06</td>
<td>-0.06</td>
<td>-0.24**</td>
</tr>
<tr>
<td>4</td>
<td>Hazard Severity</td>
<td>0.27</td>
<td>0.45</td>
<td>-0.06</td>
<td>0.33**</td>
<td>0.06</td>
<td>1.00</td>
<td>-0.04</td>
<td>-0.04</td>
</tr>
<tr>
<td>5</td>
<td>Prior Recalls</td>
<td>0.29</td>
<td>0.46</td>
<td>0.04</td>
<td>-0.05</td>
<td>-0.06</td>
<td>-0.04</td>
<td>1.00</td>
<td>0.55**</td>
</tr>
<tr>
<td>6</td>
<td>Firm Size</td>
<td>7.58</td>
<td>1.53</td>
<td>0.07</td>
<td>0.02</td>
<td>-0.24**</td>
<td>-0.04</td>
<td>0.55**</td>
<td>1.00</td>
</tr>
<tr>
<td>7</td>
<td>Leverage</td>
<td>0.28</td>
<td>1.79</td>
<td>0.05</td>
<td>-0.00</td>
<td>-0.20**</td>
<td>-0.08*</td>
<td>-0.13**</td>
<td>0.31**</td>
</tr>
</tbody>
</table>

*p < .10, **p < .05

Results of cross-sectional regression

To test the remaining hypotheses, a second stage of analysis was implemented in order to explain the magnitude and direction of shareholder value of rival U.S. food retailers after product recall announcement. The full model including all interaction effects is shown as follows:

\[
\text{Returns} = \beta_0 + \beta_1 \text{Media Coverage} + \beta_2 \text{Slack} + \beta_3 \text{Media Coverage} + \beta_4 \text{Hazard Severity} + \beta_5 \text{Media Coverage} \times \text{Hazard Severity} + \beta_6 \text{Media Coverage} \times \text{Prior Crises} + \beta_7 \text{Firm Size} + \beta_8 \text{Leverage} + \beta_9 \text{Year Dummies} + \varepsilon_1
\]

(4)

Prior to our analysis, all variables were mean centered in order to avoid multicollinearity issues. Next, the regression was run using the `xtreg` command in Stata 13.0 with “gvkey” as panel variable due to the fact that data is nested by the firm. Table 5 presents the results of cross-sectional regression covering the two days including the announcement date as the dependent variable (0, +1).
How does media coverage influence market evaluation of rivals after product recall announcement?

Having tested the impact of media coverage on abnormal returns of rivals, the results demonstrate a significant estimate with a positive coefficient ($\beta=0.009$, $z=2.02$, $p<.05$), supporting H2. Therefore, media coverage of product recall prior to its official announcement that affects a focal firm mitigates the recall’s negative impact on rivals’ market value.

How do slack resources influence market evaluation of rivals after product recall announcement?

In support of H3, there is a positive and significant effect of financial slack resources on rival firms’ abnormal returns ($\beta=0.138$, $z=2.67$, $p<.01$). It proves that investors react more favorably to rival food retailers with greater financial slack.

Does a product recall hazard severity and history of prior recalls impact the effect of media coverage on rivals’ shareholder value after product recall announcement?

Next, the study explored whether there was a significant negative interaction between product recall media coverage and hazard severity. H4 proposes that the positive effect of media coverage on rival food retailers’ shareholder value surrounding the product recall announcement will be stronger for product recalls with high hazard severity. To support this hypothesis, the results show a significant negative result ($\beta=-0.019$, $z=-3.37$, $p<.01$) for the Media Coverage*Hazard Severity interaction. Therefore, H4 is supported.
H5 predicted that a retailer’s recent history of prior recalls strengthens the negative impact of the product recall media coverage on rival food retailers’ shareholder value surrounding the product recall announcement. However, this hypothesis is not supported ($\beta=0.001$, $z=1.68$, $p=0.09$). It can be explained that some firms can learn from their past failures (Madsen and Desai, 2010). Furthermore, recent recall history may enable rival firms to develop managerial skills and knowledge in order to handle information about product recalls more effectively.

Table 5. Effects of product recall on rivals’ shareholder value

<table>
<thead>
<tr>
<th>Variable</th>
<th>Model 1 (Main Effects)</th>
<th>Model 2 (Interaction Effects)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>-0.004 0.007</td>
<td>-0.005 0.007</td>
</tr>
<tr>
<td><strong>Main Effects</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Media Coverage (H2)</td>
<td>0.002 0.003</td>
<td>0.009* 0.004</td>
</tr>
<tr>
<td>Slack (H3)</td>
<td>0.143** 0.052</td>
<td>0.138** 0.051</td>
</tr>
<tr>
<td>Hazard Severity</td>
<td>-0.004 0.002</td>
<td>0.001 0.003</td>
</tr>
<tr>
<td>Prior Recalls</td>
<td>0.004 0.003</td>
<td>-0.002 0.003</td>
</tr>
<tr>
<td><strong>Interaction Effects</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hazard Severity x Media Coverage (H4)</td>
<td>-0.019** 0.006</td>
<td></td>
</tr>
<tr>
<td>Prior Recalls X Media Coverage (H5)</td>
<td>0.001 0.006</td>
<td></td>
</tr>
<tr>
<td><strong>Controls</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Firm Size</td>
<td>0.000 0.001</td>
<td>0.000 0.001</td>
</tr>
<tr>
<td>Leverage</td>
<td>0.005 0.007</td>
<td>0.006 0.007</td>
</tr>
<tr>
<td>Year Dummies*</td>
<td>- -</td>
<td>- -</td>
</tr>
</tbody>
</table>

$R^2=0.037$  

**p<.01  *p<.05

* No Year dummies were significant.
Robustness checks

A robustness check analysis was performed to estimate the robustness of current study results. First, I re-ran the event study using multiple models: Market Model, Market-Adjusted Model, and Fama French Three Factor Model (see Table 6, Panels A, B, and C). As a result, all models demonstrate negative and significant CARs for the window (0, +1). For Market Model AR is also negative and significant for the (0,0) event window (AR= - 0.21%), according to both t-test (t= - 2.18, p<.05) and Patell Z-test ($z= - 2.10, p<.05$). The CAR is also negative and significant for the period occurring during the 0 to +2 window (t= - 2.40, p<.05, $z=-2.93$).

However, the most significant and negative results are related to the 0 to +1 event window (CAR =-0.53%, t= - 3.24, $z= - 4.49$, p<.01).

In addition, Market-Adjusted Model demonstrates negative and significant ARs for several event windows prior to and following the event, however the most negative results are for the (0, +1) event window (CAR = - 0.74%, t = - 3.42, z = - 6.58, p<.01). Finally, according to Fama-French Three Factor model, CAR for the window (0, +1) is negative and significant (CAR= - 0.51%, t = - 3.14, z = - 4.33, p<.01). These results support H1 and confirm the robustness of this study findings.
Table 6. Abnormal returns of rivals from product recall announcement (alternative models)

<table>
<thead>
<tr>
<th>Window</th>
<th>CAR</th>
<th>t-statistic</th>
<th>Patell Z</th>
</tr>
</thead>
<tbody>
<tr>
<td>(-2,0)</td>
<td>0.06%</td>
<td>0.28</td>
<td>0.88</td>
</tr>
<tr>
<td>(-1,0)</td>
<td>-0.27%</td>
<td>-1.99*</td>
<td>-1.82</td>
</tr>
<tr>
<td>(0,0)</td>
<td>-0.21%</td>
<td>-2.18*</td>
<td>-2.10*</td>
</tr>
<tr>
<td>(0,1)</td>
<td>-0.53%</td>
<td>-3.24**</td>
<td>-4.49**</td>
</tr>
<tr>
<td>(0,2)</td>
<td>-0.48%</td>
<td>-2.40*</td>
<td>-2.93**</td>
</tr>
<tr>
<td>(1,2)</td>
<td>-0.28%</td>
<td>-1.62</td>
<td>-2.07*</td>
</tr>
<tr>
<td>(2,2)</td>
<td>0.06%</td>
<td>0.57</td>
<td>1.39</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Window</th>
<th>CAR</th>
<th>t-statistic</th>
<th>Patell Z</th>
</tr>
</thead>
<tbody>
<tr>
<td>(-2,0)</td>
<td>-0.18%</td>
<td>-0.89</td>
<td>-1.27</td>
</tr>
<tr>
<td>(-1,0)</td>
<td>-0.32%</td>
<td>-3.19**</td>
<td>-3.62**</td>
</tr>
<tr>
<td>(0,0)</td>
<td>-0.28%</td>
<td>-2.81**</td>
<td>-3.20**</td>
</tr>
<tr>
<td>(0,1)</td>
<td>-0.74%</td>
<td>-3.42**</td>
<td>-6.58**</td>
</tr>
<tr>
<td>(0,2)</td>
<td>-0.73%</td>
<td>-3.46**</td>
<td>-4.91**</td>
</tr>
<tr>
<td>(1,2)</td>
<td>-0.46%</td>
<td>-2.56*</td>
<td>-3.71**</td>
</tr>
<tr>
<td>(2,2)</td>
<td>-0.01%</td>
<td>-0.12</td>
<td>0.60</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Window</th>
<th>CAR</th>
<th>t-statistic</th>
<th>Patell Z</th>
</tr>
</thead>
<tbody>
<tr>
<td>(-2,0)</td>
<td>0.17%</td>
<td>0.79</td>
<td>2.00*</td>
</tr>
<tr>
<td>(-1,0)</td>
<td>-0.21%</td>
<td>-1.52</td>
<td>-1.11</td>
</tr>
<tr>
<td>(0,0)</td>
<td>-0.16%</td>
<td>-1.68</td>
<td>-1.54</td>
</tr>
<tr>
<td>(0,1)</td>
<td>-0.51%</td>
<td>-3.14**</td>
<td>-4.33**</td>
</tr>
<tr>
<td>(0,2)</td>
<td>-0.40%</td>
<td>-2.01</td>
<td>-2.25*</td>
</tr>
<tr>
<td>(1,2)</td>
<td>-0.25%</td>
<td>-1.47</td>
<td>-1.70</td>
</tr>
<tr>
<td>(2,2)</td>
<td>0.11%</td>
<td>1.05</td>
<td>2.30*</td>
</tr>
</tbody>
</table>

**p<.01, *p<.05

Next, a regression analysis was conducted without control variables. Although control variables can enhance the internal validity of the study by reducing the impact of confounding variables and help to establish a causal relationship between variables to avoid research bias, the results without controls confirm that the findings are robust. Table 7 demonstrates that results are
consistent with the models with controls. There is a positive and significant effect of media
coverage of product recall that affects focal firm on a shareholder value of rival firms, supporting
H2 (β = 0.008, z = 1.97, p<.05). In addition, H3 is supported by demonstrating a positive and
significant effect of rival firms’ financial slack resources on abnormal returns of these firms (β =
0.136, z = 3.09, p<.01). Finally, H4 is supported by negative and significant results for the Media
Coverage*Hazard Severity interaction (β = - 0.017, z = - 3.06, p<.01).

**Table 7.** Effects of product recall on rivals’ shareholder value (without control variables)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Model 1 (Main Effects)</th>
<th>Model 2 (Interaction Effects)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Estimate</td>
<td>S.E.</td>
</tr>
<tr>
<td>Constant</td>
<td>-0.008</td>
<td>0.002</td>
</tr>
<tr>
<td><strong>Main Effects</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Media Coverage (H2)</td>
<td>0.002</td>
<td>0.003</td>
</tr>
<tr>
<td>Slack (H3)</td>
<td>0.140**</td>
<td>0.043</td>
</tr>
<tr>
<td>Hazard Severity</td>
<td>-0.004</td>
<td>0.002</td>
</tr>
<tr>
<td>Prior Recalls</td>
<td>0.001</td>
<td>0.002</td>
</tr>
<tr>
<td><strong>Interaction Effects</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hazard Severity x Media Coverage (H4)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prior Recalls X Media Coverage (H5)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>R²=0.0219</td>
<td></td>
</tr>
</tbody>
</table>

*p<.01  **p<.05

**Discussion**

This essay provided evidence of how product recall affects rival firms’ shareholder value.

This is one of the first studies, examining the interorganizational spillover effect in the food
category. Using a sample of product recalls at the U.S. food retailers, the study explored how
rival firms and recall characteristics impact changes in shareholder value after the product recall
announcement. The results show a negative and significant effect of a product recall on rival
food retailers. Using the recent AMC framework (Shi et al., 2022), this essay investigated how rival firms’ following motivational factors: how awareness of the crisis (media coverage), a rival firm capability to respond (organizational slack), and motivation to respond (hazard severity, prior recalls history) influence the direction and magnitude of the rival firm’s shareholder value after a product recall. The results of cross-sectional regression demonstrate that product recall high media coverage can mitigate the negative effect of product recall for rival food retailers. Furthermore, rivals with high resource slack have more opportunities to absorb the negative consequences of a product recall. Finally, recalls with high hazards result in greater investors disapproval.

**Theoretical implications**

The study makes important theoretical contributions to the product-harm crisis and product recall literature. First, it expands previous findings of the intra-industry spillover effect and demonstrates that product recall at the U.S. firm can hurt its rivals’ financial performance. In contrast to previous studies related to product recalls impact on competitors’ market value in the automobile industry (Jarrell and Peitzman, 1985; Barber and Darrough, 1996; Liu et al., 2021), current event study results suggest researchers need to develop a more thoughtful perspective to gain a better understanding of the spillover effects of the product recall. In addition, prior literature mainly investigated how product recalls affected the market value of the focal firm rather than rivals (Gao et al., 2015; Liu et al., 2017). Furthermore, prior research that have examined the spillover effect of product recalls on rivals’ shareholder value using event studies (Barber and Darrough, 1996; Jarrell and Peltzman, 1985; Liu et al., 2021), demonstrated inconsistent results. It indicates that the spillover effect is more complicated than expected. The
findings of this essay help researchers gain a better understanding of the interorganizational spillover effect.

Second, the findings contribute to the media literature by demonstrating the positive effect of product recall media coverage prior to its official announcement. The study provides evidence that investors see pre-recall media announcements as a signal that the firm cares about the well-being of its consumers. Only a small proportion of product recalls receive media attention before they are officially announced. Thus, minor product recalls that are not covered by the media may negatively affect rivals.

Third, study results suggest that the presence of resource slack gives investors confidence in a firm’s ability to absorb the consequences of a product recall. Study findings related to recall hazard levels rooted in prospect theory and loss aversion provide valuable insights into how investors react to recall announcements for products with different levels of hazard. Specifically, the stock market responds more strongly to recall announcements for more dangerous products. Finally, the present study extends the evidence of product recalls from the automotive, hospitality, CPG, and toy industries to food retailers and examines its unique characteristics.

**Implications for managers**

The results also have managerial implications. First, although managers may consider their competitor’s product recall irrelevant to their business, the findings demonstrate that product recall has a negative impact on rivals’ market value. For example, after Kroger voluntarily recalled specific lots of salad, other food retailers reported similar recall issues.

Second, with the growing number of product recalls in recent times, rival firms need more guidelines about what factors they should consider. The results demonstrate that pre-recall
media coverage helps reduce the negative spillover impact. Furthermore, rival firms with high resource slack have a greater ability to mitigate product recall consequences. Therefore, the managers should pay close attention to the rivals’ product recall announcements and incorporate positive information about financial performance in their press releases.

Finally, the results show that recalls with a high hazard level have a negative impact on retailers' value. Thus, retailers should take steps to ensure product safety as early as possible during product development, production, and distribution. To avoid product safety issues associated with more severe product hazards, retailers should take a more proactive role in managing their supply chain partners.

**Limitations and future research**

Although this study provides valuable insights into the intra-industry spillover effect, it still has some limitations. First, a key limitation of the present study is that it focuses only on product recalls from the U.S. food retailers. Therefore, it is recommended to replicate current findings using other retailers (e.g., department stores) and industries (e.g., drugs). Second, it focuses on firm value, however, according to Srivastava et al., 1998, there are additional measures reflecting the firm’s financial performance. For example, future researchers may investigate how product recalls affect the rival firms’ idiosyncratic and systematic risks. Furthermore, current research demonstrates that rival firms lose $2.7 million on average in shareholder value in a low margin setting. Thus, these shareholder value losses cannot be quickly made up with unit sales. Third, future investigators can examine additional factors that can impact abnormal returns, such as rivals’ marketing capability, market share, and advertising intensity. In addition, one of the important future directions is to investigate how the nature of
the recalled product (private label vs national brand) can mitigate the negative consequences of a product recall on rival retailers’ financial performance. For example, some consumers may blame the retailer for product safety issues if the recalled product has a private label. However, if the recalled product is associated with a national brand, consumers will be more likely to react negatively toward the manufacturer than the retailer. Finally, more research is needed to examine how rival firms should react to mitigate the negative consequences of a product recall. For instance, future studies can explore investors’ reactions to different types of promotions and remediation strategies, such as refunds, replacements or repairs implemented by rivals.
IV. ESSAY III

WHAT DRIVES BRAND EXTENSION SUCCESS?

EFFECTS OF PRODUCT CATEGORY SIMILARITY, BRAND LOGO SYMMETRY, AND SELF-REGULATORY FOCUS ON ATTITUDE TOWARD BRAND EXTENSIONS
Introduction

Firms often use brand extension strategies (launching a new product category with an established brand name) to increase sales volume and broaden their business opportunities. In the consumer packaged goods market, brand extensions account for almost 70% of new products (NielsenIQ, 2019). The success of Dove's brand marketing to women led it to expand its brand to men, making it the most popular American brand for men's skincare products (Statista, 2017). A vacuum cleaner producer Dyson has successfully expanded into sleek home products such as fans and humidifiers. Reese has extended its product line from peanut butter cups to dessert bars and peanut butter spread. However, only 30% of all brand extensions survive the first two years in the U.S. consumer packaged goods market (Peng et al., 2023). As a result of the high failure rate of brand extensions, marketers must gain a deeper understanding of what drives their success.

Prior research has long been devoted to understanding the factors that affect brand extension success. Over the past three decades, scholars have demonstrated that brand extensions are more likely to be accepted by consumers when they are categorized as near (similar) to the existing core product line (Aaker and Keller, 1990; Barone et al., 2000; Yeo and Park, 2006). In addition, prior brand extension research has examined how individual and brand-related factors influence the strength of the effect. For example, consumers tend to evaluate near brand extensions more favorably when parent brand quality is high (Smith and Park, 1992), when there is a positive attitude toward the parent brand (Boush and Loken, 1991; Keller and Aaker, 1992), if perceived risk is low (Nijssen and Bucklin, 1998), and if consumer innovativeness is high (Klink and Smith, 2001).
A substantial number of studies have also investigated a number of factors that influence individual acceptance, adoption, perceptions, and attitude toward brand extensions, including individual characteristics such as mood (Yeung and Wyer Jr., 2005; Barone et al., 2000), construal level (Kim and John, 2008), thinking style (Ahluwalia, 2008; Monga and John, 2007). Nevertheless, the effect of self-regulatory goals as factors that might moderate the effect of extension similarity on attitudes toward brand extension has received little attention in the marketing literature. According to regulatory focus theory, individuals pursue goals with either a promotion or a prevention focus (Higgins, 1997). People who pursue goals for promotion construe pleasure as the realization of hopes, ideals, and aspirations. Contrary to this, people who pursue goals with a prevention focus view pleasure as the attainment of security and satisfaction of responsibility. Thus, there is a reason that consumers with different regulatory focus evaluate similar (near) and dissimilar (distant) brand extensions differently.

Previous research suggested that brand extension launch consists of two basic components that influence consumer decisions: the hedonic attainment value of a new product and perceived risk/uncertainty (Yeo and Park, 2006). Earlier studies have demonstrated that prevention-focused consumers evaluate similar extensions more favorably than dissimilar extensions (Yeo and Park, 2006). Chang et al. (2011) have proposed that promotion-focused consumers favor extensions with benefit overlap, while prevention-focused consumers value category similar extensions. In addition, Kim and Park (2019) have examined the effects of thinking style and regulatory focus on brand extension judgments in cross-cultural context and found that Asians evaluate extension more favorably than Westerners when it is psychologically close and construed at a concrete level. However, there is a gap in understanding of the role of regulatory focus on the attitude toward distant brand extensions. In today's market, managers
looking to extend brands into new distant categories to create more product variety need to understand how regulatory focus can affect consumers' behavior. Therefore, it is important to study how consumers’ regulatory focus affects the success of distant brand extensions.

In order to strengthen the brand identity of a new extensions, firms often leverage the parent brand logo in addition to the brand name. Prior research has demonstrated that consumers’ brand evaluations can be affected by brand logo attributes. Scholars examined such brand logo features as shape (rounded vs. angular, Jiang et al., 2016; Lieven et al., 2015), color (black vs. colored, Bresciani and Paolo, 2017), typeface (Henderson et al., 2004; Hagtvedt, 2011), frame (Cutright, 2012; Fajardo et al., 2016; Chen, 2019). Another research stream has investigated logo design principles including complexity (Janiszewsky and Meyvis, 2001; van Grinsven and Das, 2016), stability (Rahinel and Nelson, 2016), dynamism (Caln et al., 2014), animation (Brasel and Hagtvedt, 2016), and symmetry (Luffarelli et al., 2019). Although researchers have examined consumers’ perception of brand logo from different viewpoints, the studies investigating the effect of brand logo attributes on attitude toward brand extensions are sparse. Specifically, there is a lack of understanding of the role of brand logo symmetry as a moderator affecting attitude toward brand extensions based on their similarity to the parent brand. Individuals tend to perceive symmetrical shapes as more attractive (Makin et al., 2018), however, they are also less exciting and arousing (Luffarelli et al., 2019). Therefore, it is important to study the effect of brand logo symmetry on consumers’ attitude toward near and distant brand extensions.

The purpose of this essay is to demonstrate how individuals’ regulatory focus and brand logo symmetry moderate the effect of extension similarity on attitude toward brand extensions. I use the near vs. distant extensions metaphor to indicate whether the extended product is similar to the parent brand. In an experimental study, I show that prevention-focused individuals have
less favorable evaluations of distant brand extensions compared to promotion-focused individuals. In addition, I propose that consumers have a more favorable attitude to near brand extensions with asymmetric brand logos.

The study aims to contribute to the existing literature by establishing new connections between the brand extension literature, regulatory focus literature, and brand logo literature. The findings add evidence to regulatory focus theory, by linking the role of individual’s regulatory focus to consumer response to brand extension strategy. Furthermore, the essay examines the role of brand logo symmetry on brand extension evaluation. Key managerial implications demonstrate that managers should avoid distant brand extensions for products that align with a prevention focus (e.g., insurance, healthcare products), however, distant extensions can be developed for products associated with a promotion focus (e.g., entertainment, innovative consumer products).

The essay is organized in the following way. First, I present an overview of prior literature examining the role of regulatory focus in brand extension evaluation and brand logo attributes highlighting the contribution of my current study. Second, I discuss the role of extension similarity in brand extension evaluation as well as the moderating effect of self-regulatory focus and brand logo symmetry on the relationship between extension similarity and attitude toward brand extension. Next, I report the main study and its corresponding results. Finally, I conclude with a discussion of theoretical and managerial implications and provide suggestions for future research.
Literature review

Category similarity and brand extensions evaluation

A substantial amount of research has been dedicated to the process of brand extension evaluations and found a considerable body of evidence that brand extension is likely to be evaluated more favorably if the extended category is similar to the core brand (Barone et al., 2000; Boush and Loken, 1990; Aaker and Keller, 1990; Park et al., 1991; Yeo and Park, 2006; Völckner and Satter, 2006). Using social cognition research on person impression formation, this premise is based on a two-stage processing model (Fiske et al., 1999; Fiske and Pavelchak, 1986). Aaker and Keller (1990) in their seminal work analyzed how consumers evaluated extended products from well-known brands and found that consumers rated more favorably extensions with a high fit with the parent brand as well as extensions with perceived high quality. Additionally, Park et al. (1991) found that extensions with high product feature similarity and brand consistency received the highest evaluations. Furthermore, Völckner and Satter (2006) examined the relationship between success factors and extension success to identify the potentially relevant factors of brand success. According to the authors, fit between the parent brand and the extended product, marketing support, brand conviction, and retailer acceptance of the parent brand drive brand extension success.

In addition, a separate research stream has documented the advantages and conditions of introducing distant (dissimilar) extensions. Keller and Aaker (1992) found that a successful intervening extension can improve evaluations of a proposed extension only for core brands of average quality. According to Swaminathan (2003), consumers’ experiences with an intervening extension increase their likelihood of trying a subsequent extension. In addition, Parker et al.
(2017) showed that early introductions of distant brand extensions can be more beneficial for the brand than late ones and can lead to more positive attitudes toward the brand.

**Effect of regulatory focus on brand extensions evaluation**

Prior research has also identified that brand extension fit has been associated with some boundary conditions, such as the moderating effect of self-regulatory goals (prevention focus versus promotion focus) (Yeo and Park, 2006; Shine et al. 2007; Chang et al., 2011; Kim and Park, 2019). According to Yeo and Park (2006), similar extensions are rated more favorably than dissimilar extensions for prevention-focused individuals (due to lower risk perception), however, this effect is eliminated for promotion-focused participants. The scholars observed the interaction effect between product category similarity and regulatory focus by comparing the following extensions: 1) CNN news channel with CNN weekly news magazine; 2) M&Ms sport drink with M&M chocolate cake; 3) Guess skiwear with Guess casual suit. In addition, Chang et al. (2011) based on these findings has demonstrated that promotion-focused consumers favor extensions with benefit overlap, while prevention-focused people prefer category similar extensions. A recent study by Kim and Park (2019) has examined the impact of regulatory focus on brand extension judgments for Asians and Westerners and demonstrated that Asians perceive brand extension more risky than Westerners due to their prevention focus. However, there is still a gap in understanding whether prevention and promotion-focused consumers evaluate dissimilar (distant) brand extensions differently. Chen and Bei (2020) have examined the moderating role of self-regulatory focus on the relationship between a logo frame design and attitude toward brand extensions. The scholars found that individuals with high-risk perception perceive a logo frame as protecting and thus have a more favorable attitude toward brand extensions with a complete frame due to perceived trustworthiness.
**Brand logo literature**

Brand logo literature acknowledges that consumers infer meanings from specific logo elements such as color, shape, and typeface that are transferred to brands through logo design (e.g., Hagtvedt, 2011; Lieven et al., 2015; Luffarelli et al., 2019). A separate research stream has investigated the effect of logo color on consumers' perceptions of brand image and purchase intent based on findings from color psychology (Bottomley and Doyle, 2006; Hynes, 2009; Chang and Lin, 2010; Labrecque and Milne, 2012; Lieven et al., 2015). Findings have demonstrated that firms should use logo colors that match their desired image (Bottomley and Doyle, 2006) or are consistent with their brand image (Hynes, 2009). Furthermore, Labrecque and Milne (2012) found that brand personality is influenced by color components such as hue, saturation, and value. Specifically, they revealed that saturation is positively associated with ruggedness, while value is negatively related to ruggedness. In addition, Chang and Lin (2010) argued that appropriate logo colors lead to a positive consumer evaluation of the brand image, which in turn leads to high purchase intention. Finally, a recent study by Song et al. (2022) has demonstrated that a highly colorful logo is associated with a wide variety of products.

A second stream of research has considered typeface as an important factor in influencing brand and firm perceptions (Henderson et al., 2004; Hagtvedt, 2011; Grohmann et al., 2013). For example, Henderson et al. (2004) have developed guidelines for a typeface logo design that can allow firms to achieve their communication goals. Expanding on this work, Grohmann et al. (2013) found that typeface characteristics such as harmony, naturalness, and flourish impact brand personality perception. Additionally, Hagtvedt (2011) suggested that firms with incomplete typeface logos are positively associated with innovativeness.
Finally, researchers explored the effect of brand logo shape on consumer perceptions. Prior studies have investigated the effect of rounded versus angular shapes (Jiang et al., 2016; Lieven et al., 2015), logo frames (Fajardo et al., 2016; Chen and Bei, 2020), logo size (Otterbring et al., 2018), and logo asymmetry (Luffarelli et al., 2019; Wang and Li, 2017). For instance, Lieven et al. (2015) revealed that an angular-shaped logo is associated with brand masculinity, whereas a rounded shape is likely perceived as feminine. Following this work, Jiang et al. (2016) found that circular shapes are perceived as soft, while angular shapes are associated with hardiness. Regarding the logo frames, Fajardo et al. (2016) suggested that the logo frame is perceived as protecting or defining based on the associated level of risk and therefore can influence consumer evaluations. Recently, Otterbring et al. (2018) found that when physically dominant male employees are present in a store, male customers are more likely to buy products with large logos. Several recent studies have also examined the effect of brand logo asymmetry on brand perceptions and reported that asymmetric brand logos generate a sense of excitement in consumers (Bajaj and Bond, 2018) and are perceived as more arousing than symmetric logos (Luffarelli et al., 2018). Furthermore, in their study, Wang and Li (2017) explored how asymmetry affected consumers' downloads of mobile applications and found that applications with slightly asymmetric designs were perceived as more attractive and dynamic, leading to a greater number of downloads.

Table 1 illustrates the summary of findings from the research streams related to the role of regulatory focus in brand extension evaluation and brand logo literature and highlights the intended contribution of the current study. The current study aims to enhance both streams by investigating the effect of brand logo symmetry on attitude toward brand extensions and demonstrate that distant
brand extensions are evaluated more favorably by individuals with a promotion focus rather than ones with a prevention focus.
Table 1. Literature on the effect of regulatory focus on brand extension evaluation and brand logo literature

<table>
<thead>
<tr>
<th>Study</th>
<th>Research Objective</th>
<th>Data (Source, Sample, Size)</th>
<th>Methods</th>
<th>Outcome Variable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research Stream 1 – Regulatory Focus Literature</td>
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<tr>
<td>Yeo and Park (2006)</td>
<td>To examine the effect of self-regulatory focus on evaluations of brand extensions (how prevention-focused individuals evaluate similar/dissimilar brand extensions)</td>
<td>Study 1 – 63 undergraduates; Study 2a – 98 undergraduates; Study 2b - 102 undergraduates; Study 3 – 108 undergraduates</td>
<td>Experiment</td>
<td>Brand extensions evaluation</td>
</tr>
<tr>
<td>Shine et al. (2007)</td>
<td>To examine brand synergy effects in multiple brand extensions evaluation</td>
<td>Study 1 – 252 undergraduates; Study 2 - 214 undergraduates; Study 3 – 193 undergraduates</td>
<td>Experiment</td>
<td>Perceived similarity in extensions, extension evaluation, purchase intent</td>
</tr>
<tr>
<td>Chang et al. (2011)</td>
<td>To examine the moderating effect of self-regulatory focus on benefit overlap and product category similarity in the context of brand extension evaluations</td>
<td>131 adults and 130 college students</td>
<td>Experiment</td>
<td>Brand extension evaluation</td>
</tr>
<tr>
<td>Kim and Park (2019)</td>
<td>To examine the effects of thinking style and regulatory focus on brand extension judgements in cross cultural context</td>
<td>Study 1 - 68 undergraduates; Study 2 – 60 undergraduates; Study 3 – 305 undergraduates</td>
<td>Experiment</td>
<td>Brand extension evaluation</td>
</tr>
<tr>
<td>Research Stream 2 – Brand Logo Literature</td>
<td></td>
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</tr>
<tr>
<td>Henderson et al. (2004)</td>
<td>To suggest guidelines for firms regarding typeface design to achieve communication goals</td>
<td>122 professional graphic designers, 336 students</td>
<td>Experiment, survey, CFA, cluster analysis, regression</td>
<td>Typeface logo dimensions</td>
</tr>
<tr>
<td>Study</td>
<td>Research Objective</td>
<td>Data (Source, Sample, Size)</td>
<td>Methods</td>
<td>Outcome Variable</td>
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<tr>
<td>Hynes (2009)</td>
<td>To investigate the relationships between brand logo color, design, and meaning and judgments of the corporate image</td>
<td>330 participants</td>
<td>Descriptive analysis</td>
<td>Perception of the corporate image</td>
</tr>
<tr>
<td>Chang and Lin (2010)</td>
<td>To examine the influence of color traits on corporate branding</td>
<td>Six focus groups, with an average of six to eight participants each</td>
<td>Focus groups</td>
<td>Perception of corporate brand identity, awareness, recognition, and purchase intent</td>
</tr>
<tr>
<td>Hagtvedt (2011)</td>
<td>To examine the impact of incomplete typeface logo on consumer perception of the firm</td>
<td>Study 1 – 207 participants; Study 2 – 135 participants; Study 3 – 120 participants</td>
<td>Experiment</td>
<td>Perceived firm trustworthiness, perceived firm innovativeness</td>
</tr>
<tr>
<td>Walsh (2011)</td>
<td>To examine consumer responses to logo redesign depending on brand commitment</td>
<td>Study 1 – 215 adults; Study 2 – 272 undergraduate students</td>
<td>Field experiment</td>
<td>Logo evaluation</td>
</tr>
<tr>
<td>Labercque and Milne (2012)</td>
<td>To examine how color impacts consumers’ reactions such as purchase intent, familiarity, likeability, personality perceptions</td>
<td>Study 1 – 279 undergraduates; Study 2 – 336 undergraduates; Study 3 – 122 undergraduates; Study 4 – 450 U.S. residents</td>
<td>Experiment</td>
<td>Perceived brand personality, purchase intent, familiarity, likeability</td>
</tr>
<tr>
<td>Ridgway and Myers (2014)</td>
<td>To examine the effect of brand logo color on perception of brand personality</td>
<td>Pilot – 20 participants; Main study – 184 participants</td>
<td>Descriptive analysis, Snowball sampling from Facebook, Survey</td>
<td>Perception of brand personality</td>
</tr>
<tr>
<td>Study</td>
<td>Research Objective</td>
<td>Data (Source, Sample, Size)</td>
<td>Methods</td>
<td>Outcome Variable</td>
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<tr>
<td>Lieven et al. (2015)</td>
<td>To examine the impact of brand design elements (logo shape, brand name, type color and font) on brand gender preferences and brand equity</td>
<td>Study 1 – 548 participants; Study 2 – 657 participants; Study 3 – 1,103 participants; Study 4 – 413 participants</td>
<td>Experiment</td>
<td>Gender perceptions, brand equity</td>
</tr>
<tr>
<td>Jiang et al. (2016)</td>
<td>To examine how circular vs angular logo shapes impact consumers’ perception of company’s product attributes</td>
<td>Study 1 – 109 undergraduates; Study 2 – 69 undergraduates; Study 3 – 306 undergraduates; Study 4 – 95 MTurk participants; Study 5 – 231 undergraduates</td>
<td>Experiment</td>
<td></td>
</tr>
<tr>
<td>Wang and Li (2017)</td>
<td>To examine the effect of app icon on consumers’ download behavior</td>
<td>725 apps within 19 categories</td>
<td>Random effect model</td>
<td>Number of downloads</td>
</tr>
<tr>
<td>Bajaj and Bond (2018)</td>
<td>To analyze the relationship between logo design symmetry and brand personality</td>
<td>Study 1 – 147 undergraduates; Study 2 – 152 MTurk participants; Study 3 – 102 MTurk participants; Study 4 – 193 undergraduates</td>
<td>Experiment, Survey</td>
<td>Personality dimensions (excitement)</td>
</tr>
<tr>
<td>Otterbring et al. (2018)</td>
<td>To examine the impact of a physically dominant male employee on male customers’ status-signaling consumption</td>
<td>Pilot study – 380 undergraduates; Study 1 – 369 customers; Study 2a – 114 undergraduates; Study 2b – 292 undergraduates; Study 3 – 473 undergraduates</td>
<td>Field study, experiment, survey</td>
<td>Total amount spent, avg price per item, logo size preference, preference for status-signaling goods</td>
</tr>
<tr>
<td>Study</td>
<td>Research Objective</td>
<td>Data (Source, Sample, Size)</td>
<td>Methods</td>
<td>Outcome Variable</td>
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<tr>
<td>Luffarelli et al. (2019)</td>
<td>To examine the interaction between logo symmetry and brand personality that affects brand equity</td>
<td>Study 1a – 306 MTurk participants; Study 1b – 220 MTurk participants; Study 2a – 230 MTurk participants; Study 2b – 140 MTurk participants; Study 3 – 100 firms, 14,516 U.S. consumers’ brand evaluations, 202 MTurk participants</td>
<td>Experiment, ANOVA, Regression analysis</td>
<td>Brand evaluation</td>
</tr>
<tr>
<td>Song et al. (2022)</td>
<td>To examine the effect of logo colorfulness on attitude toward a brand</td>
<td>Study 1 – 126 MTurk participants; Study 2a – 202 MTurk participants; Study 2b – 183 undergraduates; Study 3 – 403 MTurk participants</td>
<td>Experiment</td>
<td>Consumer attitudes</td>
</tr>
</tbody>
</table>
Conceptual background

Extension similarity and attitude toward brand extensions

A substantial amount of research has shown that consumers judge brand extensions in two stages: categorization and evaluation. Categorization theory states that people tend to simplify and interpret a complex environment by organizing objects into categories (Sujan, 1985; Ozzanne et al., 1992). A fundamental assumption of categorization theory is the similarity between the category and the object. Individuals tend to categorize similar objects together and separate dissimilar objects into different categories (Medin et al., 1993).

Taking this theory further, it has been argued that brands can be considered as categories in the context of brand extensions (Aaker & Keller, 1990; Boush, 1993). Thus, consumers first categorize the new extension based on its similarity to the parent brand and then evaluate it based on associations with the parent brand. As long as consumers perceive high levels of similarity between the extension and the parent brand and the extension is favorably categorized into the parent brand category, consumers evaluate it based on associations with the parent brand.

Prior brand extension research provides considerable evidence that consumers tend to evaluate new brand extensions based on their similarities to the parent brand (Aaker & Keller, 1990; Park et al., 1991; Barone, 2005; Boush and Loken, 1991). Specifically, a parent brand and new extension may be assessed based on whether they belong to similar product categories. Research has shown that a similar extension of a brand is perceived more positively than a dissimilar one. It is more likely that consumers prefer extensions whose product categories are similar to those of their parent brands because it is easier to generalize brand images to new extensions that belong to similar product categories (Boush and Loken 1991). For example, Dove
brand has been successfully extended from body soap to shampoo, conditioner, body wash, lotion, and deodorant because these extensions have similar product associations with the parent brand, such as mildness, and cleanliness.

However, brand extension will not inherit associations related to the parent brand if there is little similarity between them, as consumers might consider new extension performance risky (Krishna et al., 2010). Therefore, consumers might not evaluate extended product favorably during the evaluation stage. For instance, Arm & Hammer has successfully extended its product range from baking soda to laundry detergents, carpet deodorizers, and cat litter due to associations with heavy-duty cleaning supplies, however, consumers did not accept a new deodorant spray due to its low similarity with the parent brand. Based on the preceding arguments, the following hypothesis is proposed:

**H1:** Individuals will hold a more favorable attitude toward near brand extensions.

**Moderating effect of regulatory focus**

The regulatory focus theory (Higgins 1997) explains how people regulate themselves during goal pursuit. Lee and Higgins (2009) argue that consumers' motivational systems and self-regulation goals influence their process of processing information and making choices. In terms of personal goals, people have a self-regulatory system that regulates their perceptions, attitudes, and behaviors (Higgins 1997, 2002). Two regulatory orientations are distinguished in the theory: promotion-focused and prevention-focused. It is common for people who need nourishment to survive (i.e., promotion-oriented) to focus on gaining and avoiding non-gains,
while people who need security (i.e., prevention-focused) control their behavior, attitudes, and perceptions in order to avoid losses (Higgins, 1997, 2002; Lee and Higgins, 2009). A promotion focus emphasizes people's aspirations and their "ideal" selves, favoring strategies based on eagerness. In contrast, a prevention focus emphasizes the person's obligations and responsibilities and encourages vigilance. Therefore, a promotion focus emphasizes positive outcomes and minimizes omissions (e.g., not taking advantage of opportunities for advancement), while a prevention focus is characterized by the absence of negative outcomes and minimizing errors of commission (e.g., committing mistakes) (Higgins 1997).

Prior research has established that consumers’ regulatory focus can influence the effect of extension fit and therefore affect consumers’ judgments toward brand extensions (Yeo and Park, 2006; Chang et al., 2011). Yeo and Park (2006) proposed that brand extension consists of two basic components that influence consumer decisions: the hedonic attainment value of a new product (i.e., how much consumers enjoy it when the product is of high quality) and perceived risk/uncertainty (i.e., a new product's likelihood of lacking quality). A new extension can result in hedonic attainment value as it provides consumers with an additional opportunity to enjoy a favorite brand in a new product category. In this case, a new extension may evoke a positive reaction, including joy and excitement. Thus, the perceived hedonic value of an extension product should be particularly important to promotion-focused consumers given their sensitivity to potential gains. On the contrary, consumers may feel uncertainty when an extension is not similar to the parent brand category because the parent brand quality might not be transferable (Yeo and Park, 2006). Therefore, if an extension is perceived to be dissimilar to its parent brand, consumers might perceive high risks when purchasing it, and evaluate the extension less favorably (Krishna,
et al., 2010; Morrin and Ratneshwar, 2003). Based on the preceding discussion, the following hypothesis is proposed:

**H2:** The effect of extension similarity on attitude toward the brand extension is moderated by individuals’ regulatory focus, such that promotion-focused individuals will hold a more favorable attitude toward distant brand extensions.

**Moderating role of brand logo symmetry in evaluations of brand extensions**

A brand logo is a complex stimulus consisting of numerous visual features that communicate a brand's meaning. A brand logo is a visual cue that helps consumers identify the firm and its products among others (Kim and Lim, 2018). Logo design helps consumers become familiar with brands (e.g., Noble et al., 2013; Tavassoli and Lee, 2003; van Grinsven and Das, 2016), and elicit certain meanings based on logo attributes (typeface, shape, and color). Prior research has demonstrated that an incomplete typeface logo has a negative impact on perceived firm trustworthiness and innovativeness for consumers with a prevention focus, however, this type of logo is positively perceived by promotion-focused consumers due to perceived ambiguity (Hagtvedt, 2011). Lieven et al. (2015) have found that a bold logo shape increases masculinity perceptions, while a slender and round shape increases femininity perceptions. Moreover, Ridgway and Myers (2014) have revealed that consumers’ perceptions of brand personality are based on color perceptions (e.g., yellow and pink – excitement, green – ruggedness, blue/red – competence). A recent study by Song et al. (2022) rooted in the associative network model of human memory has shown that a high colorful logo is associated with a high variety of products.

Brand logo symmetry is typically defined as “the level of reflection of an image around its vertical axis” (Bettels and Wiedmann, 2019). Existing research has revealed that symmetric forms create the impression of structure and calm (Creusen et al., 2010), while asymmetry is
associated with arousal (Krupinski and Locher, 1988). In addition, prior literature has demonstrated that consumers react favorably to brands with asymmetric (vs. symmetric) brand logos (Luffarelli et al., 2019) or perceive a firm with an incomplete typeface logo as innovative (Hagtvedt, 2011). This is because the incomplete logo is perceived as creative and interesting in consumers’ eyes (Hagtvedt et al., 2008). In terms of brand extensions, the halo or spillover effect of parent brand logo design perception may impact consumers’ attitudes toward new extended products. However, consumers may transfer the image of the parent brand to the new product only if there is a high perceived similarity between the parent brand and the new extension (Keller and Aaker, 1992). Due to the perception of asymmetric brand logos as more exciting and innovative and the spillover effect, consumers can positively react to near brand extensions with asymmetric brand logos. Thus, I predict:

\textbf{H3:} The effect of product category similarity on attitude toward the brand extension is moderated by brand logo symmetry, such that individuals will hold a more favorable attitude toward near brand extensions with asymmetric brand logos than symmetric ones.

Figure 1 presents the conceptual model for the study.

\textbf{Method}

\textit{Pre-test}

A pre-test was conducted to verify that stimuli represent near and distant brand extensions and that proposed logo designs suit my research purposes. In total, 28 U.S. based participants were recruited from Prolific for monetary compensation. The participants evaluated the product similarity of the parent brand and possible extensions for the chocolate product (1 = very dissimilar, 7 = very similar). Next, a fictitious logo for a fictitious brand was designed to control for the possible confounding effect of design features and brand preferences (see Appendix A). Each participant was randomly shown one logo, either the symmetric or
Fig. 1 Conceptual model
asymmetric version of the logo designs, and was asked to rate perceived logo symmetry (1 = perfectly asymmetric, 9 = perfectly symmetric) and logo liking (1 = dislike extremely, 9 = like extremely). Furthermore, the participants were asked to indicate whether they were familiar with the logo. A logo's familiarity can influence participants' arousal and may impact their associations with it (Paasovara et al., 2012, Bettels and Wiedmann, 2019). Therefore, I included this question to avoid biased results associated with the participants’ familiarity with the logo.

The results of the pre-test have demonstrated that participants perceived a significant difference in the level of symmetry ($M_{\text{symmetry}} = 7.43$ vs $M_{\text{asymmetry}} = 3.21$; $F (1,26) = 31.15$, $p<0.001$) and no difference in terms of liking ($M_{\text{symmetry}} = 6.29$ vs $M_{\text{asymmetry}} = 5.29$; $F (1,26) = 3.81$, $p>0.05$). In addition, none of the participants was familiar with the presented brand logos. Therefore, the brand logos meet all the requirements and can be used further for the main study. The results of the extension similarity assessment are presented in Table 2. The cookies category was selected as a near brand extension, and ice tea was selected as a distant brand extension.

Table 2. Comparison among six product categories in terms of extension similarity

<table>
<thead>
<tr>
<th>Category similarity</th>
<th>Cookies</th>
<th>Oatmeal</th>
<th>Popcorn</th>
<th>Chocolate cake</th>
<th>Ice tea</th>
<th>Ice cream</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>5.50 (1.04)</td>
<td>3.50 (1.75)</td>
<td>3.25 (1.89)</td>
<td>5.36 (1.22)</td>
<td>2.43 (1.67)</td>
<td>4.79 (1.17)</td>
</tr>
</tbody>
</table>

Main Study

The main study was designed to estimate the effect of extension similarity, regulatory focus, and brand logo symmetry on attitude toward the brand extension. To test the hypotheses, I used a 2 (near brand extensions vs distant brand extensions) x 2 (symmetric logo vs. asymmetric logo) between subjects factorial design. 201 U.S. based participants were recruited from Prolific.
(50% female, mean age = 38 years) for monetary compensation. All participants were randomly assigned to one of the following conditions: (near brand extension/symmetric logo, distant brand extension/symmetric logo, near brand extension/asymmetric logo, distant brand extension/asymmetric logo).

After reviewing the scenarios (See Appendix B), participants were asked to evaluate the new extensions on the following adopted seven-point scales (1 = strongly disagree to 7 = strongly agree (1) the new brand extension will be popular in the market, (2) I am willing to recommend this new brand extension to my friends who need it, (3) the new brand extension will be popular in the market (Chen and Bei, 2020). These scores were then averaged to provide a more reliable measure of the brand extension attitude.

Next, the participants’ regulatory focus was accessed. I adapted Higgins et al. (2001) model and asked the participants to answer how frequently specific events have occurred in their lives and rate them on a five-point scale (1 = “never or seldom”, and 5 = “very often”). Six items describe a participants’ promotion focus (e.g., “Do you often do well at different things that you try?”), and five others define a prevention focus (e.g., “Growing up, would you ever “cross the line” by doing things that your parents would not tolerate?”). All measures with their response scales are reported in Appendix C.

In order to confirm regulatory focus and attitude toward brand extension scales reliability I performed CFA on a set of corresponding items. Items with standardized loadings less than 0.7 were excluded from the analysis. In the final model all items were loaded on corresponding factors with loadings equal to or above 0.7. Composite reliabilities for the latent factors are above 0.60, indicating that the measures were unidimensional. AVE for the factors are above 0.50, further supporting convergent validity (Fornell and Larker 1981). The discriminant validity
is demonstrated as the lowest AVE is higher than the squared correlation of the two most highly correlated constructs. The fit statistics indicated that the measurement model fit the data acceptably well ($\chi^2_{92} = 449.37$, root mean square error of approximation [RMSE] = 0.146, standardized root mean square residual [SRMR] = 0.161, comparative fit index [CFI] = 0.74, Tucker-Lewis Index [TLI] = 0.70). Item wording, standardized factor loadings, and scale composite reliabilities are presented in Table 3.

According to Higgins et al. (2001) procedure, total scores for prevention and promotion will be summed up, promotions sums were divided by four, and prevention sums were divided by three in order to place scores for both orientations on the same 1-5 scale. The net difference between these measures represent regulatory focus, with high scores indicative of a relatively stronger promotion orientation. Finally, the participants were asked to answer demographic questions to control age and gender.

**Results**

*Manipulation check*. First, I conducted a manipulation check to confirm the participants’ perception of brand logo symmetry. The results proved the findings of the pre-test and showed a significant difference in symmetry perception ($M_{symmetry} = 8.09$ vs $M_{asymmetry}=3.54$; $F (1,181) =255.91$, $p<0.001$). Second, I confirmed that manipulation of extension similarity was successful. Participants perceived near extension (cookies) as more similar to the parent brand than when it was distant extension (ice tea) ($M_{near} = 5.33$ vs $M_{distant} = 2.18$, $F (1,181) =249.93$, $p<0.001$).
Table 3. Confirmatory Factor Analysis and Measurement Properties of the Scales

<table>
<thead>
<tr>
<th>Scale</th>
<th>Standardized Loading</th>
<th>t-value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Attitude toward brand extension</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. The new brand extension will be popular in the market</td>
<td>0.96</td>
<td>77.6</td>
</tr>
<tr>
<td>2. I am willing to recommend this new brand extension to my friends who need it</td>
<td>0.94</td>
<td>68.0</td>
</tr>
<tr>
<td>3. The new brand extension will be popular in the market</td>
<td>0.84</td>
<td>35.4</td>
</tr>
<tr>
<td><strong>Promotion regulatory focus</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. How often have you accomplished things that got you &quot;psyched&quot; to work even harder?</td>
<td>0.73</td>
<td>15.3</td>
</tr>
<tr>
<td>2. Do you often do well at different things that you try?</td>
<td>0.73</td>
<td>15.2</td>
</tr>
<tr>
<td>3. When it comes to achieving things that are important to me, I find that I don't perform as well as I ideally would like to do (reversed)</td>
<td>-0.67</td>
<td>-12.6</td>
</tr>
<tr>
<td>4. I feel like I have made progress toward being successful in my life</td>
<td>0.71</td>
<td>14.5</td>
</tr>
<tr>
<td><strong>Prevention regulatory focus</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Growing up, would you ever “cross the line” by doing things that your parents would not tolerate? (reversed)</td>
<td>0.86</td>
<td>27.4</td>
</tr>
<tr>
<td>2. Did you get on your parents’ nerves often when you were growing up? (reversed)</td>
<td>0.81</td>
<td>23.1</td>
</tr>
<tr>
<td>3. Growing up, did you ever act in ways that your parents thought were objectionable? (reversed)</td>
<td>0.84</td>
<td>26.0</td>
</tr>
</tbody>
</table>

Note: Model fit statistics: $\chi^2_{27}= 449.37$, root mean square error of approximation = 0.146, Tucker-Lewis index = .70, comparative fit index = 0.74.

a. Attitude to brand extensions: item scores range from 1 (strongly disagree) to 7 (strongly agree).
b. Regulatory focus: item scores from 1 (never or seldom) to 5 (very often)
Moderating effect of regulatory focus.

94 promotion-focused and 89 prevention-focused individuals were identified. 18 participants, whose promotion and prevention focus were equal, were excluded from further analysis. The promotion-focused participants had higher promotion scores than prevention-focused people did (\(M_{\text{promotion}} = 3.5\) vs \(M_{\text{prevention}} = 2.98\), \(F (1,181) = 28.78, p < 0.001\)). The prevention-focused participants had higher prevention scores than the promotion-focused individuals did (\(M_{\text{promotion}} = 2.66\) vs \(M_{\text{prevention}} = 3.87\), \(F (1,181) = 148.36, p < 0.001\)). The gender effect was checked to make sure there were no confounding effects on attitudes toward brand extensions (\(F (1, 181) = 0.83, P > 0.05\)).

Next, I conducted a 2 (regulatory focus: promotion vs prevention) \(\times\) 2 (extension type: near vs distant) ANOVA, in which regulatory focus and extension type were between-subject variables. The main effect of the extension type was significant (\(M_{\text{near}} = 3.92, M_{\text{distant}} = 5.83, F (1, 181) = 107.61, p < 0.001\)). Using the planned contrast analysis, I found that participants had more positive attitudes toward near brand extensions than distant brand extensions (\(t (181) = 10.37, p < 0.001\)). These findings support H1. The interaction between the extension type and the regulatory focus was also significant (\(F (1,179) = 4.27, p < 0.05\)). Therefore, there is a significant difference in preference between promotion-focused and prevention-focused individuals for distant brand extensions. The planned contrast analysis was performed to assess whether the differences between promotion-focused and prevention-focused individuals were significant for near and distant brand extensions. The results demonstrate that prevention-focused individuals have a less favorable attitude toward distant brand extensions than promotion-focused participants (\(M_{\text{promotion}} = 4.25\) vs \(M_{\text{prevention}} = 3.62, t (88) = -2.18, p < 0.05\)). However, there is no significant difference between promotion-focused and prevention-focused participants for near
brand extensions ($M_{promotion} = 5.65$ vs $M_{prevention} = 5.70$, $t (91) = 0.30$, $p = 0.77$). The results are presented in Table 4 and Figure 2. These findings confirm the moderating role of individuals’ regulatory focus, and H2 is supported.

**Table 4.** Attitude Toward Brand Extension as a Function of Brand Extension Similarity and Regulatory Focus

<table>
<thead>
<tr>
<th></th>
<th>Near extension</th>
<th>Distant Extension</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Promotion focus (n=43)</td>
<td>Prevention focus (n=50)</td>
</tr>
<tr>
<td>Attitude toward brand extension</td>
<td>5.65 (0.17)</td>
<td>5.70 (0.16)</td>
</tr>
<tr>
<td>$t$</td>
<td>0.30, n.s.</td>
<td>-2.18, p&lt;0.05</td>
</tr>
</tbody>
</table>

*Notes:* Numbers in parentheses represent standard deviations; *n.s.* = not significant.

Fig. 2. Interaction effect of extension similarity and regulatory focus on attitude toward brand extension
**Moderating effect of brand logo symmetry**

I performed a 2 (logo: symmetric vs asymmetric) × 2 (extension type: near vs distant) ANOVA, in which logo and extension type were between-subject variables. The interaction between the extension type and the type of brand logo was non-significant ($F(1, 179) = 1.62, p = 0.21$). For distant brand extensions ($M_{symmetric} = 4.10$ vs $M_{asymmetric} = 3.79$, $t(88) = -1.08$, $p = 0.26$) and for near brand extensions ($M_{symmetric} = 5.62$ vs $M_{asymmetric} = 5.73$, $t(91) = 0.66$, $p = 0.28$). Therefore, H3 is not supported. Figure 3 displays the results.

![Interaction effect of extension similarity and logo symmetry on attitude toward brand extension](image)

Fig. 3. Interaction effect of extension similarity and logo symmetry on attitude toward brand extension

**General discussion**

In the last three decades, researchers have investigated the importance of brand extension similarity as one of the crucial factors of brand extension success (e.g., Aaker and Keller, 1990; Barone et al., 2000; Boush and Loken, 1991; Broniarczyk and Alba, 1994; Park et al., 1991; Yeo and Park, 2006; Zhang and Sood, 2002). The essay found that consumers evaluate near (similar) brand
extensions more favorably than distant (dissimilar) ones. It confirms the robustness of the parent brand-extension similarity effect presented in the brand extension literature. In addition, the research has examined the moderating role of regulatory focus in the relationship between extension similarity and attitude toward brand extensions. Although Yeo and Park (2006) have suggested that prevention-focused consumers are likely to evaluate dissimilar extensions less favorably than similar ones, the results of the existing study show that promotion-focused consumers also have a more favorable attitude toward distant brand extensions than prevention-focused individuals, whereas they are equally responsive to near brand extensions. To my knowledge, this finding has not been reported before.

**Theoretical Implications**

The existing brand extension literature has reported the impact of the similarity effect on brand extension evaluations, however, there is a limited investigation of self-regulatory focus as a moderator for the effect. This essay aims to examine not only the extension similarity effect but also to demonstrate how brand extension similarity influences attitude toward brand extensions depending on the level of individuals’ self-regulatory focus. First, the study contributes to the brand extension literature by inferring that brand extension similarity to the parent brand is a driver of brand extension success. This finding is consistent with prior research that shows that category similarity is an important consideration for consumer evaluation of brand extensions (Barone et al., 2000; Boush and Loken, 1990; Aaker and Keller, 1990; Park et al., 1991; Yeo and Park, 2006; Völckner and Satter, 2006).

Second, the findings contribute to the research stream that examines personal differences in consumer evaluations of brand extensions. Specifically, the study enhances the regulatory
focus literature by adding evidence to existing research that individuals’ regulatory focus plays an important role in their attitude toward extended product and consequently brand extension success. Third, it establishes the linkage between brand extension and regulatory focus literature. Grounded on the findings from Yeo and Park (2006) that promotion-focused individuals allocate a greater weight to the perceived hedonic value while prevention-focused individuals assign more weight to the perception of risk, the study findings demonstrate that promotion-focused consumers evaluate distant brand extensions more favorably than prevention-focused consumers. However, they perceive near brand extensions equally. Therefore, the individual’s regulatory focus consideration is vital for the success of distant brand extensions.

Managerial Implications

Introducing new extensions that successfully leverage the parent brand image has been a great concern for marketing professionals for a long time. Therefore, this essay has important implications for managers. First, the findings provide brand managers with insights into brand extension development strategy, considering extension similarity as a determinant of brand extension success. Therefore, managers should pay close attention to extension similarity. In particular, marketers should prioritize near brand extensions and be cautious when launching distant brand extensions. In support of this finding, there are numerous examples of unsuccessful distant brand extensions. For example, Samsonite successfully went from luggage to suitcases and business bags, however, when the brand tried to extend its portfolio from luggage to clothing, consumers did not accept this new extension. Colgate has successfully extended its products in the oral category (e.g., toothbrushes, mouthwashes), however, it failed to enter the food category.
Second, brand managers should take into account consumers’ regulatory focus when designing as successful brand extension strategy. Nowadays, marketers try to leverage the brand by extending it into new distant categories. Nevertheless, in introducing distant brand extensions, managers should recognize that consumers with a prevention focus evaluate these extensions less favorably than promotion-focused consumers. In other words, distant brand extensions will be more successful if managers launch them for categories associated with a promotion focus (e.g., entertainment industry, innovative consumer products, energy drinks). However, managers should be cautious when developing distant brand extensions in prevention-focused categories (e.g., sunscreen, oral care, vitamin supplements). Finally, marketers who plan to launch brand extensions that emphasize prevention-focus should develop near brand extensions (e.g., toothpaste and toothbrush) to attract more consumers.

**Limitations and Future Research Directions**

Although this essay makes theoretical and practical contributions, it acknowledges its limitations and identifies the need for further investigation. First, this essay employs only one brand logo design, therefore, additional studies featuring different brand logo stimuli are recommended to confirm the robustness of the results. Second, the findings are based on one low-involvement product category affiliated with the parent brand. However, it is unclear whether similar results occur for high involvement and durable products (e.g., laptops, mobile phones). Considering that product involvement differences impact consumers’ perceptions of brand extension fit and risk (Maoz and Tybout, 2002), it would be important to assess whether the findings may be generalized to high involvement or durable product categories extended from these parent brands. Third, future research can investigate other brand logo attributes such as logo dynamism, typeface, and their effect on brand extension evaluation. Finally, more
qualitative studies (e.g., focus groups, in-depth interviews) are needed to answer the question of why individuals with different self-regulatory focus perceive distant brand extension in a different way. Adding supplemental qualitative approaches to the quantitative study may provide richer meanings and interpretations of the present experiment.
V. CONCLUSION

Main Takeaways from Essay I

First, the findings from Essay I provide scholars with a better understanding of the state of the brand extension topic. More specifically, the results of bibliometric analysis of the articles collected from Scopus, Web of Science, and Google Scholar databases demonstrate the trajectory of the evolution of the scientific articles on brand extensions published to date, analyze the source productivity, identify the most prolific authors, and the most cited papers.

Second, Essay I provides a thematic analysis by identifying motor and emerging themes in each period and their evolution. Based on this analysis, I proposed a conceptual model that points to potential directions for future research. The proposed conceptual framework is focused on three clusters. Cluster 1 is called “Brand marketing” includes future themes related to Brand Personality, Brand Equity, Brand Image, Brand Extension Authenticity, Masstige. Cluster 2, called Advertising,” incorporates the following keywords for future research: Social Media, Brand Equity. Cluster 3, focused on "Neuroscience,” includes potential themes related to Event-Related Potential, Brand Associations.

Main Takeaways from Essay II

Essay II expands previous limited and mixed findings of the interindustry spillover effect from the automotive industry to food retailers and examines its unique characteristics. The results demonstrate that product recall at the U.S. food retailer can diminish its rivals’ shareholder wealth. It is important because managers may consider their competitor’s product recall irrelevant to their business.
Next, using the recent AMC framework (Shi et al., 2022), Essay II examines how a focal firm’s product recall media coverage before its official announcement and a rival firm’s organizational slack affect the shareholder wealth of a rival firm. These factors were not explored in prior literature, therefore, this research fills an important gap in the product-harm crisis and product recall literature, evaluating the interorganizational spillover effect.

Finally, Essay II evaluates the moderating effect of factors related to rival firm's motivation to respond, such as product recall hazard severity and history of product recalls at a rival firm on the relationship between product recall media coverage and rival firm shareholder value. To my knowledge, these findings were not reported before in the literature. However, consideration of recall hazard severity is important as recalls with high hazards result in greater investors' disapproval.

**Main Takeaways from Essay III**

One of the important takeaways from Essay III is the impact of brand extension similarity on the attitude toward brand extensions. The findings provide additional evidence to prior research, confirming that individuals hold a more favorable attitude toward near brand extensions than distant brand extensions. Therefore, it is important consideration for managers responsible for brand extension strategy development.

Secondly, Essay II evaluates the moderating role of individuals’ regulatory focus on the relationship between extension similarity and attitude toward brand extensions. Although prior research has investigated the role of regulatory focus on brand extension evaluation, this Essay fills an important gap in the literature by examining the impact of regulatory focus on attitude.
toward distant brand extensions. The findings confirm that regulatory focus consideration is essential for the success of distant brand extensions.
References


Hsu, L., & Lawrence, B. (2016). The role of social media and brand equity during a product recall crisis: A shareholder value perspective. *International journal of research in Marketing, 33*(1), 59-77.


Appendix A
Logo stimuli used in Study

Symmetric logo design

Asymmetric logo design

Appendix B
Scenario used in Study

Please read the following scenario:

BIX is a famous brand that makes delicious chocolate bars and candies. In order to expand its product line, the company has intended to launch an ice tea/cookies under BIX brand.
Appendix C

Measures used in Study

*Regulatory focus adapted from Higgins (2001)*

4. Compared to most people, are you typically unable to get what you want out of life? (1=never or seldom, 5=very often)

5. Growing up, would you ever “cross the line” by doing things that your parents would not tolerate? (1=never or seldom, 5=very often)

6. How often have you accomplished things that got you "psyched" to work even harder? (1=never or seldom, 5=many times)

7. Did you get on your parents’ nerves often when you were growing up? (1=never or seldom, 5=very often)

8. How often did you obey rules and regulations that were established by your parents? (1=never or seldom, 5=always)

9. Growing up, did you ever act in ways that your parents thought were objectionable? (1=never or seldom, 5=very often)

10. Do you often do well at different things that you try? (1=never or seldom, 5=very often)

11. Not being careful enough has gotten me into trouble at times (1=never or seldom, 5=very often)

12. When it comes to achieving things that are important to me, I find that I don't perform as well as I ideally would like to do (1=never true, 5=very often true)

13. I feel like I have made progress toward being successful in my life (1=certainly false, 5=certainly true)

14. I have found very few hobbies or activities in my life that capture my interest or motivate me to put effort into them (1=certainly false, 5=certainly true).
Attitude toward brand extension adapted from Chen and Bei (2020)

Please indicate the level of agreement with the following statements (1=Strongly disagree, 7=Strongly agree)

1. The new brand extension will be popular in the market
2. I am willing to recommend this new brand extension to my friends who need it
3. The new brand extension will be popular in the market
Appendix D

Consent Statement

You are being asked to participate in a research study. Svetlana Tokareva of the University of Memphis, Department of Marketing is in charge of the study. She is being guided by Dr. Susana Jaramillo. You will be one of 200 subjects to participate in the research.

The purpose of this research is to learn more about consumer attitude to brand extensions. You are being invited to participate because you are over 18 years of age. You will be paid 70 cents for this ten (10) minute survey.

Participating in this study is completely voluntary and if you decide to participate now, you may change your mind and stop at any point. You may choose not to exit the survey at any time.

By taking part in the research study you will be compensated. You will be paid prorated minimum wage for the time it takes for you to take this survey.

There are no foreseeable risks involved in participating in this study other than those encountered in day-to-day life.

If you have questions, the research you may contact Svetlana Tokareva at stkareva@memphis.edu or Dr. Susana Jaramillo at mjchvrrri@memphis.edu. If you have questions about your rights as a research subject please contact the University of Memphis Institutional Review Board at 901.678.2705

ELECTRONIC CONSENT

Please select your choice below. You may print a copy of this consent documents for your records. Clicking on the “Agree” button indicates that you

- Have read the above information
- Voluntarily agree to participate
- Are 18 years of age or older
Appendix E

Institutional Review Board Approval

Institutional Review Board
Division of Research and Innovation
Office of Research Compliance
University of Memphis
315 Admin Bldg
Memphis, TN 38152-3370

May 16, 2023

PI Name: Svetlana Tokareva
Co-Investigators:
Advisor and/or Co-PI: Maria Susana Echeverri
Submission Type: Initial
Title: Regulatory focus and brand extensions evaluation
IRB ID: PRO-FY2023-382
Exempt Approval: May 16, 2023

The University of Memphis Institutional Review Board, FWA00006815, has reviewed your submission in accordance with all applicable statuses and regulations as well as ethical principles.

Approval of this project is given with the following obligations:

1. When the project is finished a completion submission is required
2. Any changes to the approved protocol requires board approval prior to implementation
3. When necessary submit an incident/adverse events for board review
4. Human subjects training is required every 2 years and is to be kept current at citiprogram.org.
   For any additional questions or concerns please contact us at irb@memphis.edu or 901.678.2705

Thank you,
James P. Whelan, Ph.D.
Institutional Review Board Chair
The University of Memphis