Umbrella Branding of Private Labels

by

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ABSTRACT

Private labels command a growing share of food retailers’ shelf space. In this dissertation, I explain this phenomenon as resulting from “umbrella branding,” or the ability of a single brand to reach across categories. Conceptually, I define umbrella branding as a behavioral attribute that describes a shopper’s tendency to ascribe a performance bond to a brand, or to associate certain performance characteristics to a private label brand, across multiple categories. In the second chapter, I describe the performance bond theory in detail, and then test this theory using scanner data in the chapter that follows. Because secondary data has limitations for testing behavioral theories, however, I test the performance bond theory of umbrella branding using a laboratory experiment in the fourth chapter. In this chapter, I find that households tend to transfer their perception of private label performance across categories, or that a manifestation of umbrella branding behavior can indeed explain private labels’ success. In the fifth chapter, I extend this theory to compare umbrella branding in international markets, and find that performance transference takes its roots in consumers’ cultural backgrounds. Taken together, my results suggest that umbrella branding is an important behavioral mechanism, and one that can be further exploited by retailers across any consumer good category with strong credence attributes.
ACKNOWLEDGMENTS

Like they say: “if it was easy, everyone would do it”... So, for their support, I would like to thank my family back in France and my parents in particular. Next on the list, I have to thank my committee with a special mention to Tim Richards who it was an honor to work with for the past three years and who allowed me to work on this AFRI grant. Finally, I would like to thank my fellow PhD students for making me feel I was not the only one embarking on this journey with a special thanks to Will Allender for his patience.
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CHAPTER 1
INTRODUCTION

Over the past two decades, several fundamental changes have occurred in the retail grocery market. One of the most notable shifts has been the increasing share of private labels, or store brands. While originally introduced as a way of capturing a price-sensitive market segment, retailers soon found many ways to generate value from private labels. For example, in April 2009 Wal-Mart reduced the amount of shelf space allocated to nationally branded bottle waters such as Dasani and Aqua Fina, in favor of their own, more profitable, private label brands (Thompson, 2010). Recognizing that national brands may not necessarily be the most important elements of many categories, retailers began offering their own store-brand solutions. In the US, private labels are gaining market share each year, rising to 23.6% of the units sold in all categories, with a dollar share of 19.5% by the end of December 2011 (Figure 1 below).

![Figure 1. Private label growth.](image)

_Source: SymphonyIRI Consumer Network Reports_
Private label growth is a global phenomenon. In France, for example, the unit share of private labels has reached 36%, and in Germany they capture fully 41% of the retail grocery market (Freeman, 2012). In this dissertation, I aim to investigate whether the growth of private labels is a function of the attributes of a particular retail market, of the products themselves, or more fundamental principles of consumer behavior. The aim of this dissertation is to determine whether there is a behavioral explanation for private label growth, and to test its importance in several retail markets.

While there are many alternative explanations for the rise in private label popularity, their ability to serve as umbrella brands for retailers, conveying a value or quality image across many, possibly unrelated categories, has been largely ignored. Umbrella branding describes a strategy of developing one brand that includes products from several categories, often at a distinct price-quality tier and offering a consistent value proposition. Successful introduction of the brand in one category, therefore, improves the likelihood of success of the same brand in other, perhaps unrelated, categories. National brand manufacturers often use umbrella branding to leverage marketing investments across several categories. Special K (cereal and snacks), Crest (toothpaste and toothbrushes), and Virgin (airlines, records, and many others) are but three notable examples. Umbrella branding is apparently successful in some national brands (Erdem, 1998; Erdem and Sun, 2002), but there is limited evidence that umbrella branding is similarly effective among private labels (Erdem and Chang, 2012; Hansen et al, 2006). Therefore, the primary objective of this dissertation is to determine whether there are significant umbrella, or cross-category, effects among private label brands.
The definition of what constitutes a private label brand has evolved over the past twenty years. Originally thought of as low-priced, generic versions of national brands, they have emerged to include not only generic knock-offs, but medium-quality competitors, or high-quality, high-price “image” offerings as well. Because many retailers offer private labels in two or more quality “tiers,” I test for the umbrella branding effect while controlling for the possibility that store brands are offered for other strategic reasons.

Purchasing products under the same store brand across numerous categories may occur for a number of reasons. Erdem and Chang (2012) suggest that this behavior may be due to a learning spillover effect. Consumers learn over time that the attributes embodied in private labels in one category are similar to attributes they prefer in other, related categories. Just as in Erdem (1998), the authors model consumers learning about mean brand quality level through Bayesian updating. Learning parameters are identified by patterns in switching behavior, conditional on past product choice. Although this way to explain cross-category effects is interesting, it can be questioned how learning really impacts product choice. If a consumer purchases the same brand repeatedly, no learning effect from one trip to the other can be identified. If the consumer switches brands from one trip to the next, the learning effect is not an explanation for that switch. In this dissertation, I argue that consumers purchase private labels in different categories due to a different set of behaviors or attitudes. Differently from Erdem and Chang (2012), I hypothesize that this behavior could be explained by a perception of performance transference of private labels across product categories. Using prior experience and product information, consumers certainly build expectations toward the brand they buy. I
hypothesize that a certain behavior or attitude is engaged when consumers repeatedly choose the private label in a category, other than justified by the lower cost. Namely, consumers transfer their perception of private labels’ level of performance across categories. Each individual has its own degree of performance transference towards private labels creating specific behaviors which has not been studied under that theory before. This difference in behavior could be observed at a larger scale across culture if the performance transference varies across markets. This explanation has not yet been studied in the past.

In conducting this analysis, I address three primary questions: Can umbrella branding help explain private label proliferation? Is umbrella branding explained from a behavioral perspective? Is umbrella branding consistent with consumer purchase data, both in the U.S. and in other retail markets? Answering these questions will help create a better understanding why private labels have evolved from niche, “generic” offerings to perhaps the core element of many retail assortment strategies.

There are many reasons why retailers have aggressive private label branding programs. Private label brands are particularly attractive to retailers because they generally have higher margins, whether through eliminating the double marginalization problem or by providing leverage over national brand manufacturers (Ailawadi and Harlam, 2004; Cotterill et al., 2000; Sayman et al., 2002; Pauwels and Srinivasan, 2004; Mills, 1995, 1999; Richards et al., 2010). Eliminating double marginalization problem involves providing one less step between the product and the consumer as the retailers do not lose market power by directly providing their own products. Private labels also contribute to store loyalty because some consumers might choose a particular store
because they have a preference for the brands offered by that store – brands that are not available from other stores by definition (Ailawadi et al, 2008). A store’s image is shaped by its private labels because consumers tend to make a cognitive association between the store and its private label line(s). However, the notion that retailers exploit umbrella branding effects when offering private labels has only recently been advanced (Erdem and Chang, 2012) and not from the behavioral perspective advanced here. This relative lack of research is somewhat surprising given that a successful umbrella branding strategy can mean significant gains in profit for a retailer as a consumer’s positive experience with a store-brand in one category can lead to that consumer buying the same brand in other categories. On an intuitive level, this is precisely what store brands are intended to do.

This research makes three fundamental contributions to the literature on private label expansion. First, it is the first to formally consider the possibility that umbrella branding is responsible for the growth in private label share. Second, I test a behavioral theory of umbrella branding that has not appeared in either the quantitative marketing or economics literatures. Third, I offer a pair of experimental tests that avoid the problems inherent in studying umbrella branding with secondary (scanner) data. In this regard, I present evidence of sharp differences in private label-perception among consumers in different countries based on their cultural background – a comparison that has not been made in the extant literature.

I provide evidence that supports the notion that umbrella branding is, at least in part, responsible for the proliferation of private labels. The theoretical framework described in Chapter 2 advances the hypothesis that behavioral mechanisms underlie
private label preference across categories. When choosing private label products in different categories, consumers use prior experiences and information to build expectations and form attitudes which are at play during their choice. Therefore, in Chapter 3, I develop an empirical model identifying the multiple choices of private labels across categories and incorporating behavioral variables, designed to test the hypothesis that a consumer purchases a private label from one category based on his/her purchase of a private label in other categories. Revealed preference data, however, cannot always control for the complexity of the retail environment in which private labels compete. In Chapter 4, I design and implement an economic experiment that is intended to test the behavioral mechanisms underlying umbrella branding. My experiment addresses the weaknesses inherent in measuring consumer behavior with revealed preference data. For example, in the panel-scanner data, all private labels offered by a particular retailer are grouped under the same Universal Product Code (UPC) even if they do not have the same name or the same tier positioning (generic versus premium). In addition, revealed preference data does not include behavioral questions so evaluating consumers’ level of performance transference. Another reason is that revealed preference data can only partially control for heterogeneity in store and brand preference. By carefully choosing product descriptions in an experimental framework, I can have a controlled laboratory environment with behavioral questions added and the identity of the private label and its quality tier.

Still, conducting an experiment in a population of relatively homogeneous consumers does not generate data sufficient to test whether cultural factors are important in generating umbrella-branding effects. Therefore, in a second experiment, I consider
the possibility that cultural differences help frame the underlying behavioral mechanism by comparing purchase behaviors between subjects in France and Germany. I use the relationship between personality and culture in order to study the impact on cross-category purchases. If umbrella branding exists in the US, with relatively low private-label penetration rates, then it should be particularly important in European markets with much higher private label penetration rates. I test my theory in the French and German markets in Chapter 5. Therefore, I investigate whether umbrella branding exists among private labels in other countries and, if it does, to what extent it differs across cultural boundaries. This study compares perceptions of private labels in two different international markets. If the underlying mechanism behind umbrella branding is indeed rooted in cultural and social norms as I hypothesize, then the experiment described in Chapter 5 will reveal sharp differences in consumer behavior between French and German consumers. Testing the umbrella branding theory in retail environments that are fundamentally different from that in the U.S. will provide corroborating evidence and, more generally, provide a more general test of the underlying mechanism involved. Differences in private label penetration across countries might come from a stronger umbrella branding effect – one that finds its roots in cultural differences that are more conducive to cross-category perceptions of private label value.

Each of the empirical tests finds support for the umbrella branding hypothesis as a factor for private label market share. In revealed preference data, I find that consumers do buy private labels across product categories and that they have a behavioral tendency to do so. This shows there is a potential for private labels umbrella branding across product categories. Consumers tend to transfer their expectations of private label
performance across grocery categories, showing potential for the idea that private labels are linked by a performance bond. The subsequent results reinforce that hypothesis, especially for consumers buying a high number of private labels. However, results indicate that tier level or specific category have a limited impact on private label umbrella branding.

In overseas markets, we also found evidence of private labels umbrella branding based on consumer performance transference. We also found that different cultures have different effect on cross-category purchases which can impact retailers’ expansion policies. For example, in France, the least neurotic are the consumers who enjoy private labels across categories the most while in Germany, the extroverts and the least conscious consumers are the ones who choose store branded products across categories.

My findings provide more general insights to consumer behavior in retail markets other than the consumer packaged goods considered here. For example, if umbrella branding is truly driven by fundamental psychological processes, then vehicle dealers may be able to offer products across different platforms under a single brand, banks a wider range of financial and risk management products, and even government agencies a broader suite of services. My results are thus fundamental not only to the retailing function but also to the definition of the extent of the firm (Williamson, 1975).

The reminder of this dissertation is organized as follows: In the second chapter, I provide a theoretical model of umbrella branding in which I argue that umbrella branding goes beyond cross-category learning to more fundamental mechanisms of performance transference and relationship-building. I develop and estimate an econometric model of multi-category purchases using revealed preference, household-panel scanner data in the
third chapter. Chapter 4 presents an experimental analysis of umbrella branding using a sample of U.S. consumers that includes more explicit descriptions of each store brand, and behavioral constructs that capture more detail on consumers’ true motivations for buying private labels than is possible with revealed preference data. The following chapter tests my theory of umbrella branding in the French and German markets hypothesizing that this phenomenon could be linked to cultural roots and local social norms using personality traits as a proxy. I discuss several generalizations, strategic implications, limitations and extensions of my research in the final chapter.
CHAPTER 2
THEORETICAL BACKGROUND

Private label penetration, which is defined as the market share of all private labels at either the country, store, or category levels, may vary across markets due to either purely economic, behavioral, or social factors (Dhar and Hoch 1997). Dhar and Hoch (1997) identify socioeconomic factors related to the consumer such as price sensitivity (less wealthy and elderly population); factors inherent to the retailer such as the level of quality invested in the private label brand, store name-association with the private label; the number of national brands present in the product category, and the price of the competition. Each of these factors reflects a structural, economic rationale for private label penetration. In addition to these structural factors, I argue that private label penetration rates depend on a number of behavioral, cultural, and social factors. I develop this model at four levels of manifestation: the consumer level, the market level, the store level and the category level. The objective of this chapter is to outline the behavioral factors that may explain private label success. More specifically, I introduce the idea that umbrella branding, or, in this case, the strategy for a retailer to offer products across categories under the same brand is one of those factors. Once I identify the behavioral factors that may form part of the explanation, I use the subsequent empirical chapters to test the specific mechanism behind my theory of umbrella branding of private labels in three complementary ways.

I summarize the model explaining private labels success factors in Figure 2 below. The rationale for including each factor within each level is based on first principles of consumer behavior, and placed in the context of previous research. The
model includes both structural, or economic factors that help explain private label penetration at an aggregate level, and behavioral, social, and cultural elements that operate at the level of the individual consumer. At the consumer level, I identify a number of macro level factors that describe all consumers, stores and the economic environment in which they shop or compete. Market-level group factors relate to local competition, growth, supply chain, and the maturity of private labels. Among store-level factors, I indentify the pricing structure of the retailer, store loyalty, store image, and specific private-labels strategies as primary factors affecting the private label penetration rate. Finally, at the product-category level, I discuss the nature of the category and the impact of national brands. I explain these factors in more details below.

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<th>Consumer Level:</th>
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<tbody>
<tr>
<td>- Storage capacity</td>
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<td>- Importance of brand names and shopper perception</td>
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<td>- Shopping trip duration</td>
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<td>- Economic situation</td>
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<th>Market Level:</th>
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<td>- Competition concentration</td>
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<td>- Private labels maturity phase</td>
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<td>- Market growth</td>
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<td>- Supply chain structure</td>
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<th>Store Level:</th>
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<tr>
<td>- Pricing structure EDLP/ HiLo</td>
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<tr>
<td>- Store clientele loyalty</td>
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<tr>
<td>- Store image</td>
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<tr>
<td>- Number of categories carrying PL</td>
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<tr>
<td>- Quality of PL developed</td>
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<table>
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<tr>
<th>Category Level:</th>
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<tr>
<td>- Perceived social risk</td>
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<td>- Price level</td>
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<tr>
<td>- Number of private labels tiers</td>
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<td>- Number of national brands</td>
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**PL penetration**

*Figure 2. Factors influencing private label penetration.*
Conceptual Model of Private Label Penetration

Consumer products succeed or fail for a number of reasons. These reasons can be either inherent in the product themselves, the retailer that sells them, or more extrinsic factors in the retail environment. Conditioning each of these factors are more fundamental features of how consumers behave, and how their preferences interact with the retail and product environment. In this section, I create a conceptual model of these factors in which I explain the nature of the effect, and the level at which it operates, from the macro or aggregate level to the specific store and category in which the product is introduced to finally the consumer who buys it. While my focus is on private label products, this framework should be considered a general model of how the retail environment interacts with consumer preferences in determining the success or failure of an individual product, or a brand more generally. The part of the model I will emphasize is the behavioral component which is the last factor that takes place in the decision making process. I will explain how a performance bond between related products can influence consumers’ purchases.

Consumer Factors

Whether a product succeeds or fails is often dependent upon household attributes that are true of most households in an economy. For example, the amount of storage capacity available in a typical home is critically important in shaping purchasing behavior. Intuitively, one might think that more storage would benefit private labels, because they tend to be low-priced, high-volume, value items. But, according to Ailawadi et al. (2001), high storage capacity is a significant factor for shoppers who stockpile promoted items. For example, if a national brand is discounted, shoppers tend to purchase larger

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quantities, at the expense generally lower-priced, competing items. Thus, a high storage capacity is associated with a high national brands purchase and thus a low private-label penetration rate.

Brand names are also important. Rubio and Yague (2007) argue that advertising investments by national brands can be overwhelming compared to the virtually non-existent level of advertising by private labels. Consumers facing this advertisement might develop a strong preference for national brands. National brand preference, therefore, can be proxied by the amount of money spent by national brands manufacturers; high national brand advertising leads to lower private label share.

More fundamentally, consumers have an inherent desire to be perceived as “smart shoppers.” Value conscious or deal prone shoppers are more inclined to buy private labels (Garreston et al., 2002; Burton et al., 1998). However, even value-conscious consumers do not want prices that are too low, because, even if they are looking for a deal, low prices often are interpreted as signals of low quality. De Wulf et al. (2005) show that private label orange juice is judged of the same or better quality than the national brand during blind taste tests in the Netherlands. This evidence disputes the common stereotype of private labels being cheap and low quality.

How long the consumer spends shopping, which is interpreted as an indicator of the care taken in considering alternative products, may also be associated with private label penetration. Private labels will have higher penetration rates when consumers take the time to think about their choice in the aisle, and do not make impulsive purchases (Burton et al., 1998). For this reason, trip duration and private label share are expected to
be positively correlated as consumers take the time to carefully choose products, and perhaps are more likely to make explicit price-quality comparisons.

As evidenced by the rise in private-label share during the recession of 2009 – 2011, general economic conditions affect the relative competitiveness of private labels. In fact, trials of private labels might actually occur more by constraint than by choice. During economic downturns, some shoppers switch to private labels because of their cheaper prices (Lamey et al., 2007). When the economic situation improves, consumers tend to stick with the private labels, suggesting that private label share tends to “racket up” during poor economic times. Lamey et al. (2007) measure the economic climate through either GDP growth, unemployment change, or consumer buying power, so this effect appears to be a very general one.

**Market Level Factors**

A second set of factors are specific to individual markets. Market structure refers to the competitiveness of a particular retail market, and is typically measured as the size and concentration of the firms in a market. Shankar and Bolton (2004) identify a number of factors influencing retailer pricing strategy, including competitive factors (price and deal frequency), and chain factors, (positioning and the size of the supply chain). Private label share is clearly dependent upon both the presence and the strategic orientation of other retailers.

The Herfindhal Index (HI, Weinstock, 1982), or the sum of the square of each firm’s market share, is a common measure of market structure. The lower the index, the more competitive the market is. HI can also be calculated for national brands as a measure of manufacturers’ concentration. There is some evidence national brand
manufacturers increase their prices and carry fewer sales when they are confronted with strong private label competition (Ward et al., 2002), indicating that national brand manufacturers tend to prefer differentiation to engaging in a price war. Therefore, the number of national brand manufacturers and the level of national brand prices may influence private label penetration.

Maturity of the private label market is another key market-level success factor. Steenkamp et al. (2010) study a cross-section of national private label market shares and classify each as in the mature stage (found mostly in Western Europe and North America), or in the development stage (Eastern Europe, Asia, South America), based on the number of years that private labels have been present. They show that the willingness to pay a premium for national brands over private labels is smaller in mature countries mainly because the quality gap between those products is smaller in such markets.

Maturity can also apply across retailers rather than across countries, and can be measured relative to a diffusion model benchmark (Bass, 1969). In this case, the retailer is deemed mature if the first difference of the adopter curve equals zero. I expect that more mature markets according to this measure will have higher private label market shares.

Independent of its phase of private label development, the rate of market growth is also an important factor driving private label share, even after controlling for pricing and product line strategies of competitors (Rubio and Yague 2007). Rubio and Yague (2007) find that when market growth is positive, national brand market share grows at the expense of private labels. Growing markets tend to favor higher-priced items because consumers are less price-sensitive when markets are growing in aggregate.
At the market level, the structure of the supply chain also influences private label share. Chen et al. (2010) show that national brand manufacturers benefit from producing private labels if they have excess capacity. Indeed, vertically integrating private labels insure lower prices for consumers compared to a vertically separated supply chain model. Therefore, if the supply chain is vertically integrated, I expect private label share to be higher as prices will, in general, be lower.

**Store Level Factors**

Several factors operate at the level of the store (or the chain, or parent organization, as opposed to individual stores). First, retail pricing strategy, or whether the retailer uses an everyday low price (EDLP) or HI-LO strategy, can influence private label share. For example, Wal-Mart’s EDLP strategy, combined with a single private label brand (Great Value), represents an entirely different approach from Kroger’s HI-LO pricing strategy and multiple tiers of private labels (from Kroger brand to Private Selection). Which is more effective at increasing private label share, however, is an empirical question. Bolton and Shankar (2003) classify retailers as exclusive, moderately promotional, HI-LO, EDLP, and aggressive. Ailawadi et al. (2001) show that retailers with EDLP strategies have higher private label penetration rates, due to the observation that the private label is typically positioned as the low-price leader in many important categories. Therefore, I hypothesize that the private label penetration rate will be higher for EDLP than HI-LO stores.

Customer loyalty is another variable influencing private label penetration. Stores with strong loyalty tend to have stronger images, which reinforces brands that bear the store’s name (Ailawadi et al, 2008; Semeijn et al 2004). However, having a positive
store image does not necessarily imply strong loyalty, so these two factors operate as independent factors driving private label share.

In addition to store loyalty, Vahie and Paswan (2006) consider store atmosphere or ambiance as significant factors. A pleasant shopping experience can improve a store’s image and thus the store brand perception. Convenience and perception of the price-for-value of the product are also positive factors. By offering a positive overall shopping experience to the consumer, a retailer can increase its store image and thus its store brand image, and market share.

Private-label breadth, or the number of categories with private labels, can either raise or lower private label share. Ailawadi et al. (2008) show that if private labels are present across many categories in the store, consumer satisfaction decreases due to a perceived lack of choice and the possible absence of favorite national brands. As a consequence, they observe a U-shaped curve for private label share: private label share is high when there is only a moderate breadth of private labels across categories. On the other hand, cross-category private labels increase brand awareness and market share. Therefore, I expect to find that private label share is a non-linear function of the number of categories in which private labels appear.

Quality, or the positioning of store brands, is clearly an important factor in private label share. Corstjens and Lal (2000) study private labels in multiple countries: UK, USA, France, and Canada and find that, in addition to increasing profit margins and bargaining power for the retailer, a quality private label increases store loyalty. They find that a premium store brand can help differentiate one retailer’s private labels from another, whereas a low quality store brand only has a price-effect. Using a high-quality
private label to drive share, however, requires a segment of consumers willing to switch to store brands, as well as a segment of consumers who keep buying national brands. They conclude that a quality store brand will better serve a retailer’s image in addition to drawing the attention of more shoppers. Arriving at the same conclusion, Braak et al. (2013) found that premium private labels have better retail margins than economic private labels even if the best margins remain for “me too” private labels.

**Product Category Factors**

Another set of factors function at the level of the category, or have an effect that differs depending upon the nature of the category itself. Each product category is unique in the sense that national brands are rarely present in more than one category, the price points are different, and the importance of the category depends on consumer preferences (for instance, olive oil for Spanish consumers or cheese for French consumers).

One way to describe categories is on the basis of the risk associated with a category purchase. Semeijn et al. (2004), for example, classify product categories by their degree of financial risk, functional risk, or psychological risk. Financial risk refers to the general dollar-importance of the category in consumer budgets. Functional risk describes the potential negative impact of choosing the wrong product (the product would not perform as expected), while psychological risk is defined the risk of choosing the wrong product in the eyes of peers when the product is presented to family or friends, for example. Toothpaste is an example of high functional risk and low financial risk and wine carries a high financial risk and high psychological risk. Zielke and Dobbeltstein (2007) simplify this notion by emphasizing only the degree of social risk for a product category. For example, in the wine or chips categories, the social risk is high because
those products are more likely to be consumed with friends, and consequently the shopper wants to offer a product of high quality, a product of a famous brand, and the consumer wants be sure of a consistent quality profile. Social risk favors premium or high-quality store brand penetration, but may be a negative influence on value private labels. Indeed, if a social risk is higher on value or generic private labels, consumers are going to be more skeptical applying their perception of private label performance for lower quality products than for premium products. Risk could form an important explanation for private label share if there is a difference in risk perception across product categories.

Price-positioning is perhaps the most critical strategic decision retailers can make regarding their private labels. Semeijn et al. (2004) find that, relative to national brands, store brands are most successful when positioned in the range of -10% or -40% of the national brand’s price. The middle of this U-shape curve (around -20%) is considered too expensive for a value private label and not expensive enough for a quality store brand. Therefore, price point is another factor influencing private labels penetration, although it seems that different price points are appropriate for different tiers. It seems that consumers would then only consider private labels priced accordingly either at -40% or at -10% depending on their positioning. If retailers want consumers to trust their products across categories, it would seem that a right pricing strategy across categories is necessary.

Many retailers use a multi-tier positioning strategy. Sethuraman et al. (2009) and Raju and Dhar (1995) find that private labels have higher penetration when the product category is characterized by a high number of national brands. However, when this effect
is broken down among private labels tiers, the results differ. Geyskens et al. (2010) show that both economy and premium private labels tend to cannibalize a standard private label product because mid-tier private labels are considered as “me-too brands,” imitating the national brand at often lower quality. Further, mid-tier private labels compete with national brands, whereas value or premium store brands do not always raise retailer market share (Bontemps et al., 2005). Considering both sides of the argument, it is clear that the effect of the number of private label tiers chosen by the retailer is an empirical question.

In Table 1, I summarize the constructs that form the conceptual model identified from the literature. Based on the review of previous findings, the factors that should positively influence private label market share are: smart shopper perception, shopping trip duration, maturity of private label development, vertically integrated supply chain, EDLP pricing structure, store clientele loyalty, store image, quality of private label developed, very small or very large price gap with national brands, and the number of national brands in the category. The remaining factors are expected to have a negative impact or have no clear a priori effect.
Table 1

Factors Affecting Private Labels Market Share

<table>
<thead>
<tr>
<th>Construct</th>
<th>Source</th>
<th>Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Consumer:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Consumer risk aversion</td>
<td>Erdem and Chang, 2012</td>
<td>Scanner Panel data/ Self report</td>
</tr>
<tr>
<td>- Storage capacity</td>
<td>Ailawadi et al, 2001</td>
<td>Hosftede scale</td>
</tr>
<tr>
<td>- Importance of brand names</td>
<td>Rubio and Yague, 2007</td>
<td>Scanner Panel data/ Self report</td>
</tr>
<tr>
<td>- Smart shopper perception</td>
<td>Garreston et al, 2002</td>
<td>Advertising $</td>
</tr>
<tr>
<td>- Shopping trip duration</td>
<td>Burton et al, 1998</td>
<td>Self Report</td>
</tr>
<tr>
<td></td>
<td></td>
<td>GDP/unemployment/</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Consumer Index</td>
</tr>
<tr>
<td><strong>Market based:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Competition concentration</td>
<td>Shankar and Bolton, 2004</td>
<td>Herfindhal Index</td>
</tr>
<tr>
<td>- Market growth</td>
<td>Rubio and Yague, 2007</td>
<td>Percentage from scanner data</td>
</tr>
<tr>
<td>- Supply chain structure</td>
<td>Chen et al, 2010</td>
<td>Vertical / Horizontal dummy</td>
</tr>
<tr>
<td><strong>Store Based:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Pricing structure</td>
<td>Bolton and Shankar, 2003</td>
<td>EDLP / Hilo dummy</td>
</tr>
<tr>
<td>- Store clientele loyalty</td>
<td>Semeijn et al, 2004</td>
<td>Self report</td>
</tr>
<tr>
<td>- Store image</td>
<td>Vahie and Paswan, 2006</td>
<td>Self report</td>
</tr>
<tr>
<td>- Number of categories</td>
<td>Ailawadi et al, 2008</td>
<td>% of total categories</td>
</tr>
<tr>
<td>carrying PL</td>
<td>Corstjens and Lal, 2000</td>
<td></td>
</tr>
<tr>
<td>- Quality of PL</td>
<td></td>
<td>Self report</td>
</tr>
<tr>
<td><strong>Product Category based:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Perceived social risk</td>
<td>Zielke and Dobbelstein, 2007</td>
<td>Self report</td>
</tr>
<tr>
<td>- Price level</td>
<td>Zielke and Dobbelstein, 2007</td>
<td>Gap at 40% or 10% =1,</td>
</tr>
<tr>
<td>- Number of NB</td>
<td>Sethuraman et al, 2009</td>
<td>other=0</td>
</tr>
<tr>
<td>- Number of PL tiers</td>
<td>Geyskens et al, 2010/ Bontemps et al, 2005</td>
<td>Number</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Number</td>
</tr>
</tbody>
</table>
Behavioral Factor

A behavioral factor refers to an action resulting from underlying psychological process; and in this case, I am interested in the behavior or the response an individual offers from an environmental stimulus, namely the possibility to choose private label. Of the factors considered in the conceptual model above, few refer to specific psychological or behavioral attributes of private label consumers. One behavioral attribute in particular may constitute a core mechanism behind private label penetration – umbrella branding. Umbrella branding is defined as the tendency for consumers to associate performance characteristics of a brand in one category, to products of the same brand in other categories. My behavioral theory of umbrella branding rests on the notion that private labels embody an implicit warranty of consistent quality across categories. Wernerfelt (1988) argues that consumers expect the same level of quality for different products with the same brand -- a promise by retailers that is akin to a "performance bond" for umbrella branded products. Because the identity of a chain as a manufacturer of consumer products relies almost entirely on the quality of its private labels, such a behavioral element is likely to be critically important in the case of private labels. Consumers use brand name as a quality signal, or as a means of reducing the expected risk that they will be disappointed by the product upon consumption. Umbrella branding reduces the consumer's perceived purchase risk, increasing their expected utility and the likelihood that they will select an umbrella-branded product. Retailers recognize this risk-reduction effect, and take advantage by introducing a new product in a different category under the same brand.
The risk in leveraging a brand across multiple categories is that a poor experience with a product in one category can erode the perceived quality of products in other categories with the same brand. In other words, the perceived quality of the brand is only as good as the lowest-quality product. Consistent quality is critical across products in different categories. This point is crucial for private labels since retailers usually introduce new private label products in a large number of categories. The objective of this section is to outline how branding across multiple categories, or umbrella branding, can drive market share growth for private labels through the performance bond mechanism.

Research shows that an umbrella branding strategy can be effective in a number of contexts. Balachander and Ghose (2003) study a number of national brands and find an umbrella branding strategy to be successful for a number of reasons. For example, brand extensions spread brand awareness and contribute to brand image, increasing parent brand equity. Use experience and advertising umbrella effects are also significant determinants of the demand for national brand toothpastes and toothbrushes (Erdem and Sun, 2002). In a cross-category sample of national brands, Erdem (1998) finds that umbrella brands benefit from a transfer of perceived quality. Each of these studies, however, uses data from national brands. Effective umbrella branding among national brands is perhaps to be expected because manufacturers are in a position to invest millions of dollars in developing and supporting brand equity, and introducing products that are closely related to existing, strong brands.

Umbrella branding among private labels, however, is not necessarily as effective *a priori* because retailers lack the resources to develop strong store-brands. Without the
ability to develop brand equity using the usual methods by which brands are built, namely advertising and trade promotion, retailers instead rely on the provision of value through a performance bond that works like an insurance contract. If consumers face an inherent quality risk in purchasing consumer goods, then retailers provide an implicit insurance contract by assuming some of the risk that a quality guarantee offered in one category can be successfully transferred to other categories. If a consumer purchases a private label in one category, he or she is more likely to purchase a private label in another category on the next purchase occasion because he or she expects the evident quality of private labels in one category to transfer to the same brand in another category. This study provides support for the existence of this form of umbrella branding in private labels, while controlling variations in perceived quality.

The theoretical model I propose differs from the previous literature because it looks at umbrella branding of private labels in a somewhat unique way. Rather than learning about the existence and quality of private labels in other categories from one trip to the next, as in Erdem and Chang (2012), the behavioral mechanism relies instead on the transfer of value perception among products of the same brand. According to the performance bond developed by Wernefelt (1988), the image of private labels is linked to past experiences and expectations, reducing consumer risk. Umbrella branding is then applied because past experience with one private label creates an expectation of similar value for the purchase of the next private label. In the past, the stimuli revolved around an image that store brands were “cheap products,” but recent trends show that this might have changed. More than simply learning about a particular private label, this theory is more general in that it implies that consumers consider a product based on past
experiences, related products in the same brand, and the related store attached to the brand. Developing encompassing attitudes toward private label products orients consumer behavior toward a whole line of private labels, and not just those in a single category. Because this perception varies by retailer, the umbrella branding effect can be identified by pooling private label purchases across consumers, retailers and over time.

The factors mentioned in Figure 2 and the behavioral factors added are econometrically taken into consideration, when the data allows, in the following chapters. These factors are important for umbrella branding because they can more or less facilitate the transfer of performance of across categories. For example, store loyalty should have a positive effect on umbrella branding. If the consumer is loyal to a store, they have a positive opinion of the store name and thus are likely to have a positive opinion of all private labels linked to that store name. In Chapter 3, I use an econometric approach applied to household panel data to explain private label share using some of the factors outlined in the conceptual model described in Table 1, while isolating umbrella branding as a new element. Secondary data, however, cannot capture the behavioral elements necessary to fully test the performance bond theory of umbrella branding. Therefore, in Chapters 4 and 5, I test for the presence of umbrella branding in an experimental treatment of consumers in the U.S., and in Europe, respectively. In this way, I control for cultural factors that may potentially confound the identification of pure umbrella effects.
CHAPTER 3

EVIDENCE OF PRIVATE LABEL UMBRELLA BRANDING

Umbrella branding implies that consumers who buy a private label in one category will have a higher probability of purchasing a private label in another category (Erdem and Chang 2012; Richards et al., 2014), everything else held constant. Correlated purchasing patterns, however, can be consistent with many other explanations. Therefore, the empirical challenge in testing the performance bond theory of umbrella branding lies in identifying empirical relationships among brands that are unique to that theory. Specifically, I test whether the tendency for households to transfer their perception of private label performance to private labels in other categories explains the private label share of their total shopping basket. This involves testing the performance bond theory developed by Wernerfelt (1988), which implies that all products under the same brand name inspire the same performance perception from the consumers. In this chapter, I present a comprehensive empirical model that isolates this specific mechanism driving umbrella branding of private labels.

Other factors are clearly important in determining private label share. Product prices, often associated with different store formats, directly affect the choice of private labels (Bolton and Shankar, 2003). The number of private labels versus the number of national brands offered also has a significant impact. Empirically, more private labels in other categories increases the share of private labels in the target category while it decreases the sale of national brands (Sayman et al., 2002). Households with different demographic and socioeconomic profiles tend to differ in their private label penetration rates (Hansen et al., 2006) for a number of reasons. Lower income households tend to
search for lower-priced substitutes to popular national brands (Hansen et al., 2006), while more highly educated households tend to favor the better value propositions offered by store brands. Even though demographics explain a small part of the variability in consumer choice in their study, Sudhir and Talukdar (2004) report that older consumers and those with large families tend to be private label consumers.

In addition to demographics, other household-based factors can influence consumers’ choices of private labels over national brands. For example, household loyalty to a particular retail chain can increase private label share. Moreover, Semeijn et al. (2004), find a linear, positive relationship between store image (physical layout, merchandise, service) and consumers’ attitudes toward its private label line. Indeed, consumers that are store loyal are more likely to buy the store brand (Bonfrer and Chintagunta, 2004). However, brand loyalty can reduce private label share. Consumers also have loyalties toward national brands, and Ailawadi et al. (2008) found that brand loyal consumers have lower private label share. Risk aversion is another household-based factor to take into consideration. In the U.S., consumers are risk averse, which means that they favor national brands when store-brand quality is uncertain (Erdem and Chang, 2012). Once these other factors are taken into consideration, there may remain a tendency for consumers to prefer private labels in many, seemingly unrelated, categories.

Observed heterogeneity among households, however, can only explain part of their tendency to purchase private labels (Erdem and Chang, 2012). Unobserved heterogeneity, in the form of preferences or other behavioral motivations, may also be important. In this chapter, I capture these elements in an empirical model of household-level private-label penetration. Namely, I maintain that there is a behavioral tendency to
purchase private labels across multiple categories that is driven by transference of performance characteristics across product categories (Wernerfelt, 1988). For example, if a consumer purchases a private label ice cream one week, and likes it, then he or she is more likely to purchase a private label cookie, in addition to the private label ice cream, on the next trip to the store, on the assumption that the cookie is likely to perform as well as the private label ice cream.

I test this hypothesis using a data set that represents a panel of household shopping-basket (multi-category) purchases across a number of different groceries stores. I define private label penetration as the share of items in each shopping basket attributable to some form of store-brand. I use a discrete choice model to estimate households’ private label market share, conditional on socioeconomic, demographic, and marketing mix variables, while isolating variables that capture the performance bond concept.

I find that this latent private label tendency has a positive effect on the likelihood of purchasing multiple private labels on each trip to the store. I interpret this finding as suggesting there is a household trait, largely driven by a latent performance-perception effect that is independent of any other mechanisms driving brand choice and leads to greater private-label brand penetration. This latent performance perception is evidence of an umbrella branding effect.

This chapter contributes to both the theoretical literature on private label penetration and the substantive literature on cross-category purchases. First, no other study considers an explicitly behavioral element in explaining umbrella branding of private labels. Empirically, I find evidence that supports this theory as the private label performance proposition appears to be transferred across product categories. Second, my study
examines cross-category purchases using a discrete choice model and latent purchase construct that is able to identify significant interactions among products in different grocery categories. This approach is unique in that it estimates households specific private labels share and tie this to their individual tendency to purchase store brands across product categories.

The chapter is organized as follows: The next section presents the conceptual model of umbrella branding. In the second section, I describe an empirical model of private label penetration in which I introduce variables that capture both macro and micro-factors that may be important. In the third section, I describe the data used to estimate the empirical model. In the fourth section, I present the estimation results, and interpret their implications for food retailing more generally. The final section concludes and offers some implications for managerial strategy, and the economic efficiency of the private label grocery market.

**Conceptual Model**

In this section, I outline a conceptual model of multi-category private-label purchase in which I describe a range of possible motivations for consumers to purchase, or retailers to offer, private labels across multiple categories, and then explain how umbrella branding can be identified uniquely from these other factors.

Retailers have many ways in which they can attract consumers to purchase private labels. First, retailers tend to offer private labels, or store brands, as alternatives to popular national brands (Chan Choi and Coughlan, 2006). In this study, the authors look at private-label positioning in a product category with two national brands of different quality levels. They find that the profit curve generated by private labels is convex,
namely, if the private label product is of high quality, the private label should imitate the better quality national brand, but if the private label is too low in quality, it should imitate the lowest-quality national brand. If the two national brands are not differentiated in quality, the private label should then be differentiated from both (Chan Choi and Coughlan, 2006). Competition with similar national brands is, therefore, likely to be important in attracting private-label buyers.

Second, retailers often price store brands in order to attract value-seeking shoppers (Hansen et al., 2006). As evidence, when retailers price discriminate with lower-price private labels, national brand prices may rise after the private label is introduced (Bontemps et al., 2005; Ward et al., 2002; Steiner, 2004). Price discriminating with private labels essentially means that retailers use their own brands to segment the market, skimming the cream by pricing national brands relatively high, and building volume by selling value-level private labels to more price-conscious shoppers.

Third, the fact that national brand prices tend to rise when private labels are introduced may also reflect a differentiation strategy on the part of retailers (Chan Choi and Coughlan, 2006). Retailers often sell private labels that are differentiated, even from others in the private label line, because doing so allows them to capture specific segments of the market that prefer attributes slightly different from those offered by the national brands. Typically, private labels are positioned to imitate the quality of leading national brands, but using multiple quality tiers allows retailers to compete across the quality spectrum. This kind of pricing strategy and quality positioning is crucial in establishing a significant private label market share (Steiner, 2004).
There is some question as to whether private labels in different quality tiers are even recognized as store brands by consumers. Implicitly, therefore, my operating assumption is that if consumers can only buy a particular brand at one store, they identify it as a store brand, even if it differs from another store brand they may typically buy. For example, Private Selection products are the premium private labels in many Kroger banners, and can only be purchased there, thus consumers consider Private Selection products private labels just as Kroger’s branded products. While this assumption may impute more conscious thought on the part of consumers than is true in reality, it is both necessary and descriptive. Because most retailers offer dozens of different brands throughout the store, identifying the relationship between different store brands within the same retailer requires that I make this assumption. Second, it reflects retailers’ marketing strategies as most advertise their store brands together on websites, through promotional materials, and through in-store merchandising.

Private label market share can depend on factors related directly to the purchaser. Indeed, the tendency to purchase private labels in multiple categories can depend on differences among households in terms of fundamental consumer needs, simply because private label penetration rates vary by category. For example, if a household tends to purchase milk, ice cream, and cookies, their measured private-label tendency will likely be greater than another household that purchases breakfast cereal, carbonated soft drinks, and condiments simply because the former are purchased more often, and tend to contain more private labels.

Household risk aversion can also be important. In fact, some categories are more likely to be conducive to private-label purchase due to the level of risk assumed by the
consumer by selecting a private label compared to a national brand (Semeijn et al., 2004; Zielke and Dobbelstein, 2007). Categories with high “social risk” are categories that carry products susceptible to social pressure, and are likely to be used with family and friends. For example, opening a bottle of store branded wine or opening a bag of store branded potatoes chips might be perceived negatively by guests. Indeed, those products can still have a stigma in society regarding their apparent quality level, and product categories such as wine or chips still have a strong national brand presence. Alternatively, low social risk categories include those that are consumed alone and involve little social stigma, such as toothpaste or yogurt. As a consequence, categories with high social risk have the lowest likelihood of having successful private labels.

Still, there may be an incentive for retailers to offer private labels even in more “risky” categories. Indeed, private labels benefit from being present in a large number of categories across the store (Sayman et al., 2002) because doing so raises consumer awareness simply due to ubiquity. Sayman and colleagues (2002), find that higher numbers of private labels in other categories increases the likelihood consumers will purchase a private label in a target category because of the increased buyer-awareness across the store.

Store perception also influences the share of private labels (Bonfrer and Chintagunta, 2004; Semeijn et al., 2004). These studies find that a positive attitude toward a particular store has a tendency to increase its private label share. This notion is supported empirically as Ailawadi et al. (2008), show that there is a relationship between a household’s private label share and consumers’ loyalty to a particular store, where loyalty is defined as the share of shopping trips taken in one store. Ailawadi et al. (2008)
describe private label share in two retailers in the Netherlands and find that household preference for private labels derives from the lower prices offered by private labels. Consumers are thus loyal to a store that offers an affordable line of private labels, at a quality level that is revealed to be acceptable. They also explain that households are loyal to private labels in general, not to a specific private label brand, but do not test for any behavioral explanations.

Prices are of obvious importance in explaining observed private label market shares. Hansen et al. (2006), show that the purchase of private labels is linked to a household’s idiosyncratic price sensitivity. Households that are more price-sensitive have a greater tendency to purchase private labels in multiple categories. That said, Hansen et al. (2006), show that unobserved household factors are more important than demographics in explaining preferences, so this finding suggests that there are other, perhaps behavioral, factors that explain private label share.

In this study, I add structure to this unobserved factor by recognizing that there may be behavioral traits within households that drive multi-category private label demand -- in addition to price sensitivity. Namely, the effectiveness of umbrella branding may be due to the trust that consumers carry over from store perception to all product categories within the store. The tendency to buy the same brand across product categories, called umbrella, or spillover effects, is effective in increasing the share of national brands (Balachander and Ghose, 2003; Erdem, 1998; Erdem and Sun, 2002), and private labels alike (Erdem and Chang, 2012). However, there is no empirical test that explains umbrella branding of private labels from a behavioral perspective. In this chapter, I synthesize the behavioral approach of Ailawadi et al., (2008) and the empirical approach
taken by Erdem and Chang, (2012) in testing for the umbrella effect among private labels.

Testing for behavioral drivers of private label penetration requires operationalizing the performance bond theory. Wernerfelt (1988) explains that different products under a same brand have a performance bond. Performance bonding means that consumers assume that performance from one product sold under the brand is the same for any other product sold under the same brand. The existence of a performance bond relies on a consumer’s ability to transfer perceptions of quality from one product to the next within a family of brands (Wernerfelt, 1988). I test for the performance bond explanation for private label proliferation based on the hypothesis that consumers transfer their perception of private label performance between categories, within brands, as a manifestation of their trust in that brand. What is needed is a single instrument that is able to sufficiently capture the notion of a performance bond.

I adopt a revealed-preference approach in modeling the existence of a performance bond, which is a latent construct, by observing households’ past brand purchases. That is, a revealed tendency to purchase the same brand, all else constant, is interpreted as the manifestation of a performance bond. By examining past purchases, I estimate a household’s tendency to purchase private labels across categories. This way, I assume that each household has a particular behavior towards private labels, which must derive from their own performance transference across categories. The result is a household specific private label market share that reflects a performance bond between the private label brand, and the household. I explain how this construct is derived more formally in the next section.
**Empirical Model**

Empirical models of brand choice tend to focus on single categories, or nest category incidence and brand choice (Lattin and Bucklin, 1989). However, multi-category choice, which describes a consumer’s shopping basket choice, is more complex than brand choice or a category choice because the decision typically involves factors that are interrelated, and rarely observed.

Much of the advance in multi-category analysis is driven by data availability. Seetharaman et al., (2005) review various models used in studying retail-choice models and argue that the recent availability of data describing multi-category choice has enabled more advanced methods. Because private-label penetration is only defined in terms of households’ shopping basket composition, my model falls into this more general literature.

In a multi-category context, there are many different types of choices. Some researchers consider purchase incidence, or category choice, across multiple categories using a multinomial probit model (Manchanda et al., 1999; Chib et al., 2001; and Deepak et al., 2002), but category choice cannot address the private-label issue. Although category choice models provide a useful point of departure, it is not appropriate in the present study because category choices are more often planned in advance based on consumers needs (Bucklin and Gupta, 1992; Bucklin and Lattin, 1991; Dillon and Gupta, 1996) and not on the existence of a private label or national brand. The behavioral component of this research applies to brand choice, so purchasing multiple private labels across categories is not likely driven by need.
Others consider how the choice of a single brand across fixed categories (Ainslie and Rossi, 1998; Erdem, 1998; Seetharaman et al., 1999; Kim et al., 1999; Iyengar et al., 2003; and Singh et al., 2005) can be used to test a univariate version of the umbrella hypothesis. However, such a framework is unable to explain why multiple private labels are purchased across various categories. Indeed, some of these studies consider the effects of marketing mix variables across only a small number of categories (Ainslie and Rossi, 1998; Iyengar et al., 2003). The price coefficient is the main focus, although Erdem (1998) and Singh et al. (2005) introduce brand preference. The models used in this literature range from a simple correlation model (Anislie and Rossi, 1998) to multinominal probit or logit models (Erdem, 1998) and the categories studied are usually closely related. In order to test the hypothesis maintained here, it is necessary to test for umbrella branding in unrelated product categories. Indeed, if private labels are linked by a performance bond, then studying unrelated categories would show effects other than complementarity or substitutability. Also, in addition to marketing mix and price coefficients, consumer behavior is an important element in private-label choice.

Models that estimate brand choice across multiple categories can be used to answer a number of practical problems in consumer-product retailing. Bell and Lattin (1998) consider consumers’ choice of store format – whether to patronize an everyday low price (EDLP) or a promotion-based (HILO) store using basket size preference and category choice. Because they use a structural model to do so, they estimate households’ brand choice and purchase incidence, nested with store choice. Although their model is an elegant approach to study brand and category choice in an integrated framework, their model consists of a limited number of categories, and focuses on the basket-size effect on
store format choice. Private label penetration, however, refers not to store choice, but to brand choice across categories. Mehta (2007), on the other hand, studies category and brand choice in an integrated model that is similar in spirit to Bell and Lattin (1998). Choices in Mehta (2007) represent basket-utility maximization that allows for interaction across brands in different categories. However, his framework restricts choices to one brand per category, and the errors are identically distributed across categories. These assumptions do not allow tests of the umbrella branding effect. Similar to Mehta (2007), Song and Chintagunta (2007) study complementarity and substitutability of brand choice across categories. However, their model differs fundamentally from Mehta (2007) because they add quantity to category and brand choice. They use four non-food product categories and they found that purchase-coincidence effects across categories, (effects arising through consumers joint purchase incidence decisions due the decreased attractiveness of the outside option), are larger than complementarity effects. Although their model produces results that would be useful in testing cross-category private-label choice, the complexity of the model confines their analysis to only a few categories, not the dozens required for a study of private-label penetration.

My model builds on this literature by considering multi-category choice in a discrete-choice, random utility framework. The utility distribution is assumed to be randomly distributed and more specifically, I use a random coefficient model. Consumers are assumed to already have made their store-and-category choices, so are left with determining what brands to include in their shopping baskets. A consumer’s shopping basket – or least their potential shopping basket -- is assumed to consist of the
entire store. Based on this definition of a shopping basket, I estimate the share of private label products purchased, or the proportion of brands in the basket that are private labels.

Umbrella branding is tested by evaluating factors affecting the cross category purchases of private labels. A discrete-choice approach is widely used to study cross-category correlations in purchase patterns (Erdem, 1998; Anslie et al., 2002; Hansel et al., 2003; and Singh et al., 2005). A discrete choice model describes the decision to purchase a brand (or an attribute), across all of the brands (or attributes) present in the product categories studied. Consumer learning (Erdem, 1998), marketing mix elements, and consumer brand-preferences are three examples (Singh et al., 2005). My model differs in the sense that discrete choices between private labels and national brands are driven by a behavioral variable is consumer-specific. Private label shares then represent the aggregation of these discrete choices across multiple categories.

Consumers are assumed to make discrete choices among differentiated food items in 1,023 categories across the store. Within each category, a consumer purchases the item that provides the highest level of utility from among all suitable alternatives. I then aggregate these decisions over all categories in a consumer’s potential shopping basket to arrive at the share of private labels. Consumers buy one alternative at a time, the one that has higher utility than all other choices, which describes a discrete choice or random utility data generating process.

I further assume that the chooser has attributes that are likely to impact their product choice. Some attributes, however, are inherently unobserved and are likely to be correlated with observed choices. Therefore, a mixed, or random coefficient, logit is preferred (Allenby and Rossi, 1998; Train, 2009).
I assume indirect utility is a linear function of product and chooser attributes. The utility is also indexed by the time and the product category because I chose to study every category in the store, and the consumer can choose which one he or she will consume from. Also, depending on the product category, the number of private labels offered compared to the number of national brands offered can vary, which can impact consumer utility. The utility obtained by consumer \( h \) from consuming brand \( j \) in shopping trip \( t \) in category \( c \) is expressed by:

\[
U_{hjct} = \beta_{o} - \alpha p_{jt} + \sum_{k} \beta_{k} X_{jck} + \sum \gamma Y_{h} + \xi_{jt} + \varepsilon_{hjct}
\]

where:

\( k \) = subscript describing a product attribute

\( p_{jt} \) = the price of the product

\( X_{jck} \) = product specific factors

\( Y_{h} \) = household specific factors

\( \xi_{jt} \) = brand-based heterogeneity that is unobserved by the econometrician

\( \varepsilon_{hjct} \) = household-based random variation in preferences

The error, \( \varepsilon_{hjct} \), is assumed to be independently and identically Type I Extreme Value distributed, reflecting the random nature of consumer preferences.

The first set of factors reflects consumer attributes. First, household storage capacity will have an impact on how much inventory households can hold, which is likely to be relevant when considering choice within a shopping trip (Bawa and Ghosh, 1999). Second, risk aversion is likely to be important (Kahneman and Tversky, 1979). Each household’s level of risk aversion is represented by calculating the squared household expenditure for each trip. Squared expenditure is a useful proxy for risk
aversion because it is well understood that higher income households are more willing to take risks with their purchases, so I expect this variable to have a negative parameter. As noted by Erdem and Chang (2012), risk aversion should negatively impact private label share.

Store-level factors are clearly important in determining private-label performance. Although they are constant over households, variation between stores will help explain why some private labels are sold more broadly than others. I included store-level fixed effects in order to capture differences in private label quality, which is a general variable that captures the inherent attractiveness of each store’s brand portfolio. Private label quality varies among stores, but is inherently unobservable. The parameters for each store-fixed effect are interpreted as measuring the relative quality of their store brands compared to other stores’ brands, as each store sells the same set of national brands, and there are no other systematic differences that can explain variation in private label share. Store-level prices are captured by using an index of national brand and private label prices. In order to measure the relationship between private label and national brand prices, I calculated the price index, $P_{\text{index}}$ as a ratio of the private label price to the average price for all national brands prices in a particular category. Because each observation is a shopping trip, I used all the categories represented in the shopping trip to calculate the price ratio. All category-level price ratios were then averaged to create an index of relative prices. Price indices are necessary and used often in the literature (Ailawadi et al., 2008; Bonfrer and Chintagunta, 2004) to explain private label penetration relative to national brands. I expect to see a negative relationship between the price ratio and the likelihood of purchasing private labels.
Store loyalty is also likely to be important (Ailawadi et al., 2008; Corstjens and Lal, 2000; Steenkamp and Dekimpe, 1997). There are many ways to capture store loyalty. For example, the extent to which a household is a loyal to a store can be calculated by measuring a household’s intent to continue shopping once the store is visited, their intent to recommend the store, perceived store image, loyalty-program popularity, store-brand penetration rate, or the frequency and number of purchases made at that store. I define store loyalty in terms of the ratio of the number of times the household does not switch retailers over the total number of shopping trips. That is, each purchase occasion represents an opportunity to switch stores, so the cumulative number of non-switching events is an accurate measure of loyalty. Store loyalty should positively impact the private label share according to Bonfrer and Chintagunta (2004) because shoppers who are loyal to a store have a tendency to have a positive perception of the retailer’s brand, which implies a higher likelihood of buying the retailer’s product.

Category-level factors constitute another set of explanatory variables. The number of categories in which private labels appear impacts private label success (Sayman et al., 2002). The more categories a retailer offers private labels in, the greater the potential private-label penetration rate. Also, the number of national brands and private labels in the category reflects fundamental category-level drivers of private-label penetration. Indeed, the more private labels are present in a category, the more consumers will be aware of their presence. I measure this variable by calculating a ratio of the number of private labels over the national brands in each product category. The variable PLNB\textsubscript{ratio} was calculated as a ratio of categories offering private labels to all categories per store and per week. Because this ratio varies by store and week, I specified PLNB\textsubscript{ratio} at the
store-and-week level across all categories in the store. It is assumed that if a private label has never been bought by any household, then a private label does not exist for that category. Because I use a large data set including purchases from over 3,500 households over a two year period, this is a reasonable assumption. My hypothesis is that as the number of private labels relative to national brands rises, the awareness of private labels rises and consumers are more likely to purchase the private label in each category.

In addition, brand loyalty is key to explaining private label penetration (Ailawadi et al., 2008). Brand loyalty can either be calculated through consumer surveys, capturing attitudinal brand loyalty, or through observed repeat purchase (Aaker, 1991; Chaudhuri and Holbrook, 2001; Keller, 1993; Oliver, 1999). Brand loyalty can also be measured empirically as the price gap between one brand and another necessary to induce the consumer to switch (Agrawal, 1996). However, implementing this method of measuring loyalty first requires estimating the willingness-to-pay for each brand, and then calculating the difference in reservation prices between each. To capture brand loyalty, I adopt a more simple and intuitive approach and include observed repeated choices of the same brand as an empirical measure of loyalty. I express this value as a ratio by dividing the number of brand-repeat purchases by all repeat purchases in each product category. Based on the findings of previous research, brand loyal consumers are hypothesized to be less willing to purchase private labels (Ailawadi et al., 1998; Burton et al., 1998; Garretson et al., 2002).

Controlling for each of these factors, I identify umbrella branding as a household-specific behavioral construct. Specifically, I calculate each household’s tendency to purchase private labels from a prior calibration period, and interpret this as a measure of
their behavioral proclivity toward umbrella brands, all else constant. Because I control for other factors that may explain private label purchase, this construct reflects a latent performance bond between the household, and each private-label brand as described by Wernerfelt (1988). To calculate each household’s tendency to purchase private labels, I use the first 25% of shopping trips for each household and calculate their individual private label share by counting how many private label products were bought compared to national brands in the product categories in which any purchase was made. The variable $UB_{tendency}$ is constant across shopping trips for each household, but varies across households. My hypothesis is that households have a perception of private label performance, that this perception is reflected in the $UB_{tendency}$ variable, and that this performance bond helps explain private label share. As such, I expect to observe a positive correlation between tendency and private-label share.

Other variables capture observed household heterogeneity. The model includes demographic variables that others find to be influential in explaining private label share (Bonfrer and Chintagunta, 2004). More precisely, I include household size and household income in my model. Household size is expected to have a positive effect on the purchase of private labels because previous literature shows that large families tend to purchase store branded product either for their larger packaging, or lower prices (Sudhir and Talukdar, 2004). On the other hand, income is expected to have a negative effect since price sensitive households are more likely to choose private labels (Hoch, 1996).

Consistent with the logit model developed above, the dependent variable, $PL_{share}$, represents the log-volume share of the private label products chosen in a shopping trip compared to national brand products. Shopping trips that contain more than ten items
each are used, to ensure that the share is meaningful (compared to a shopping trip including only two items for example). Others define the private-label share using dollar-share or purchase-share, and use only the categories in which private labels are offered (Ailawadi et al., 2008). Because the objective of this study is to explain private-label share across categories, it is important to include every product category in the store even if they do not include private labels.

Equation (1) can be simplified by defining mean utility as $\delta_h$ so that:

$$U_{hjct} = \delta_{hjt} + \epsilon_{hjct}$$  \hspace{1cm} (2)

where $\delta_h$ represents the mean utility of consuming product $j$.

The random error term $\epsilon_{hjct}$ reflects heterogeneity in consumer tastes. Consumers prefer different product attributes and thus make different choices based on those preferences. Consumers then choose the product (or brand) with the highest realization of utility. In the present case, some consumers have a tendency to favor private labels over national brands. For that reason, brands are categorized as either private labels ($PL$), or national brands ($NB$). For practical purposes, this amounts to defining each brand as either a private label, or not, so all brands chosen that are not private labels form the outside option. Consistent with Berry et al. (1995), I define the outside option as the total potential product purchases of a consumers shopping basket minus the amount of private labels purchased.

Assuming the discrete brand choice is replicated throughout all $c = 1,2,3,\ldots,C$ categories, I aggregate over all categories to describe the composition of the entire shopping basket. The Type I Extreme Value assumption implies that each discrete choice
is represented by a logit probability expression. Aggregating the logit probabilities over all $C$ categories provides a model of the shopping-basket share for each brand $j$, or $S_{hjt}$.

$$S_{hjt} = \frac{\exp(\beta_{0j} - \alpha p_{jt} + \sum_k \beta_k x_{jkc} + \sum \gamma Y_h + \xi_{jt})}{\sum_{l=1}^{C} \exp(\beta_{0l} - \alpha p_{jl} + \sum_k \beta_k x_{lkc} + \sum \gamma Y_h + \xi_{jt})}$$  \hspace{1cm} (3)

or, more compactly as:

$$S_{hjt} = \frac{\exp(\delta_{hj})}{\sum_{l=1}^{C} \exp(\delta_{hl})}$$  \hspace{1cm} (4)

The market share of the outside good is $s_0$ and the share I am interested in, $s_j$, is the probability that a private label will be purchased. I then apply the linearization described by Berry (1994) to yield a tractable model of shopping-basket share. That is, I take the logarithm of both sides to find:

$$\ln(S_{hjt}) = \ln(\exp(\delta_{hj})) - \ln(1 + \sum_{l=1}^{C} \exp(\delta_{hl}))$$  \hspace{1cm} (5)

I then move the last part of this previous equation (representing the outside option) to the left end side and expend the $\delta_{hj}$ to show the different factors impacting the share:

$$\ln(S_{hjt}) - \ln(s_0) = \delta_j = \beta_{0j} - \alpha p_{jt} + \sum_k \beta_k x_{jk} + \sum \gamma Y_h + \xi_{jt}$$  \hspace{1cm} (6)

This logit model presents some limitations. This model assumes the error term is i.i.d. so it represents random variation in taste, which yields the independence of irrelevant alternatives (IIA) property. This implies that the choice made is independent of the utility made from any other choice. However, choosing private labels in other product categories is rather assumed to impact the choice of a private label in the target categories, according to my theory, which is a violation of the i.i.d. error property. The simple logit model is thus not appropriate, so I estimate a mixed logit model that relaxes the IIA assumption (McFadden, 1978).
In a mixed-logit framework, choices are assumed to be correlated through the unobserved heterogeneity term. This correlation is captured by allowing one or more parameters of the utility function to be random variables. In my model, I allow the tendency to buy private labels across categories to be randomly distributed over households. I examine the appropriateness of the mixed logit assumption by estimating a simple logit model, and compare the goodness of fit across models.

More formally, utility is written as:

$$U_{hjct} = \sum_c \beta_{0j} - \alpha p_{jt} + \gamma_1 UB_h + \sum_k \beta_k x_{jk} + \sum \gamma Y_h + \xi_{jt} + \epsilon_{hecjt}$$

(7)

where the random term $\gamma_1$ varies over households and $UB_h$ represents the household tendency to buy private labels across product categories, which is intended to capture the latent umbrella branding effect. I explain the construction of this variable in more detail below. I assume that the umbrella effect is a normally distributed parameter, or:

$$\beta_{1h} \sim N(\bar{\beta}_{1h}, \sigma_{\beta})$$

(8)

I compare three models in order to examine the robustness of my empirical results. The first is a simple logit model where the independent variables are product specific, category specific, store specific or household specific factors impacting private label share, but where the tendency for umbrella branding is omitted. This is the base model that reflects explanatory variables consistent with the literature. The second model is a simple logit where the tendency variable is added. It has the same econometric structure as it is a simple logit but the tendency variable capturing the umbrella branding hypothesis is introduced. The third model is a mixed logit that assumes the umbrella branding effect to be randomly distributed among sample members.
Category-choice is assumed to be exogenous, but brand choice in each category is endogenous. Therefore, the dependent variable represents an aggregation of discrete choices over all categories in the shopping basket. In aggregate data, private label prices and some of the other category and store-level factors are likely to be endogenous, so instrumental-variables estimation is required. However, in household data the error term is likely to be independent of each factor that I include in the model, so endogeneity is not likely to be a significant source of estimation bias.

Including all of the variables described above, the empirical model is written as:

\[
\log \left( \frac{S_{hj}/S_0}{\cdot} \right) = \beta_{0j} - \alpha \eta_j + \gamma_1 \text{UB} + \beta_1 \text{PLNBratio} + \beta_2 \text{Pindex} + \beta_3 \text{Store1} + \beta_4 \text{Store2} + \gamma_2 \text{Size} + \gamma_3 \text{Income} + \gamma_4 \text{Risk} + \gamma_5 \text{Sloyal} + \gamma_6 \text{Bloyal} \quad (9)
\]

The \( \text{UB}_{\text{tendency}} \) variable is estimated as random parameter since I hypothesize that there is likely to be substantial unobserved heterogeneity in how the performance bond is manifested in each household’s choice of private labels relative to national brands. The entire model is estimated using simulated maximum likelihood (Train, 2009) with 40 Halton draws in order to improve the speed of estimation.

The linear model cannot be estimated with Ordinary Least Square (OLS) because the random parameters introduce a source of non-linearity into the estimation routine, so simulated maximum likelihood (SML) is used (Train, 2003). Also, as Moulton (1986) noted, OLS with large cross sectional data sets gives inflated standard errors resulting in biased t-stats. SML is commonly used to estimate random parameter logit models (Bhat, 2001; Train, 2001, 2009).
Data Description

The data consists of household-panel scanner data from Nielsen Homescan (Kilts Center\(^1\), 2012). Homescan links household characteristics (e.g., income, size, education) to purchases on each shopping trip. The purchase data includes the store chosen, product identification, price, any promotion activity, and coupons used. Household panel data is required because the model requires cross-sectional variation in private label penetration in order to identify the umbrella-branding effect.

Each observation in Homescan is a household-shopping trip taken at one of three major retailers over the most recent two years, 2008 and 2009, and includes every food category in dry goods, frozen products, grocery, meat and dairy. Only those shopping trips in which at least ten items were purchased in any food category are included in the analysis. In order to identify household-specific behaviors, I also limited the data to households reporting at least ten shopping trips over the two-year period. These two restrictions ensure that enough data for each household are available to analyze cross-category purchases, and umbrella branding behavior. The final dataset comprised 62,813 observations representing the total number of shopping trips for the 3,559 households.

In general, the Homescan data describes households that are relatively similar to the general U.S. population. In this particular sample subset, household size is similar to the national average at 2.6, but the median income is higher comparing to the national median at $51,371 (US census, 2012). This difference can be explained by the fact that households in the Homescan data represent consumers who can afford to shop at the grocery store.

\(^1\) The author thanks the Kilts Center of the Booth School of Business at the University of Chicago for making the Homescan data available.
Table 2 presents demographic and socio-economic data for the sample, as well as price and share variables for each retailer. The data in this table reveals that there are substantial differences among retailers on each of these factors. Table 2 shows that consumers who shop at Store 3 have the highest mean income and the largest family size. Store 3 shoppers also have the highest level of risk aversion and are the most store-loyal. However, they also have the lowest brand loyalty. Based on the hypotheses made earlier, large family size, high store loyalty and low brand loyalty are positive indicators for private label purchases, but high income and high risk aversion are expected to be negatively correlated. If shoppers trust the store name, and the private-label offering is of a high quality, this environment should be favorable to private label umbrella branding.

Store 1, on the other hand, is frequented by patrons with the lowest income, risk aversion, family size, and store loyalty. Store 1 likely benefits from value shoppers attracted to lower-priced private labels. The low risk aversion of shoppers of Store 1 should also suggest they will sell a high share of private labels. However, other demographics for Store 1, namely low household size, low store loyalty and high brand loyalty, are not supportive of a strong private label strategy.

Due to the apparent difference in private label strategies, and patron demographics, the sample stores differ widely in terms of PL penetration. Store 3 displays the highest prices, but the lowest number of private labels compared to national brands, while consumers who shop at Store 3 have the lowest private label share. It appears from Table 2 that Store 3 does not seem to be a favorable environment for private label umbrella branding. On the contrary, Store 1 has the lowest prices, higher private label share, and a higher ratio of the number of private labels compared to the number of
national brands. It seems that the low income and low risk aversion of Store 1 shoppers have then a bigger impact than the other factors on private label choice. Formal econometric estimation is necessary, however, to control for these other factors and test the umbrella branding hypothesis.

Table 2

Means of store data and demographics

<table>
<thead>
<tr>
<th>Store</th>
<th>Household Income ($)</th>
<th>Household Size</th>
<th>Store loyalty</th>
<th>Brand loyalty</th>
<th>Risk aversion</th>
<th>Price Index</th>
<th>PL/NB ratio</th>
<th>PL share</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>62,918</td>
<td>2.5</td>
<td>0.886</td>
<td>0.777</td>
<td>1.106</td>
<td>77.25%</td>
<td>18.44%</td>
<td>33.06%</td>
</tr>
<tr>
<td>2</td>
<td>77,198</td>
<td>2.6</td>
<td>0.915</td>
<td>0.775</td>
<td>1.208</td>
<td>85.46%</td>
<td>11.79%</td>
<td>26.81%</td>
</tr>
<tr>
<td>3</td>
<td>82,395</td>
<td>3.1</td>
<td>0.939</td>
<td>0.699</td>
<td>1.739</td>
<td>86.99%</td>
<td>8.54%</td>
<td>16.99%</td>
</tr>
</tbody>
</table>

The data in that table also reveals a considerable diversity in store-format choice. Because different retailers have different policies regarding private label strategy, including a binary variable capturing store choice, or store fixed-effects as described above is clearly necessary. Finally, based on that table only, it seems that the highest private label share is found where the household income is the lowest, but also the household size, the store loyalty, the risk aversion and the price index are the lowest while the brand loyalty and the ratio of private labels to national brands in the store are the highest.

Income represents the mean income of the household (household head and other active members counted). The size is the average number of person, including the household head. The store loyalty and brand loyalty are the ratio of the store choice and brand choice over all trip and purchase occasions. The risk aversion factor is represented by an index linked to household expenditure. Price index reflects the ratio of private labels prices versus national brands prices if only private labels were chose in a basket compared to only national brands. The share is expressed by the number of private labels chosen over the total number of items purchased. The ratio PL NB describes the number of private labels over the number of national brands, aggregated per category and then per store in this case.
Private labels are present in many shopping baskets. Figure 3 shows the frequency with which private labels are purchased per shopping trip. Although there are some 7% of shopping trips where consumers buy no private labels, it is very likely that consumers will choose to purchase at least one, and often several private labels. In fact, 3 or 4 private labels are purchased on 24% of shopping trips, and 35% of the time 5 to 10 private labels are purchased. Clearly, private label purchase occurs across multiple categories, but it remains to determine why.

![Pie chart](image)

**Figure 3.** Frequency of private labels purchased per shopping trip.

My primary concern is the tendency of households to buy private labels across categories. Figure 4 shows the distribution of tendency values across households. The data in this figure is interpreted as follows: About 28% of households from the sample (N=3,559) have a 30% chance of choosing private label in any category.
**Figure 4.** Households’ tendency to purchase private labels across product categories.

As shown on Figure 4, most households are in the 20 - 30% range of the tendency variable. This is consistent with the overall private-label market share in the U.S. (23% in 2011, Symphony IRI) so lends some validity to the accuracy of this construct. The tendency variable also appears to be a good predictor for the share as illustrated by the relationship between those two variables on Figure 5 below.

**Figure 5.** Households’ distribution over the main constructs
Overall, those preliminary results show diversity among stores in terms of their private label strategies, and outcomes, but also in households’ behavior. Their demographics, the number of private labels bought, and the scope of tendency for umbrella branding show substantial variation and, hence, opportunity to identify significant relationships among them. In the next section, I present more formal econometric tests of the umbrella branding hypotheses that control for each of these household and store-specific factors.

**Results**

In order to test the importance of the behavioral variable UB\(_{\text{tendency}}\), I estimate three different regression models. The first one does not include the tendency construct, while the second one includes UB, and the third does so as a random parameter. In the first two models, the specification also includes a constant term to account for the baseline tendency of households to purchase private labels. Model 1 represents the base model while Model 2 and Model 3 represent tests of the umbrella branding hypothesis. In order to test the appropriateness of the random coefficient specification for the UB parameter, I used a t-test for the UB parameter and a Likelihood ratio test to compare the models. Table 3 shows the results of the different models but only the preferred specification is interpreted.
**Table 3**

*Models of Panel Data*

<table>
<thead>
<tr>
<th></th>
<th><strong>MODEL 1</strong></th>
<th></th>
<th><strong>MODEL 2</strong></th>
<th></th>
<th><strong>MODEL 3</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Coefficient</strong></td>
<td><strong>t- ratio</strong></td>
<td><strong>Coefficient</strong></td>
<td><strong>t- ratio</strong></td>
<td><strong>Coefficient</strong></td>
<td><strong>t- ratio</strong></td>
</tr>
<tr>
<td><strong>Constant</strong></td>
<td>0.0129</td>
<td>1.56</td>
<td>-0.0308***</td>
<td>-4.34</td>
<td>0.0252***</td>
<td>4.43</td>
</tr>
<tr>
<td><strong>UB</strong></td>
<td>0.6959***</td>
<td>148.54</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>UB (random)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.6570***</td>
<td>173.90</td>
</tr>
<tr>
<td><strong>Std. Dev. UB (random)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.1220***</td>
<td>662.56</td>
</tr>
<tr>
<td><strong>Risk</strong></td>
<td>-0.0014***</td>
<td>-8.62</td>
<td>-0.0008***</td>
<td>-5.88</td>
<td>-0.0006***</td>
<td>-4.97</td>
</tr>
<tr>
<td><strong>Income</strong></td>
<td>-0.0403***</td>
<td>-29.49</td>
<td>-0.0117***</td>
<td>-9.84</td>
<td>-0.0125***</td>
<td>-13.40</td>
</tr>
<tr>
<td><strong>Size</strong></td>
<td>0.0048***</td>
<td>10.24</td>
<td>0.0022***</td>
<td>5.45</td>
<td>0.0033***</td>
<td>10.16</td>
</tr>
<tr>
<td><strong>Store1</strong></td>
<td>0.1596***</td>
<td>34.07</td>
<td>0.0399***</td>
<td>9.72</td>
<td>0.0548***</td>
<td>16.29</td>
</tr>
<tr>
<td><strong>Store2</strong></td>
<td>0.0930***</td>
<td>44.36</td>
<td>0.0331***</td>
<td>17.92</td>
<td>0.0533***</td>
<td>36.28</td>
</tr>
<tr>
<td><strong>Pindex</strong></td>
<td>0.0112***</td>
<td>2.38</td>
<td>0.0107***</td>
<td>2.47</td>
<td>0.0122***</td>
<td>3.53</td>
</tr>
<tr>
<td><strong>Sloyalty</strong></td>
<td>0.0834***</td>
<td>21.75</td>
<td>0.0253***</td>
<td>7.63</td>
<td>0.0239***</td>
<td>8.64</td>
</tr>
<tr>
<td><strong>Bloyalty</strong></td>
<td>0.1388***</td>
<td>20.95</td>
<td>0.0394***</td>
<td>6.87</td>
<td>-0.0523***</td>
<td>-11.20</td>
</tr>
<tr>
<td><strong>PLNBratio</strong></td>
<td>-0.0986***</td>
<td>-2.32</td>
<td>0.2187***</td>
<td>5.98</td>
<td>0.2775***</td>
<td>9.39</td>
</tr>
<tr>
<td><strong>LLF</strong></td>
<td>27876</td>
<td>37332</td>
<td>40477</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

N=62,813, Note: ***, **, * => Significance at 1%, 5%, 10% level

The t-test for the UB variable between Model 2 and Model 3 is as follows:

\[ t = \frac{\beta_{UB2} - \beta_{UB3}}{\sqrt{\frac{\text{var}_{UB2}}{n_2} + \frac{\text{var}_{UB3}}{n_3}}} = \frac{0.6959 - 0.6570}{\sqrt{\frac{0.0000143}{62813} + \frac{0.0000219}{62813}}} = 1617 \]  

(10)

The calculated t-value is greater than the t-statistic at 5% (1.96), so the null hypothesis is rejected and I conclude that the UB parameters are statistically different from each other.

In addition, the likelihood ratio between the two models including the behavioral variable is:

\[ LR = 2(LLF_2 - LLF_3) = 2(40477 - 37332) = -6289 \]  

(11)

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3 Model 1 is a simple logit with factors from the literature. Model 2 is also a simple logit but in addition to the factors from the previous model I add the UB tendency variable. Model 3 is a random parameter logit model where UB tendency varies among households.
Compared to the Chi-square value at 5% (3.84), the LR value is large so the null hypothesis is rejected; the two models are statistically different. Model 3 thus is the preferred model.

I focus my interpretation below on the random coefficient specification. Based on the results reported in Table 3, all of Model 3 explanatory variables are statistically significant. Each household attribute has a significant impact on PL share. The income estimate is negative indicating that households with higher income have a preference for national brands, as expected. The fact that the income variable has a significant and negative impact on the share of private labels is consistent with my prior expectations that wealthier consumers do not buy private labels. Indeed, consumers who can afford national brands might not want to take the risk associated with the purchase of private labels. National brands are still more expensive on average and convey the image of trust and quality stability in a consumer’s mind. This also explains why risk-averse consumers appear to be less willing to purchase private labels. Indeed, risk aversion is significant and negative indicating that consumers still associate a certain level of risk with private labels and as the risk aversion increases, share of products that are private labels decreases. Household size has a positive effect, indicating that larger families have a higher likelihood of purchasing private labels. Store loyalty, on the other hand, has a positive effect, so consumers who are attached to a particular store also purchase their store brands. This result is again, intuitive. Brand loyalty reduces the share of private labels, perhaps because national brands inspire greater loyalty than do store brands. Those estimates are all consistent with results reported elsewhere in the literature. Importantly, the brand loyalty estimate appears positive in Model 1 and 2 against
expectations and changes sign in the preferred model, which highlights the bias inherent in models that do not account for unobserved household heterogeneity. The number of private labels offered across all product categories has a significant and positive effect on the private label share, which is consistent with my expectations. Indeed based on the literature, having more private labels in the store compared to the number of national brands should increase their awareness in the consumer’s mind and should translate to more private label purchases (Sayman et al., 2002). Illustrating the extent of bias in Model 1 that omits the UB variable, the sign of the PLNB ratio is inconsistent with my expectations in that model.

Store-level fixed effects have the expected effect on private label share. Store 1, which has lower overall prices and a higher private label share in calibration, has a significant and positive effect. This result reflects the likelihood that Store 1 has a successful store-brand strategy relative to the other retailers. Based on their lower income clientele, and less risk averse customers, the retailer is apparently able to offer a line of private labels that suits their shoppers and takes advantage of the umbrella branding effect at the same time. Based also on the fact that store loyalty is high for Store 1, it would seem that consumers trust the store name. By offering a large number of private labels across categories at an attractive price for these value seeking shoppers, this retailer has successfully implemented their private label policy.

Prices are clearly important. The results in Table 3 show that the price index variable has a significant and positive effect. As it represents the ratio of private label prices compared to national brands, it seems that the closer private label prices are to national brand prices, the higher is private-label share, contrary to expectations. This
variable reflects a more fundamental aspect of private label strategy. Steiner (2004) as well as Bontemps et al., (2005) argue that private labels are tools for price discriminating between national brands and private labels, so if private labels are positioned closely to national brands, I would expect more intense competition between the two. At the same time, however, more intense competition between national brands and private labels that closely mimic their attributes is likely to reflect a Hotelling-competition dynamic (Hotelling, 1929). Namely, if retailers closely imitate national brands in both price and attribute space, then they are more likely to split the market in half than if a differentiated, or lower-price private label strategy were to be adopted.

Most important to the goals of this chapter, the UB variable appears to be both statistically and economically significant in Model 3, which provides empirical support for the Performance Bond theory. Because I control for all other factors available in the Homescan data that may explain private labels penetration, I interpret this finding as indicating the presence of a performance bond effect. In other words, even after controlling for all other explanations for household-level private label penetration, there appears to be a latent tie between households and private labels across several categories. This conclusion is supported by the significance of the scale parameter for the random umbrella branding effect. Because this parameter measures the importance of unobserved heterogeneity, it essentially picks up all of the unexplained variation in PL share among households. Indeed, this shows that households have a behavioral tendency to purchase private labels and that this tendency is particular to each one of them. In explaining private label market share, the umbrella branding tendency of the shoppers is thus a key element.
The implications of these findings are likely to be more general than the specific results reported above. First, recommendations to the retailers aiming at increasing their private labels share would be the following. Increasing the number of private labels across categories, matching private labels prices to national brands prices and developing marketing strategies to increase store loyalty are the three main factors to focus on. This can be done by extending the private labels line and ensuring that the quality gap with the national brands is as small as possible, and engaged promotion such as advertising. Communicating about the quality of their store brands would also be beneficial for retailers. Store displays and taste tests are examples of such strategies. Second, from the consumer perspective, evidence of umbrella branding shows that shoppers feel comfortable buying a known brand across categories. National brands have been able to capitalize on their brand name reputation across close categories (toothbrushes and toothpaste for example), but with the presence of private labels across the store in a significant number of categories, there is a real opportunity for private labels. Consumers can develop a trust in the store brand and diminish their perceived risk by choosing the same brand across categories. This could result in easier shopping choices for the consumers if they choose to be loyal to the store brand. In each category they would not have a whole new consideration set since the store brand would be their consistent brand, like a familiar marker. Last, in light of those implications, national brand manufacturers face a challenge. If the private label share continues to increase, they might need to rethink their product line and offer differentiated products, in attributes or prices. Innovation for new product development is still the national manufacturers’ advantage since most private labels offer similar products to existing ones.
Conclusion

Private labels continue to extend their reach throughout most U.S. supermarkets. In this chapter I offer the hypothesis that, in addition to the usual store, category, and consumer-based explanations, consumers tend to transfer their expectations of private label performance across grocery categories, in an effect akin to a performance bond, or extension of trust in one brand across several others.

Using an econometric model of household-level private label market share, I test this theory by controlling for the other factors likely to explain private label purchase and including a latent construct intended to capture households’ preferences for store brands. I find that this private-label tendency variable has a strong and statistically-significant impact on the share of private labels in each shopping cart. Moreover, this effect shows substantial and significant heterogeneity across households so does indeed reflect a behavioral influence that is not captured by other measureable variables. The results suggest that if households transfer their behavior towards one private label among other private labels, retailers can potentially benefit from offering private labels across as many product categories as possible as long as product performance can be maintained.

There are many implications of these findings, both for retail practice and the existing knowledge in this field. Food retailers can capitalize on that finding by developing their private labels lines across categories in order to tap into the umbrella branding tendency. However, this recommendation is tempered by the realization that if private labels in different categories have a performance bond, the extensions need to be at the level of performance of the existing products. In other words, the performance bond theory is likely to cut both ways – if good performance transfers across categories,
so will poor performance too. In addition, this result encourages retailers to invest in their private labels. Consumers do have a specific behavior towards private labels and the retailer should focus on pleasing their consumers with their private label lines so they can extend their perception across categories. Consumers are thus inclined to have a reduced risk while shopping across product categories by trusting the private labels line of products. The retailers can capitalize on that behavior by displaying favorably their private labels line in physical stores or online. If consumers are used to the store brand level of performance, shopping through retailers’ website would become easier. Further studies would be necessary to affirm that implication.

My findings contribute to the broader literature on private label marketing in that a behavioral approach to explaining private label share has not been implemented to the extent that I have here. Whereas others have tested the umbrella branding hypothesis in both private labels and national brands, none have done so using a construct that directly measures the extent of a performance bond between consumers and their private label brands.

One limitation of this research is that I use secondary or revealed-preference data. Revealed preference data always suffers from the weakness that purchase motivations are never explicit, and must be inferred from observed behavior. Therefore, in order to test this hypothesis more directly, in the next chapter I present a complementary analysis based on primary choice data.
CHAPTER 4
AN EXPERIMENTAL ANALYSIS OF
PRIVATE LABEL UMBRELLA BRANDING

In the previous chapter, I test for evidence of cross category effects that have the potential to be associated with the behavioral mechanisms underlying umbrella branding. My empirical evidence, based on secondary data, suggests that consumers who buy private labels in one product category are more likely to buy private labels in other categories. Inference from revealed preference data, even data gathered at the household level, however, is only indirect. Because umbrella branding is hypothesized to derive from behavioral mechanisms that operate at the consumer-level, experimental data may provide useful, corroborating evidence. Indeed, if consumers who perceive private labels favorably purchase them in multiple categories, and if their purchase behavior is moderated by a perception that private labels offer superior quality, then an experiment will provide a more direct test of the performance bond theory of umbrella branding. Through the experiment, I can also vary private label offerings to include a generic or a premium product in the same category in order to identify the effect of quality-tier strategies by the retailer. The objective of this chapter, therefore, is to evaluate consumers’ perceptions of private labels offered by the same retailer across product categories, and determine how their perceptions influence the willingness to purchase the same private label brand in multiple categories. Controlling for price and quality tier effects with experimental data, I test whether cross-category spillover, or umbrella effects, are based on some notion of transference of quality expectations within brands.
Secondary data analyses are unable to control for many behavioral factors, such as a consumer’s perception of the image projected by a brand, or product attributes such as the quality tier, that may be important in the selection of private labels across multiple categories (Semeijn et al., 2004). While designing a survey provides such flexibility, estimating willingness to pay that way can be biased if it remains hypothetical (Hensher, 2010). Thus, I chose to use an incentive compatible framework to accurately reflect consumers’ real-life choices. In this context, incentive compatibility means that subjects had an incentive to report their true willingness to pay. Therefore, in this chapter, I develop an incentive compatible choice experiment in which I test for umbrella effects in a controlled, experimental environment.

I test the theory that perceptions of quality transfer among like-branded products in different categories, or the performance bond theory of umbrella branding advanced in Chapter 2. A number of hypotheses are tested that are relevant to this objective. First, I test whether the evidence of cross-category purchase behavior found in the previous chapter holds in primary data as it does in the secondary data used in that chapter. Cross-category purchase behavior, however, is a necessary, but not sufficient, condition for the identification of umbrella branding. Cross-category purchases can be driven instead by price effects, preference heterogeneity, or simple brand preference. Rather, if consumers perceive private label brands in different categories are fundamentally the same quality, and purchase across categories, then I will have evidence in support of the performance bond theory of umbrella branding. My second hypothesis is that consumers perceive distinctions between different categories, or quality-tiers, of private labels. The third hypothesis is that the nature of the category determines the extent of umbrella branding.
Logically, if products are inherently complementary in use (e.g. milk and cereal) then there is greater scope for quality transference across categories, and stronger umbrella effects.

I test these hypotheses using primary data gathered through a choice based conjoint (CBC, Louviere, 1988) laboratory experiment conducted using a sample of subjects from the general population of grocery shoppers in a large Southwestern U.S. metropolitan area. In the experiment, I ask shoppers to risk their own money in making decisions regarding the purchase of milk, cereal, and ice cream brands as part of a simulated “shopping basket”. By choosing from among private labels and national brands in each category, subjects reveal whether they value the implicit performance bond offered by retailers as a reason for purchasing private labels across multiple categories. To this end, I introduce measures of general attitudes towards private labels in order to isolate the behavioral component of my theory.

This chapter is organized as follows: First, I detail the experiment and how it was conducted. Then, I describe the empirical framework that I use and how I intend to test my core hypotheses in the context of an econometric model of experimental choice. The results are discussed in the third section, both in summary form and in more detail from the econometric model. The final section concludes, and offers several implications for retailing strategy more generally.

**Experimental Design and Description**

Others test for evidence of cross category effects that are driven by other behaviors that underlie umbrella branding. For example, Erdem and Chang (2012) test for cross-category learning effects, while Richards et al. (2014), test for complementarity driven by
unobserved preferences for private labels. This evidence, based on secondary data, suggests that consumers who buy private labels in one category are more likely to buy private labels in other categories. Secondary data, however, does not inform of any behavioral factors that might be at play when consumers shop. If consumers purchase private labels due to the presence of an implicit performance bond, then evidence linking specific attitudes regarding the quality, reliability, and consistency of private labels to purchase behaviors is required.

If umbrella branding derives from behavioral mechanisms that operate at the consumer-level, then experimental data is necessary. Indeed, if consumers who perceive private labels favorably purchase them in multiple categories, and if their purchase behavior is moderated by a perception that private labels offer superior quality, then experimental data provides a more direct test of the performance bond theory of umbrella branding. Secondary data analyses are unable to control for many behavioral factors, such as a consumer’s perception of the image projected by a brand, or product attributes such as the quality tier, that may be important in the selection of private labels across multiple categories (Semeijn et al., 2004).

In my experiment, I control for these behavioral factors by asking a number of questions that uncover subjects’ underlying motivations for purchasing private labels. Specifically, the behavioral questions I use in the survey instrument ask consumers to rate statements about their perception of private label quality, the level of performance they expect from private labels and the level of trust they have in private labels. Those items were rated on a Likert type scale and used to develop the performance transference variable. Through the experiment, I also vary the range of private label offerings,
including a generic or a premium product in the same category in order to identify any variety or “tier” effects that retailers commonly use to position store brands.

The experimental framework is incentive compatible in order to accurately capture choices that consumers would make in the “real world”. In this context, incentive compatibility means that subjects are provided the opportunity to make real money, so have an incentive to behave as they would in a store, and report their true willingness to pay.

The experiment is designed as a choice based conjoint (CBC, Louviere, 1988) laboratory experiment, and is conducted using a sample of subjects from the general population of grocery shoppers in a large Southwestern metropolitan area. The laboratory experiment was conducted using 200 participants recruited through the social website Craigslist. Participants were offered up to $40 to participate (depending on whether they choose to buy goods as part of the experiment). Subjects needed to be at least 18 years of age, be the primary grocery shopper at their household and principally shop at Fry’s, Safeway, or Target. Focusing on these shoppers is necessary because these chains are the only supermarkets in the area that offer multiple-tier store brand strategies in the ice cream category. This also ensures variety in the store format and store policy which would strengthen my results. Once in the laboratory, participants were given the option of keeping their $40 and leaving the experiment, or using some of their endowment to choose from a set of products in three different categories. Within each category, participants were free to choose from national brands and private label brands at different price levels or choose to purchase nothing (See the survey instrument in Appendix A).
I ask shoppers to risk their own money in making decisions regarding the purchase of milk, cereal, and ice cream brands as part of a simulated “shopping basket.” By choosing from among private labels and national brands in each category, subjects reveal whether they value the implicit performance bond offered by retailers as a reason for purchasing private labels across multiple categories. To this end, I introduce measures of general attitudes towards private labels in order to isolate the behavioral component of my theory.

Milk, ice cream and breakfast cereal were chosen as product categories because private labels vary in prominence among them. While private label penetration is typically over 90% in the milk category, it is more often below 20% in the cereal category. They also come from different departments within the grocery store (frozen, dairy, dry goods) which is important in identifying umbrella branding effects independent from the effect of use-complementarity between some product-pairs (such as toothbrushes and toothpaste). In general, the choice of these three product categories is appropriate to study umbrella branding as quality perceptions are likely to transfer among products in categories that have strong brands that are important to each store’s private label strategy, and in which quality is an important choice variable. Within the ice cream category, I included three brands: One national brand and two private labels, one of which is a premium private label and the other a “value” or low-priced brand. For this category, I then assess whether variation in choice probability is related to the tier of the private label. For the cereal category, I allow the choice of one national brand or one private label. Similarly, there are two choices for milk, one national brand and one private label. Each one of these brands is assigned three different price levels. Because
of the different price levels, it is important to note that some of the choice involves options where the private label is as expensive as or even more expensive than the national brand. This ensures that preference is not only based on a lower price criterion. Studies use all kind of different discounts for the price levels (Della Bitta et al., 1981; Dodds et al., 1991; Grewal et al., 1998); I chose -25% and -50%:
Table 4

*Product brands and price levels*

<table>
<thead>
<tr>
<th></th>
<th>SAFEWAY</th>
<th>FRY'S</th>
<th>TARGET</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SHELF PRICE</td>
<td>-25%</td>
<td>-50%</td>
</tr>
<tr>
<td>Kellogg’s Cereal</td>
<td>4.99</td>
<td>3.74</td>
<td>2.5</td>
</tr>
<tr>
<td>Safeway Cereal</td>
<td>3.29</td>
<td>2.47</td>
<td>1.65</td>
</tr>
<tr>
<td>Horizon Milk</td>
<td>4.79</td>
<td>3.59</td>
<td>2.4</td>
</tr>
<tr>
<td>O'organics Milk</td>
<td>2.99</td>
<td>2.24</td>
<td>1.5</td>
</tr>
<tr>
<td>Breyers Ice cream</td>
<td>4.39</td>
<td>3.29</td>
<td>2.2</td>
</tr>
<tr>
<td>Safeway Ice cream</td>
<td>2.33</td>
<td>1.75</td>
<td>1.17</td>
</tr>
<tr>
<td>Lucerne Ice cream</td>
<td>2.75</td>
<td>2.06</td>
<td>1.38</td>
</tr>
</tbody>
</table>

The experimental design used is a fully orthogonal, fractional factorial in which price levels and national brand/private label attributes were varied such that the main

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effects of interest are identified (see Table 1). The 36 bundles were randomly grouped by three to create choice sets so that the participants faced 12 bundle choices. After each subject made all his or her choices, one of the 36 bundles was chosen at random to serve as the “winning” bundle. If a subject chose this bundle in the CBC procedure, he or she is to receive the chosen products and gave up an amount of cash equal to the sum of the prices of the three products. This mechanism, a variation on the Becker, DeGroot, Marshack (BDM) mechanism (Becker al., 1967), is well-understood to be incentive compatible. The BDM mechanism is originally used in an auction context. Participants formulate bids, and depending on the computer’s randomly picked price value, the participants receive the product or not. This mechanism has been used in behavioral economics to evaluate product choice and willingness to pay (Lusk et al., 2004). In this particular context, consumers who choose to purchase the auction bundle were given store gift cards for the products they purchase, and cash for the balance of their account. Once the experiment was completed, each subject completed a survey in which they recorded their demographic data and general questions regarding their shopping behavior, store loyalty, and attitudes toward private labels. The experiment was designed and implemented using Qualtrics online experimentation software.

Although the sample used fit a certain number of criteria explained before (chosen stores and categories shoppers), I did not screen the participants on their demographic variables. The final sample was comprised of 57% male shoppers. Participants range in age from 18 to 69, with a mean of 33 years old. About half of the participants have never been married. Their income distribution is represented below.
The income distribution of the sample show a large part of lower income compared to the state average of that area. This, in addition to the marital status and younger average age might be due to the fact that 21% of the participants were students. The location of the experiment on a college campus is probably a factor influencing the nature of the sample.

**Empirical Model**

The mechanism that causes umbrella branding that I propose differs from the previous literature because it derives from consumers’ inherent risk aversion and search for some guarantee of performance. Rather than learning about the existence and quality of private labels in other categories as in Erdem and Chang (2012), the behavioral mechanism relies instead on the transfer of value or performance perception among products of the same brand (Wernerfelt, 1988). The image of private labels is linked to past experiences and expectations. Umbrella branding is important because past experience with one private label creates an expectation of similar value for the purchase of the next private label. In the past, the stimuli revolved around an image that store brands were “cheap products,” but recent trends show that this might have changed. More than simply learning about a
particular private label, the performance transference theory is more general in that it implies that consumers consider a product based on past experiences, related products in the same brand, and the related store attached to the brand.

Umbrella branding implies that consumers who buy a private label in one category will have a higher probability of purchasing a private label in another category (Erdem and Chang, 2012; Richards et al., 2014). Correlated purchasing patterns, however, can be consistent with many alternative explanations for umbrella branding. Therefore, the empirical challenge in testing the performance bond theory of umbrella branding is identifying empirical relationships among brands that are unique to the Performance Bond theory. Because the existence of a performance bond effect relies on consumers’ ability to transfer perceptions of quality from one product to the next within a family of brands, my model tests for inter-brand correlation in latent quality.

I use the experimental data described above to test the theory that perceptions of quality transfer among like-branded products in different categories, or the performance bond theory of umbrella branding. When investigating the reasons why consumers purchase products from different categories, a multi-category demand model is required. Traditional discrete-choice models are not appropriate, because the data generating process underlying multi-category decision making is not independently and identically distributed (i.i.d.) when it comes to alternatives (Bell and Lattin, 1998; Ansari and Gupta, 2004; Metha, 2006; Song and Chintagunta; 2007). In my model the errors are independent over the choices, thus I take another approach from these authors: I develop a basket-utility maximization framework wherein the object of a consumer’s choice is a bundle of goods from a fixed set of categories, rather than a set of goods from categories
of their choice. In other words, the consumer does not have the choice to select a particular category. If he or she selects a bundle, then all three product categories are represented. By allowing respondents the flexibility to choose across different brands and prices, I retain the i.i.d. nature of consumers’ choices.

In the experiment, each subject is asked to choose one bundle from four possible options (three different bundles and one “none of the above” option). Each bundle represents a shopping basket, and each basket differs in terms of its attributes. Consumers are assumed to have heterogeneous tastes, some of which are unobserved. Therefore, I use a random parameters logit (RPL) model to test the hypotheses at hand\(^4\).

A logit model is also preferred over a probit model because the errors distribution follow a Type I extreme value and not a normal distribution. The logit model can be construed as a random utility model where the random parts of the utility function are distributed as Type I extreme value. Because unobserved heterogeneity is captured in the RPL model by allowing key parameters of the utility function to be random variables, I allow the marginal utility of purchasing one, two, or three private labels to depend on behavioral variables collected during the experiment. The random utility framework that underlies my model ensures that the consumer purchases the option that gives him/her the highest utility. It thus allows identifying individual behavior regarding performance perception, estimating marginal utility of bundle attributes, and relaxing the independence of irrelevant alternatives (IIA) that the multinomial logit is subject to.

\(^4\) A multinomial probit (MNP) model, such as the one estimated by Erdem and Chang (2012) is more flexible in that it allows for discrete choices while permitting interdependence among the error terms, but estimating a MNP model in the presence of unobserved heterogeneity is sufficiently burdensome, and my model sufficiently complex, that any reasonable specification could not be estimated.
Recall that umbrella branding, in general, implies that purchases in one category increase the probability of purchasing in another category. I test for umbrella effects by including a set of binary indicator variables that equal 1 when one, two, or three private label products are included in the bundle. If the presence of a private label increases the probability of purchase, then I interpret this as evidence of umbrella effects. If a subject chooses more than one private label, then I expect the performance bond effect to be stronger. Implicitly, therefore, my empirical model allows for the performance bond hypothesis to have a non-linear effect on purchase outcomes.

Whether umbrella branding implies the existence of a performance bond between the retailer and consumer, however, depends on the notion that the cross-category effect is moderated by a perception of quality transference across categories. I test for this effect by considering the effect of each subject’s perception of the inherent quality of private labels on the cross-category purchase of private labels. If the coefficient on this variable is significant, then the model provides evidence not only of umbrella branding, but of the performance bond mechanism hypothesized in the theory.

The other variables in the model include bundle characteristics: The total price of the bundle, the number of private labels in the bundle, the presence of a premium private label, and the product category in which a private label is present. For consumer characteristics, the theory aims at studying consumers and their performance perception across categories, not demographics. Thus, the performance transference is the only consumer specific variable used. The bundle variables will indicate which private labels (what category/premium or not), has an effect on the bundle choice while the consumer variable is entered as the random parameter.
Given these considerations, the form of the estimated utility function is expressed as:

\[ U_{hj} = \alpha_{pj} + \gamma_{1h}PL1 + \gamma_{2h}PL2 + \gamma_{3h}PL3 + \beta_1Pm + \beta_2Ice + \beta_3Cer + \beta_4Mlk + \epsilon_{hj} \]

(12)

where:

- \( PL1 = 1 \) for one private label in the chosen bundle
- \( PL2 = 1 \) for two private labels in the chosen bundle
- \( PL3 = 1 \) for three private labels in the chosen bundle
- \( Pm = 1 \) for a premium private label in the chosen bundle
- \( Ice = 1 \) for a private label ice cream in the chosen bundle
- \( Cer = 1 \) for a private label cereal in the chosen bundle
- \( Mlk = 1 \) for a private label milk in the chosen bundle
- \( \epsilon_{hj} \) is the i.i.d. error term

The \( \beta \) parameters are fixed while the \( \alpha \) and \( \gamma \) are allowed to vary randomly over subjects. I allow each of the gamma parameters to vary with each household’s perception of private label performance (\( Perf \)) in order to test the primary hypothesis of the paper. Intuitively, if the tendency to purchase one or more private labels (\( PL \)) depends on performance perception in a significant way, then there must be some form of performance bond between the subject and the retailers’ brands. Thus, each random parameter gamma test the behavioral hypothesis and varies according to a specific household and the number of private labels found in a product bundle. The parameter \( \gamma_{PLh} \) is then defined as a mean value based on the number of private labels, plus the effect
of the performance transference, plus a normalized standard deviation. Formally, the random parameter functions are written as:

\[ y_{PLh} = y_{PL} + \tau \text{Perf} + \sigma_v \]  
\[ v \sim N(0,1) \]

If each of the tau (\(\tau\)) parameters is significant and positive, then the notion that consumers transfer their perception across categories is supported. In terms of the predictions of the model, a positive effect of performance perception suggests that the performance bond theory is the reason why households choose bundles containing private labels.

Estimation must account for the fact that the functional form for the probability of choosing each bundle does not have a closed form due to the fact that I include three random parameters. Therefore, in estimating this model, I use simulated maximum likelihood (SML) (Train, 2003) with 40 Halton draws in order to expedite estimation.

**Results**

In this section, I present the results obtained from estimating the RPL bundle-choice model in (12) above. I first present the results from specification tests to establish the validity of the maintained model, and then interpret the coefficient estimates from the preferred specification. I draw implications from this model for both the presence of umbrella branding, and the relevance of the Performance Bond theory of umbrella branding.

In the table below, I compare the three models estimated. Model 1 represented a fixed parameter model with the bundle variables only, while Model 2 consists of a mixed logit model with price as only random parameter. Model 3 is the most comprehensive
specification with random parameters on each of the price, and performance functions.

I compare the goodness of fit across model specifications using likelihood ratio (LR) tests. Based on this criterion, I find that Model 3 is preferred.

\[
LR = 2(LLF_2 - LLF_3) = 2(2248 - 2226) = 44
\]  

(15)

The LR is greater than the Chi-square statistic value at 5% (3.84), so the two models are judged significantly different from one another.

Table 5

*Models estimation from experimental data*

<table>
<thead>
<tr>
<th></th>
<th>MODEL 1</th>
<th>MODEL 2</th>
<th>MODEL 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Coefficient</td>
<td>t- ratio</td>
<td>Coefficient</td>
</tr>
<tr>
<td><strong>Price</strong></td>
<td>-0.0037***</td>
<td>-15.25</td>
<td>1.5432***</td>
</tr>
<tr>
<td><strong>PL1</strong></td>
<td>1.0288***</td>
<td>9.83</td>
<td></td>
</tr>
<tr>
<td><strong>PL2</strong></td>
<td>1.9231***</td>
<td>13.90</td>
<td>2.9728***</td>
</tr>
<tr>
<td><strong>PL3</strong></td>
<td>3.5114***</td>
<td>22.98</td>
<td></td>
</tr>
<tr>
<td><strong>Price (random)</strong></td>
<td>-0.0051***</td>
<td>-15.09</td>
<td>-0.0050***</td>
</tr>
<tr>
<td><strong>PL1(random)</strong></td>
<td></td>
<td></td>
<td>1.8826***</td>
</tr>
<tr>
<td><strong>PL2(random)</strong></td>
<td></td>
<td></td>
<td>3.5451***</td>
</tr>
<tr>
<td><strong>PL3(random)</strong></td>
<td></td>
<td></td>
<td>5.5299***</td>
</tr>
<tr>
<td><strong>Pm</strong></td>
<td>-1.4382***</td>
<td>-12.70</td>
<td>-2.0022***</td>
</tr>
<tr>
<td><strong>Ice</strong></td>
<td>-1.6107***</td>
<td>-12.84</td>
<td>-2.1302***</td>
</tr>
<tr>
<td><strong>Cer</strong></td>
<td>-1.8454***</td>
<td>-19.59</td>
<td>-2.4246***</td>
</tr>
<tr>
<td><strong>Mlk</strong></td>
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<td><strong>PL2*Perf</strong></td>
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N=2076, Note: ***, **, * => Significance at 1%, 5%, 10% level

---

\(^5\) Model 1 is the base model with fixed parameters. Model 2 has the price coefficient as a random parameter. Model 3 has a price and the performance transference parameters as random.
I focus my interpretation of the results on Model 3. Several inferences can be made from the results reported in Table 5. First, note that price is defined as the total price of all products in the bundle. Therefore, the more expensive the bundle, the less likely it is to be chosen since the price coefficient is negative. This effect is expected, and is consistent with prior expectations. Note, however, that the interaction between price and performance has a positive effect, although not statistically significant at conventional significance levels. This finding implies that consumers’ price-sensitivity does not change depending upon their performance perception, which is somewhat surprising. Because the point estimate is positive, there is weak evidence that consumers become less price-sensitive the higher their expectation of performance, which is an intuitive result.

Second, the presence of a premium private label has a negative impact on bundle choice as the Prem parameter is negative and significant. It is possible that consumers do not associate premium private labels with the store they are in as retailers commonly use brand names to differentiate premium labels from their usual, value offerings. For example, Target uses Archer Farms and Market Pantry, while Kroger uses Kroger branded goods alongside their premium Private Selection. Investigating this further would require a follow up study on consumers’ association of premium private label names with each retailer in question. In addition, a private label in the cereal category reduces the probability of bundle purchase more than the presence of private labels in either of the other two categories. This may be due to the fact that the cereal category has strong national brands. Consumers seem to attach and unusual importance to having national brand cereals in their chosen bundle. Based on those bundle characteristics, retailers can adjust their policies knowing that their premium private labels and their
private label in the cereal category will face bigger challenges. For example, they can emphasize their promotion tools on those products.

Third, bundle choice is positively affected by the number of private labels it contains: A bundle with three private labels (so having a private label in every category in this case), is more likely to be chosen relative to a bundle with two private labels, and a bundle with two private labels is more likely to be chosen relative to a bundle with one private label. Moreover, a bundle with one private label is more likely to be chosen than one without private labels. This is observed by the positive and significant PL1, PL2, and PL3 variables. This shows indication of the household tendency to buy private labels across categories. The interaction between the performance transference and the bundle choice containing private labels are all positive coefficients, bringing support to my hypothesis that households have a behavioral tendency to buy store brands across categories. The intent in allowing the performance and private-label indicator interactions to vary randomly is to test my primary hypothesis that umbrella branding – or the tendency to purchase several private labels on the same trip – is related to consumers’ perceptions of private label performance. In this regard, the interaction term between the performance transference the choice for bundles highly populated with private label is positive and significant at the 5% level. This indicates that performance transference is significant for the bundle containing three private labels. For consumers purchasing the most private labels, it appears that perceived performance is an important consideration. More importantly, the tendency to purchase private labels in multiple categories depends on a common perception of performance, which I interpret as support for the Performance Bond theory.
Overall, the results show evidence of the quality transference theory as the tendency to purchase across-categories depends on the perception of performance. This finding has important implications for consumers, retailers, and both private label and national brand manufacturers. Namely, retailers need to ensure that their private labels maintain a level of consistency if shoppers are going to apply their performance perception of one product to other products in various categories. As private labels are tied to the store, it is important that retailers keep a positive image in consumers’ mind. Enhancing store image and the store brand image through advertising campaigns are recommended for retailers. For shoppers, they should expect retailers to understand this mechanism, and ensure that they offer consistent quality within private label lines. Since consumers transfer their performance transference, they develop expectations and reduce their risk. At the same time, private label suppliers should also realize that quality needs to be uniform and that retailers will want to expand their line across categories. By developing their line and increasing their private labels share, retailers might gain market power and enter tougher negotiations with their suppliers. For national brand manufacturers, trying to compete on the umbrella branding front does not seem to be possible as national brands are usually offered until one or a few related product categories. Innovation and differentiation still remains the recommendations if they want to keep market share.

**Conclusion**

This chapter aims at studying the umbrella branding theory of private labels in an experimental setting. After finding evidence of umbrella branding in the previous chapter, I further evaluate the possibility for this phenomenon to be linked to consumer’
behavior. I specifically investigate the perception of a common level of performance across private label brands. The main findings are that private labels have the potential for umbrella branding because shoppers do transfer their perception of performance across product categories. This behavior can lead consumers to develop trust in the store brands, thus their likelihood of choosing them across the store, and then contributing to an increased private label share.

My research contributes to the private label literature in that I offer an explanation for umbrella branding, and for private-label proliferation, that is fundamentally behavioral. Because the results show that consumers transfer their performance perception for bundles with the largest amount of private labels, I conclude that umbrella branding in private labels is linked to consumers’ performance transference.

This work has several implications. First retailers can exploit umbrella branding and may benefit from extending private label lines across categories. In fact, private labels can carry an implicit performance bond, and this bond serves as quality insurance across categories for the consumers. The categories where strong national brands exist are a bigger challenge, but may still yield an umbrella branding effect. Private labels are thus linked by a performance bond (Wernerfelt, 1988) and retailers need to introduce private labels that are consistent in quality across product categories. Retailers also can benefit from more market power regarding their suppliers or their competitors (national brand manufacturers).

Our findings can be generalized to other retailing contexts. For example, in the auto industry, Toyota already uses different tiers of its brand to expand new lines such as Lexus or Scion. Retailers may also consider expanding their brands into other, unrelated
lines of business, such as Kirkland insurance at Costco or Private Selection tools at Fred Meyers’ stores.

The experimental analysis presented here has a possible weakness, however, in that the subjects are all relatively homogeneous in that they are U.S. shoppers. Because private label penetration is higher in other countries – France and Germany, for example – umbrella branding may, in fact, be due to other, cultural factors. Because of the homogeneity of my U.S. sample in this study, I am unable to comment on this possibility, and leave this task to the next chapter.
CHAPTER 5

CULTURAL EFFECTS ON PRIVATE LABEL UMBRELLA BRANDING

If a consumer expects a brand to perform in one category as it does in another, then there is, in essence, a performance bond between the brand and the consumer (Wernerfelt, 1989). Such behavior would result in umbrella branding among private labels if the consumer likes the private label product in one category, he or she would be willing to try it in other product categories. In this way, umbrella branding may be a factor in explaining the rapid growth in private label-penetration in U.S. food retailing industry. However, the share of private labels is even higher in European countries: While the share in the U.S. is approximately 23% of units sold, the share in France is 36%, and in Germany is 41% (Freeman, 2012). This disparity could derive from differences in umbrella branding strategies across regions, or could be evidence of a more fundamental, cultural difference among consumers since usually consumers of a culture “share certain patterns of thinking, feeling and behavior (Thommen and Wettstein, 2010).” Extending the analysis of psychometric determinants (perception and attitudes) of consumer choices regarding product bundles in the previous chapters, I investigate the role of cultural background on the cross-category purchases of private labels by means of personality traits.

Culture engages “processes unfolding in time” between an individual and their environment (Thommen and Wettstein, 2010, p.217). The human living, psychic and social systems co-evolve with a culturally-constructed environment. In that dynamic context, Triandis and Suh (2002) conclude that culture is constitutive of personality. Indeed, personality traits are thought to capture how people think, feel, and behave
(Borghans et al., 2008) and hence, are able to explain the shared behavioral patterns in a culture.

Even though some individual variations must occur, overall, shoppers from a same culture possess similar shopping behavior (Triandis and Suh, 2002). If personality traits impact consumer product choice and culture is expressed by personality, then different cultures should show variations in their shopping behavioral trends. In addition, there is growing evidence that differences in personality explain variability in economic outcomes and can explain inconsistencies in observed choices (Almlund et al., 2011; Grebitus et al., 2013). Therefore, my focus is to test if differences in personalities explain differences in private label penetration rates.

To accomplish this objective, I conduct a cross-country study of two countries (France and Germany) that have similarly high private label penetration rates and, therefore, enable me to uncover the influence of cultural effects measured through personality traits on cross-category purchases of private labels. Umbrella branding of private labels is an important factor explaining its penetration rate in a market. Perceptual effects associated with umbrella branding may be cultural in origin providing an explanation for the difference in private label share. Again, I hypothesize that consumers’ cultural background has an impact on the success of umbrella branding. In this chapter, I aim to test whether or not the perception of private label performance is related to consumers’ cultural background expressed through personality traits.

The previous literature offers many explanations for why private label penetration rates differ among countries, but without focusing on the interaction between umbrella branding and cultural influence (Ailawadi et al., 2008; Erdem et al., 2004; Lamey et al.,
2007). For example, Ailawadi et al. (2008), study private label share in Europe, using Dutch data, but they did not analyze the effect that consumers’ cultural background could have on their product choice across categories. However, other studies give reason to believe that consumers with differing cultural backgrounds may perceive private labels in fundamentally different ways (Dhar and Hoch, 1997; Guerrero et al., 2000; Steenkamp et al., 2010). Indeed, because of their personality, consumers might have different product-choice behaviors (e.g., Grebitus et al., 2013). For example, in some cultures consumers can be more or less trusting of store brands based on how much they worry about fitting in with their friends and family (Erdem et al., 2006). Being worried, nervous or moody, however, are characteristics of the personality trait ‘neuroticism’ (e.g., Clark et al., 2007). Thus, I study the cultural aspect of consumers when it comes to choice of private labels across categories using personality measurement and a multinomial framework of product choice to add more detail to the hypothesis that cultural background may be the core mechanism behind umbrella branding of private labels.

The findings of this chapter show that, first, the umbrella branding effect among private labels is also found in markets other than the U.S. . This supports my theory that umbrella branding of private labels exists and that it can be explained by consumers’ performance transference. Second, the results indicate that the umbrella effect stems from consumers’ cultural backgrounds through the manifestation of individual personality. I show that performance transference from one product category to another heavily depends on consumers’ personality, which largely reflects culture (Triandis and Suh, 2002). My findings help explain private label market share in different markets, regardless of differences in store, category, and regional factors uncovered earlier.
There are many implications that follow from my findings. First, retailers can learn from those findings by considering consumers’ personalities and cultural background of a targeted new market and adjust their private labels offering accordingly. Mainly, the quality, or the name of a store brand can be modified based on the level of trust or willingness to try new products expressed by the local shoppers. If retailers find that consumers in a new market might be skeptical of store brands, they can use higher quality and a brand name that is not associated with the store. Second, consumers, based on their dominant personalities, can take advantage of the private labels offerings. If the retailers feel like that they are in a market where cheaper private labels or more promotion is needed to reach a large consumer base, then the whole market benefits from it. Third, national brands manufacturers might want to inversely take advantage of cultural markets that are not in favor of store brands.

I contribute to the literature by demonstrating that culture as expressed by personality has an impact on consumers’ behavior, by serving as a motivating factor for the multi-category purchase of private labels. In other words, variation in private label penetration rates among markets can result from differences in culture. This study is unique because it uses personality traits as a proxy to evaluate consumers’ culture based on the relationship that culture is constitutive of personality (Higgins, 2008; Markus and Kitayama, 1998; Triandis and Suh, 2002). I show that dominant personality traits among a population of shoppers impacts product choice across product categories. While others have considered personality as a factor in more general product-choice environments (Kassarjian, 1971; Sirgy, 1982), personality traits and consumers’ cultural effects have not been considered as potential drivers of cross-category purchase behavior.
This chapter is organized as follows: I first establish the validity of culture and personality as potentially important factors in private label purchase. I then describe the experiment implemented in France and Germany to test the importance of personality and culture on cross-category purchases of retail brands. In the third section, I explain how I test the effect of culture on cross-category purchases using an econometric model. The results section presents and discusses my findings, and I conclude by offering more general implications for retailing practice, and marketing strategy.

**Background on Private Labels and Culture**

In this section I establish the link between culture and private label purchases. Although culture and private label purchases have not been studied, it is well understood that consumer characteristics can impact product choices, and more specifically private label purchases.

Consumer characteristics significantly influence private labels purchases. Dhar and Hoch (1997) identify factors inherent to the retailer, such as the level of private-label quality or the fact that the private label has the retailer’s name, as impacting private label purchase, as well as factors related to the consumer himself. For example, price sensitivity, particularly among the less wealthy and more elderly populations, proved to be significant in their study. Nevertheless, the authors do not tie these attributes to consumers’ purchases of private labels across categories. Furthermore, Dhar and Hoch (1997) did not investigate consumer characteristics other than demographics.

Risk aversion, which is related to the performance bond concept, is also important in private label choice. Erdem and Chang (2012), show that risk-averse U.S. consumers purchase fewer private labels. They find that private labels in the U.S. provide less
consistent consumer experiences than in Europe, so the perceived risk of buying a private label over a national brand is higher in the U.S.. While they offer risk aversion as an explanation, it is also consistent with the performance bond theory that implies all private labels convey an equivalent level of performance across categories. Erdem et al. (2002) also show that the brand equity in European private labels is higher than for American store brands. Higher brand equity indicates that European consumers seem to trust local private labels more than is the case in the U.S.. The authors identify consumers’ attitudes toward risk, quality, and price, and find that consumer learning directly impacts the success of private labels. Consumers thus develop a set of expectations that impacts their future purchases of private labels. Those expectations can then be applied across product categories and lead to umbrella branding.

National or regional characteristics reflective of a culture or country may influence private label penetration rates. Erdem et al. (2006) show that national brands might be favored in some cultures compared to others. If national brands are a sign of superior product quality in the consumer’s mind, countries where the culture is characterized by a strong importance of the group (collectivism), and a low tolerance for ambiguity (high uncertainty avoidance), tend to avoid private labels purchases. As a result, culture has an effect on consumer behavior and product choice. Shoppers differ in nature because of their cultural background, which in turn influences their buying behavior, and the private label share. Guerrero et al. (2000) find that cultural background matters for private label purchases, especially in certain product categories. The authors consider olive oil purchases among Spanish consumers relative to Irish consumers, and find a strong interest in olive oil from the Spanish participants relative to the Irish.
Because olive oil is a key product in the Spanish culture, Spanish consumers are particularly careful with the quality and the product image of their choice and would then disfavor private labels. However, since the researchers considered only a single product category more research is needed to identify how cultural differences can spread across product types.

The hypothesis advanced in this chapter is supported by Steenkamp et al. (2010) and, indirectly, by Erdem and Chang (2012). Both of these studies find empirical results that suggest culture is important in private label brand choice. In each case, the authors looked at each country’s history of private label penetration and classified each as in the mature stage (mostly in Western Europe and North America) or in the development stage (Eastern Europe, Asia, South America), based on the number of years private labels have been present on the market. They show that consumers are less willing to pay a premium for national brands over private labels in mature countries, mainly because the quality gap between those products is smaller. Consumers recognize and trust store brands, and modify their behavior accordingly. Although cultural effects are not measured, differences between each group of countries could as easily be explained by differences in culture. I extend these studies by investigating consumers’ choice of private labels across product categories based on their cultural background.

My hypothesis is that private label umbrella branding differs in strength across countries because consumer behavior is driven, in part, by culture that differs across markets. As culture is expressed by consumers’ personalities and consumers’ personalities’ impact product choice, I propose that the performance transference leading to umbrella branding of private labels, is impacted by such consumer characteristics. In
order to test this hypothesis, I collect data in different cultural contexts concerning the consumers themselves and the product choices that they make. I address this gap in the literature by investigating the hypothesis that the importance of umbrella branding might explain observed variations in the penetration of private labels between countries, and that because the primary difference among countries is culture, umbrella branding may be described as a cultural phenomenon.

Culture and Consumer Personality

First, a culture is defined in general terms by its norms, values and habits (Higgins, 2008; Triandis and Suh, 2002). Culture and personality have been studied in the field of psychology since the late 1950s and early 1960s (Siegel, 1963). Earlier, anthropologists embraced the concept of a national character defining personality characteristics of a society. This notion lost interest until 1971, when Lynn published a book relating personality studies he had done indifferent countries. The researcher found that mean personality characteristics were common at a cultural level and comparisons could be made across cultures. Thus, from an individual level—personality, conclusions could be made at a collective level—culture. The empirical literature has evolved to conclude that an individual’s personality is created through the process of enculturation, or in other words, that culture builds personality (Hofstede and McCrae, 2004). The same authors show that measures of cultural aspects are highly correlated with measures of personality dimensions. The process of internalizing a culture to build a personality arises in an individual between the age of 3 and 6 (Higgins, 2008). The personality, then, translates into predispositions for a stable individual to show differences in behavior. Triandis and Suh (2002) explain that behavior is likely to be a function of one’s culture and
personality. The authors elaborate that individual personality is, among other factors, such as living environment and parenting influence, shaped by individual culture. I use the relationship between consumers’ personalities and their cultures in order to study the impact of culture on product preference.

A consumer’s personality is defined by an individualized and specific pattern of thoughts, emotions and behavior (Funder, 1997). The subject of personality has been studied under different theories that involve more or less factors or characteristics descriptive of personality called “personality traits” (Digman, 1990). Personality traits are mental dispositions of human personality that tend to be stable over time but differ across individuals, and are thought to capture how people actually think, and behave (Borghans et al., 2008). In the literature, there is a consensus around the most popular model of personality structure used to evaluate those personality traits (McCrae and Costa, 1987; Digman, 1990). McCrae (2002) stated that the Five Factor Model of Personality is a universally valid taxonomy of traits. Other competing systems comprised of 3, 10 or 16 traits were identified but the superiority of the five traits model is well documented (McCrae and Costa, 1987). Analyzing individual personality traits offers a bottom-up approach where the individual is the unit of analysis compared to the bottom-down approach where the culture is the unit of analysis (McCrae and Terracciano, 2004). The cultural approach was used by Hofstede and McCrae (2004), and four main dimensions of culture were identified: power distance, uncertainty avoidance, individualism and masculinity; but all of those dimensions are correlated with one or more traits from the Big Five model. The model categorizes any individual personality along five main traits: Openness, Conscientiousness, Extraversion, Agreeableness, and
Neuroticism (OCEAN). The openness to experience trait describes individuals who prefer novelty to convention; who favor originality and creativity, and are flexible in ideas and emotions. The second trait, conscientiousness, describes the individual’s level of organization; how responsible, detail oriented, and perfectionist the individual is. That trait is the one that predicts behavior the most accurately (Almund et al., 2011).

Extraversion measures the sociability of an individual, or how socially active he or she is. Extroverted individuals like to be the center of attention and are very outgoing. Next, agreeableness represents how kind and trustworthy an individual is. Agreeable individuals are warm, caring and cooperative. Last, neuroticism represents how stable or unstable emotionally an individual is. Neurotic individuals can be stressed out and nervous (Digman, 1990; John and Srivastava, 1999; McCrae, 2002). Those five traits will be used in this research project to collect data on consumers’ culture.

Based on the OCEAN model, I develop hypotheses about how each trait can influence the shopper’s behavior when it comes to private label purchases. Individuals who are open are perceived to be creative and enjoy novelty. I expect them to favor private labels that are considered less established brands compared to national brands, and could be perceived as new products for the shopper. Consumers are used to purchasing national brands (since the market share of private labels has only been increasing in the last decade) so switching to private labels is hypothesized to be easier for open individuals. Since conscientious individuals are thought of as organized, quality oriented, perfectionist and very responsible, this would seem to discourage private label purchases. Indeed, private labels are still perceived as less consistent in quality and consumers would more easily trust a national brand. The extraversion trait can be
interpreted as either favoring or disfavoring private label purchase. Because extroverts are very outgoing and social, it may be the case that they do not mind making a statement by buying a store branded product, but the social risk that those products can carry could discourage extroverts from selecting private labels. Because agreeable personalities are trustworthy, sympathetic, and cooperative, their likelihood to buy private labels is high. It takes trustworthy and cooperative consumers for them to take the risk to buy the store brand compared to a more trusted and well known national brand. Finally, neurotic shoppers are self-conscious and anxious, and might be less likely to buy private labels because of the perceived risk they project. Those consumers have high uncertainty avoidance and would rather choose a national brand that is established and trusted.

Through the use of the Big Five model, I am able to measure individual personality traits, which gives a perspective on the overall culture of my sample subjects. Personality traits are each, present in every culture, and in every individual, but the importance of each (score) is what matters. The literature reveals that even if there is variability across individuals, those individual differences are dominated to give overall aggregated scores at the culture level. Those overall personality traits scores can thus be used by researchers to characterize various eclectic cultures (McCrae, 2002; McCrae and Terracciano, 2005). The use of personality traits was previously employed to predict different consumers’ behaviors such as time preference or risk aversion (Almlund et al., 2011). Although the Big Five is a widely used instrument, its use in this model in relation to private label purchases is a new methodology for this literature to the best of the author’s knowledge. This approach allows me to test my hypotheses and study the
potential effect of cultural factors and consumer decisions on the cross-category purchase of private labels.

**Methodology and Data**

I use an experimental method similar to the U.S. experiment described in Chapter 4, but applied to consumers in Germany and France. Specifically, I use a non-hypothetical choice-based conjoint experiment. The differences are that the questionnaires are translated from English to French and German, and that the products represent those offered by local food retailers.

I chose major retailers that have private label strategies and different tiers of private labels in one of the three product categories chosen for the previous experiment: milk, ice cream and breakfast cereal. For France, I selected Carrefour and Leclerc, and the national brands included Kelloggs for cereal, Lactel for milk and La Laitiere for ice cream. For Germany, I selected Rewe and Real stores, and the following national brands: Dr Oekter for cereal, Berchtesgardener Land for milk, and Langnese Cremissimo for ice cream. These national brands are the most common in their respective product category and are available in both stores from each country. For those markets, instead of including three brands of ice cream (one national brand and two private labels), I study the “tier effect” with the cereal category for both France and Germany. I do not study tiers for ice cream because Carrefour, the top retailer in France, does not have multiple tiers for ice cream. I also present the bundle choices through product pictures as a shelf simulation technique to reduce any possible confusion or bias. Representing an experimental situation as close to a real life situation as possible provides reasonably valid results (Burke et al., 1992; Hensher, 2010).
My experiments were non-hypothetical, which means that one of the bundles was randomly determined as the binding bundle and, in order to be compensated, participants had to actually purchase that bundle with currency. That is, subjects had to pay money for the bundle and take ownership of the products. Bundle payment was made by a third-party firm that was used to recruit participants. However, two of the products included in the bundles were perishable (milk and ice cream). Hence, participants did not get a package sent with the chosen products but a coupon to be redeemed at the relevant supermarket.

The experiment was carried out by using the online survey tool, Qualtrics, which allowed me to reach the most individuals possible, over a wide geographic frame. Online experiments have been shown to be valid by Couper (2000) and Wright (2005) for entirely different purposes. The sample was recruited by the market research company Skopos. They used their panel of consumers in each of France and Germany. Using a recruitment company with a consumer panel provides a better confidence in the accuracy of the answers given, even though bias is not completely eliminated compared to laboratory experiments. The participants had to be 18 years of age, shop at the selected grocery stores and regularly consume milk, ice cream and cereal.

The survey instrument comprised demographics questions, 12 bundle choices, some behavioral questions and a personality scale. For each bundle, I capture the price of each item and the total price of the bundle. I created a variable to express how many private labels are in each bundle and if private labels from the cereal category, ice cream category or milk category are included. I also created a variable to indicate the presence of a premium private label in the bundle.
The Big Five survey instrument was included in this experiment to measure consumers’ personality. I use the survey instrument by John and Srivastava (1999) that represents 44 items or adjectives to construct the five OCEAN traits (see Appendix B). The personality questions were measured using a 5-point Likert-type scale. The five traits are computed by calculating the mean value of the adjectives for each. I start by calculating the mean for each adjective, then summing up those adjectives that are ‘part’ of a personality trait and dividing it by the number of adjectives that are part of the respective personality trait. This methodology is the most widely used and accepted in the personality literature (McCrae et al., 2002). It also has the advantage of characterizing consumers’ personalities in five clearly identifiable traits.

**Econometric Model**

To model cross-category purchases of private labels, I use a multinomial logit model. Consumers make a discrete choice of a product bundle from among all the possible choices. I use a random utility framework because performance transference, and hence umbrella branding, is an individual attribute that is likely to explain heterogeneity in private-label preference. In addition, the personality traits are also assumed to be individual specific and are added as random parameters as well. I hypothesize that those unobserved attributes are correlated with observed choice. More formally, the utility function for consumer $h$ is expressed by:

$$U_{hj} = \alpha_h p_j + \gamma_{1h} PL2 + \gamma_{2h} PL3 + \beta_1 Pm + \beta_2 Ice + \beta_3 Cer + \beta_4 Mlk + \varepsilon_{hj} \quad (16)$$

where:

- $p_j$ represents the price of the bundle
- $PL2$ represents that two out of three products in the bundle are private labels
PL3 represents a bundle with all products being private labels

$Pm$ represents a bundle with the premium private label

$Ice$ represents a bundle with a private label in the ice cream category

$Cer$ represents a bundle with a private label in the cereal category

$Mlk$ represents a bundle with a private label in the milk category

$\varepsilon_{hj}$ represents the i.i.d. error term

The error term is i.i.d Type 1 extreme value to reflect the random nature of consumer preferences. The $\beta$ parameters are fixed while the $\gamma_{PLh}$ are the random parameters of the model. The random parameter structure accounts for considerable unobserved heterogeneity of individuals and allow me to relax the independence of irrelevant alternative issue. I test my hypotheses using the variable $Perf$ as the consumers’ perception of private labels performance and adding each personality trait. The performance transference and the personality trait are normally distributed parameters.

$$\gamma_{ih} = \gamma_i + \tau_1 Perf + \tau_2 Open + \tau_3 Cons + \tau_4 Extr + \tau_5 Agr + \tau_6 Neuro + \sigma_v \quad (17)$$

$$\nu \sim N(0,1)$$

The performance transference variable indicates if consumers do transfer their perception across product categories with respect to private labels or not. The personality traits indicate a positive or negative impact on private labels purchase across categories reflecting consumers’ cultural effects. The tau parameters are part of the gamma which are impacting themselves the PL2 and PL3 variables indicating product bundles highly populated in private labels across categories. If $\tau_1$ is positive and significant, this reinforces the umbrella branding theory and the impact of consumers’ performance
transference. In order for my personality hypotheses to hold, $\tau_2$ and $\tau_5$ should be positive and significant, $\tau_3$ and $\tau_6$ should be negative and significant.

I estimate the model through simulated maximum likelihood because OLS is not an option with a random parameters model (Train, 2003). I expect to find evidence of umbrella branding of private labels due to the performance transference factor. In addition, I expect to find that the umbrella branding effect is also affected by the consumers’ cultural background. In other words, cultural differences may explain variations in the umbrella effects among European consumers relative to U.S. consumers.

**Descriptive Statistics**

I first describe both the German and the French samples, and then establish the differences in personality profiles between the two sub-samples. The sample consists of exactly 152 participants for each German store, and 101 participants for each French store for a total of 304 participants in Germany and 202 participants in France. The two samples have approximately similar number of males and females: 51% of males in the German sample and 54% of males in the French sample. Participants are, on average, 43 years of age in the German sample and 49 years of age in the French sample. The average household is slightly larger in France averaging at 2.62 persons versus 2.35 for Germany. However, the mean household income is higher in Germany, (35,000 Euros) compared to France (30,000 Euros). Students’ t-tests for two samples of unequal variance shows that there is no statistical differences between the French and German samples regarding key socio-demographics.

Table 7 presents the calculated means of the aggregated personality traits and the means of the single items used to construct the overall measures for each country. Each
single item mean was aggregated over individuals for each country, and each overall country trait mean was calculated by aggregating individual trait scores. For example, I know the individual score for each item or adjective given by the raw data. For the overall country trait score, I calculate the five individual scores first, and then I aggregate over individuals.
Table 6

*Personality Traits Comparison by Country*

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<td>Inventive</td>
<td>3.45</td>
<td>3.61</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>values aesthetics</td>
<td>3.27</td>
<td>3.62</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>doesn’t like work routine</td>
<td>3.61</td>
<td>2.57</td>
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<td></td>
<td>Reflective</td>
<td>3.96</td>
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<td>Thorough</td>
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<td>4.06</td>
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<td>Careful</td>
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<td>Reliable</td>
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<td></td>
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<td>Organized</td>
<td>3.95</td>
<td>3.50</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>not lazy</td>
<td>3.05</td>
<td>3.23</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Perseverant</td>
<td>4.00</td>
<td>3.83</td>
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<tr>
<td></td>
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<td>Efficient</td>
<td>3.98</td>
<td>3.84</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>always follows through</td>
<td>3.77</td>
<td>3.80</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Focused</td>
<td>3.23</td>
<td>3.64</td>
</tr>
<tr>
<td>Extraversion</td>
<td>3.27</td>
<td>3.38</td>
<td>Talkative</td>
<td>2.80</td>
<td>3.63</td>
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<tr>
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<td>not reserved</td>
<td>2.81</td>
<td>3.01</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Energetic</td>
<td>3.70</td>
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<tr>
<td></td>
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<td>Enthusiastic</td>
<td>3.79</td>
<td>3.66</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Loud</td>
<td>2.33</td>
<td>3.28</td>
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<tr>
<td></td>
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<td>assertive personality</td>
<td>3.66</td>
<td>3.46</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Outgoing</td>
<td>3.02</td>
<td>3.01</td>
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<tr>
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<td></td>
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<td>Sociable</td>
<td>3.95</td>
<td>3.39</td>
</tr>
<tr>
<td>Agreeableness</td>
<td>3.73</td>
<td>3.60</td>
<td>doesn’t blame others</td>
<td>3.87</td>
<td>3.13</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Helpful</td>
<td>4.00</td>
<td>3.97</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>avoid conflict</td>
<td>4.15</td>
<td>4.25</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>forgive full</td>
<td>3.20</td>
<td>3.35</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Trustworthy</td>
<td>3.52</td>
<td>3.73</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Warm</td>
<td>2.99</td>
<td>2.96</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Considerate</td>
<td>4.11</td>
<td>3.93</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Polite</td>
<td>3.68</td>
<td>3.12</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Cooperative</td>
<td>3.92</td>
<td>3.81</td>
</tr>
<tr>
<td>Neuroticism</td>
<td>2.70</td>
<td>2.56</td>
<td>Depressed</td>
<td>1.93</td>
<td>2.23</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>stressed out</td>
<td>2.43</td>
<td>2.46</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Tense</td>
<td>3.47</td>
<td>2.71</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Worried</td>
<td>3.08</td>
<td>2.93</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>emotionally unstable</td>
<td>2.75</td>
<td>2.52</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Moody</td>
<td>2.63</td>
<td>2.69</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>not calm</td>
<td>2.46</td>
<td>2.50</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Nervous</td>
<td>2.92</td>
<td>2.51</td>
</tr>
</tbody>
</table>
For the single items, Table 7 shows that French consumers see themselves as curious while German consumers score the highest in avoiding conflicts. Consumers from both countries do not see themselves as depressed. For the overall traits, most means are close to 3, which is the average score. Agreeableness has the highest score for France at 3.73 while the average German subject scored 3.60. The highest score for German participants is the conscientiousness trait at 3.72, while French subjects were close behind at 3.71. Openness is also very close for both countries at 3.52 and 3.53, respectively, for France and Germany. Extraversion is slightly higher for German shoppers at 3.38 versus 3.27 for French shoppers. Last, neuroticism has the lowest numbers for both countries with 2.70 for France and 2.56 for Germany. Both countries have the same levels of openness and conscientiousness, but vary considerably on the extraversion, agreeableness, and neuroticism components. Both countries, therefore, differ in terms of their personality profile, which implies a difference in culture, and thus, likely differ in their product choice.

In order to identify the effect of personality on product choice, and to link these personality traits to culture, it is critical that the aggregated personalities differ between the two countries. Student t-tests are performed on the personality traits, comparing both German and French sample of individuals. For a two tails distribution and for two samples of unequal variance, I obtain the following probabilities:

Table 7

*Sample differences in personality*

<table>
<thead>
<tr>
<th></th>
<th>Openness</th>
<th>Conscientiousness</th>
<th>Extroversion</th>
<th>Agreeableness</th>
<th>Neuroticism</th>
</tr>
</thead>
<tbody>
<tr>
<td>Probability associated with the Student t-test</td>
<td>0.8866</td>
<td>0.4804</td>
<td>0.0387</td>
<td>0.0023</td>
<td>0.0233</td>
</tr>
</tbody>
</table>
At the 5% level, the two samples are statistically different on the extroversion, agreeableness and neuroticism traits. Based on those differences, I can assume that as a whole, the two cultures are fundamentally different, although not uniformly across all personality traits. Econometrically, variation in extroversion, agreeableness, and neuroticism can identify differences in product choice between the two countries, but not openness nor conscientiousness.

**Results**

I first establish the validity of my maintained specification, and then interpret the results obtained from the preferred model. I present the results for French shoppers in one model for German shoppers in another model and for the pooled sample in a third model. I separated the two markets in two different models since I had two different samples.

\[
LR = 2(LLF_2 - LLF_3) = 2(4,244 - 7,104) = -5,720
\]  \hspace{1cm} (18)

\[
LR = 2(LLF_1 - LLF_3) = 2(2,807 - 7,104) = -8,594
\]  \hspace{1cm} (19)

Both LR calculated values are large indicating that the pooled model is statistically different than the single sample models (Chi-square statistic equals 3.84 at 5% level).

In the results presented below, the key parameters are the interactions between the personality traits and the choice of bundle as well as the interaction between the personality traits and the performance transference. They test whether personality is important, and whether personality supports or detracts from the umbrella branding hypothesis.
Table 8

*Cross-category Purchases Models*

<table>
<thead>
<tr>
<th></th>
<th>FRANCE</th>
<th></th>
<th>GERMANY</th>
<th></th>
<th>ALL</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Coefficient</td>
<td>t- ratio</td>
<td>Coefficient</td>
<td>t- ratio</td>
<td>Coefficient</td>
<td>t- ratio</td>
</tr>
<tr>
<td><strong>Random parameters in utility functions</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perf</td>
<td>-1.4713</td>
<td>-0.42</td>
<td>0.0579</td>
<td>0.04</td>
<td>0.9050</td>
<td>0.67</td>
</tr>
<tr>
<td>PL3</td>
<td>0.2397</td>
<td>0.15</td>
<td>-1.6817*</td>
<td>-1.71</td>
<td>-1.6845**</td>
<td>-2.01</td>
</tr>
<tr>
<td>Stdev. Perf</td>
<td>2.5416***</td>
<td>6.49</td>
<td>2.1631***</td>
<td>12.75</td>
<td>2.2169***</td>
<td>15.04</td>
</tr>
<tr>
<td>Stdev. PL3</td>
<td>0.9762***</td>
<td>7.95</td>
<td>0.5037***</td>
<td>4.18</td>
<td>0.7428***</td>
<td>8.96</td>
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<tr>
<td><strong>Non-random parameters in utility functions</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Price</td>
<td>-0.0001</td>
<td>-0.28</td>
<td>-0.0009***</td>
<td>-3.45</td>
<td>-0.0009***</td>
<td>-4.15</td>
</tr>
<tr>
<td>PL2</td>
<td>-0.7572***</td>
<td>-3.93</td>
<td>-1.3455***</td>
<td>-9.08</td>
<td>-1.1223***</td>
<td>-9.57</td>
</tr>
<tr>
<td>CePL</td>
<td>1.0085***</td>
<td>5.62</td>
<td>0.7873***</td>
<td>5.43</td>
<td>0.8763***</td>
<td>7.88</td>
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<tr>
<td>MiPL</td>
<td>1.0421***</td>
<td>5.97</td>
<td>1.1598***</td>
<td>8.48</td>
<td>1.1252***</td>
<td>10.47</td>
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<tr>
<td>IcePL</td>
<td>0.8710***</td>
<td>4.86</td>
<td>1.0207***</td>
<td>7.46</td>
<td>0.9417***</td>
<td>8.82</td>
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<tr>
<td>PremPL</td>
<td>0.8183***</td>
<td>4.58</td>
<td>1.0029***</td>
<td>7.31</td>
<td>0.9253***</td>
<td>8.52</td>
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<tr>
<td>None</td>
<td>0.6268**</td>
<td>2.25</td>
<td>0.5497***</td>
<td>2.68</td>
<td>0.4244***</td>
<td>2.86</td>
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<tr>
<td><strong>Heterogeneity in mean random coefficients</strong></td>
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<td></td>
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</tr>
<tr>
<td>Perf*Extro</td>
<td>1.0640*</td>
<td>1.74</td>
<td>0.5248**</td>
<td>2.47</td>
<td>0.5958***</td>
<td>3.17</td>
</tr>
<tr>
<td>Perf*Agre</td>
<td>-0.6320</td>
<td>-1.13</td>
<td>0.0947</td>
<td>0.36</td>
<td>-0.0984</td>
<td>-0.44</td>
</tr>
<tr>
<td>Perf*Cons</td>
<td>-0.4749</td>
<td>-0.74</td>
<td>-0.7645***</td>
<td>-2.89</td>
<td>-0.9660***</td>
<td>-3.67</td>
</tr>
<tr>
<td>Perf*Neu</td>
<td>-0.2833</td>
<td>-0.63</td>
<td>0.2807</td>
<td>1.32</td>
<td>0.0414</td>
<td>0.25</td>
</tr>
<tr>
<td>Perf*Open</td>
<td>1.2132**</td>
<td>2.31</td>
<td>0.3712</td>
<td>1.38</td>
<td>0.5780**</td>
<td>2.53</td>
</tr>
<tr>
<td>Perf*France</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PL3*Extro</td>
<td>0.0014</td>
<td>0.01</td>
<td>0.1610</td>
<td>1.28</td>
<td>0.0832</td>
<td>0.78</td>
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<tr>
<td>PL3*Agre</td>
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<td>-0.2977*</td>
<td>-1.73</td>
<td>-0.1089</td>
<td>-0.78</td>
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<td>PL3*Cons</td>
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<td>-0.1609</td>
<td>-1.14</td>
<td>-0.1634</td>
<td>-1.31</td>
</tr>
<tr>
<td>PL3*Neu</td>
<td>-0.4919***</td>
<td>-2.34</td>
<td>0.0263</td>
<td>0.22</td>
<td>-0.0918</td>
<td>-0.89</td>
</tr>
<tr>
<td>PL3*Open</td>
<td>-0.2244</td>
<td>-0.88</td>
<td>-0.0444</td>
<td>-0.32</td>
<td>-0.0533</td>
<td>-0.44</td>
</tr>
<tr>
<td>PL3*France</td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>LLF</strong></td>
<td>-2807</td>
<td></td>
<td>-4244</td>
<td></td>
<td>-7104</td>
<td></td>
</tr>
</tbody>
</table>

N=2172, Note: ***, **, * => Significance at 1%, 5%, 10% level

Concerning the model for France, the first significant parameter appears to be of negative sign for PL2 indicating that French shoppers do not have a natural tendency to select bundles with the most private labels. The product category specific parameters are all positive and significant and the presence of a premium private label also makes the
bundle more desirable for the consumer since that parameter is positive and significant. In the interaction terms, the results in Table 8 show significant and positive effect of extroversion and openness and the performance transference phenomenon. As indicated in my hypotheses above, those two traits are likely to be associated with higher private labels share. This result means that French shoppers with a personality prominent in extroversion and openness will be more likely to easily transfer their perception of the quality of the private labels from one category to the next. Extroversion is also a trait that is fundamentally different between German and French cultures. French retailers can then target extrovert shoppers through communication techniques (such as ads showing the private label used in a group of friends). The last significant parameter of this model is the interaction between neuroticism and the purchase of private labels across categories. This trait had been identified as prominent in the French culture in the descriptive statistics mentioned above and is also fundamentally different from the German culture. This negative effect implies that more neurotic consumers are less inclined to purchase private labels across product categories. This is consistent with the hypothesis ventured above. This implies that when encountering culture that has a high likelihood of containing neurotic shoppers, retailers should prepare to face challenge when it comes to their store brands. A higher quality and a different name might be a solution to address those consumers who are less trusting and are more susceptible to not trust private labels.

The results for the German sample are slightly different. The German shoppers seem to naturally be unlikely to purchase the bundles with the most private labels, as the parameter on the PL3 variable is statistically significant and negative. However, similar
to the results for France, private labels in each product category have a positive and significant effect on bundle choice. Further, a premium private label has a positive and significant effect on the likelihood of bundle selection. Concerning the interaction terms with the performance transference, the personality effects, extroversion and conscientiousness, are the two traits that are significant determinants. As anticipated in my hypotheses, conscientiousness has a negative effect and extroversion has a positive effect on the behavioral mechanism behind umbrella branding. This indicates that quality oriented, organized and detail oriented consumers do not favor private labels as a product choice. A higher level of quality and informative promotion technique could re-ensure those consumers in Germany. On the other hand, extroverted consumers are the easier ones for retailers to target since they have a natural tendency to choose store brands. Extroversion and conscientiousness are two traits that are strong in the German culture and their effects, positive and negative respectively, validate previous hypotheses, although only the extroversion trait is fundamentally different with the French culture. Concerning the interactions between the personality and the cross-category purchases, the only notable effect is a negative impact of agreeableness. This result seems to go against our hypotheses but the significance level is the weakest in our model (10%) and the coefficient on agreeableness and performance transference interaction is non-significant but positive. Thus, this last effect is rather inconclusive.

The pooled model is interesting to look for the country interaction. The interaction between France and the Perf and PL3 variables are both significant and positive, indicating a natural tendency for French consumers to transfer their perceived
level of performance and buy private labels across categories that is higher compared to German shoppers.

Overall, these results show that the umbrella branding of private labels across product categories is impacted by personality traits. Also, by examining two different countries it appears that different personality traits are at play, suggesting an impact of cultural origin. In France, retailers have to appeal to extroverts and manage neurotic shoppers while in Germany, retailers should appeal to the extroversion trait of the consumer base while re-ensuring the conscientious shoppers. Due to the high penetration rate of private labels in those countries, it seems that local retailers already have a good understanding of their consumers and know how to manage the cultural effects. Secondary results show that umbrella branding was detected in the data. I also found that the present product categories positively impact private label cross-category purchases, as well as the presence of a premium private label also. Finally, French shoppers seem to have a natural tendency to choose private labels across the store and transfer their perceived level of performance compared to Germans. Implications of those results also apply for national brand manufacturers. They can take advantage of markets where consumers’ personalities are not in favor of private label choice.

Conclusion

Private label penetration differs among countries for a variety of reasons. My hypothesis is that cross-category purchases are linked to cultural factors. By conducting a choice experiment in both France and Germany, I was able to analyze the potential effect of those cultural factors. Personality traits, reflective of consumers’ cultures, vary in
significance across the chosen markets, but have a significant impact on the cross-category purchase of private labels.

In general, my results corroborate those from the U.S. sample in that I find evidence of umbrella branding among private labels in European markets. Cross-category purchases are linked to culture indirectly through aggregate measures of subject personalities in each country. Considering the fundamental differences between the two cultures, I get the following conclusions: in France, extroverts and less neurotic consumers display behavior resulting in umbrella branding. It seems that retailers in France would need to take into consideration the self-consciousness of the shoppers to guarantee success of private labels across the store. To do so, retailers could focus on offering higher quality private labels and engage in more aggressive promotion strategies such as store tasting to convince shoppers. Establishing brand trust and loyalty for private labels would be a way to address this concern and fulfill extroverts’ expectations. In Germany, the most extrovert consumers are the ones who choose store branded products most often. Again, the retailers would need to reassure the shoppers about the private label level of performance, and possibly gear any marketing strategy towards social and active shoppers. Extroversion and Neuroticism are two traits that were found fundamentally different across the two countries ‘cultures. For France, neuroticism is the main cultural trait to control for the retailer while in Germany; extroverted consumers are the ones to target for retailers. It seems that considering the private label market share in those countries, retailers have been succeeding in implementing those strategies. Considering other markets, the countries with consumers
who score low on neuroticism but high on extraversion seem to be the most favorable to private labels umbrella branding.

Those results have direct implications for retailers who wish to expand overseas. Cultural factors need to be taken into consideration when potential markets are examined for expansion. Indeed, based on culture, some branding strategies might need to be adapted. Some consumers’ personality traits might be more pronounced in one market compared to another, and being aware of the receptiveness for novelties for example, can be essential for the success of a product. More precisely, in the case of private labels, it seems that if the dominant personality trait is neuroticism, offering only high end private labels under a premium brand name might be the best option for the retailer. On the other end, countries where shoppers are particularly extroverts seem to be more flexible in terms of private labels offering and strategy. Measuring personality traits as part of the market research would then be a recommendation to any company extending business in new markets.

One of the limitations of this study is that it was done in a limited number of countries. Adding multiple countries in other parts of the world would strengthen the tested theory, for example, using countries that might have even stronger cultural differences than France and Germany (e.g., comparing Asian and European countries). Another extension of this work would be to collect data with retailers who have already made extension overseas and analyze how they were able to adapt their products to local culture in order to guarantee their success from a shopper’s behavior standpoint. Finally, latent class analyses or cluster analyses could analyze the underlying factors of why the personality traits affect private label purchase.
CHAPTER 6

CONCLUSION

The dissertation contributes to the literature on private label proliferation by explaining the breadth of private label throughout grocery stores in the U.S. and abroad as resulting from umbrella branding. My work adds to the theoretical literature in that I develop an explanation for umbrella branding that is fundamentally behavioral, that is, conditional on prices, incomes, marketing mix, socioeconomic and demographic effects. In the first substantial essay, I found evidence of private labels cross-category purchases with a significant household tendency to do so. This first study was a way of explaining private label market share and considering umbrella branding as one of the factors influencing it, using secondary data. Store effects: price levels and assortment of brands offered, and demographic effects: income household size and loyalty, were also found as significant factors. The second essay investigates the behavioral aspect of umbrella branding deeper by realizing a choice experiment. Evidence of umbrella branding of private labels was shown based on a behavioral explanation. I identify, in this work, how consumers develop performance transference across categories regarding their perception of private labels. The impact of specific product categories or private label tier is not found important in that essay. In the final one, I test the performance theory in other markets and investigate the possible cultural impact as an explanation for varying private labels penetration rate across markets. In that last part of my work, I find that umbrella branding effects are identified in overseas markets. Product categories and the presence of premium private labels in the products offered do increase the likelihood of the consumer to purchase private labels. Most importantly, I found some influence of culture
through consumers’ personality traits when it comes to their purchase of private labels across product categories and performance transference behavior.

This dissertation’s findings imply that retailers should have a broad line of private labels across their stores in order to take advantage of the umbrella branding effect. They also need to make sure that the level of quality of their products is consistent across categories since the consumers show signs of performance transference. Communicating the quality of their products is important if retailers want to benefit from umbrella branding, thus marketing campaign such as store display are essentials. Retailers also benefit from an increased market power regarding their suppliers and competitors if they can take advantage of umbrella branding. Finally, they should focus on targeting the right consumers or adapt their product to the consumers’ personality in the chosen market. A certain level of trust is necessary to be established in some markets. Studying consumer behavior and background culture is thus a major recommendation for retailer planning expansions in new markets.

Overall, the findings of this work concerning consumer behavior could be applied to any retailing context. In the clothing industry or transportation industry, consumers likely display similar behaviors where they apply behaviors resulting in umbrella branding. Thus, it would be in any retailer best interest to develop their private labels lines across products, maintaining a consistent quality.

There are a few limitations to this work that could be further researched as work extensions. First, the notion of private labels’ tiers and determining whether or not having the retailers name affiliated to the private label could be clarified in future research. This topic could also be analyzed from suppliers’ point of view by comparing
retailers adopting one overall store brand policy compared to a multiple tiers, multiple store brands policy. It is indeed interesting to see that some categories have private labels, some don’t, some of them multiple tiers in the same categories, and some private labels have the retailer’s name while some don’t. The reasoning behind those policies could be further investigated in relation to the umbrella branding and what this means for the performance bond across those private labels. This would give some insight to why Wal-Mart, the number one retailer in the world, succeeds with only one private label across the board compared to other stores who try to develop multiple tiers of private labels. Studying other retailing contexts would also be of interest. For example, how does umbrella branding fits in the transportation industry when one company develops different brands of cars? Finally studying other markets are retailers extensions overseas and how they adapt their store line of products to local consumers is another topic to consider in the future.
REFERENCES


APPENDIX A

EXPERIMENTAL SURVEY INSTRUMENT
Spillover Effects of Private Label Choice

I am a graduate student under the direction of Professor Richards in the Morrison School of Agribusiness and Resource Management at Arizona State University. The purpose of this research study is to identify the spillover effects of private label purchases on choices made in other categories. You must be 18 years old or greater and be the primary shopper for the household to participate.

You will be asked to participate in a choice experiment that should take about twenty minutes of your time. You will be asked to choose among several bundles of national brand and private label products. You will be given $40 for participating in the survey. One bundle will be chosen at random and, if you chose that bundle, you will receive a coupon for the products included in the bundle, but will give up the total price of the bundle. Therefore, it is in your best interest to choose only the bundles that you actually want to buy. Please read each question carefully and answer to the best of your ability.

We assure you that your identity will remain anonymous. To that end, a number will be assigned to each participant and your name removed from the data file. Your responses will be combined with those of other participants and only group data will be released. We also would like to remind you that your participation is voluntary and you may stop participating at any time. You can skip questions if you wish. If you choose not to participate or to withdraw from the study at any time, there will be no penalty. Although there is no benefit to you possible benefits of your participation is a better understanding of the role of store brands in the food retailing industry. There are no foreseeable risks or discomforts to your participation.

If you have any questions concerning the research study, please contact the research team at: (stheron@asu.edu or trichards@asu.edu). If you have any questions about your rights as a subject/participant in this research, or if you feel you have been placed at risk, you can contact the Chair of the Human Subjects Institutional Review Board, through the ASU Office of Research Integrity and Assurance, at (480) 965-6788.

Please let me know if you wish to be part of the study.

Thank you.

-Sophie Theron-
SECTION 1

1. Which of the following best describes you?
   - Male (1)
   - Female (2)

2. What is your ethnicity?
   - White/Caucasian (1)
   - Black/African-American (2)
   - Asian (3)
   - Hispanic (4)
   - Indian-American (5)
   - Other (6)

3. Please chose the category below that describes the total amount of money your household spends on groceries in an average month?
   - $0 - $200 (1)
   - $201 - $400 (2)
   - $401 - $600 (3)
   - $601 - $800 (4)
   - $801 - $1000 (5)
   - $1001 - $1200 (6)
   - $1201 - $1400 (7)
   - $1400+ (8)
   - I don't know (9)

4. How many people live in your household? Include yourself, your spouse and any dependents. Do not include your parents or roommates unless you claim them as dependents.
   ____________ people
5. Please indicate the category below that describes the total amount of INCOME earned in 2009 by the people in your household (as “household” is defined in the previous question). [Consider all forms of income, including salaries, tips, interest and dividend payments, scholarship support, student loans, parental support, social security, alimony, and child support, and others.]

- Under $5000 (1)
- $5000-$7999 (2)
- $8000-$9999 (3)
- $10,000-$11,999 (4)
- $12,000-$14,999 (5)
- $15,000-$19,999 (6)
- $20,000-$24,999 (7)
- $25,000-$29,999 (8)
- $30,000-$34,999 (9)
- $35,000-$39,999 (10)
- $40,000-$44,999 (11)
- $45,000-$49,999 (12)
- $50,000-$59,999 (13)
- $60,000-$69,999 (14)
- $70,000-$99,999 (15)
- $100,000 - $124,999 (16)
- $125,000 - $149,999 (17)
- $150,000 - $199,999 (18)
- $200,000 + (19)

6. What is your current age?

_____________ years of age

7. What is the highest level of education you attained?

- Some High School (1)
- High School / GED (2)
- Some college (3)
- Associates degree (4)
- Bachelor’s degree (5)
- Master’s degree (6)
- Some Doctorate education (7)
- PhD or MD (8)
8. What is your marital status?
- Married
- Engaged
- Divorced
- Widowed
- Partner
- Separated
- Never married / Single

10. What is your current employment status?
- Full time employee
- Part time employee
- Student
- Unemployed
- Retired
- Other (please specify)______________________________

11. How frequently do you shop at a grocery store?
- About once a month
- Once every other week
- Once a week
- Twice a week
- Three times a week
- More than three times a week
SECTION 2

1. Can you identify the brand name for Safeway's "value" store brand?
   ☒ Safeway
   ☒ Private Selection
   ☒ O’organics
   ☒ Market Pantry
   ☒ Kirkland

2. Can you identify the brand name for Safeway's "premium" store brand?
   ☒ Safeway
   ☒ Private Selection
   ☒ O’organics
   ☒ Market Pantry
   ☒ Kirkland

3. Which of the following product bundle would you choose? Please circle one.

   | Bundle 1 | Safeway Ice cream $2.33 | Kelloggs Cereal $4.99 | Horizon Milk $4.79 |
   | Bundle 2 | Breyers Ice cream $4.39 | Kelloggs Cereal $4.99 | O’organics Milk $2.24 |
   | Bundle 3 | Safeway Ice cream $1.75 | Kelloggs Cereal $4.99 | Horizon Milk $2.40 |
   | Bundle 4 | None of the above |

4. Which of the following product bundle would you choose? Please circle one.

   | Bundle 1 | Lucerne Ice cream $1.38 | Safeway Cereal $3.29 | Horizon Milk $2.40 |
   | Bundle 2 | Lucerne Ice cream $1.38 | Safeway Cereal $2.47 | O’organics Milk $1.50 |
   | Bundle 3 | Lucerne Ice cream $2.06 | Safeway Cereal $3.29 | Horizon Milk $3.59 |
   | Bundle 4 | None of the above |

5. Which of the following product bundle would you choose? Please circle one.

   | Bundle 1 | Breyers Ice cream $2.20 | Safeway Cereal $3.29 | O’organics Milk $2.24 |
   | Bundle 2 | Lucerne Ice cream $2.06 | Kelloggs Cereal $2.50 | O’organics Milk $2.99 |
   | Bundle 3 | Lucerne Ice cream $2.75 | Kelloggs Cereal $3.74 | Horizon Milk $2.40 |
   | Bundle 4 | None of the above |
6. Which of the following product bundle would you choose? Please circle one.

<table>
<thead>
<tr>
<th>Bundle 1</th>
<th>Breyers Ice cream</th>
<th>Kelloggs Cereal</th>
<th>O'organics Milk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bundle 2</td>
<td>Lucerne Ice cream</td>
<td>Safeway Cereal</td>
<td>Horizon Milk</td>
</tr>
<tr>
<td>Bundle 3</td>
<td>Breyers Ice cream</td>
<td>Kelloggs Cereal</td>
<td>Horizon Milk</td>
</tr>
<tr>
<td>Bundle 4</td>
<td>None of the above</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

7. Which of the following product bundle would you choose? Please circle one.

<table>
<thead>
<tr>
<th>Bundle 1</th>
<th>Breyers Ice cream</th>
<th>Safeway Cereal</th>
<th>Horizon Milk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bundle 2</td>
<td>Breyers Ice cream</td>
<td>Safeway Cereal</td>
<td>O'organics Milk</td>
</tr>
<tr>
<td>Bundle 3</td>
<td>Breyers Ice cream</td>
<td>Kelloggs Cereal</td>
<td>Horizon Milk</td>
</tr>
<tr>
<td>Bundle 4</td>
<td>None of the above</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

8. Which of the following product bundle would you choose? Please circle one.

<table>
<thead>
<tr>
<th>Bundle 1</th>
<th>Safeway Ice cream</th>
<th>Kelloggs Cereal</th>
<th>Horizon Milk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bundle 2</td>
<td>Safeway Ice cream</td>
<td>Kelloggs Cereal</td>
<td>O'organics Milk</td>
</tr>
<tr>
<td>Bundle 3</td>
<td>Lucerne Ice cream</td>
<td>Kelloggs Cereal</td>
<td>Horizon Milk</td>
</tr>
<tr>
<td>Bundle 4</td>
<td>None of the above</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

9. Which of the following product bundle would you choose? Please circle one.

<table>
<thead>
<tr>
<th>Bundle 1</th>
<th>Safeway Ice cream</th>
<th>Kelloggs Cereal</th>
<th>Horizon Milk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bundle 2</td>
<td>Safeway Ice cream</td>
<td>Safeway Cereal</td>
<td>Horizon Milk</td>
</tr>
<tr>
<td>Bundle 3</td>
<td>Safeway Ice cream</td>
<td>Safeway Cereal</td>
<td>O'organics Milk</td>
</tr>
<tr>
<td>Bundle 4</td>
<td>None of the above</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

10. Which of the following product bundle would you choose? Please circle one.

<table>
<thead>
<tr>
<th>Bundle 1</th>
<th>Breyers Ice cream</th>
<th>Safeway Cereal</th>
<th>O'organics Milk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bundle 2</td>
<td>Safeway Ice cream</td>
<td>Safeway Cereal</td>
<td>O'organics Milk</td>
</tr>
<tr>
<td>Bundle 3</td>
<td>Lucerne Ice cream</td>
<td>Kelloggs Cereal</td>
<td>Horizon Milk</td>
</tr>
<tr>
<td>Bundle 4</td>
<td>None of the above</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

11. Which of the following product bundle would you choose? Please circle one.

<table>
<thead>
<tr>
<th>Bundle 1</th>
<th>Lucerne Ice cream</th>
<th>Kelloggs Cereal</th>
<th>O'organics Milk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bundle 2</td>
<td>Safeway Ice cream</td>
<td>Safeway Cereal</td>
<td>O'organics Milk</td>
</tr>
<tr>
<td>Bundle 3</td>
<td>Breyers Ice cream</td>
<td>Safeway Cereal</td>
<td>Horizon Milk</td>
</tr>
<tr>
<td>Bundle 4</td>
<td>None of the above</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
12. Which of the following product bundle would you choose? Please circle one.

<table>
<thead>
<tr>
<th>Bundle 1</th>
<th>Safeway Ice cream $1.75</th>
<th>Safeway Cereal $3.29</th>
<th>O’organics Milk $2.99</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bundle 2</td>
<td>Breyers Ice cream $4.39</td>
<td>Safeway Cereal $1.65</td>
<td>Horizon Milk $4.79</td>
</tr>
<tr>
<td>Bundle 3</td>
<td>Lucerne Ice cream $1.38</td>
<td>Safeway Cereal $3.29</td>
<td>Horizon Milk $4.79</td>
</tr>
<tr>
<td>Bundle 4</td>
<td>None of the above</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

13. Which of the following product bundle would you choose? Please circle one.

<table>
<thead>
<tr>
<th>Bundle 1</th>
<th>Breyers Ice cream $4.39</th>
<th>Kelloggs Cereal $4.99</th>
<th>O’organics Milk $1.50</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bundle 2</td>
<td>Safeway Ice cream $1.17</td>
<td>Safeway Cereal $1.65</td>
<td>O’organics Milk $2.24</td>
</tr>
<tr>
<td>Bundle 3</td>
<td>Safeway Ice cream $1.17</td>
<td>Kelloggs Cereal $4.99</td>
<td>Horizon Milk $4.79</td>
</tr>
<tr>
<td>Bundle 4</td>
<td>None of the above</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

14. Which of the following product bundle would you choose? Please circle one.

<table>
<thead>
<tr>
<th>Bundle 1</th>
<th>Safeway Ice cream $1.17</th>
<th>Kelloggs Cereal $3.74</th>
<th>O’organics Milk $2.24</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bundle 2</td>
<td>Lucerne Ice cream $2.75</td>
<td>Safeway Cereal $2.47</td>
<td>O’organics Milk $2.99</td>
</tr>
<tr>
<td>Bundle 3</td>
<td>Lucerne Ice cream $2.06</td>
<td>Kelloggs Cereal $2.50</td>
<td>O’organics Milk $2.24</td>
</tr>
<tr>
<td>Bundle 4</td>
<td>None of the above</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

SECTION 3

1. How often do you consume store brand foods (foods that are branded by the store such as Safeway Select or Lucerne at Safeway):
   Often: __1__:__2__:__3__:__4__:__5__:__6__:__7__: Never

2. Store brand products are usually cheaper than national brand products:
   Strongly agree: __1__:__2__:__3__:__4__:__5__:__6__:__7__: Strongly disagree.

3. Store brand products are usually of less quality than national brand products:
   Strongly agree: __1__:__2__:__3__:__4__:__5__:__6__:__7__: Strongly disagree.
4. Store brands have a positive image with most consumers:

5. In my opinion store brand foods are a good value for money:

6. Store brand foods are reliable:

7. If a Safeway brand ice cream is good I would trust the brand enough to buy other Safeway products:

8. Store brand food and national brand foods taste different:

9. If the price is the same, I would rather buy the national brand food than the store brand food:

10. Not all store brand foods are the same, their quality depends on the store which gives their name:

11. If I dislike the store brand cereal after buying them for the first time I will reluctant to buy store brand ice cream after:

12. Store brand foods are inferior to national branded foods:

13. I love it when store brand products are available for the product categories I purchase:
14. When I buy a store brand product I feel like I am getting a good deal:
Strongly agree: __1__:__2__:__3__:__4__:__5__:__6__:__7__: Strongly disagree.

15. Regardless of this survey, I intend to buy store brand foods in my next shopping trips:
Strongly agree: __1__:__2__:__3__:__4__:__5__:__6__:__7__: Strongly disagree.

16. I think that all store brand products (Lucerne milk and Safeway cereal) have the same level of quality:
Strongly agree: __1__:__2__:__3__:__4__:__5__:__6__:__7__: Strongly disagree.

17. Safeway offers different store brands in many different categories of products: Safeway Select, Eating right, and O’organics. If you have shopped at Safeway in the past, then answer the question that follows:

A. Have you purchased either a Safeway Select, Eating right or O’organics?
   - Yes
   - No

B. If you answered yes to A, did your purchase make you more or less willing to purchase the same brand in another category?
   - More
   - Less

- Thank you for your participation -
APPENDIX B

PERSONALITY SCALE INSTRUMENT
The Big Five Inventory (BFI)

Here are a number of characteristics that may or may not apply to you. For example, do you agree that you are someone who likes to spend time with others? Please write a number next to each statement to indicate the extent to which you agree or disagree with that statement.

<table>
<thead>
<tr>
<th>Disagree strongly</th>
<th>Disagree a little</th>
<th>Neither agree nor disagree</th>
<th>Agree a little</th>
<th>Agree strongly</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

I see Myself as Someone Who...

1. Is talkative
2. Tends to find fault with others
3. Does a thorough job
4. Is depressed, blue
5. Is original, comes up with new ideas
6. Is reserved
7. Is helpful and unselfish with others
8. Can be somewhat careless
9. Is relaxed, handles stress well
10. Is curious about many different things
11. Is full of energy
12. Starts quarrels with others
13. Is a reliable worker
14. Can be tense
15. Is ingenious, a deep thinker
16. Generates a lot of enthusiasm
17. Has a forgiving nature
18. Tends to be disorganized
19. Worries a lot
20. Has an active imagination
21. Tends to be quiet
22. Is generally trusting
23. Tends to be lazy
24. Is emotionally stable, not easily upset
25. Is inventive
26. Has an assertive personality
27. Can be cold and aloof
28. Perseveres until the task is finished
29. Can be moody
30. Values artistic, aesthetic experiences
31. Is sometimes shy, inhibited
32. Is considerate and kind to almost everyone
33. Does things efficiently
34. Remains calm in tense situations
35. Prefers work that is routine
36. Is outgoing, sociable
37. Is sometimes rude to others
38. Makes plans and follows through with them
39. Gets nervous easily
40. Likes to reflect, play with ideas
41. Has few artistic interests
42. Likes to cooperate with others
43. Is easily distracted
44. Is sophisticated in art, music, or literature