

A Global Perspective of Private Labels Success: The Function of Manufacturer Power,
Retailer Strategy and Consumer Conduct

by

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ABSTRACT

Private label growth in emerging markets has not kept pace with the growth in private labels elsewhere. For instance, in Europe and North America, private labels now constitute an average of 35% of total retail market share, compared to emerging markets, where market shares vary between 1% and 8%. This dissertation examines the possibility that differences in private-label performance between developed and emerging economies is not driven by one mechanism, but arises from a variety of sources, both structural, and behavioral. Specifically, I focus on manufacturers' bargaining power, retailers' private label portfolio strategies, and consumers' perceptions of private labels. In most emerging economies, national brand manufacturers tend to be the sole producers of private labels. As a result, manufacturers have inherent bargaining power and can deter retailers from pursuing aggressive private label strategies, which results in low private label market shares. Moreover, some retailers in emerging economies now carry their private labels as part of a multi-tiered portfolio. However, a small price-gap between the quality tiers results in high intraportfolio competition leading to cannibalization and lower private label market shares. Last, private label market shares in emerging economies may be smaller than in developed economies because low-income households prefer higher priced national brands. This counterintuitive phenomenon is driven by two interrelated factors. First, social influence implies that low-income households are upward-comparing, they contrast themselves with high-income households whom they believe are better-off. Because higher-income households purchase national brands, upward-comparisons lead to a preference for national brands. Second, low income

households are unknowledgeable about private label advancements hence they prefer national brands.

DEDICATION

This dissertation is dedicated to my mother, who taught me that even the largest task can be accomplished if it is done one step at a time. It is also dedicated to my father, who taught me that the best kind of knowledge to have is that which is learned for its own sake.

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“Many hands make light work.” This quote from John Heywood not only refers to manual labor, but encompasses work in general. The completion of this dissertation has not been the work of one individual, but the combined effort of many. Without the help of my committee, family and friends, this dissertation would never have come to fruition.

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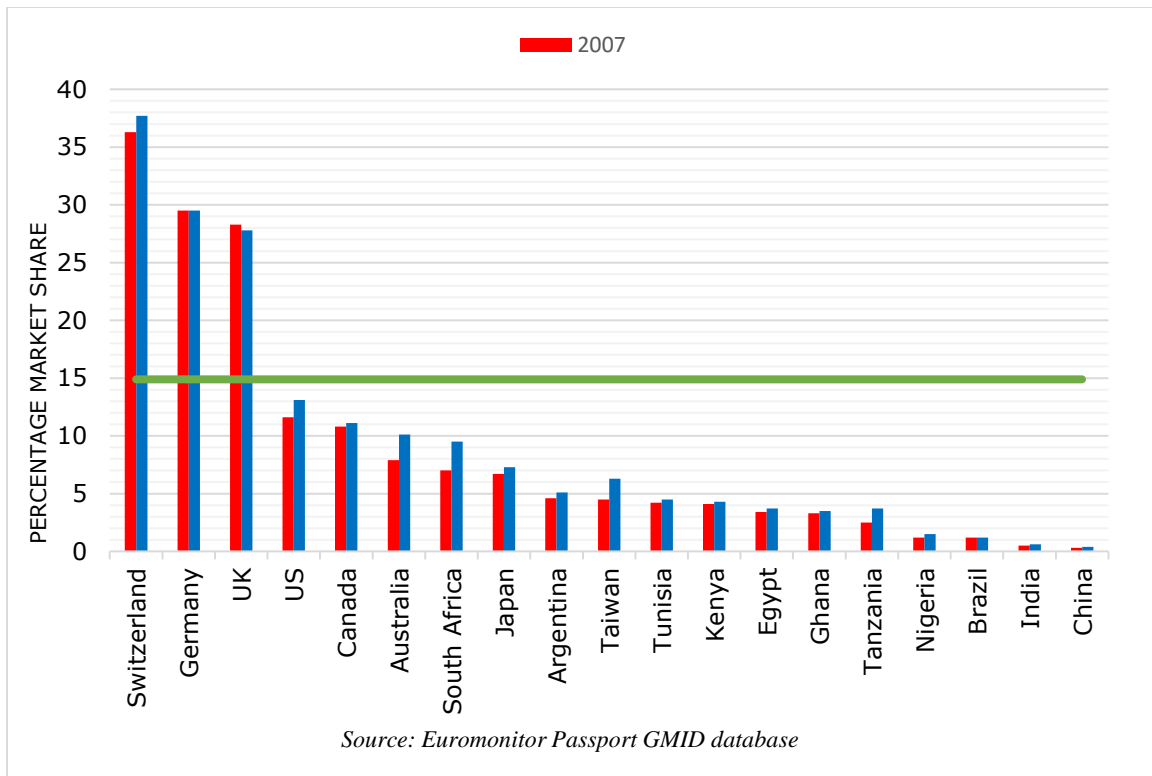
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CHAPTER 1

INTRODUCTION

Private labels continue to make significant inroads into the packaged goods market. Over the past decade alone, annual sales of private-label products have risen by over 55% in supermarkets and by 96% in drugstore chains, reaching more than \$115.3 billion in 2015 (Private Label Manufacturers Association 2015). Private label growth is particularly apparent in the premium segment, where revenues continue to grow rapidly. According to a 2015 Nielsen report, overall revenues from private labels increased 2.5% in 2015, pushing private label dollar share up one and half points to 21.5%, a record high. However, the rate of private label growth varies widely across geographical markets. In Europe and North America, private labels now constitute an average of 35% of total retail market share, whereas market shares vary between 1% and 8 % in developing countries (see figure 1). In this dissertation, my goal is to investigate the primary causes of failure among private labels, and to explain the relatively low private label penetration rates observed in emerging markets. Specifically, I investigate whether differences in vertical relationships between manufacturers and retailers, retailers' private label portfolio strategies, and consumers' perceptions of private labels, limit private label growth in developing relative to developed economies.

Figure 1. Private label Market Shares by Country



Existing research identifies several factors that cause private-label penetration rates to vary across product categories and retailers. However, there have been limited efforts to understand variation in private-label penetration rates across geographical markets. Steenkamp, Van Heerde, and Geyskens (2010) use survey data from 23 countries in Asia, Europe, and the Americas to show that product innovation, distinctive packaging and private label production by national brand manufacturers impacts the price premium consumers are willing to pay for private labels. They however, make no attempts to determine why private labels market shares vary across countries. Erdem and Chang (2012) find evidence of learning spillover effects of umbrella brands across multiple categories for private labels in three different countries (i.e. the United States,

the United Kingdom, and Spain). However, they also make no attempts to determine why private label-penetration varies across countries and why market shares are sharply lower in emerging markets.

In contrast with the two preceding studies, Cuneo et al (2015) attempt to explain variation in private label market shares across different countries. They examine how retail distribution channels, the presence of multinational retailers, and logistics networks determine the success of private labels in different countries. They find that private label market shares are high in countries where grocery items are sold through well-developed modern channels such as supermarkets, hypermarkets and discounters, as opposed to less-developed traditional channels like small local chains and independent outlets. However, modern grocery retailing has gained traction in most emerging markets as both local and global retailers seeking high-growth opportunities have expanded rapidly. Yet private label market shares are still very low, even in markets with seemingly modern grocery channels (A.T. Kearney 2013).

Moreover, these authors argue that the presence of multinational retailers in a market often results in high private label market shares. Because brands from multinationals have stronger appeal, especially in emerging economies where consumers aspire to consume brands that are popular elsewhere, private labels from multinational retailers should be successful. However, this viewpoint is somewhat incomplete and contradictory because country-of-origin studies show that customers are “ethnocentric”, in that they prefer local brands, particularly in food-product categories (Netemeyer et al 1991; Mooij 2013; Siamagka and Balabanis 2015).

Last, they conclude that private label market shares vary across countries because of the logistical challenges that retailers face in the distribution of private label products. They argue that, in these countries, supply chain networks are underdeveloped, inefficient, uncompetitive and unreliable. However, they fail to explain how national brand manufacturers thrive under the same conditions. Moreover, they also contend that retailers in these markets lack both technical and financial capabilities required to run successful private label programs. Yet, there is a strong presence of both large local and large multinational retailers in most of these countries. For example, US retailing giant Walmart has a footprint in most emerging markets, as it operates in India, China, South Africa, Brazil and Argentina. Likewise, other global players such as Carrefour, a leading French retailer, the UK's Tesco and Germany's Aldi have subsidiaries in most emerging markets (A.T. Kearney 2013). These apparent shortcomings all but negate generalizations following from differences in logistical networks. My research examines instead differences in vertical relationships between private-label manufacturers and retailers, retailers' private-label portfolio strategies, and consumers' perceptions of private labels, on private label growth in developing markets

My dissertation is comprised of three essays. In the first, I consider the nature of vertical relationships in the grocery supply channel. In the second, I consider retailers' private label portfolio strategies and in the third, I consider consumer perceptions and attitudes toward private labels. Taken together, these three essays provide a comprehensive explanation for the multiple factors that explain why private label shares are lower in developing relative to developed economies.

In the first essay, the contribution to low private label market shares results from a fundamental difference in the relationships between grocery buyers and suppliers in developing economies relative to those in developed economies. Namely, in saturated and consolidated western markets, where private label market shares are highest, retailers either produce their own private labels or acquire them from contract manufacturers (Meza and Sudhir 2009). In most emerging markets, in contrast, retailers source their private labels solely from national brands manufacturers (Song 2008; Beneke 2009; Van Wyk 2013). This supply arrangement allows national brand manufacturers to directly influence both national and private label retail prices by jointly selecting wholesale prices for each brand (Innes and Hamilton 2009; Kumar, Radhakrishnan and Rao 2010).

In, Chapter 2, I utilize bread sales data from a major South African market to investigate whether national brand manufacturers possess sufficient bargaining power to remove retailers' incentives to produce their own private labels, and how that may affect private label market share, and consumer welfare. Specifically, I use a structural econometric approach to analyze the vertical relationships between manufacturers and retailers and to estimate the degree of bargaining power exercised by manufacturers in setting relatively high wholesale prices on private labels.

I find that manufacturers, set wholesale prices for private label products that provide margins equal to their own national brands, this results in high wholesale prices on private labels. In turn, high wholesale prices, result not only in higher private label retail prices, but suppresses private label market shares as retailers have little incentive to develop and promote aggressive private label programs.

Supplier-retailer relationships are only part of a retail-value chain structure that affects retail private label margins and market shares (Meza and Sudhir 2009). In my second essay, I investigate how private label portfolio strategies, or designing tiers of private labels that target premium quality, standard quality and economical shoppers at three different price-quality points, may also determine private label shares (Geyskens, Gielens, and Gijbrecchts 2009). Portfolio strategies allow retailers to satisfy multiple customers segments as they can target customers based on their price and quality preferences (Ailawadi and Keller 2004; Kumar and Steenkamp 2007). But, for a portfolio strategy to increase private label market share, the tiers within the portfolio must be distinct, and complementarity to overall store-brand growth.

Most retailers in emerging economies now carry a portfolio of private labels that spans different customer segments (Planet Retail 2012; Beneke 2009). However, the price-gap between low, medium and premium-quality private labels in their portfolios is very small, moreover, in some cases low and medium-quality private labels are priced more than high-quality brand alternatives (Euromonitor 2014). In Chapter 3, I examine whether the price-gap between private labels in different tiers impacts perceived brand similarity, cannibalization, and private label market shares.

From an economic perspective, narrow price-gaps imply that brands are regarded as similar, so will cannibalize sales from each other. In order to investigate this possibility econometrically, I utilize data from the South African breakfast cereal market in a discrete-choice framework that allows brand similarity to shift demand. The brand similarity measure in this model represents a second-order effect that not only accounts for brand attributes but also the price differential between the tiers. I test whether a

narrow price-gap between brands in different tiers impacts brand similarity and how this impacts private label market shares. I then conduct counterfactual simulations to determine the effect of varying brand similarity on private label market shares.

My results show that the price-gap contributes to perceived brand similarity such that when the gap is small customers cannot distinguish between brands in different price-quality tiers. This results in increased intraportfolio competition, cannibalization, and lower private label market shares. Moreover, a narrow price-gap results in a minimally differentiated private label portfolio counter to the Principle of Maximum Differentiation (d'Aspremont et al 1979) which states that an equilibrium in differentiated product markets occurs when the products are highly differentiated i.e. when the products are located further away from each other (Irmén and Thisse 1998; Rajan and Sinha 2009). This suggests that retailers' private label portfolio management strategies may also in part explain the relatively low private label market shares in emerging markets.

Ultimately, consumers are the final link in the private label supply chain. Given that most manufacturers rely on their retail partners to create direct relationships with their consumers, the supplier-retailer relationship is an important antecedent for brand success (Poirier and Reiter 1996). Consumers' not only influence supplier-retailer conduct in the market place but also what product or brands are manufactured and how they are marketed. In both developed and emerging markets, low-income households show preferences for national brands (Sinha and Batra 1995; Bronnenburg et al 2015). Taking into account that a majority of consumers in emerging markets are low income, most retailers in these markets are reluctant to market private labels. Against this

background, I examine why low-income households consume more expensive brands and how this impacts private label penetration, particularly in emerging markets.

In Chapter 4, I seek to determine which persuasion appeals (descriptive appeals and informational appeals) are most effective at motivating low-income consumers to buy private labels. In so doing, I provide insight into the underlying cause of why low-income consumers prefer national brands to private labels, and its implications for private label market share. Informational appeals are designed to target the rationality of consumers by providing objective information on brand quality, price promotions and product attributes (Cutler et al 2000). For example, to motivate consumers into buying certain products or brands, retailers can provide consumers with factual information about tangible product features such as product quality or attributes. Consequently, if informational appeals increase private label consumption among low income consumers it suggests that lack of private label information is a cause of why low income consumers do not buy private labels.

On the other hand, descriptive appeals are emotive and are often based on social influence (Cialdini et al 2006). For example, to encourage consumers to buy certain products or brands retailers can link the products to an aspirational reference groups (i.e. positive groups that individual aspire to be part of). The influence of reference groups on consumers' purchase decisions is well documented in the marketing literature. Aspirational reference groups have been shown to exert influence over an individual's consumption decisions (Taylor and Lobel 1989; Aspinwall and Taylor 1993; Zeelenberg and Pieters 2011). Therefore, if descriptive appeals increase private label consumption

among low income consumers it implies social influence is also a major reason why low income consumers do not buy private labels.

I find that informational appeals are the most effective way of increasing private label consumption. I also find that descriptive appeals that are based on the preferences of aspirational reference groups also encourage low-income consumers to buy private labels. These results suggest that low-income consumers prefer national brands to private labels for two main reasons. First, they do not consume private labels because they are generally unaware of private label attributes and quality. This may be due to the fact that private labels are rarely advertised, and because of financial constraints low-income consumers may be wary about purchasing new and unfamiliar brands because of the relative risk associated with it (Sinha and Batra 1999). Second, low-income may prefer national brands to private labels because of social influences. I find that under a complex set of structural and social interactions low-income individuals are status seeking and this influences their brand choices in a grocery-retail setting. More specifically, I find that low-income consumers associate private labels with other low-income households and national brands with high income households. Ultimately these associations result in them preferring national brands over private labels. These findings may explain the relatively low private label market shares in emerging markets.

Chapter 5 offers a summary of my findings and a discussion on the implications for retailing in developing economies, and the economics of development more generally. I also offer some comments on how my findings may generalize beyond the markets and the product category considered here. My findings provide more general insights into manufacturer-retailer relationships. I find that when national brand manufacturers are the

sole producers of private labels they generally price in excess of purely competitive levels implying that they have the ability to influence retailers' decisions. I show that manufacturers exercise bargaining power by setting high wholesale prices on private labels, which results in high private label retail prices, and, ultimately, low private label market shares.

The implications for practitioners are also important. Taking into account that, I find that when manufacturer bargaining power is low, private labels market shares and retailer margins are high, if retailers can attenuate manufacturer bargaining power by either producing their own private labels or by partnering with contract manufacturers it may increase private label market shares and subsequently their overall profits. On the other hand manufacturers earn higher margins by producing both their own brands and private labels, so are not likely to change the status quo.

The results also highlight that when manufacturer bargaining power is low, overall retail prices are low as well. This finding has clear implications for consumers, in that expansion of private labels can aid households in developing economies to fight food insecurity. Evidence points to the fact that food prices are higher in the least developed countries of the world as compared to the wealthier nations, thus, they can benefit from less expensive food.

In my second essay, I find evidence that the price-gap between brands in a portfolio impacts brands preferences within that portfolio. More specifically, I find that a narrow price-gap results in cannibalization of upper-tier brands. These results from this study also generalize beyond the market and products considered here. In that they highlight that a narrow price-gap between brands in a portfolio, private label or otherwise

results in high cross-brand sales in which the high quality brands loses out. This not only results in reduced market shares but also potential loss of revenues.

In my third essay I highlight the role of consumer knowledge and social influence in brand choice. Specifically, I find that low-income consumers prefer national brands over private labels for two main reasons. First, low-income consumers are uninformed about private labels, they are generally unaware that private quality advances hence they avoid buying them. Second, low-income consumers buy national brands so as to enhance their social standing. They, fervently believe that high-income consumers buy national brands and thus they desire national brands as well. In fact, informing them that private labels are consumers by high income consumers increases their purchase intentions and willingness to pay for private labels. These results validate the role of social influence in non-durable products such as grocery items that are mostly consumed in private. An area current research is yet to investigate.

CHAPTER 2

ASSESSING THE IMPACT OF MANUFACTURER POWER ON PRIVATE LABEL MARKET SHARE IN AN EQUILIBRIUM FRAMEWORK.

Abstract

Private label growth in emerging markets has not kept pace with the growth in private labels elsewhere. In Europe and North America, private labels now constitute an average of 35% of total retail market share, but market shares vary between 1% and 8 % in developing countries. Existing explanations for this observation do not account for the unique nature of manufacturer-retail relationships in emerging economies. That is, in most emerging economies, national brand manufacturers tend to be the sole producers of private labels. I investigate whether national brand manufacturers possess bargaining power relative to retail buyers and, if so, I examine how this may affect private label market shares. The results show that dominant manufacturers set relatively high wholesale prices for private labels, which reduces retailers' margins on private labels, and results in higher-priced private label products. Lower private label market shares result.

Introduction

The rise in private label market shares in emerging markets has not kept pace with growth elsewhere. While private label shares in the UK, Canada, the US and Switzerland are 43%, 28%, 25% and 54% respectively, penetration rates in emerging markets average 3%¹. In this chapter, I seek to explain the gap in private label market shares between developed and developing economies by examining the unique structure of manufacturer-retailer relationships in developing economies. In most emerging markets national brand manufacturers tend to be the sole producers of private labels. Therefore, I investigate whether they possess bargaining power relative to retailers and, if so, how this impacts private label market shares.

There has been a limited amount of effort to understand variation in private label penetration rates across geographical markets. Erdem et al (2012) show that variation in private label market shares among the United States, Spain, and the United Kingdom is partly due to variation in consumers' private label quality expectations, quality uncertainty, and risk perceptions. However, their comparison does not include any emerging economies. In contrast, Cuneo et al (2015) attempt to explain private label market share variability across a sample of markets that includes some developing economies, arguing that private label market shares vary because of logistical challenges faced by retailers. Specifically, they contend that in markets where private labels underperform, supply chain networks are underdeveloped, inefficient, uncompetitive, and

¹ For example private label market shares are 5.3% in Argentina, 1.5% in India, 3.5% in Brazil and 9.5% in South Africa.

unreliable. However, they fail to explain how national brand manufacturers in these economies thrive under the same conditions. Moreover, they also argue that retailers in these markets lack both the technical and financial capability required to run successful private label programs. Yet, in a number of these markets there is a strong presence not only of large local retailers, but also divisions of large, well-capitalized, multinational retailers.

What is different in the structure of retailing between developing and developed countries that may help explain why private label market shares are low in emerging economies? Retailers in both regions are highly sophisticated, often multi-national, and sell groceries through hundreds of individual locations. Consumers in emerging markets have less disposable income, but that would argue for higher private label shares, not lower. Perhaps the most striking difference lies in the upstream relationships between retailers and suppliers. In developed economies, contract manufacturers tend to produce private labels, whereas national brand manufacturers are largely responsible in most emerging economies (Song 2011; Beneke 2009; Van Wyk 2013). This supply arrangement suggests two possible explanations for low private label market shares in emerging economies.

First, market shares may be low because national brand manufacturers set relatively high wholesale prices on private labels. Unlike in developed economies where retailers earn relatively high margins on private labels because of their favorable bargaining position relative to contract manufacturers (Meza, and Sudhir 2010). Retailers in developing countries are not able to match the scale and quality of the national brand manufacturers through equivalent contractor relationships. Manufacturers, therefore, set

wholesale prices for private label products that provide margins equal to their own national brands, leaving retailers with little incentive to price private labels aggressively in competition with national brands. This behavior by manufacturers is consistent with prior studies showing that wholesale prices are directly related to the number of upstream firms and bargaining power, (Gilbert and Hastings 2001). A smaller number of upstream suppliers suggests that the supply chain is consolidated, this in turn creates incentives for upstream firms to increase wholesale prices as they have bargaining power over downstream firms (Riordan 2008).

Second, it may instead be that national brand manufacturers' position manifests not in high private-label wholesale prices, but in low wholesale prices. Extant research finds that firms with bargaining power often engage in pricing strategies aimed at eliminating or substantially reducing competition. For example, they may maximize long term profits by setting their prices relatively low in order to drive out competitors and to create barriers to entry for potential new rivals (Galbraith and Stiles 1983; Bhuyan and Lopes 2007). Therefore, national brand manufacturers may seek to foreclose any possibility of losing their advantage in the private label market by offering retailers low wholesale prices. This translates to high margins on private labels for the retailers. Although manufacturers earn less on private labels, their margins on national brands are still relatively high such that the two margins are in equilibrium. However, by offering private labels at low wholesale prices it effectively eliminate any incentives for retailers to seek alternative sources of supply, as such private label market shares remain low. Thus, in a competitive equilibrium, retailers have no incentive to compete. Therefore,

which of these two explanations to why private label market shares are low in emerging economies is more likely is an empirical question.

I investigate this question using retail bread sales data from a major South African retail market. I analyze this data using a structural econometric framework in which I test whether national brand manufacturers possess bargaining power and, if they do, whether wholesale prices are nearer the competitive or non-competitive benchmarks. I use counterfactual simulations to determine how wholesale bargaining power may affect private label wholesale prices, wholesale margins, retail margins, and, consequently, private label market shares.

I find that manufacturers generally price in excess of purely competitive levels, which implies that they exercise a measure of upstream bargaining power. Importantly, I find that in equilibrium national brand manufacturers set relatively high wholesale prices on private labels, resulting in high private label retail prices, and low private label market shares. Moreover, retail prices of both national brands and private labels are highest when manufacturers' bargaining power is relatively high.

The remainder of this chapter is organized as follows: In the next section I describe the South African private label manufacturing market and its similarities to other retail markets in emerging economies. In the third section I explain in detail the effects of manufacturers' bargaining power on both the manufacturer-retailer relationship, and consumer welfare. The fourth section presents the structural econometric model of retail bread demand, and manufacturer supply. I explain how the model was estimated in the fifth section. I then describe the South African private label retail and bread markets, and provide some descriptive statistics that highlight key price and market share trends. The

estimation results are interpreted in the sixth section. Last, I discuss the results, formulate conclusions and offer managerial and policy implications.

Private Labels in Emerging Markets

Unlike in western markets, where retailers can acquire private labels from multiple suppliers at wholesale prices that are close to marginal cost (Kumar and Steenkamp 2007; Sayman and Raju 2007), retailers in most emerging economies procure private labels solely from national brand manufacturers. In this supply arrangement, both retailers and manufacturers derive mutual benefits. Retailers procure private labels from national brand manufacturers for quality and cost assurances and better category management (Hoch 1996). On the other hand, even though manufacturers make substantial margins from the sale of their own brands, private-label production permits them to use excess production capacity, leading to higher overall margins (Quelch and Harding 1996; Narasimhan and Wilcox 1998). Importantly, private label production also allows manufacturers to directly regulate retailers and contract manufacturers in the private label supply chain (Innes and Hamilton 2009). As such, private label manufacturing in emerging economies is dominated by a few manufacturers.

In nearly all developing economies, private label manufacturing is controlled by a few very large firms that also dominate sales in most food categories (Sexton 2010; das Nair and Chisoro 2015). For example, in South Africa a majority of the private labels are manufactured by large national brand manufacturing companies, Tiger Brands, Pioneer Foods, Unilever-Unifoods, Heinz and Premier Foods (Van Wyk 2013; Lodestar Marketing Research; Euromonitor 2014). With few suppliers, manufacturers may be in an advantageous bargaining position relative to retailers, and with respect to their own

upstream suppliers. For example, manufacturers can pressure suppliers into providing large quantities of raw materials at relatively low prices (Reardon and Barrett 2000), and can control distribution by “pushing” goods through to retailers (Sexton 2010).

Importantly, manufacturers may have the ability to determine prices, create barriers to entry (Bhuyan and Lopes 1997; Azzam 1997) and can possess bargaining power (Bayus and Putsis 1999; Lenox, Rockart and Lewin 2007).

Private label manufacturing in most emerging economies is also characterized by vertically integrated national brand manufacturers. For example, nearly all national brand manufacturers in the South African market that produce private labels are vertically integrated with input suppliers. The leading manufacturers -- Tiger Brands, Pioneer Foods, Foodcorp and Premier Foods -- each own subsidiaries that dominate the wheat and corn milling industries (Mncube 2010; National Chamber of Milling 2011). Vertical integration reduces manufacturers’ costs throughout the supply chain as it allows greater control over transportation costs, material costs, and factory overheads (Stuckey, and White 1993). This is particularly important given that food manufacturing is both capital intensive and higher-cost than in other markets, especially for contract manufacturers who generally have limited access to operating capital (Mncube 2013; Food and Agricultural Organization 2014).

Vertical integration may also explain why private label manufacturing in emerging economies is dominated by a few manufacturers. Essentially, vertically integrated manufacturers invest heavily in productive capacity and expertise in order to keep contract manufacturers out, and private-label competition minimal (Ellickson 2007). Firms compete by over-investing in capital in order to signal their ability to compete

aggressively on price, or endogenize fixed costs (Sutton 1991). When incumbent manufacturers incur additional fixed costs in order to either raise quality or to reduce variable costs, they are able to sustain oligopoly power. Moreover, incumbent manufacturers engage in a competitive escalation of investments as the size of the market increases. Using this logic, the private label manufacturing market consists of only a few, relatively powerful firms, protected by substantial barriers to entry, because manufacturers compete for consumers by offering competitive prices which requires continual fixed investments in vertical integration.

In addition, incumbent manufacturers' increase entry-capital requirements and the minimum efficient scale of operations for potential entrants (Krattenmaker and Salop 1986; Ordoover, Saloner and Salop 1990). Consequently, retailers and contract manufacturers may have to enter all stages of production in order to compete efficiently. These entry-barriers potentially give rise to bargaining power (Riordan 1998). Therefore, given that there are few firms in the private label supply chain in emerging economies, the existing firms are protected by entry barriers, that private label manufacturers are vertically integrated, they may indeed possess bargaining power. I test this possibility, and whether high or low wholesale prices on private labels are responsible for the low private label market shares in emerging economies using the framework described below.

Model Specification

In this section, I describe an empirical model of private label demand and supply that is able to test for any exercise of bargaining power on the part of private-label suppliers. The model is structural in the sense that I specify private label demand, supply, and equilibrium pricing models under the assumption that both retailers and manufacturers

operate in imperfectly competitive markets. On the demand side, I model consumers' discrete purchasing choices, using a random parameter logit model. On the supply side I assume Bertrand-Nash competition between manufacturers and retailers (Villas-Boas and Zhao 2007). I then estimate the extent of deviation from Bertrand-Nash margins, and interpret deviations from the maintained equilibrium as evidence of bargaining power (Villas-Boas and Zhao 2005; Draganska and Klapper 2007; Richards and Allender 2010). I also consider counterfactuals that examine the effects of bargaining power on private label market shares. I begin my analysis by modeling consumer demand, and then conditional on the demand estimates, I calculate profit-maximizing retailer and manufacturer margins implied by the vertical model of the supply chain

Consumer Demand

I model consumer demand at the household level assuming preferences for differentiated products are randomly distributed among consuming households. Households make discrete choices among brands each week, choosing one brand from among several other brands. Utility depends on random elements, product attributes, and observed heterogeneity.

Formally, I assume that consumers choose one unit of the brand that offers the highest utility, and they choose only one brand during each shopping trip. Thus, the indirect utility customer i obtains from purchasing product j , at time period t , depends on product and consumer characteristics. With these assumptions, indirect utility is written as:

$$U_{ijt} = X_{jt}\beta_i - \alpha_i p_{jt} + \varepsilon_{ijt}, \quad (1)$$

where X_j is a vector of characteristics for product j , p_{jt} represents the price of product j during time period t , ε_{ijt} is an error term that is assumed to be independently and identically distributed across both products and consumers and α_i is consumer i 's marginal utility of income. Here, I allow α_i to vary randomly across consumers such that:

$$\alpha_i = \alpha + \sigma v_i, \quad v_i \sim N(0,1), \quad (2)$$

where α the mean price response is across all consumers, v_i summarizes all the unobserved individual-specific characteristics and, σ is a coefficient that characterizes how consumer marginal disutilities of price vary with respect to average disutility α according to unobserved characteristics. Following Nevo (2001) equation (1) can be further decomposed into two components:

$$U_{ijt} = \delta_{jt} + \mu_{ijt} + \varepsilon_{ijt}, \quad (3)$$

where:

$$\delta_{jt} = X_{jt}\beta - \alpha p_{jt} + \xi_{jt}, \quad (4)$$

In equation (3) the first term, δ_{jt} , is the mean utility level of brand j , it is a product-specific term that is common to all consumers. The second term, $\mu_{ijt} + \varepsilon_{ijt}$ denotes the deviation from the mean-level utility, which captures the effects of all random elements. Therefore, indirect utility is redefined in terms of the mean utility and deviations from the mean utility as shown in equation (3). I use the estimates from this model as inputs to the supply-side model which I describe next.

Manufacturer and Retailer Conduct

In order to estimate the degree of manufacturers' bargaining power, I develop a model of the private label supply chain, and derive equilibrium wholesale and retail margins under

the maintained assumption of Bertrand-Nash manufacturer conduct. The nature of the vertical game is such that I assume the manufacturer Stackelberg pricing game. In this channel structure, the manufacturers are the first movers, they set the prices paid by the by retailers, who then, in turn, set prices to consumers for all brands in the category. This model has substantial empirical support in existing literature (e.g. Besanko, Dubé and Gupta 2003; Villas-Boas and Zhao 2005; Allender and Richards 2010). Taking into account that the manufacturers move first, I solve the model by backward induction, first describing the second-stage pricing decision made by retailers, and then the first-stage wholesale pricing decision. In the remainder of this section I derive the subgame perfect Nash equilibrium in prices to this channel game.

Retailer Pricing

For a given array of products and wholesale prices, retailers set their prices to maximize the expected category profit. Thus, if there are N Nash Bertrand multi-product oligopoly retailers and each retailer maximizes category profit from the sale of national and private labels. The profit for retailer r , for a particular time period, is given by:

$$\prod^r = \sum_{j \in S_r} M \cdot (p_j - w_j) \cdot S_j(p), \quad (5)$$

where j represents the products carried by a retailer in a category, p_j is the price the retailer sets for product j , w_j is the manufacturer price paid by the retailer for product j , S_j is the market share of product j which is a function of the prices of all J products, S_r is the set of products sold by retailer r , and M is the size of the local market. Assuming a pure strategy Bertrand-Nash equilibrium in prices exists and that equilibrium

prices are strictly positive, the retail price p of any product j sold by retailer r must satisfy the first-order profit-maximizing conditions:

$$\frac{\partial \pi}{\partial p_j} = s_j + \sum_{k=S_r} (p_k - w_k) \frac{\partial s_k}{\partial p_j} = 0, \quad (6)$$

Stacking the first order conditions for each product at each retailer and solving for retail prices, this linear system can be expressed in matrix notation as:

$$\mathbf{p} - \mathbf{w} = -(\mathbf{T}_r * \Delta_r)^{-1} \cdot \mathbf{S}(\mathbf{p}). \quad (7)$$

where \mathbf{T}_r is a $J \times J$ ownership matrix with the general element $\mathbf{T}_r(k, j) = 1$ if a retailer has both products k and j in their portfolio and $\mathbf{T}_r(k, j) = 0$ otherwise, Δ_r is a $J \times J$ response matrix which includes the first derivatives of market share of product j with respect to all retail prices, with element $\frac{\partial s_j}{\partial p_k}$, and $\mathbf{T}_r * \Delta_r$ is an element by-element multiplication of the two matrices. Equation (7) represents the retailer's decision rule that frames their pricing decisions, and conditions manufacturer's upstream pricing decisions.

Manufacturer Pricing

On the manufacturer side, national brand manufacturers set prices to maximize total profits from all products sold. Generally, I assume that the manufacturers set their prices such that the surplus they acquire over production costs is maximized for all goods they produce, while accounting for retailers' responses. Formally, the profit for manufacturer m is given by:

$$\prod_l^m = \sum_{l \in G_f} M \cdot (w_l - c_l) \cdot S_l(p(w)), \quad (8)$$

where c_l is the marginal cost of producing product l incurred by the manufacturer, G_f is the set of products sold by manufacturer m , and the other terms are as explained earlier.

The first order condition for the manufacturer is then given by:

$$S_l + \sum_{k \in G_f}^l (w_k - c_k) \frac{\partial S_k}{\partial w_l} = 0, \quad (9)$$

Following Villas-Boas and Zhao (2005), I define the manufacturer ownership matrix \mathbf{T}_m in a manner similar to that of the retail ownership matrix. Specifically, element (l, m) of \mathbf{T}_m is equal to 1 if the manufacturer produces both national brands and private labels i.e. l and m , and is otherwise equal to zero. The elements of the manufacturer's response matrix, $\mathbf{\Delta}_m$ are the derivatives of the product market shares with respect to all wholesale prices, i.e. $\frac{\partial s_l}{\partial w_i}$. The matrix $\mathbf{\Delta}_m$ comprises of the cross price elasticity of demand and the effects of cost pass through, these effects can be decomposed as follows by evoking the chain rule:

$$\mathbf{\Delta}_m = \Delta'_p \mathbf{\Delta}_r, \quad (10)$$

where Δ_p is the cost pass-through matrix, which is a matrix of derivatives of all the retail prices with respect to the wholesale prices and have the general element $\Delta_p(k, l) =$

$\frac{\partial p_l}{\partial w_k}$. The elements of the matrix Δ_p are derived by totally differentiating, for a given

product l , the retailer's first-order condition in equation (6):

$$\sum_{k=1}^N \left[\frac{\partial s_j}{\partial p_k} + \sum_{i=1}^N \left(T_r(i, j) \frac{\partial^2 s_i}{\partial p_j \partial p_k} (p_i - w_i - c_i) \right) + T_r(k, j) \frac{\partial s_k}{\partial p_j} \right] dp_k - \underbrace{T_r(f, i) \frac{\partial s_f}{\partial p_j}}_{h(j, f)} dw_f = 0, \quad (11)$$

Stacking these conditions for all $l = 1, 2, \dots, N$ products together in a linear system, I obtain:

$$Gdp - H_f dw_f = 0, \quad (12)$$

The matrix G has general element $g(l, k)$, and H_f is an N – dimensional vector with general element $h(j, f)$. Rearranging terms leaves the vector,

$$\frac{dp}{dw_f} = G^{-1}H_f. \quad (18)$$

Horizontally concatenating H_f together for all products l , I obtain the matrix $\Delta_p =$

$G^{-1}H$, which has the derivatives of all prices with respect to all wholesale prices.

Collecting terms and solving equation (14) for the manufacturers' implied price-cost margins results in:

$$\mathbf{w} - \mathbf{c} = -(\mathbf{T}_m * \mathbf{\Delta}_m)^{-1} \mathbf{S}(\mathbf{p}). \quad (13)$$

Finally, the implied price-cost margins for the whole channel are obtained by substituting equation (12) into (20) for retail and manufacturer prices respectively:

$$\mathbf{p} - \mathbf{c} = -(\mathbf{T}_m * \mathbf{\Delta}_m)^{-1} \mathbf{S}(\mathbf{p}) + \mathbf{\Delta}_r^{-1} \cdot \mathbf{S}(\mathbf{p}). \quad (14)$$

where the first expression on the right side is manufacturer margin and the second expression is the retailer margin.

All of the parameters needed to identify the equilibrium margin are in the price and demand side estimates, with the exception of marginal cost. Marginal cost is estimated as a linear function of input price variables such that:

$$C_{lt} = \theta \omega_{lt} + u_{jt}, \quad (15)$$

where ω_{jt} is a vector of input prices (electricity, wheat-flour, diesel, labor), θ is the vector of input-price parameters, and u_{jt} is the error term that accounts for unobserved shocks to marginal cost.

Manufacturer Power

I assume that both manufacturers and retailers behave as Bertrand-Nash oligopolists, earning profits consistent with a Bertrand-Nash equilibrium, which should be between perfect competition and monopoly. However, it is likely that real-world outcomes differ from any of these theoretical ideals. Therefore, following Villas-Boas and Zhao, (2005), Draganska and Klapper, (2007) and Allender and Richards (2010), I parameterize deviations from the Bertrand-Nash equilibrium to test for manufacturers' bargaining power. I augment equation (14) by introducing multipliers that measure the deviation of the manufacturer margin θ and the retail margin ϕ from the maintained assumption at each level. Specifically I let, $m^M = -(T_m * \Delta_m)^{-1} S(p)$ represent the manufacturers' margin and $m^R = \Delta_s^{-1} \cdot S(p)$ denote the retailers' margin so equation (21) can be rewritten as:

$$p = c + \phi m^R + \theta m^M. \quad (16)$$

The estimating equations for the full model are, therefore, equation (1) for the demand side, and equation (14) for the supply side where c is the marginal cost equation (15). In terms of the supply model the estimating equation is written as:

$$p = c + \phi m^R + \theta m^M + \varepsilon. \quad (17)$$

where ε captures variations in price that are not explained by the model and are assumed to be i.i.d. If ϕ or θ are greater than 1 then both retailers and manufacturers price more cooperatively than in Bertrand-Nash Equilibrium, but if ϕ or θ are less than 1, then they are pricing more competitively. In effect, θ measures manufacturer power, as it parameterizes any observed deviation from Bertrand-Nash. Therefore, if it is greater than 0, I can conclude that manufactures have bargaining power.

Counterfactual Simulations

Estimating bargaining power, however, merely establishes the extent of imperfection in either the wholesale or retail market. How this is manifest in private-label shares requires simulating outcomes under alternative behavioral assumptions. Therefore, to determine the effects of bargaining power, I use counterfactual simulations to calculate changes in private label market shares, prices and consumer welfare under a variety of alternative assumptions.

The simulation is intended to determine whether higher levels of bargaining power result in lower private label market shares. Bargaining power is assumed to be exogenous, and hence parametric to the decisions made by all agents. Therefore, I vary the conduct parameter introduced in the equilibrium pricing model, and calculate the resulting impact on manufacturers' and retailers' margins, and private label market shares. The first scenario assumes a market where manufacturers have no bargaining power. Here, I restrict θ to 0 and assume that manufacturers and retailers set prices as perfectly competitive firms. I also conduct a simulation in which I assume that manufacturers price more competitively than Bertrand-Nash competition by restricting θ to 0.5. Last, I simulate results for markets where manufacturers price exactly as Bertrand-Nash, and more cooperatively than Bertrand-Nash by setting ($\theta = 1$) and ($\theta = 2$), respectively. I describe the data used to test this model, and my estimation procedures, in the next section.

Data

Bread is one of the largest selling products in emerging economies (Euromonitor 2013). In South Africa, bread accounts for the majority of sales in the baked goods category

because it is a staple item for nearly all households, regardless of income. Bread manufacturing in South Africa is very dominated by a few manufacturers. There are four major bakeries: Blue Ribbon Bakeries, which is owned by Premier Foods; Albany Bakeries, which is owned by Tiger Consumer Brands; Sasko and Duens Bakeries, which are subsidiaries of Pioneer Foods, and Sunbake Bakeries, which is controlled by Foodcorp. Together, these firms control more than 90% of the market, while the rest is served by smaller independent bakeries. In contrast the top four bread manufacturers in the US – Flowers Food Inc, Grupo Bimbo SAB de CV, Sara Lee Corporation and Campbell Soup Company have a combined market share of less than 15% (Euromonitor 2014). In South Africa, the leading manufacturers are all vertically integrated, operating milling companies that control over 90 % of all milled wheat, which is the main ingredient used to bake bread. The manufacturers sell their bread to retailers, general traders, and independent agents. Large retailers are the largest customers, which purchase more than 60% of all production. The remainder is sold to smaller entities such as cafes, truck shops, smaller retailers and independent distributors (Mncube 2013).

The bread retail market is also dominated by a few players. The four-firm concentration ratio (CR4) is approximately 84.3%, and the market is controlled by five major players, Pick n Pay, Woolworths, Shoprite, Spar, and Walmart’s subsidiary, Cambridge Foods. Although the market is dominated by national brands, each of the retailers except Cambridge Foods sells a private label. The bread market has four leading brands Albany, Sasko, Blue Ribbon and Sunbake. Private labels are one of the lowest selling brands in this category and have a combined market share of 5.3% (see table 8). In contrast, US private labels account for about 14% of all bread sales (Euromonitor

2014). In South Africa, Pioneer Foods is the largest manufacturer, followed by Tiger Brands, Premier Foods, and Foodcorp.

Table 1, Brand and Manufacturer Market Shares (%)

Brand	Manufacturer	Market Share (%)	Av. Price (ZAR)
Brand 1	Tiger Brands	6.80	11.83
Brand 2	Premier Foods Plc	3.79	9.15
Brand 3	Tiger Brands	3.69	10.77
Brand 4	Pioneer Food Group Ltd	5.98	9.81
Brand 5	Pioneer Food Group Ltd	1.76	8.84
Brand 6	Premier Foods Plc	1.41	8.91
Brand 7	Pioneer Food Group Ltd	1.24	8.22
Brand 8	Tiger Brands	1.10	12.53
Brand 9	Foodcorp (Pty) Ltd	1.74	8.48
Brand 10	Tiger Brands	0.73	8.30
Brand 11	Pioneer Food Group Ltd	1.24	8.20
Brand 12	Tiger Brands	0.57	11.77

To test my principal hypothesis I use nationally-representative, a panel data set gathered by Nielsen (Homescan). The data includes a comprehensive set of retailers and brands, and tracks South African households between August 2013 and June 2014. Consistent with household-panel data sets elsewhere, households in the panel keep shopping diaries in which they record their biweekly purchases of all grocery items. The data describes the main characteristics of their purchases: quantity, brand, store, price and date of purchase.

For current purposes, I use purchases from the five leading retailers – Woolworths, Pick n Pay, Spar, Shoprite and Cambridge Foods. Together these purchases account for 80.5% of sales in the sample. I also use purchases from six leading national brands (four white and two brown bread brands) and six private labels (four white and

two brown bread brands). Purchases of these twelve brands account for about 85.8% of the sales for the five retailers in my sample.

Input prices are required to estimate the cost of producing and retailing bread. Electricity prices are from Eskom. Electricity is mainly used to power the high capacity commercial ovens used by the manufacturers. The data on wheat-flour prices is from South African Grain Information Service (SAGIS). I acquire data on wheat prices from SAFEX. Wheat-flour is the most important ingredient in baking bread, accounting for 41% of the total cost (Mncube 2010). Marginal cost also includes fuel prices from South Africa (Stats SA) as petrol and diesel are key components of distribution costs. Last, I acquire data on manufacturing wages from the South African Department of Labor. Table 2 reports summary statistics for these variables

Table 2, Summary Statistics for the Input Variables.

Variable	Units	Mean	SD	Min	Max
Petrol	R/Liter	13.554	0.485	12.843	14.163
Diesel	R/Liter	12.895	0.331	12.484	13.432
Wheat	R/Ton	3701.254	240.069	3301	41903
Flour	R/Kg	9.324	0.715	8.6233	10.622
Electricity	R/Kwh	0.505	0.049	0.4132	0.592
Labor	R/Month	2960.971	74.205	2359.410	3480.821

Estimation

There are a number of issues to address when estimating the demand (9) and supply models (23). First, when estimating the demand model, some potentially-important product characteristics (e.g. advertising, promotions and shelf placement) may have been omitted in the specification of utility, but are likely correlated with the price paid by

consumers. The resulting endogeneity results in bias if not addressed. I follow Petrin and Train (2010) and estimate a control function to address the endogeneity of prices.

A control function is a supplementary regression in which the potentially-endogenous variable is regressed on set of exogenous instruments. The error from this regression is, by definition, the component of price variation that is orthogonal to the instruments. By including the error in the demand equation, the model is essentially purged of any remaining endogeneity. The control function is written as:

$$p_{jt} = \delta J_{jt} + \gamma W_{jt} + \lambda_r + \eta_{jt}, \quad (18)$$

where p_{jt} the price of bread is, J_{jt} is a vectors of product characteristics, W_{jt} is a vector of possible cost shifters, λ is a retailer dummy and η_{jt} is an iid error-term.

For the product characteristics I include a dummy indicating whether the product is a private label of national brand and a binary indicator of whether the bread is brown or white. For supply-shifters, similar to Draganska and Jain (2005), and Bonnet and Dubois (2010) I use factor price series of wheat, flour, labor and electricity. These inputs are appropriate instruments because manufacturers' input prices are uncorrelated with unobserved demand shocks. Further, I interact the input prices with product dummies which allows each input to enter the production function of each product differently (Villas Boas 2006). This is a reasonable assumption as each bread is likely to use inputs in different proportion, depending upon the type of bread, the type of production process used, and the amount of transportation involved in moving it to market. I test the relevance of my instrumental variables with a first stage F-test (Stagier and Stock 1997). I conclude that they are relevant as the F-statistic of 75,033.23 is sufficiently high.

I then substitute the residual retained from equation (18) into the utility function, equation (1) to obtain the following:

$$U_{ijt} = X_{jt}\beta_i - \alpha_i p_{jt} + \tau \hat{\eta}_{jt} + \varepsilon_{ijt}, \quad (19)$$

Maintaining the assumption that ε_{ijt} is iid extreme value I distributed, I can write the conditional probability L_{ijt} for consumer i of buying product j in period t , i.e. $U_{ijt} > U_{ikt}, \forall k \neq j$, as:

$$L_{ijt}(\alpha_i, \beta_i) = \frac{\exp(V_{ijt})}{1 + \sum_{k=1}^j \exp(V_{ikt})}, \quad (20)$$

where $V_{ijt} = X_{jt} - \alpha_i p_{jt} + \tau \eta_{jt}$ I assume that (v_i^α, v_i^β) are independent and let f denote the standard normal probability distribution function. The unconditional probability of observing the sequence of T choices made by consumer i is then:

$$P_i(\alpha, \beta, \sigma^\alpha, \sigma^\beta) = \int \left(\prod_{t=1}^T L_{ij(i,t)t}(\alpha_i, \beta_i) \right) f(\alpha_i | \alpha, \sigma^\alpha) f(\beta_i | \beta, \sigma^\beta) d\alpha_i d\beta_i \quad (21)$$

where $j(i, t)$ is the alternative chosen by consumer i in period t , $f(\alpha_i | \alpha, \sigma^\alpha)$ and $f(\beta_i | \beta, \sigma^\beta)$ are the p.d.f of the random coefficients α_i and β_i respectively, and are assumed independent. Given that there is no analytical solution to the integral in equation (8) I use simulated maximum likelihood to estimate the model parameters (Train 2009), maximizing:

$$SLL(\alpha, \beta, \sigma^\alpha, \sigma^\beta) = \sum_{i=1}^N \ln \left[\frac{1}{R} \sum_{r=1}^R \left(\prod_{t=1}^T L_{ij(i,t)t}(\alpha^r, \beta^r) \right) \right] \quad (22)$$

with respect to the coefficients $(\alpha, \beta, \sigma^\alpha, \sigma^\beta)$ and where R is the number of simulations, α^r and β^r are the r^{th} Halton draws of the distributions $f(\alpha_i | \alpha, \sigma^\alpha)$ and $f(\beta_i | \beta, \sigma^\beta)$ respectively.

For the vertical supply model I estimate two separate models, First, I estimate the model of horizontal competition alone (among retailers) in order to show how retail margins behave for private labels and national brands if manufacturer conduct is not taken into account. Second, I estimate the model that includes both retailers' and manufacturers' margins.

However, prior to estimation, I test the endogeneity of the both the retailer margins and the manufacturer margins using the Wu-Hausman test (Wu 1974; Hausman 1978). The Wu-Hausman statistic is formed by selecting ordinary least squares (OLS) as the efficient estimator and the instrumental variable (IV) as the inefficient but consistent estimator. Thus, it is a test of the consequence of employing different estimation methods on the same equation. The Wu-Hausman statistic in both my models (the one with retail margins only ($\chi^2 (7.09), p < 0.0311$) and the one with retail and manufacturer margins ($\chi^2 (8.08) p < 0.0326$) show that the margins are endogenous. Therefore, I use generalized methods of moments (GMM) to estimate the vertical supply models. In a GMM environment, identification on the supply side requires instruments that are correlated with the endogenous variables but not the unobservables in the pricing equation.

Following Villas-Boas (2007), I use a set of store and product dummy variables as instruments. These dummies allow demand to differ across the geographical regions represented in my data and account for distinctive unobservable supply factors. I also include a set of lagged prices in order to account for any predetermined pricing effects.

Again, I test for the relevance of my instrumental variables. For both models I reject the hypothesis that my instrumental variable are not relevant as my first-stage F-

statistics are relatively high, 6,580.47 for the retail margin and 27.32 for the wholesale margin. I also test the exogeneity of the instrumental variables following Hansen (1982). For the retail margins only model the J-statistic of (8.965, $p < 0.111$) implies that the IV's are indeed exogenous. For the model with retail and manufacturer margins, the J-statistic of (9.293, $p < 0.097$) also suggests that my IV's here are exogenous.

Estimating the demand and pricing models simultaneously is beneficial in terms of estimation efficiency, but I estimate them sequentially due to the complexity of the cross-equation restrictions between the demand parameters and supply variables. I use estimates from the demand model to estimate the pricing model, conditional on the demand estimates. This estimation procedure is widely accepted in the literature and produces results that are similar to those obtained with simultaneous estimation (Villas-Boas and Zhao 2005). The results of my model are presented in the next section.

Results and Discussion

In this section I first present the demand-system estimates, followed by specification tests of the pricing model, and estimates from the preferred pricing model. Specifically, for the pricing model I present estimates from a number of variants of the model in order to examine the robustness of my specification, and estimation method. As a specification test for the supply-side model I first present a model that only includes retailer margins, followed by second model that includes both retail (downstream) and manufacturer (upstream) margins. Last, I present findings derived from the counterfactual simulations, and how these inform my hypothesis regarding the relationship between manufacturer bargaining power and private label market share.

Demand Results

As a first step in interpreting the demand model results I conduct a series of specification tests to determine whether my maintained model is preferred to a number of logical alternatives. Accounting for unobserved heterogeneity through the random parameter logit model is only necessary, or desirable, if heterogeneity is indeed a feature of the data. I conduct two types of specification tests. First, a likelihood ratio (LR) test is appropriate because a simple-logit model is nested within the more general random parameter specification. Second, simple t-tests of the random parameters are used to determine whether heterogeneity with respect to individual parameters is important. The standard deviations of price (t-statistic, 9.983) and income (t-statistic, 2.882) parameters had significant t-statistics. Moreover, the significance of these parameters in the random parameter model supports this specification over a constant parameter alternative.

With respect to the LR test, the estimated Chi-square value for the test is 3,762.39, while the critical Chi-square value with 5 degrees of freedom at the 5% level of significance is 11.074. Therefore, I reject the fixed parameter model in favor of the random-parameter alternative. I conclude that the random parameter model is preferred to the constant parameter version, so use this version to interpret the demand results.

Table 3 shows the estimated demand side parameters. The price coefficient is negative as expected (-0.420) and has a statistically significant standard deviation (0.474) implying that households seem to vary substantially with respect to their marginal utility of income. On average, national brands are preferred over private labels. The estimates show that consumers prefer national brands (brand 1 to brand 6) as compared to private labels (brand 7 to brand 12). Also, consumers prefer white bread over brown bread (-

0.324). The preference for brown bread is also heterogeneous across the different households. With respect to observed heterogeneity, higher incomes seems to increase price sensitivity.

Table 3. Random Coefficient Logit Demand Estimates

	Non-Random Parameter Model		Random Parameter Model	
	Estimate	Standard Error	Estimate	Standard Error
Brand 1	6.684*	0.684	6.655*	0.701
Brand 2	6.091*	0.684	6.300*	0.701
Brand 3	5.889*	0.684	5.536*	0.703
Brand 4	5.753*	0.684	5.755*	0.702
Brand 5	5.554*	0.685	5.758*	0.701
Brand 6	5.532*	0.685	5.836*	0.701
Brand 7	5.128*	0.685	5.450*	0.701
Brand 8	4.833*	0.685	5.043*	0.702
Brand 9	4.722*	0.685	5.043*	0.702
Brand 10	4.929*	0.685	5.25*	0.702
Brand 11	4.973*	0.685	5.236*	0.702
Income	0.003*	0.001	0.001*	0.001
Household Size	-0.023	0.031	-0.012	0.032
Brown	-0.324*	0.436	-0.212*	0.046
Price	-0.392*	0.063	-0.420*	0.065
CF	-0.385*	0.064	-0.416*	0.066
			Standard Deviation of Price Parameter	
Price			0.474*	0.048
Income			0.001*	0.000
Household Size			0.008*	0.014
Brown			0.345*	0.059
LLF	-56258.34		-54377.17	
Chi-square	644.076		15674.87	

* $p < 0.05$

Table 4 provides the entire matrix of own-and cross price elasticities. All the estimates have expected signs. The average own-price effect is negative (as expected) and highly significant. The estimate of -3.632 suggests that bread in the South African

market is elastic which is reasonable, given that bread is highly differentiated. However, private labels seem to be more price sensitive (-3.987) to changes in prices than national brands (-3.187). The elasticities estimates also show that there is considerable brand-preference as the highlighted by the low cross price elasticities. Furthermore, the cross price elasticities highlight that private labels are weak substitutes for each other whereas national brands are strong substitutes for each other. The elasticity estimates are also similar to estimates from other emerging countries. For example, the price elasticity of bread in Brazil is -3.8 (Byerlee and Sain 2001), in Turkey it is -2.65 (Tekguc 2011), and -2.53 in China (Zhou 2012). In contrast, price elasticity of bread in developed economies is much higher. For example, Bergtold, Akobundu, and Peterson (2004) find that in Canada the own-price elasticity of demand for both brown and white bread is less responsive to changes in price (elasticities of -0.78 and -0.81, respectively). Similarly, Okrent and Alston (2012) find that in the US the unconditional demand for bread is relatively high, -0.59 for brown bread and -1.54 for white bread. I present the results from my pricing model next.

Table 4. Own and Cross Price Elasticity Matrix

	National Brands					Private Labels					
	Brand 1	Brand 2	Brand 3	Brand 4	Brand 5	Brand 6	Brand 7	Brand 8	Brand 9	Brand 10	Brand 11
Brand 1	-2.389	0.4241	0.381	0.315	0.258	0.247	0.168	0.123	0.112	0.138	0.139
Brand 2	0.826	-3.483	0.445	0.425	0.360	0.348	0.237	0.173	0.158	0.195	0.196
Brand 3	0.703	0.452	-2.845	0.340	0.275	0.262	0.178	0.231	0.319	0.147	0.148
Brand 4	0.804	0.553	0.419	-3.442	0.337	0.324	0.221	0.162	0.147	0.381	0.182
Brand 5	0.841	0.601	0.448	0.433	-3.779	0.356	0.242	0.077	0.161	0.199	0.470
Brand 6	0.846	0.617	0.455	0.441	0.378	-3.869	0.249	0.182	0.245	0.205	0.206
Brand 7	0.736	0.575	0.765	0.441	0.378	0.366	-3.986	0.182	0.166	0.316	0.086
Brand 8	0.847	0.613	0.451	0.440	0.375	0.364	0.247	-4.034	0.165	0.203	0.205
Brand 9	0.576	0.617	0.495	0.441	0.378	0.366	0.368	0.182	-4.070	0.205	0.316
Brand 10	0.846	0.505	0.658	0.441	0.378	0.367	0.249	0.182	0.166	-4.031	0.206
Brand 11	0.635	0.616	0.454	0.441	0.377	0.366	0.289	0.382	0.166	0.205	-4.026

Bargaining Power Results

These high price elasticities of demand suggest that retail margins in the bread market will be generally low. With smaller margins, the allocation of value between manufacturer and retailer becomes even more critical as there is less to share. The primary parameters of interest in the pricing model are ϕ and θ , the conduct parameters that determine how the total margin is allocated among players in the bread supply chain. I start by estimating horizontal competition alone (among retailers) in order to show how retail margins behave for private labels and national brands if manufacturer conduct is not taken into account. Estimates of this model are shown in Table 5. I then estimate the model that includes both retailers' and manufacturers' margins; the results from that model are shown in Table 6.

In the model that only includes retailer margins I find that, in general retailers price significantly below the level implied by Bertrand-Nash competition, but above the perfectly competitive level ($\phi = 0.96$). In contrast, retailers in developed economies mostly price in excess of purely competitive levels (Meza and Sudhir 2010) which may explain differences in private label market shares. In terms of the cost elements I find that electricity prices, labor prices and fuel prices (diesel and petrol) significantly explain retail price of breads. However, the likelihood ratio (LR) test statistic of 35.05 ($p < 0.001$) shows that adding manufacturer margins results in a statistically significant improvement in model fit. Therefore, a more comprehensive picture is given by the estimates of the model that introduces manufacturer margins and vertical competition.

Table 5. Retail Margin Model: Generalized Method of Moments (GMM) Estimates

	Least Squares Model		GMM	
	Estimate	Standard Error	Estimate	Standard Error
Electricity	-14.734*	3.693	-7.742	5.900
Labor	9.695*	2.359	-13.261	7.186
Diesel	10.830*	1.007	11.148*	1.718
Brand 1	0.062	0.269	1.386	1.014
Brand 2	-1.998*	0.271	-0.697	0.997
Brand 3	-0.698*	0.270	0.551	0.997
Brand 4	-1.632*	0.269	-0.346	0.971
Brand 5	-2.423*	0.269	-1.018	0.982
Brand 6	-2.485*	0.269	-1.073*	0.977
Brand 7	-2.993*	0.336	-1.551	1.083
Brand 9	-2.656*	0.336	-1.234*	1.032
Brand 10	-3.172*	0.336	-1.755*	0.994
Brand 11	-2.941*	0.336	-1.448	1.082
Brand 12	-0.177	0.339	1.056	1.099
ϕ	0.286*	0.152	0.962*	0.330
LR			35.05	
Chi-square			7.09	

* $p < 0.05$

From this model, I find that retailers price below implied Bertrand-Nash competition ($\phi = 0.77$) but above the perfectly competitive levels. This estimate is qualitatively similar to the estimate from the model that does not include manufacturers. Once more, the cost elements show that labor costs, diesel prices and fuel prices explain bread prices. Importantly, I find that manufacturers price in excess of purely competitive levels, and that they earn margins greater than those implied by Bertrand-Nash competition ($\theta = 1.73$), implying that they have a considerable degree of bargaining

power. Taking into account that the South African bread market is dominated by a few manufacturers, this is not an unexpected result. Because I cannot directly test this either hypothesis ventured above, I conduct counterfactual simulations under alternative bargaining power supply assumptions. The results of these simulations are presented in Table 7.

Table 6. Retail and Wholesale Margin Model: Generalized Method of Moments (GMM) Estimates

	Least Squares Model		GMM	
	Estimate	Standard Error	Estimate	Standard Error
Electricity	-26.705*	5.176	-2.821*	22.348
Labor	11.942*	2.403	-10.233*	9.380
Fuel	10.952*	0.983	2.634*	14.749
Wheat-Flour	49.870*	15.662	10.975*	79.975
Brand 1	-0.092	0.264	0.399	0.520
Brand 2	-2.165*	0.266	-1.585*	0.517
Brand 3	-0.820*	0.265	-0.348	0.515
Brand 4	-1.744*	0.263	-1.188*	0.498
Brand 5	-2.544*	0.263	-1.831*	0.506
Brand 6	-2.632*	0.264	-1.952*	0.505
Brand 7	-3.136*	0.329	-2.572*	0.586
Brand 9	-2.692*	0.328	-1.878*	0.571
Brand 10	-3.326*	0.329	-2.656*	0.517
Brand 11	-3.044*	0.328	-2.238*	0.641
Brand 12	-0.327	0.333	0.716	1.053
ϕ	0.348*	0.149	0.777*	0.255
θ	1.063*	0.213	1.731*	0.361
LR				48.21
Chi-square				8.08

* $p < 0.05$

Table 7 shows results of the counterfactual scenario in which I examine whether higher levels of manufacturer bargaining power result in low private label market shares.

In this counterfactual I exogenously vary manufacturer bargaining power (θ) and calculate the resulting effects. Specifically, I estimate changes in market shares, wholesale prices, retailer and manufacturer margins, and retail prices when both manufacturers and retailers set prices as perfectly competitive firms i.e. when ($\theta = 0$), when manufacturers price more competitively than Bertrand-Nash competition i.e. when ($\theta = 0.5$), when manufacturers price at than Bertrand-Nash manufacturers i.e. when ($\theta = 1$) and when they price more cooperatively than Bertrand-Nash i.e. when ($\theta = 2$).

I find that at when ($\theta = 0$) private label market shares increase. The average market shares of private labels (brands 7 to 11) increases by 10.57% with brands 7 and 9 (the most popular private labels) gaining the most market share. In contrast, national brands lose market shares, the average loss is -0.57%. The results also show that as manufacturer bargaining power increases private label market shares decrease, whereas national brand market shares increase. As a matter of fact, private label market shares are lowest and national brand market shares are highest when manufacturers price more cooperatively than Bertrand-Nash competition i.e. when ($\theta > 1$).

In terms of wholesale prices, I find that when the industry conduct is identical to perfect competition both private label and national brand wholesale prices decline, as expected. However, the decline is more prominent in private labels. Moreover, as manufacturer power increases, private label wholesale prices increase faster than national brand wholesale prices. For example, the wholesale price of brand 7 (the best-selling private label) increases by 13.72% when ($\theta = 2$), whereas, the wholesale price of brand 5 (the best-selling national brand) increases by 9.83%. Given that, private label market

shares are low when wholesale prices are high and that they are high when wholesale prices are low, these results imply that low private label market shares in emerging markets may be due to dominant manufacturers setting relatively high private label wholesale prices.

Under perfectly competitive market conditions, the decrease in private label retail prices is greater than that of national brands. Private label prices decline by an average of 5.21%, whereas national brand prices decline by an average of 2.78%. Nonetheless, both increase with manufacturer bargaining power. I also find that when ($\theta = 0$), manufacturer margins on both private and national brands decrease and increase when manufactures price above competitive levels ($\theta > 0$). In contrast, retailer margins on both private labels and national brands decline at higher values of θ , albeit the decline is highest in private labels.

In general, my results highlight that high manufacturer power ($\theta > 1$), leads not only to low private label market shares, but also to high private label wholesale prices suggesting that in equilibrium national brand manufacturers set relatively high wholesale prices on private labels. I also find that, retail prices on private labels rise and as such private labels margins are lower. This confirms that even though retailers earn relatively low margins on private labels they still earn relatively high margins from national brands, such that the two margins are in equilibrium. Importantly, this gives retailers no incentives to enter the private label manufacturing market. Consequently, these results imply that low private label market shares in emerging markets may be due to dominant

manufacturers setting relatively high private label wholesale prices in an effort to deter retailers from pursuing private label programs.

Table 7. Simulation Results: Relatively High Bargaining power

	$\theta = 0$					$\theta = 0.5$					$\theta = 1$					$\theta = 2$				
	% Δ Mark et Share	% Δ RET Marg ins	% Δ MFG Marg ins	% Δ WHL Price (w)	% Δ RET Price (p)	% Δ Mark et Share	% Δ RET Marg ins	% Δ MFG Marg ins	% Δ WHL Price (w)	% Δ RET Price (p)	% Δ Mark et Share	% Δ RET Marg ins	% Δ MFG Marg ins	% Δ WHL Price (w)	% Δ RET Price (p)	% Δ Mark et Share	% Δ RET Marg ins	% Δ MFG Marg ins	% Δ WHL Price (w)	% Δ RET Price (p)
Brand 1	-4.27	-0.02	-0.07	-0.03	-0.60	-1.71	-0.04	2.64	1.52	-0.10	-0.03	-0.20	4.78	3.95	-0.20	2.28	-0.49	10.5	16.41	-0.49
Brand 2	-1.18	0.00	-5.63	-0.01	-0.70	-3.63	-0.01	2.85	0.26	1.19	0.13	-0.18	4.84	1.31	-0.18	4.23	-0.61	11.1	12.93	-0.61
Brand 3	-0.16	-0.02	-0.80	-0.02	-0.72	-0.87	-0.05	2.01	1.28	-0.15	0.12	-0.27	3.99	3.70	-0.27	0.48	-0.63	10.2	16.52	-0.63
Brand 4	1.11	-0.03	-0.08	-0.04	-0.71	0.08	-0.08	2.86	2.12	-0.17	0.37	-0.35	4.92	5.43	-0.35	2.88	-0.75	11.4	19.84	-0.75
Brand 5	1.25	0.00	-0.08	-0.04	-0.92	-0.24	-0.01	2.98	2.23	-0.18	0.22	-0.08	5.12	5.47	-0.08	0.86	-0.27	11.8	18.28	-0.27
Brand 6	1.47	-0.03	-0.08	-0.04	-0.78	-1.13	-0.08	2.97	2.07	-0.01	-1.06	-0.34	5.11	5.57	-0.34	1.96	-0.79	11.8	21.59	-0.79
Brand 7	4.42	-0.05	-0.08	-0.07	-0.06	-0.29	-0.14	3.07	3.66	0.00	-3.07	-0.54	5.28	8.83	-0.54	-3.91	-1.06	12.2	31.42	-1.06
Brand 8	1.70	-0.04	-0.07	-0.05	-4.22	-0.72	-0.11	2.59	2.63	-2.71	-2.36	-0.41	4.46	6.45	-0.41	-3.37	-0.75	10.3	20.69	-0.75
Brand 9	5.78	-0.04	-0.08	-0.03	-4.91	-3.95	-0.11	2.99	1.77	0.00	-5.29	-0.24	5.14	4.24	-0.24	-6.95	-0.86	11.9	14.73	-0.86
Brand 10	-0.57	-0.03	-0.08	-0.04	-10.7	-0.51	-0.08	3.05	1.90	-5.06	-0.91	-0.35	5.25	4.85	-0.35	-1.22	-0.77	12.1	19.44	-0.77
Brand 11	3.36	-0.04	-0.08	-0.05	-10.8	-2.29	-0.11	3.07	2.38	-2.16	-3.42	-0.43	5.28	5.73	-0.43	-3.69	-0.99	12.2	20.02	-0.99
Brand 12	-0.14	-0.01	-0.07	-0.03	-5.91	-1.25	-0.03	1.49	1.52	-3.75	0.02	-0.18	4.61	3.65	-0.18	-0.60	-0.49	10.7	18.02	-0.49

Conclusion

This study examines why private label market shares are growing at lower rates in developing economies than developed economies. In particular, I investigate the possibility that low private label market shares may be an artifact of relatively manufacturing sector. Because manufacturers produce both national brands and private labels, there are fundamental economic incentives that prevent retailers from expanding the role of private labels as they do in markets with relatively less-powerful manufacturers. Evidently, the manufacturer-retailer relationship favors manufacturers, allowing them to set relatively high wholesale prices on private labels, which in turn leads to high private label retail prices, and low private label market shares. Importantly, my results generalize beyond the markets and the product category considered here. The findings provide more general insights into manufacturer-retailer relationships. That is we, show that national brand manufacturers with bargaining power can influence not only private label market shares but also retail prices of both national brands and private labels.

The implications for practitioners are also important. Taking into account that, I find that when manufacturer bargaining power is low, private labels market shares and retailer margins are high, if retailers can attenuate manufacturer bargaining power by either producing their own private labels or by partnering with contract manufacturers it may increase private label market shares and subsequently their overall profits. On the other hand manufactures earn higher margins by producing both their own brands and private labels, so are not likely to change the status quo.

The results also highlight that when manufacturer bargaining power is low, overall retail prices are low as well. This finding has clear implications for consumers, in that expansion of private labels can aid households in developing economies to fight food insecurity. Evidence points to the fact that food prices are higher in the least developed countries of the world as compared to the wealthier nations, thus, they can benefit from less expensive food.

As with most research, my research is also subject to limitations despite its contribution to some interesting findings. The primary limitation of my research is that I use data from the South African market only. Although there are overt similarities in the private label markets among South Africa and most emerging economies, examination of data from several other countries will improve the generalizability of my findings, therefore, this is an area that future studies can look at.

CHAPTER 3

RETAILERS' PRIVATE LABEL MARKET SHARE, THE ROLE OF PRIVATE LABEL PORTFOLIO STRATEGIES AND BRAND SIMILARITY.

Abstract

Retailers commonly manage their private labels as part of a portfolio. That is, they own and market more than one brand at a time. In the past, a majority of retailers in emerging markets either carried a single brand or many undifferentiated brands (no distinct quality tiers) in their private label portfolios. This, however, is no longer the case, as now more retailers follow a tiered, value-added scheme. However, the price gap between some of the retailers' private labels in different quality tiers is very small. In fact there are times economy and medium-quality private labels are priced more than high-quality brand alternatives. I examine the effects of this pricing strategy on private label market shares. I find that the price-gap contributes to perceived brand similarity so that when the gap is small customers cannot distinguish between brands in different price-quality tiers. This results in increased intraportfolio competition and subsequently cannibalization between brands. Importantly, I find that high brand similarity negatively impacts private label market shares.

Introduction

In most emerging markets, retailers carry a portfolio of private labels within a product category in order to target different price-quality tiers. For example, leading South African retailers such as Checkers, Spar and Pick n Pay offer portfolios that consist of three private labels, targeting premium quality, standard quality and economical shoppers at three different price-quality points². Cannibalization is a natural outcome of this strategy, which can occur across tiers, particularly when consumers cannot differentiate upper-tier from low-tier brands. In this chapter, I examine whether the price-gap between private labels in different tiers impacts perceived brand similarity, and subsequently, private label market shares.

Offering private label portfolios has become a key strategy for most retailers. For example, In 2010, roughly 75 % of all major food retailers carried quality-differentiated private label portfolios, compared to less than 50% in 2007 (Planet Retail 2012). Evidently, this “good,” “better,” and “best” portfolio strategy has gained popularity among retailers, yet, there is little research offering a rigorous explanation for the existence of private label portfolios. Theoretical and empirical research on private labels mainly emphasizes the role of standard private labels, and provides limited empirical insight into the concurrent roles of premium or economy private labels (Ailawadi and Keller 2004). Among the few studies that do, Geyskens, Gielens, and Gijsbrechts, (2010) show how introducing economy and premium private labels affects not only national brand choices, but also preferences for incumbent private labels. In a related study,

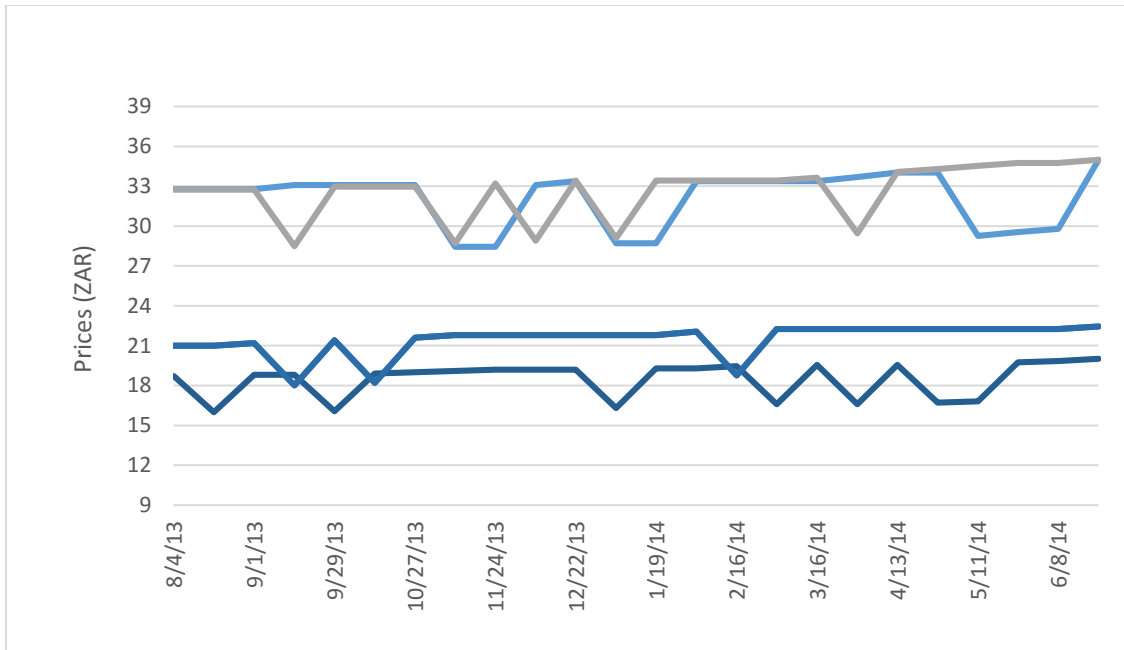
² For example, Pick n Pay, offers “Finest” a premium brand, “PnP” a standard quality brand and “No name” a value brand, across multiple grocery categories.

Braak, Dekimpe, and Geyskens (2014) find that retailers employ multi-tiered portfolios to expand their overall margins. Further, they show that premium private labels offer higher margins than standard and economy private labels, but only when they are manufactured by suppliers who are knowledgeable about national brands. But, neither of these studies consider how retailers' pricing strategies, in particular the price-gap between brands in different quality tiers, impacts cross-brand sales among private labels within a portfolio.

Examining cross-brand effects reveals how intra-category private label strategies can affect retailers' margins and overall private label market shares. Researchers typically assume that consumers can differentiate between brands in different quality-tiers. Rather, the evidence regarding consumers' bounded-rationality in grocery decision-making, particularly given the complexity of filling an entire shopping basket with items, is well understood (Dickson and Sawyer 1990; Jensen et al 2014). In this essay, I consider the possibility that consumers may not be able to differentiate between private labels in different quality-tiers, especially when the price-gap is narrow and, when prices, which are strong signals of quality, frequently overlap among price tiers (see figure 2)³.

³ For example, Pick n Pay, offers "Finest" a premium brand, "PnP" a standard quality brand and "No name" a value brand, across multiple grocery categories. For Spar, SaveMor is the economy private label and Spar is the standard private label (Series 1 and 2). For Pick n Pay, No Name is the economy private label and Pick n Pay is the standard private label (Series 3 and 4).

Figure 2. Average Brand Portfolio Prices– 46 week



A narrow price-gap among brands in a portfolio may be deliberate or unintended. For example, intense price competition within a product category may result in an unintended narrow price-gap between upper-tier and low-tier private labels. Usually, in order to attract “no frills” consumers, low-tier private labels are priced closer to marginal cost, whereas upper-tier private labels have higher margins. However, when price competition is intense, to compete effectively retailers are likely to promote upper-tier private labels, which results in a narrow price-gap between the brands. Although each retailer would rather not maintain such a narrow price gap, it is well understood that oligopoly retailers fail to internalize pricing externalities that affect the demand for their rivals’ products (Richards and Hamilton 2016). As a result, competitive interactions on the inter-retailer margin force private label price gaps to be lower than they would if retailers priced as monopolists.

In emerging markets, a narrow price-gap among brands may also occur because of manufacturer power. In most emerging economies private labels are procured from national brand manufacturers (Song 2011; Beneke 2009; Van Wyk 2013) suggesting that manufacturers can influence the retail price of private labels (Pasirayi 2016). This limits the retailer's degree of flexibility in that they can only compete with national brands on attributes, and not undercut prices. Consequently, private label portfolios are forced, into a narrow price-band closer to national brand prices.

Manufacturer bargaining power may also explain why the price-gap between retailers' private label tiers is relatively larger in developed economies as compared to emerging markets retailers. In developed economies, retailers set the prices for the private labels generally in excess of purely competitive levels, suggesting they have bargaining power vis-à-vis manufacturers (Morton and Zettelmeyer 2004; Meza and Sudhir 2010). Retailer bargaining power implies that they have more control over the positioning of their store brands, and, importantly, are able to offer a wider price range for their private labels.

On the other hand, retailers may deliberately offer low-tier private labels at prices that are closer to the upper-tier brands so as to maximize profits. Prior research finds that the price knowledge among consumers is imperfect. In fact, a majority of consumers form impressions of prices rather than actually attending to exact prices (Oxenfeldt 1966; Kalyanaram and Little 1994). For example, Dickson and Sawyer (1990) and Jensen et al (2014) find that, in a grocery retail setting, consumers tend to spend a relatively small amount of time making their selection, and a substantial number do not thoroughly check prices of their items or alternative brands. Moreover, consumers use "reference prices,"

or prices that they think the retail prices should be, and compare those to observed prices to (Winer 1986; Gupta and Cooper 1992; Kalwani and Yim 1992; Kalyanaram and Little 1994; Han, Gupta, and Lehmann 2001; Terui and Dahana 2006). Reference prices typically reflect a range of recalled price experiences to set lower and upper bounds of price expectations. Thus, the attractiveness of an observed price is a function of its location in the range, and consumers will buy the product if the price falls within the range of their reference price. Reference-price behavior suggests that consumers rarely pay close attention to the actual price of a product, making them highly susceptible to retailer pricing strategies.

Regardless of source, I argue that a narrow price-gap between private labels in different tiers results in high perceived brand similarity, which in turn leads to cannibalization, and low private label market shares. The Principle of Maximum Differentiation (d'Aspremont et al 1979) can explain why private label market shares decrease with brand similarity. The more usual Principle of Minimum Differentiation (Hotelling 1929) implies that two differentiated products offered to a group of consumers with homogeneous tastes will be only slightly differentiated in order to divide the market in half. In contrast, d'Aspremont et al (1979) show that the Hotelling equilibrium is, in fact, unstable, and that an equilibrium in which sellers maximally differentiate is more likely. As a result, the Principle of Maximum Differentiation states that an equilibrium in differentiated product markets occurs when the products are highly differentiated i.e. when the products are located further away from each other (Irmén and Thisse 1998; Rajan and Sinha 2009). Importantly, in a maximum differentiation equilibrium, differentiated products located further from others in attribute space can have a positive

effect on market shares as they appeal to consumers' demands for variety (Ansari, Economides and Ghosh 1994; Anderson, Fornell and Lehmann 1994). Moreover, optimal assortment models find that market shares are positive when products are located far from each other in attribute space, with no substitution between products in the assortment (Gaur and Honhon 2006; Misra 2008). Therefore, when private labels within the portfolio are not maximally differentiated it may negatively impact market shares.

I investigate the impact of brand similarity on private label market shares using breakfast cereal sales data from a major South African retail market. I analyze the data using a distance-metric nested logit demand system (Pinkse, Slade, and Brett 2002; Slade 2004; Pofahl and Richards 2009) that allows brand similarity to shift demand, and thereby change private label shares relative to other, national, brands. In the model I test whether a narrow price-gap between brands in different tiers impacts brand similarity and how this impacts private label brand market shares. Thereafter, I conduct counterfactual simulations to determine how the level of brand similarity impacts private label market shares.

My results provide a unique perspective on the effects of brand similarity on intra-brand portfolio competition, cannibalization and private label market shares. Most importantly, I find that, within a private label brand portfolio, consumers have a preference for brands that are dissimilar as market shares fall the closer one brand is to another. This result is consistent with the Principle of Maximum Differentiation. This maximum differentiation outcome explains why I observe a reduction in market shares when upper-tier and low-tier private labels are similar to each other. I also find that a narrow price-gap leads to high intra-portfolio competition, and cannibalization between

upper-tier and low-tier private labels. Taken together, these results suggest that retailers' private label portfolio strategies may, in part, explain the relatively low private label market shares in emerging economies.

The remainder of this chapter is organized as follows: In the next section I develop the research framework. Here, I describe private label portfolios and specify how the price-gap through brand similarity impacts private label market shares. In the third section, I develop an econometric model of retail breakfast cereal demand. I explain how the model is estimated in the fourth section. In the fifth section, I describe the South African breakfast cereal market, and provide some descriptive statistics that highlight key price and market share trends. In a sixth section, I present the econometric results, and test the core hypotheses of brand similarity and cannibalization. The final section consists of a discussion of the results, some conclusions, and key managerial implications.

Private Label Portfolios

Many retailers have a portfolio of private labels. The purpose of a portfolio is, in part, to capture demand from multiple consumer segments as it permits a retailer to price discriminate (Ailawadi and Keller, 2004). Generally, consumers are heterogeneous in their willingness to pay for added quality (Moorthy 1984). Therefore, carrying a multi-tiered portfolio of brands with different price-quality strata from which consumers choose their desired products may generate greater profit than a single-tier strategy. Moreover, retailers benefit from private label portfolios in a number of other ways.

Private label portfolios allow retailers to achieve economies of scale and scope, which lowers their overall cost of production (Quelch and Kenny 1994; Alden, Steenkamp, and Batra 2003). The combined costs of producing multiple brands is often less than the cost of producing each brand separately (e.g., Grant and Jammie 1988). In addition, from a portfolio-theory perspective, private label portfolios permit retailers to diversify risks of brand failure, as carrying a number of brands assures them of revenue in case of one of their brands fails (Martos-Partal and Gonzalez-Benito 2011). Last, private label portfolios allow retailers to streamline their marketing efforts as they can market their brands simultaneously which enhances their effectiveness and efficiency (Palmeira and Thomas 2011).

Carrying a portfolio of differentiated private labels may also present challenges to retailers. For example, it is costly to manage product variety. Large portfolios increase the complexity of managing inventory as well. In particular, demand forecasting becomes increasingly difficult, so inventory decisions involve greater uncertainty, and more attention to inter-brand relationships is necessary (Alfaro and Corbett 2003; Fisher and Ittner 1999; Wan, Evers and Dresner 2011). Further, manufacturing and distribution costs increase and, as a result, multiple tiers of private labels can compromise operational performance, and ultimately undermine sales (Alfaro and Corbett 2003; Ton and Raman 2010). Importantly, private label portfolios lead to intraportfolio competition among the brands, which can result in cannibalization. Importantly, retailers pay more attention to cannibalization among private labels over national brands mainly because it may result in lower profits particular if the low-tier private labels cannibalize low-tier private labels.

On the other hand retailers may not be concerned about cannibalization among national brands within their store as it does not affect their profitability.

As evidence of the complexity of managing a multi-tier private-label portfolio, witness the strategies used by major US grocery retailers. Seeking to enhance its profitability, Walmart in 2013 reduced its private label portfolio to one from two brands, by dropping its low tier private label “Price First” and retaining its standard private label “Great Value” in various grocery categories (Springer 2013). However, during the same period, Kroger grew its private label portfolio to three tiers⁴. Similarly, Safeway and Target increased the number of private labels in their portfolios to two and three tiers respectively (Planet Retail 2012)⁵. Clearly, there is no commonly-agreed private label portfolio strategy among retailers in practice.

Within-portfolio cannibalization can be reduced through the adoption of price-quality tiers (Hilleke and Butscher 1997). Within these tiers, prices are important as they support market segmentation in that premium quality brands usually cost more than standard and economy brands. Therefore, a narrow price-gap between the tiers may result in highly similar indistinguishable price-quality tiers and brands.

Brand Similarity

Brand similarity is the perception held by consumers that the differences in the number of shared salient attributes between brands alternatives are minimal (Aaker and Keller 1990; Howard, Kerin and Gengler 2000). Brand similarity may impact brand preferences within

⁴ Kroger, offers “Private Selection” a premium brand, “Kroger Banner” a standard quality brand and “Kroger Value” a value brand, across multiple grocery categories.

⁵ Safeway, offers “Safeway Select” a standard quality brand and “Pantry Essential” a value brand, across multiple grocery categories. Target, offers “Archer farms” a premium quality brand and “Market Pantry” a value brand, across multiple grocery categories.

a retailer's private label portfolio as differentiation is key to attracting, and retaining, consumers with heterogeneous preferences for product attributes.

The foundations of brand similarity lie in Tversky's (1977) contrast model which describes similarity as a function of the number of salient shared attributes less the number of salient distinctive attributes between two or more brands. For example, the similarity $S(a_1, a_2)$ between two brands a_1 and a_2 is a function of their common attributes ($A_1 \cap A_2$) less the distinct attributes of a_1 , ($a_1 - a_2$) and the distinct attributes of a_2 , ($a_2 - a_1$). Formally, $S(a_1, a_2) = \phi f(A_1 \cap A_2) - \alpha f(A_1 - A_2) - \theta f(A_2 - A_1)$ where ϕ, α and $\theta \geq 0$. The parameters ϕ, α and θ represent the weights of the attributes in the similarity judgment and the f function represents the salience of the attributes and their contribution to similarity (Boush 1997). In this model, similarity is a linear combination of attributes that two brands share and attributes that are distinct. As such, brands that have shared attributes are considered similar, whereas brands that have attributes that are very different are perceived as relatively dissimilar (Keller and Sood 2003).

Brand similarity judgments within in a multi-tiered portfolio are also based on the price-gap between the brands. Prices are important as they support market segmentation within a brand portfolio. Specifically, prices define tiers in a way that is clear and understandable to consumers, with each tier strictly targeting its assigned price-quality segment. However, when the price-gap between the tiers is relatively small, it may result in consumers not being able to distinguish between the brands in the different quality tiers. Moreover, consumers often use price as an informational input to formulate product quality perceptions (Zeithaml, 1988; Lemon and Nowlis 2002; Völckner and Hofmann

2007). Hence, a small price differential may lead them to perceive that there is little difference in quality among the brands. Consequently, a narrow a price-gap between upper-tier and low-tier brands within a retailers' private label portfolio results in higher brand similarity. Ultimately, high brand similarity may negate the effectiveness of multi-tiered private label portfolios in that it limits variety within the portfolio as there is minimal differentiation between the brands, which may, in turn, lead to lower market shares.

Using the framework described in the next section, I test whether the price-gap between private labels in different quality tiers results in increased brand similarity and if this impacts brands private label market shares. I also investigate whether high brand similarity results in cannibalization between upper-tier and low-tier private labels within a retailer's portfolio.

Model Specification

Measuring the extent of cannibalization is a complex topic, with no definitive approach generally accepted in the empirical literature. Analytical models tend to find that cross-price elasticities derived from demand-system models are a more definitive measure of cannibalization effects than market share measures (Lomax et al 1996; Yuan et al 2009). Essentially, large (more positive) cross-price elasticities suggest the presence of cannibalization as this means that a price increase for one brand has a relatively large effect on volume sales of a substitute brand. However, the type of demand system potentially can have an important effect on estimated elasticities.

In this study, I model consumers' brand-level demand as a function of inherent consumer preferences for each brand, prices, and product characteristics using a nested

logit model (Berry 1994; Cardell 1997). I use a nested logit, because preferences are assumed to be hierarchical in nature: Consumers choose a quality-tier first, and brand variants within the tier second. Importantly, the nested logit demand model combines multiple brands, multiple tiers, and differing levels of similarity in a relatively parsimonious way. Specifically, higher similarity between brands within a quality-tier lead to a higher own-price effect, and higher within-tier cross price effects (Hui 2004; Aribarg and Arora 2008). In addition, dividing brand variants by quality-tier represents a natural choice because consumers are more likely to substitute among brand variants within quality tiers than across tiers. Consumers are prone to substitute between variants to satisfy their need for variety instead of trying different brands within a product category (Feng and Bassok 2008).

I extend the traditional nested demand model to allow for perceived brand similarity in a distance metric (DM) framework (Pinkse, Slade, and Brett 2002; Slade 2004). DM demand models frame consumer preferences in explicitly spatial terms. That is, each product in the consideration set is located a certain distance in attribute space from each other product. DM models represent a natural way to test the importance of differentiation, because distance is explicit, and not implicit as in traditional logit-based models of demand (Berry, Levinsohn, and Pakes 2005). My measure of brand similarity represents a second-order effect that not only accounts for brand attributes but also the price differential between the tiers. I begin my analysis by modeling consumer demand in the next section. I also consider counterfactuals that examine the effects of high and low brand similarity on private label market shares.

Consumer Demand

I assume consumers employ a hierarchical decision process. Specifically, they make a discrete choice of a quality-tier r ($r = 1, \dots, R.$) from among those represented by my sample of retail data, or else an alternative quality-tier which I define to be the outside option. Second, they decide on which of the J brand-variants to purchase. Therefore, the utility consumer i derives from consuming brand-variant j in quality-tier r during period t is given by:

$$u_{irjt} = \delta_{rjt} + \zeta_{irt} + (1 - \sigma)\varepsilon_{ijrt} \quad (1)$$

where:

$$\delta_{rjt} = \eta_{rt} + \beta_k x_{jkt} + \alpha_1 p_{rjt} + \alpha_2 d_{rjt} + \alpha_3 d_{rjt} p_{rjt} + \xi_{rjt} \quad (2)$$

From equation (1) ζ_{iv} represents the common taste for brand-variants from tier r and has a distribution that depends on σ , $0 \leq \sigma \leq 1$ such that $\zeta_{irt} + (1 - \sigma)\varepsilon_{ijrt}$ has an extreme value distribution if the household specific error term ε_{ijrt} is itself extreme-value distributed (Cardell 1997). The parameter σ measures the degree of heterogeneity among the groups, in this case the quality tiers. When $\sigma = 1$, the correlation among tiers goes to 1 and the tiers are regarded as perfect substitutes. On the other hand as σ goes towards 0, the correlation among the tiers trends towards zero such that when $\sigma = 0$, the model reduces to the ordinary logit model where all the variants belong to the same group and the elasticities of substitution are perfectly symmetric. Therefore, the magnitude of σ indicates the extent to which consumers view brand variants in a given quality tier to be similar. The mean utility of the no purchase option is normalized to 0 and the corresponding utility is $U_{i00t} = \zeta_{i00t}$.

Equation (2) is the level of mean utility for each choice of variant j and tier r . The parameter η_{rt} captures consumer preference for tier r in time period t , x_{jkt} represents observable product characteristics k making up variant j at time period t , p_{rjt} is the price of brand-variant j at time period t , f_{rjt} is a dummy variable that takes the value of 1 if variant j is on promotion at time period t , $f_{rjt}p_{rjt}$ is an interaction between the price and the promotion indicator f_{rjt} , represents the temporal utility shock that is observed by the consumer but not the researcher and is common to all consumers in the market.

I extend the usual nested logit model by accounting explicitly for brand similarity using the distance metric approach. To implement the DM approach, I define a distance matrix W in which each element represents the inverse distance (proximity) between the brand variants in attribute space and price (Anselin 1988). More specifically, the distance matrix, W has typical element w_{rjl} between brand variants j in tier r such that:

$$w_{rjl} = [(p_a - p_b)^2 + 1 + I_j(a, b)] \left[1 + 2 \sqrt{\sum_j (n_{a,k} - n_{b,k})^2} \right]^{-1} \quad (3)$$

where P_a and P_b denote the prices of brands a and b respectively, $I_j(a, b)$ is an indicator function which takes the value of 1 when both brands are in different tier and 0 if otherwise, n represents the attribute profile of two items i and j . For example, in the breakfast cereal category, n consists of cereal attributes such sugar content, calories per serving and carbohydrates content. Equation (3) therefore, measures of how close (i.e. how similar) the brand variants are. I then define a $J \times J$ spatial weight matrix W that includes all of the w_{rjl} as elements. The spatial weight matrix measures the similarity between each pair of brand variants in my sample. Importantly, I row-standardize the

spatial weight matrix such that row-sum to unity i.e. $\sum_r j = 1$, I set the main diagonal to normalized to 0, since it measures the distance of each product to itself. Thus, equation (3) measures how each consumer forms a perception of the extent to which a brand is distinct from others based on its distance in attribute space and price.

I use the \mathbf{W} matrix to capture the effect of brand similarity on utility into equation (2) such that the mean utility consumer i derives from consuming brand-variant j in quality-tier r during period t is now given by:

$$\delta_{rjt} = \eta_{rt} + \beta_k \mathbf{x}_{jkt} + \alpha_1 \mathbf{p}_{rjt} + \alpha_2 \mathbf{d}_{rjt} + \alpha_3 \mathbf{d}_{rjt} \mathbf{p}_{rjt} + \gamma \mathbf{W}_{rjt} \mathbf{PL}_{rt} + \xi_{rjt} \quad (4)$$

where \mathbf{PL} is a $J \times 1$ vector of private label indicators which takes the value of 1 when the brand variant is a private label and 0 if otherwise. Spatial models provide an element of intuition that is missing from non-spatial models, based on the explicit treatment of spatial differentiation (Slade 2004). In equation (4), \mathbf{W}_{rjt} is central to my hypotheses in that γ is the main parameter of interest. The sign of γ is interpreted as measuring how brand similarity affects market shares. In the terminology of spatial econometrics, γ is the spatial auto-regressive (SAR) parameter (Anselin 2002), as it measures how distances between brands affect preferences. Because the elements of \mathbf{W} are defined as inverse distance, for easier interpretation, larger values of w_{ijl} indicate that two brands are closer together. Therefore, if γ is positive, then carrying similar brands results in increased market share, and if γ is negative it implies that carrying similar brands reduces market share. In terms of the Principle of Maximum Differentiation, a negative γ suggests that highly differentiated portfolio is optimal as brands that are highly differentiated result in

increased market shares and those that are similar have a negative impact on market shares.

However, the model still exhibits the (IIA) property within each group (tier). This implies an impractical pattern of substitution. Thus, to avoid this problem I allow the marginal utility of income α_i , the product-specific preference term δ_{rjt} and the brand similarity measure W_{rjt} to vary randomly (Berry, Levinsohn and Pakes 1995; Nevo 2001; McFadden and Train 2000). Formally, the marginal utility of income is normally distributed over consumers such that:

$$\alpha_i = \alpha_0 + \sigma_\alpha v_i, \quad v_i \sim N(0,1) \quad (5)$$

where v_i is the consumer-specific variation α in response with parameter α_0 . In similar vein, product-specific preferences also depend on individual attributes, I specify it as:

$$\delta_{irj} = \delta_{0rj} + \sigma_\delta \mu_i \quad \mu_i \sim N(0,1) \quad (6)$$

where δ_{0ij} is the mean preference for brand j in quality-tier r and μ_i is the random consumer specific effect on variant and quality-tier preferences. Last, I allow the marginal utility parameters (spatial autoregressive parameter) for the brand similarity effect to be random such that:

$$\gamma_{rjt} = \gamma_{10} + \sigma_{1\gamma} z_i, \quad z_i \sim N(0,1) \quad (7)$$

where γ_{10} represents mean preference for brand similarity, and z_i is the random component for consumer i .

I follow Nevo (2001), and Richards and Hamilton (2015) and write the indirect utility function in the general case in terms of two sets of variables (random and non-random) as follows:

$$u_{irjt} = \delta_{rjt}(p_{rjt}, x_{jt}z_l, \zeta_{jrt}; \gamma, \alpha, \beta, \sigma) + \varphi_{ijt}(p_{rjt}, x_{jt}, v_h, \mu_h, z_h, \sigma_\alpha, \sigma_\gamma, \sigma_z) + \varepsilon_{ijrt} \quad (8)$$

where δ_{rjt} represents the mean level of utility that varies over brand-variants, but not consumers, φ_{ijt} is the idiosyncratic part that varies by consumer and product. Define the densities of μ_i , v_i and z_i as $f(\mu)$, $g(v)$ and $h(z)$, respectively, so that the market share of variants j , obtained by integrating over the distributions reflecting consumer heterogeneity, becomes:

$$s_{ijt} = \int \int \frac{\exp(\delta_{rjt} + \varphi_{ijt}) / (1 - \sigma)}{D_i^\sigma (\sum_j D_i^{1-\sigma})} f(\mu) g(v) h(z) d\mu dv dz, \quad (9)$$

where $D_i = \sum_{i \in I} \exp(\delta_{rjt} + \varphi_{ijt}) / (1 - \sigma)$. Taking into account that there is no closed form-expression for market share as in the simple logit case (Berry 1994). I estimate equation (8) with simulated maximum likelihood (SML) (Train 2003) using the control function approach (Petrin and Train 2010).

Counterfactual Simulations

To further determine the effects of brand similarity on private label market shares, I conduct counterfactual simulations to calculate changes in private label market shares and elasticities under a variety of alternative assumptions.

The simulations are intended to determine whether higher levels of brand similarity result in lower private label market shares. More specifically, I vary the spatial-auto regressive parameter introduced in the demand model, and calculate the resulting impact on private label market shares and elasticities. The first scenario assumes a market where there is low brand similarity. Here, I restrict γ to a range between -5 and -1. I also conduct a simulation in which I assume high brand similarity by restricting γ to a range

between 1 and 5. I describe the data used to test this model, and my estimation procedures, in the next section.

Data

Unlike in developed economies, breakfast cereal sales in South Africa have continued to grow steadily in recent years. In 2014, annual sales rose to \$3.2 billion, up 15% from 2010 (Euromonitor 2014). This continuous growth has been spurred, in part, by the growth of middle income consumers, who are looking for non-traditional South African breakfast options.

The retail breakfast cereal market in South Africa is highly concentrated. The four-firm concentration ratio is approximately 89% and the market is controlled by five major players, Pick n Pay, Woolworths, Shoprite, Spar, and Walmart's subsidiary, Cambridge Foods. Although the market is dominated by national brands⁶, each of the retailers except Cambridge Foods sells a private label. In fact, Pick n Pay, and Spar each carry a multi-tiered portfolio of private labels to target different market segments. Pick n Pay offers "Pnp" a standard quality brand and "No name" an economy brand. Likewise, Spar, carries, "Spar" a standard quality brand and "SaveMor" an economy brand. I focus the analysis on these brands.

My data consists of a household-panel scanner data set (Homescan), collected by Nielsen. The data tracks South African households between August 2013 and June 2014, and is broadly representative of household consumption in South Africa. Households in the panel keep shopping diaries in which they record their biweekly purchases of all

⁶ Kellogg's is the most popular brand, commanding a market share of 21.8%. Bokomo and Weet-Bix are second and third, respectively, with market shares of 19.4% and 17.8% and private label market shares average 3.1%

grocery items. Essentially, the data describes the main characteristics of their purchases, which include quantity, price and date of purchase.

To test my hypotheses, I use purchases from 15 brand-variants⁷. These brands account for about 78.7% of the sales in the sample. I draw my variants from both national brands and private labels. Importantly, each variant belongs to a quality tier r ($r = 1, \dots, R$). To determine which tier each brand belongs to I refer to its classification on the retailers or manufacturer website (for national brands). I also verify the tier of each brand by consulting an industry expert⁸. For the private labels, I use purchases of brand variants from Pick n Pay brands, (PnP and Noname) and Spar brands (Spar brand and SaveMor). Purchases of these four brands account for about 55.8% of the private label sales and 4.8% of total sales for the five retailers in the sample. On average, the Pick n Pay brands, PnP (market share 1.2%), and No name (market share, 0.8%) outperform their same tier competitors offered by Spar, Spar (market share, 0.9%), and Savemor (market share, 0.6%) respectively (see table 8).

Average prices across the brands appear to highlight the tier-compression dynamic described in the introduction as the price-gap is very narrow. For example, for the upper-tier brands, PnP and Spar, the mean prices are R26.93 and R21.22 respectively. Whereas, for the low-tier brands, Noname and Savmor the mean prices are R22.89 and R19.78⁹. Moreover, the prices frequently overlap during the observed time period with

⁷ A brand variant is a different offering of a brand for example, Bokomo is the brand and Bokomo bran flakes and Bokomo Corn flakes are brand-variants.

⁸ Consultation was via email with Craig KoIb from Acentric Marketing Research in Johannesburg South Africa.

⁹ In comparison the price-gap in the US between upper tier and low-tier private labels is large. For example the price-gap between, Kroger's cereal brands "Kroger Brand" (R47.29) and "P\$\$T..., Check This Out" (R30.42) is relatively large.

several periods where the upper-tier private label cost less than the lower tier private labels (see figure 2).

Table 8, Brand Market Shares and Mean Prices (%)

Brand	Market Share (%)	Av. Price (ZAR)
Bokomo	19.45	26.47
Kellogg's	21.87	29.75
Noname	0.78	22.89
PnP	1.26	26.93
Spar	0.93	21.22
Savmor	0.65	19.78
Weetbix	17.88	24.48
Jungle	15.62	20.25

I aggregate all purchases in each two week period, and calculate the market share for each brand. Market share is defined as the sum of the purchases of each brand during a two week period divided by the total market size of the respective period. Market size, in turn, is calculated by assuming each household consumes 125g of breakfast cereal weekly, which implies a biweekly average of 250g (Analytixbi 2014). I calculate the total size of the market by multiplying the biweekly average consumption with the total population of the market. I define the share of the outside good as the difference between the total size of the market and the shares of the inside goods (Berry, Levinsohn, and Pakes 1995). Therefore, the outside good includes breakfast cereal alternatives as well as breakfast cereal sold by retailers not included in the analysis.

In retail data, prices are assumed to be endogenous. That is, prices are likely to be correlated with unobservables, such as shelf-space positioning, or in-store promotions, that also affect market shares. Therefore, an instrumental-variables (IV) estimating method is necessary. To that end, I obtained data on input prices to serve as instruments

(Villas-Boas 2007; and many others). I use electricity prices to measure energy-input costs, which I obtain from Electricity Supply Commission of South Africa (Eskom Tariffs and Charges 2014). I also use corn and wheat prices as inputs. Corn is one of the most used ingredient in producing breakfast cereal (Euromonitor 2010). However, a number of the brands in my analysis also have wheat as a major ingredient. I obtain the data on wheat prices and corn prices from the South African Grain Information Service (SAGIS). Marginal cost also includes fuel prices from South Africa (Stats SA) as petrol is a key components of distribution costs. Manufacturing wage data are from the South African Department of Labor. Importantly, the input prices vary over time, and the input contents also vary by brand, so the interaction between input prices and brands provides enough variation to identify the demand parameters. Further, because the demand model includes variant fixed effects, my instruments will not be correlated with the observed error terms for each demand equation.

Table 9, Summary Statistics for the Input Variables.

Variable	Units	Mean	SD	Min	Max
Petrol	R/Liter	13.554	0.485	12.843	14.163
Diesel	R/Liter	12.895	0.331	12.484	13.432
Wheat	R/Ton	3701.254	240.069	3301.147	41903.014
Flour	R/Kg	9.324	0.715	8.6233	10.622
Electricity	R/Kwh	0.505	0.049	0.4132	0.592
Labor	R/Month	2960.971	74.205	2359.410	3480.821
Corn	R/Ton	2285.921	71.631	1790.041	2976.942

Estimation

There are a number of issues to address when estimating the demand model (9). First, as briefly discussed above, some potentially-important product characteristics (e.g. advertising and shelf placement) may have been omitted in the specification of utility, but are likely correlated with the price paid by consumers. The resulting endogeneity leads to bias if not addressed (Villas-Boas and Winer 1999). Although there are many possible estimation methods within the class of IV estimators, I account for endogeneity by estimating the demand model using the control function approach (Petrin and Train 2010). The control function approach addresses price endogeneity through a two-stage estimation method. In the first stage, I estimate an IV regression in which I regress the endogenous prices on a set of instruments. In the second stage, the demand model is estimated using simulated maximum likelihood (SML, Train 2003) with the residuals from the first stage as independent variables. Including the first-stage residuals as the control function essentially purges the residuals of any correlation with the endogenous prices.

Following Draganska and Jain (2005) and Bonnet and Dubois (2010) I use the input prices described above as instruments. Specifically, I use prices of wheat, fuel, corn, labor and electricity. These inputs are appropriate instruments because they are likely to be correlated with retail prices, but likely uncorrelated with unobservables in the demand equation. Further, I interact the input prices with product dummies, which allows each input to enter the production function of each product differently (Villas Boas 2006). This is a reasonable assumption as breakfast cereals use inputs in different

proportion, depending upon the type of cereal, the type of production process used, and the amount of transportation involved in moving it to market.

I then test the validity of the instruments using a variety of different approaches. First, I test for the relevance of the instrumental variables by regressing retail prices on the set of instruments (Staiger and Stock 1997) in a first-stage regression. I reject the hypothesis that the instrumental variables are not relevant as the first-stage F-statistic is relatively high: 38.05, which is easily above the threshold of 10.0 defined by Staiger and Stock (1997). I also examine the partial R^2 statistic in the first stage regression. The partial R^2 is the squared partial correlation between the excluded instruments and the endogenous regressor (Baum, Stillman, and Schaffer 2003). I use the Shea Partial R^2 statistic to test for instrument relevance. An R^2 of 0.49 also suggests that the instruments are relevant. Third, I also use the Cragg-Donald F-statistic (Stock and Yogo 2002) to test for weak instruments. By this criterion, an F-statistic of (20.786, $p < 0.05$) indicates that the instruments are valid. Finally, I also test the exogeneity of the instrumental variables following Hansen (1982). The J-statistic of 755.215 ($p < 0.285$) implies that the IV's are indeed exogenous. Therefore, based on the results from these tests, I conclude that the estimates are likely to be valid, so I proceed in the next section to interpret the results from this model.

Results and Discussion

In this section, I present the results obtained from estimating the random parameter nested logit in equation (9) 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. Last, I present findings derived from the counterfactual

simulations, and how these inform the hypothesis regarding the relationship between brand similarity and private label market shares.

Tables 10 represents results for two different models: Model 1 is a simple nested logit demand model (limited model), and Model 2 is a more comprehensive nested logit demand model that takes into account similarity between upper tier and lower tier private labels. I begin my analysis by comparing the two models. Given that the limited model is nested in comprehensive model I conduct a likelihood ratio (LR) test to compare the models. Based on the LR test statistic, the estimated Chi-square value is (23.44 $p < 0.05$). This result shows that adding the brand similarity measure as an independent variable results in a statistically significant improvement in model fit. Furthermore, the limited model understates the promotion effect and the degree of substitutability among the tiers – both results are important from a managerial perspective. Therefore, I reject the limited model in favor of the comprehensive model.

As a first step in interpreting the demand model results, I evaluate whether the form of the nested logit model used here (i.e. tier choice, then brand-variant) is an appropriate representation of breakfast cereal demand. My results reveal that the estimated nested logit scale parameter is $\sigma_1 = 0.723, p < 0.001$, which is significantly different from zero, and indicates that consumer utility is highly correlated within tiers. This estimate also suggests that utility is nearly uncorrected across the tiers, implying that the nested logit model is appropriate for the task at hand.

Next, I assess whether the random parameter specification is preferred to a constant parameter alternative specification by examining whether the standard deviation of the price and intercept terms used to describe unobserved heterogeneity are statistically

significant. The standard deviations of price ($t = 4.771$) and income ($t = 3.851$) are greater than the relevant critical value ($t = 1.96$), so I reject the null hypothesis that the coefficient standard-deviations are equal to zero. Moreover, the significance of these parameters in the random parameter model supports this specification over a constant parameter alternative. Further, I perform a likelihood ratio (LR) test in which the constant parameter model is the restricted version and is compared to the random parameter model which is the unrestricted version. The LR statistic for the test is 33.46 while the critical Chi-square value with 5 degrees of freedom at the 5% level of significance is 11.074. Therefore, I reject the fixed parameter model in favor of the random-parameter alternative. I conclude that the random parameter model is preferred to the constant parameter version, so I use this version to interpret the demand results.

Table 10a. Random Coefficient Nested Logit Demand: Breakfast Cereals – Limited Model

	Non-Random Parameters		Random Parameters	
	Estimate	t-ratio	Estimate	t-ratio
Price	-2.035*	-4.377	-	-
σ_1	0.714*	9.606	0.715*	9.152
Discount	0.671*	3.739	0.672*	3.778
Discount \times Price	-1.066*	-4.002	-1.068*	-4.12
Brand Similarity	-	-	-	-
Variant 1	0.612*	2.026	0.611*	1.381
Variant 2	-0.283	-0.933	-0.279	-0.539
Variant 4	0.520*	1.758	0.524*	1.925
Variant 5	0.243*	0.819	0.245	0.574
Variant 6	0.392	1.335	0.393	0.574
Variant 7	-0.769*	-2.789	-0.767*	-2.936
Variant 8	-1.263*	-4.163	-1.261*	-4.381
Variant 9	-0.591*	-2.08	-0.590*	-2.159
Variant 10	0.119	0.397	0.12	0.422
Variant 11	1.541	5.667	1.544*	6.125
Variant 12	0.619	1.769	0.623*	1.859
Variant 13	-0.071	-0.251	-0.068	-0.253
Variant 14	-0.583*	-2.218	-0.582*	-2.345
Variant 15	-0.713*	-2.205	-0.713*	-2.42
Constant	-15.363*	-17.309	-	-
CF	0.184	0.378	0.192	0.414
Means for Random Parameters	-	-	-	-
Constant	-	-	-15.370*	-19.322
Price	-	-	-2.040*	-4.496
Brand Similarity	-	-	-	-
	Std Dev for Random Parameters			
Constant			0.130*	6.69
Price			0.006*	0.192
Brand Similarity			-	-
LLF			-2627.823	
Chi Square			25.48	

* $p < 0.05$

Table 10b. Random Coefficient Nested Logit Demand: Breakfast Cereals – Brand Similarity Model

	Non-Random Parameters		Random Parameters	
	Estimate	t-ratio	Estimate	t-ratio
Price	-2.165*	-4.663		
σ_1	0.721*	9.726	0.723*	9.427
Discount	0.681*	3.525	0.686*	3.53
Discount \times Price	-1.013*	-3.813	-1.006*	-3.887
Brand Similarity	-0.467*	-3.917	-	-
Variant 1	0.569	1.888	0.571*	1.264
Variant 2	-0.265	-0.876	-0.259	-0.533
Variant 4	0.506	1.717	0.510*	1.881
Variant 5	0.226	0.766	0.228	0.554
Variant 6	0.394	1.346	0.396	0.608
Variant 7	-0.792*	-2.883	-0.788*	-3.048
Variant 8	-1.270*	-4.204	-1.269*	-4.451
Variant 9	-0.625*	-2.206	-0.624*	-2.299
Variant 10	0.138	0.462	0.141	0.495
Variant 11	1.496*	5.516	1.499*	5.978
Variant 12	0.622*	1.784	0.630*	1.877
Variant 13	-0.113	-0.404	-0.111	-0.419
Variant 14	-0.584*	-2.231	-0.588*	-2.366
Variant 15	-0.739*	-2.291	-0.734*	-2.474
Constant	-14.760*	-16.445	-	-
CF	0.245	0.503	0.247	0.533
	Means for Random Parameters			
Constant	-	-	-14.749*	-18.8
Price	-	-	-2.170*	-4.771
Brand Similarity	-	-	-0.472*	-3.851
	Std Dev for Random Parameters			
Constant			0.165*	7.898
Price			0.044*	1.396
Brand Similarity			0.163*	1.806
LLF			-2616.124	
Chi Square			33.467	

* $p < 0.05$

The demand estimates shown in table 10 reveal that promotions have a significant effect on demand. Moreover, discounting breakfast cereal results in an outward shift and negative (counterclockwise) rotation of demand suggesting that demand becomes more elastic when a breakfast cereal is on promotion. This result indicates that customers may anticipate retailers' promotional activities and adjust their purchasing behavior accordingly. In all, this suggests that breakfast cereals in the South African market are slightly responsive to price promotions. I also find that national brand variants are preferred to private label variants. As a matter of fact, among all the variants, variants from Kellogg's (variant 11 and variant 12) have the highest mean utility. In addition, I also find that there is a high correlation between mean utility and market share in the sample. For example, based on the data in table 9 variants from Kellogg's are some of the most expensive brands but they also have the highest market share.

The focus of this essay, however, is on the nature of the tier structure among brands, and how similarity affects market shares across tiers. The demand results in table 10 show that on average, private label variants from PnP and Noname (variants 3, 6 and 7) have a lower mean utility than brand variants from Spar and Savmor (variants 2 and 5). Moreover, I also find that the preferences for variants from Spar and Savemor clearly violate the brand-tier structure (upper-tier and low-tier). That is, the mean utility of the upper tier brand variant (variant 2) is lower than that of the low-tier private label (variants 3, 6 and 7). This is also the case for the variants from PnP and Noname, as the consumers show greater preference for the low-tier Noname variants (variants 3 and 6) suggesting that brand similarity between the upper-tier and low-tier brands negates the effectiveness of the brand portfolio.

Importantly, the estimate for brand similarity (the spatial auto-regressive parameter on brand similarity) shown in table 10 is significantly different from zero. I interpret this parameter as indicating the effect of brand similarity on market share. For example, conditional on prices and other product characteristics, a positive brand similarity coefficient means that if a retailer carries brands that are similar it results in increased market share, and a negative coefficient means that it results reduced market shares. From the comprehensive model, I find that the coefficient on brand similarity is negative and significant, suggesting that that carrying similar private-label brands has a negative effect on the market share of brands that are more similar to others. Put differently, the less differentiation there is between the private-label brands, the lower the market share. This result is consistent with my hypothesis as it highlights that having a highly undifferentiated brand portfolio results in decreased market share. Moreover, this suggests that the Principle of Maximum Differentiation outcome better describes private label portfolio strategies as undifferentiated brands tend to have lower market shares.

Beyond the direct effect of similarity, however, perhaps the stronger impact on private labels market shares is through cannibalization, or large cross-price elasticities that suggest promotions, or any other form of price variation, are likely to draw more from a private labels product than would otherwise be the case. Table 11 provides the entire matrix of own-and cross price elasticities. All estimates have expected signs, and are statistically different from zero. The average own-price effect is negative (as expected), the estimate of -4.761 suggests that breakfast cereal in the South African market is elastic which is reasonable, taking into account that breakfast cereals are highly differentiated products. The own price elasticities range of from -6.482 to -2.247 ,

suggesting that some variants are vulnerable to other variants. However, private labels seem to be more price sensitive: The average price elasticity of -4.582 is much larger than the average own-price elasticity for national brands of -3.521 . In fact, lower tier private labels are more price sensitive than upper-tier private labels. In addition, I also find that the own-price elasticity is higher in the comprehensive model that includes the brand similarity measures as opposed to the limited model that does not include the similarity measures¹⁰.

More importantly, the cross price elasticities from the comprehensive model also highlight that there is considerable entrenched preference among the national brands as the cross price elasticities among them is relatively low. However, the cross price elasticities among private labels is relatively high suggesting that private labels are strong substitutes for each other. This result provides evidence of cannibalization across retailers as there is high substitutability among private labels from the different retailers. This may explain why private label market shares are low for each retailer, as consumers are willing to substitute among private labels but not among national brands.

Moreover, the cross price elasticity is relatively high between upper-tier and lower-tier brands within a retailer's portfolio. For example, the average cross price elasticity between variants for Pick n Pay brands (PnP and Noname) is 0.473 . This is also true for variants from Spar brands (Spar and Savmor) where the cross price elasticity is 0.354 . This high cross price elasticity confirms the presence of cannibalization within the portfolio. These high cross-brand sales not only negate the effectiveness of private label portfolios, but they may also explain the relatively low private label market shares in emerging

¹⁰For the entire matrix of own-and cross price elasticities for the limited model see Appendix A

economies. Strong intraportfolio competition results in private labels competing among themselves rather than of with national brands.

I also compared the cross price elasticities between the comprehensive model and limited model. The cross price elasticities from the comprehensive model are relatively higher which highlights the importance of accounting for brand similarity when estimating cannibalization rates between brands.

Table 11. Own and Cross Price Elasticity Matrix

	V1	V2	V3	V4	V5	V6	V7	V8	V9	V10	V11	V12	V13	V14	V15
Variant 1	-3.594	0.035	0.037	0.328	0.036	0.359	0.068	0.219	0.099	0.071	0.036	0.036	0.085	0.069	0.064
Variant 2	0.035	-2.509	0.496	0.050	0.250	0.250	0.476	0.153	0.069	0.050	0.026	0.025	0.060	0.148	0.045
Variant 3	0.036	0.496	-2.247	0.022	0.322	0.242	0.426	0.137	0.062	0.044	0.023	0.023	0.053	0.043	0.040
Variant 4	0.328	0.050	0.022	-4.007	0.400	0.040	0.076	0.244	0.110	0.079	0.041	0.040	0.095	0.077	0.072
Variant 5	0.036	0.250	0.322	0.400	-2.970	0.030	0.056	0.181	0.082	0.059	0.303	0.030	0.071	0.057	0.053
Variant 6	0.359	0.250	0.242	0.040	0.030	-2.834	0.454	0.173	0.078	0.056	0.029	0.284	0.167	0.054	0.051
08 Variant 7	0.068	0.476	0.426	0.076	0.056	0.454	-4.646	0.286	0.129	0.093	0.048	0.047	0.047	0.290	0.084
Variant 8	0.219	0.153	0.137	0.244	0.181	0.173	0.286	-4.814	0.139	0.100	0.052	0.051	0.121	0.097	0.091
Variant 9	0.099	0.069	0.062	0.110	0.082	0.078	0.129	0.139	-4.802	0.096	0.050	0.049	0.116	0.094	0.088
Variant 10	0.071	0.050	0.044	0.079	0.059	0.056	0.093	0.100	0.096	-5.487	0.057	0.056	0.132	0.106	0.099
Variant 11	0.037	0.026	0.023	0.041	0.303	0.029	0.048	0.052	0.050	0.057	-4.368	0.044	0.044	0.104	0.084
Variant 12	0.036	0.025	0.023	0.040	0.030	0.284	0.047	0.051	0.049	0.056	0.044	-6.482	0.154	0.124	0.116
Variant 13	0.085	0.060	0.053	0.095	0.071	0.167	0.047	0.121	0.116	0.132	0.044	0.154	-4.923	0.096	0.090
Variant 14	0.069	0.148	0.043	0.077	0.057	0.054	0.290	0.097	0.094	0.106	0.104	0.124	0.096	-2.344	0.042
Variant 15	0.064	0.045	0.040	0.072	0.053	0.051	0.084	0.091	0.088	0.099	0.084	0.116	0.090	0.042	-5.293

Table 12 shows results of the counterfactual scenario in which I examine the effects of varying brand similarity on private label market shares. More specifically, I investigate the impact of either decreasing or increasing brand similarity on private label market shares. I find that reducing brand similarity has two major consequences. First, it results in increased market shares suggesting that lower brand similarity enhances brand differentiation within the private label portfolio. This is consistent with not only the Principle of Maximum Differentiation but also prior research which demonstrates that product differentiation positively impacts market shares (Anderson, Fornell and Lehmann 1994; Makadok and Ross 2012). Second, I find that the effects of lowering brand similarity within the portfolio varies with brand-variant. For example, for some variants' market shares go down as similarity decreases suggesting that variants benefit from being similar to other variants within the portfolio. Moreover, I also find that the own-price elasticity increases as brand similarity decreases. In terms of cross-price elasticities they go down as brand similarity increases. This points out that increasing the brand similarity also reduces cannibalization among the retailer's brands. Last, I also find that higher brand similarity lowers market shares. Moreover, higher brand similarity results in increased cross-price elasticities among the brands, and hence cannibalization.

Table 12. Simulation Results: Relatively Increase in Brand Similarity

		% Δ in Market Share									
		-5	-4	-3	-2	-1	1	2	3	4	5
8	Variant 1	0.605	0.427	0.268	0.127	0.002	-0.208	-0.296	-0.374	-0.444	-0.506
	Variant 2	-0.541	-0.444	-0.327	-0.185	-0.012	0.449	0.756	1.127	1.576	2.121
	Variant 3	-0.812	-0.777	-0.736	-0.686	-0.628	-0.476	-0.378	-0.262	-0.125	0.039
	Variant 4	-0.694	-0.682	-0.670	-0.658	-0.645	-0.618	-0.603	-0.588	-0.573	-0.557
	Variant 5	1.692	1.248	0.878	0.569	0.310	-0.086	-0.236	-0.362	-0.467	-0.555
	Variant 6	0.428	0.319	0.218	0.126	0.040	-0.112	-0.180	-0.242	-0.300	-0.353
	Variant 7	0.272	0.535	0.852	1.235	1.696	2.925	3.736	4.715	5.896	7.320
	Variant 8	-0.738	-0.779	-0.813	-0.842	-0.867	-0.905	-0.920	-0.932	-0.943	-0.951
	Variant 9	0.022	-0.064	-0.144	-0.216	-0.283	-0.399	-0.450	-0.496	-0.539	-0.578
	Variant 10	-0.031	-0.014	0.003	0.020	0.037	0.073	0.092	0.111	0.130	0.149
	Variant 11	0.801	0.676	0.560	0.453	0.352	0.172	0.091	0.015	-0.055	-0.120
	Variant 12	0.178	0.063	-0.041	-0.134	-0.219	-0.364	-0.426	-0.482	-0.533	-0.578
	Variant 13	-0.567	-0.604	-0.638	-0.669	-0.697	-0.747	-0.769	-0.789	-0.807	-0.823
	Variant 14	-0.312	-0.384	-0.448	-0.505	-0.557	-0.644	-0.681	-0.715	-0.744	-0.771
	Variant 15	0.993	1.166	1.353	1.556	1.777	2.278	2.562	2.870	3.205	3.568
Av. Market Share	0.801	0.676	0.560	0.453	0.352	0.172	0.091	-0.015	-0.055	-0.120	
Own-Price Elasticity	-9.937	-8.586	-7.387	-6.315	-5.351	-3.686	-2.963	-2.301	-1.692	-1.129	

Taken together, the estimation results show that a narrow price-gap between private labels in a retailers' portfolio results in increased brand similarity. When the gap is small customers cannot distinguish between brands in different price-quality tiers. This results in increased intraportfolio competition and cannibalization between upper-tier and low-tier brands. Importantly, high brand similarity results in reduced private label market shares. The loss in market share can be attributed to the consumers' desire for highly differentiated private labels. Currently, retailers are not offering that as their brands are highly similar which may result in customers looking for an outside option. In all these results aid in explaining the low relatively private label market shares in emerging economies.

Managerial Implications

My findings are immediately relevant to private-label brand managers, but go beyond to provide more general comment on retailing and product portfolios in general. First, the results show that when the brand similarity between two brands within a portfolio is very small, brand managers can make decisions pertaining to a brand with less regard to the feedback effect it will have from brands in other tiers. However, high brand similarity requires managers to pay close attention when implementing promotion strategies within a portfolio so as to reduce cannibalization. In fact, frequent price promotions result in price overlap between brands which may exacerbate the effects of cannibalization.

Second, my findings also provide some important insight that helps our understanding of how managers can benefit from managing cannibalization in both the short and long terms. In the short term, private label portfolio managers should avoid

promotional strategies that cause the promoted price of their brand to violate clear identification from other brands. Price promotion may provide short-term sales gains, but the long-term negative impact on brand identity cannot be ignored. However, in the long-term, the degree of competition among the brands can help in the defining portfolio pruning strategies as the retailer can use brand similarity to decide on which brand to discontinue within its portfolio.

Last, retailers can use brand similarity to build private label portfolios that have minimum cannibalization rates thereby improving profitability. More specifically, the brands within the portfolios should highly differentiated from each other. For example, my results show that cannibalization is high when brands are close in attribute space. Therefore, retailers can reduce cannibalization by differentiating the attributes of their brands within the portfolio. For instance, they can add an organic brand to target a different segment of the market.

Conclusion

In this study I examine whether the price-gap between private labels within a retailers' private label portfolio has an effect on private label market shares. I find that a narrow price-gap between brands in a portfolio results in high brand similarity, a minimally differentiated portfolios, and subsequently low private label market shares. This suggests that retailers' private label portfolio management strategies may also in part explain the relatively low private label market shares in emerging markets.

The results from this study also generalize beyond the market and products considered here. In fact, this result can translate to any type of brand portfolio. For example, car manufacturers such as Honda and Nissan can use results from this study

when pricing vehicles within their portfolios. For example, Nissan have Nissan Rogue and Nissan Juke in their crossover segment (the price-gap between the two is narrow), whereas Honda have only the CR-V in the same category. In fact the CR-V is the segment leader followed closely by the Nissan Rogue. However, the Nissan Juke is least popular cars in the segment. Nissan can therefore, examine whether the price-gap between their two brands in the crossover segments impacts their total market share in the segment.

As with most research, this research is also subject to limitations despite its contribution to some interesting findings. The primary limitation of this research is that it considers only one product category in a single market, potentially limiting the generalizability to other countries. For example, prior research on private labels in the US finds that proximity to national brands is an optimal strategy for private labels as it facilitates easier comparison to national brands (Choi et al 2006). Therefore having a portfolio of private labels that is closer to national brands may have a different effect in such a market, this an area future research can explore. In addition future research can also look into what strategies retailers can employ to decrease cannibalization within private label portfolios, particularly when brands similarity is high. For example, I can look into determining the optimal price-gap between upper-tier and low-tier brands that maximizes market shares.

CHAPTER 4

THE CONSUMER PARADOX: WHY BOTTOM-TIER CONSUMERS ARE LOYAL TO BRAND NAMES

Abstract

Recent studies on private labels find that store brand consumers tend to be middle income, educated, older consumers with large families. Moreover, low-income households that have the same needs as wealthier households do not economize by buying a greater proportion of private-label products. Instead they prefer higher priced national brands. In this chapter, I investigate how effective persuasion appeals (descriptive appeals and informational appeals) are at motivating low-income consumers to buy private labels. In so doing, I provide insight into the underlying cause of why low-income consumers do not buy private labels from which they would benefit significantly. I find that informational appeals are the most effective way of increasing private label consumption. I also find that descriptive appeals that are based on the preferences of aspirational reference groups also encourage low-income consumers to buy private labels. Taken together the results suggest that low income consumers do not buy private labels mainly because they are unknowledgeable about them and that they want to align themselves with an aspirational group (high-income consumers) whom they believe consume national brands.

Introduction

In the past, private labels were targeted toward low-income households. These households were most likely to buy them as they are price sensitive, and generally have lower disposable income (Starzynski 1993; Hoch 1996; Baltas and Doyle 1998). However, this trend appears to have changed. With the introduction of new types of private label products (new categories), and the improvement in private label quality, different types of consumers are now private label shoppers¹¹. Admittedly, Kaufman et al (1997) and Bronnenburg et al (2015), find that current private label consumers tend to be high to middle-income, educated, and mature with large families. In fact, low-income consumers prefer national brands to private labels, despite the fact that private labels are often a less-expensive option¹². These findings are somewhat counterintuitive as low-income households, with presumably the same needs as wealthier households, do not economize by buying a greater proportion of private label products, but rather consume more costly national brands. In this research I seek to determine which persuasion appeals are most effective at motivating low-income consumers to buy private labels. In so doing, my work also provides insight into the underlying cause that up to this point has prevented low-income consumers from purchasing less expensive products from which they would benefit significantly.

¹¹ Heraud (2006) finds that affluent households have been the main driver of private label growth as they represent the fastest-growing market segment.

¹² This is not unique to the USA, e.g. in South Africa middle-income and high-income households have increased private label consumption, whereas low-income groups have reduced consumption (Euromonitor, 2013).

Apart from premium private labels, private label prices in most categories are significantly less than those of national brands, therefore, buying them saves money¹³. This is particularly important for low income consumers as they spend a significant portion of their income on necessities (Orhun and Palazzolo 2016). Therefore, consuming private labels may be beneficial especially accounting for the fact that they are now little differences in quality or value between private labels and national brands (Sethuraman and Gielens 2014).

A number of industry and academic findings support that private label quality has greatly improved. For example, expert quality rankings by consumer advocacy publications such as Consumer Reports and the Good Housekeeping Research Institute (GHRI) confirm that today the objective quality of many private labels is if not equal to or greater than, the objective quality of comparable national brands. For example, in a 2013 study Consumer Reports compared brands in a number of product categories¹⁴ and found that in 33 of 57 product categories, private label products' quality was either equivalent to or better than competing national brands. Similarly, the Good Housekeeping Research Institute (GHRI) (2014) used blind taste tests in 29 different product categories, and also found that consumers considered private label and national brands to have the same objective quality in 19 categories with national brands winning in six categories and private labels coming out tops in four.

¹³ In the South African Market although the price-gap between national brands and private labels is relatively small, on average private labels in a number of categories cost less than national brands.

¹⁴ These included among others ice cream, trail mix, mixed vegetables, fruit juice, paper towels, ketchup, maple syrup, mayonnaise, cheese and seafood.

Furthermore, prior studies on private labels find that the gap between private labels and national brand quality has narrowed significantly. For example, Davies and Brito (2004) examine consumer's preferences for national and private labels by analyzing brand attributes – taste and price. In blind taste tests in four food product categories they find that even though most of the consumers in the sample claimed that they usually consume national brands in butter, breakfast cereal, crackers and mayonnaise only a very small percentage were able to differentiate between private labels and national brands. Further, they also found that brand image rather than quality is often the only explanation for the higher prices consumers pay to acquire national brands. Similar results were found by Wulf et al (2005) and Lybeck et al (2006) who identified that most consumers see virtually no difference between private labels and national brands. In fact, even “heavy” national brand users often cannot differentiate between national brands and private labels in blind taste tests.

In the South African market, a number of tests by consumer advocacy organizations also confirm that private label products have quality that either matches or exceeds national brands. For example, most recently the Good Housekeeping Research Institute (2016) tested brands from various product categories¹⁵. They found that in most categories private labels matched national brands on quality. However, not all private labels fared the same, private labels from Pick n Pay, Checkers, Woolworths and Spar performed relatively better against national brands than private labels from other retailers. These findings are consistent with prior research which shows that consumers in the

¹⁵ They included among others orange juice, peanut butter, chocolate spread, ready-mix flour, bran muffins, puff pastries, tea, butter, coffee, cake mix, milk, breakfast cereals, ketchup, canned tomatoes, baked beans, and ice cream.

South Africa market generally have positive quality perceptions of private labels from Pick n Pay, Checkers, Woolworths and Spar (Beneke 2009).

In order to motivate low income consumers into purchasing private labels two types of appeals (informational appeals and descriptive appeals) can be employed. Informational appeals are designed to target the rationality of consumers by providing objective information on brand quality, price promotions and product attributes (Cutler et al 2000). Presenting consumers with factual and objectively verifiable product information increases purchase intentions and results in favorable brand attitudes (Maddux and Rogers 1980; Pallak, Murrioni, and Koch 1983). Thus, in this study I investigate the effectiveness of informational appeals in motivating low-income consumers to purchase private labels.

On the other hand, descriptive appeals are emotive and are often based on social influence (Cialdini et al 2006). The impact of social influence on consumer behavior in a retail setting is well documented. It plays a key role in shaping consumer preferences. For example, interactive social influence, such as being aided by sales assistants or shopping with friends, (Sharma and Levy 2003; Mangleburg et al 2004; Kurt, Inman, and Argo 2011) impacts not only the amount of money consumers spend on each shopping trip, but also the frequency of store visits and overall customer emotions. Similarly, a noninteractive social presence, such as the “mere presence” of others who may not be involved nor attempt to engage the other consumer in any way have an effect on consumers’ emotions, self-presentation behaviors and ultimately purchase decisions (Dahl, Manchanda, and Argo 2001; Argo, Dahl, and Manchanda 2005). Therefore, in this study I also contribute to the social influence literature by examining the

effectiveness of descriptive appeals in motivating low-income consumers to purchase private labels.

I contrast the effectiveness of informational appeals and descriptive appeals using a series of economic experiments. I conduct my experiments in the US and in South Africa. I chose to conduct my experiments in these countries primarily because private label consumption patterns among low-income households are similar. Moreover, in the South African market there is a large number of low-income consumers, and a substantial proportion of them prefer national brands. Importantly, conducting the study in two countries allows me to compare the effectiveness of the different types of persuasion appeals across culturally diverse populations (i.e. independent and interdependent).

My findings show that informational appeals are the most effective way to convince low-income consumers to buy private labels. In fact, providing consumers with information regarding product attributes and quality increases private label purchase intentions and willingness to pay in both the US and South Africa. Moreover, across both countries I find that descriptive appeals that focus on aspirational reference groups are also an effective way of prompting low-income consumers to buy private labels, albeit not as effective as informational appeals. My results also reveal that the least effective appeals, are descriptive appeals that highlight low-income consumers as the primary customers of private labels. In other words, descriptive appeals that highlight consumption patterns of other low-income consumers (i.e. in-group members). In fact, in the US study they result in significantly lower purchase intentions and willingness to pay for private labels. Last, I also find that the appeals are much more effective in hedonic categories as compared to utilitarian product categories.

My research contributes to the existing literature by showing the effectiveness of different types of appeals when marketing presumably low status products to low-income individuals. Importantly, in so doing, I am also able to provide initial insights as to why low-income consumers have been found to not purchase private label products (Kaufman et al 1997; Bronnenburg et al 2015). At a more general level, I validate the importance of social influence in a grocery retail setting and the presence of status seeking behavior in non-durable products that are consumed mostly in private.

The remainder of this chapter is organized as follows: In the next section I develop my research framework and formulate hypotheses on how descriptive persuasion appeals and informational appeals can be employed as persuasion techniques to motivate behavioral change among low-income consumers. In the subsequent section I describe how the effectiveness of the different types of appeals vary between hedonic and utilitarian product categories. In the third section, I explain the design and execution of my experiment which I then use to test my hypotheses. Last, I discuss the results, offer managerial implications and formulate conclusions.

Research Framework

A consistent finding in research on consumer decision making is that social influence plays a pervasive role in forming consumer attitudes toward products, brands, and services (Dahl, Manchanda, and Argo 2001). Recognizing the impact of social influence, to attract consumers, marketers frequently account for social influence when attempting to persuade individuals to buy their products or services (Cutler et al 2000). In fact, persuasion is a type of social influence in which consumers are prompted into adopting ideas, attitudes, or course of action by symbolic means. The main goal of persuasion is to

change or strengthen attitude towards a certain product, brand or service. (Cutler et al 2000).

Prior research on persuasion highlights the important role of social groups, in particular reference groups in shaping consumer choice. Generally, persuasion attempts are more effective when they are from in-group members as opposed to out-group members (Mackie, Worth and Asuncion 1990). This is because in-group members are similar and usually have shared opinions, which results in them processing information from other in-group members in a more structured manner than information from out-group members (McGarty et al 1994). Consequently, consumers are relatively easily persuaded by arguments that reference in-group members.

However, when it comes to low-status in-groups (e.g. low-income households) group members may dissociate from their own group in order to enhance their identities (Kirchmeyer, 2002). In fact, they may display favoritism toward a higher status group, despite not being a member of it (Simon et al 1995). Importantly, they may perceive their group as dissociative reference group (i.e. a negative group that an individual shuns and does not want to be associated with). In this case persuasion attempts by in-group members are likely to be ineffective. Likewise, persuasion attempts by out-group members are also far less effective except in instances where the in-group members view the out-group as an aspirational reference group (i.e. a positive group that an individual aspires to be member of, but to which they do not belong) (Wilder 1984). In that case, the aspirational reference group is influential in that it may provide greater motivation for in-group members.

Descriptive Appeals

Past studies find that aspirational reference groups are positively viewed and that group members are often revered (Childers and Rao 1992; Cialdini et al 2006). As such, products that are associated with aspirational reference groups are positively valued, particularly by low-status individuals (Taylor and Lobel 1989; Zeelenberg and Pieters 2011). As a matter of fact, low income consumers often view high income consumers as aspirational reference groups, which results in them desiring products and services that are supposedly consumed by high income individuals (Aspinwall and Taylor 1993). For example, prior studies find that low-income individuals spend a disproportionate amount of their income on status-laden brands. In fact, they speciously signal their wealth by consuming brands that are a surrogate for income, such as expensive luxury and status-laden brands which are primarily targeted for high-income individuals (Mandel et al 2006; Sivanathan and Pettit 2010; Banerjee and Duflo 2007; Han et al 2010). Moreover, their need for social status is positively correlated with conspicuous consumption, as they purchase brands to signal social status rather than for their inherent objective or subjective value. This suggests that descriptive appeals targeted at low-income consumers that draw from aspirational reference groups can be an effective way to motivate them to buy private labels.

On the other hand, low-income individuals may also strongly identify with other low-income individuals; this emanates from a desire to be a part of a normative group with shared characteristics (Hogg 2003). Moreover, this strong in-group identification can result in a need to identify with others through the possession and use of products and brands thereby influencing purchase decisions. For example, Escalas and Bettman,

(2005) find that consumers who see themselves as part of a group often use products or brands associated with that group. In that case it makes sense to frame descriptive persuasion appeals directed at low-income consumers in such a way that they resemble the consumption patterns of other low-income consumers.

However, low-income consumers may also consider fellow low-income consumers as a dissociative reference group. The desire to avoid dissociative reference groups influences not only consumer preferences but also purchase intent. For example, self-presentation concerns often result in consumers shunning brands or products linked to a dissociative reference group. White and Dahl (2006), show that males are less motivated to select, a product associated with females (i.e. a dissociative reference group) than a neutral product. Moreover, they find that products and brands associated with dissociative reference groups have a larger effect on consumers' negative self-brand connections, choices and purchase intentions. These findings suggest that descriptive appeals that highlight what low-income consumers are doing may be ineffective at motivating fellow low income households into buying private labels. Therefore, taking into account that low-income consumers can either dissociate or identify with fellow low-income individuals, descriptive persuasion appeals that focus on low-income household's consumption patterns may either prompt or discourage low-income consumers into buying private labels.

Informational Appeals

Informational appeals provide meaningful facts about the product or brand to the consumer. Specifically, they focus directly on providing information on features, product attributes or benefits of the product itself (Cutler et al 2000). Knowledge on product

quality and attributes shapes both consumers preferences and purchase intentions. In fact, purchase decisions of informed and uninformed consumers vary greatly. For example, current research finds that compared to high-information consumers, low-information consumers are likely to pay for more for food products (Kaufman et al 1997). This is because they have limited knowledge of price distributions, and therefore are more likely to shop at random stores where prices maybe higher (Stiglitz 1977; Jain and Srivastava 2000). Moreover, they have a positive cost for searching for the lowest-price store, which leads them to observe only a single price prior to purchasing.

In most cases low-income individuals have limited market information. This is because they attain lower levels of education which may result in limited understanding of not only product quality but also product attributes. For example, low-income households have been shown to have lower financial literacy which results in a lower propensity to engage in strategies that allow them to navigate markets and save money (Agarwal et al 2009; Delaney and Doyle 2012). Further, low income individuals have less information on product attributes and quality as they rarely search all available information concerning a specific product or brand prior to purchase (Berman and Evans 2010). They are also less likely to read product labels and panel information, which also constrains their knowledge of product quality (Sullivan 2003). Therefore, it is highly likely that low-income consumers have limited information and understanding about private labels in general or advancements in private label relative quality suggesting that informational appeals that highlight product quality and attributes maybe an effective way to motivate them to buy private labels.

The Moderating Role of Product Categories.

Consumer choices are also driven by hedonic and utilitarian considerations (Holbrook and Hirschman 1982). The hedonic dimension, results from sensations derived from the experience of using products. Thus, hedonic products are those that provide gratification from sensory attributes such as tastes, sounds, aromas, tactile sensations and visual images, which are much more subjectively than objectively oriented¹⁶. The second dimension, the utilitarian dimension results from functions performed by products; for example, utilitarian products are those whose consumption is more cognitively focused to fulfill functional or practical tasks¹⁷ (Dhar and Wertenbroch 2000). This product classification can influence the effectiveness of both descriptive persuasion appeals and informational appeals on consumers' choices between private labels and national brands.

Low income consumers may prefer to buy more national brands in the utilitarian product category as opposed to the hedonic product category mainly because the level of risk (uncertainty regarding the efficacy of a brand) may be higher in utilitarian products. In general, low-income consumers, are risk averse as they may not be in a financial position to make poor purchase decisions by buying a product that is not effective (Batra and Sinha 1999). Therefore, low-income households can only afford to make mistakes in the hedonic product category where costs maybe inconsequential. For example, the costs incurred in consuming private label ice cream which does not taste quite as good as national brands are far less than those incurred from consuming private label laundry detergent that is not as effective as the national brand alternatives. Therefore, the effect of

¹⁶ Examples of hedonic products include ice-cream, ketchup, yogurt and soft drinks.

¹⁷ Examples include toilet paper, paper towels, bottled water and laundry detergent.

the appeals may be stronger in the hedonic product categories as compared to the utilitarian product categories.

I test my hypotheses in two laboratory experiments, one in the US (study 1) and the other in South Africa (Study 2). In both studies I investigate whether a descriptive appeal that informs low-income consumers about the consumption patterns of high-income households is as effective as either a descriptive appeal that highlights consumption patterns of low-income consumers or an informational appeal that highlights product attributes and product quality of private labels. I also assess whether product category (utilitarian versus hedonic) impacts the effectiveness of the appeals. Last, as a secondary goal I seek to substantiate whether low-income households prefer national brands to private labels.

Pretest

In order to identify which products and brands to use in my study I conducted a pretest. The pretest helped determine which brands consumers regard as either high status or low status, and products they consider hedonic or utilitarian. Following Mandel (2006), for the US study (study 1) I asked 120 MTurk participants to rate brands from various product categories on a 7-point scale that ranges from 1 (*very low status*) to 7 (*very high status*). In addition, I asked the participants to classify products as either hedonic or utilitarian goods using Batra and Ahtola's (1990) eight-item semantic differential scale. I tested twenty three products that past research (Ratchford 1987) suggests vary in terms of being perceived as hedonic or utilitarian. And for each product I tested the status of 8 brands (4 national brands and 4 private labels).

For the product category designation, I found that ketchup, yogurt, soft drinks and ice cream loaded heavily on the hedonic factors,¹⁸ and that toilet paper, bottled water, paper towels and detergent loaded heavily on the utilitarian factors¹⁹ Subsequently, I used these products in my study. For the brands, in all the aforementioned categories I found that national brands rated significantly higher in status than private labels^{20 21}.

For the South African study I used brands from the utilitarian product category (bath soap, laundry detergent, household cleaners)²², and hedonic product category (yogurt, ketchup, cookies)²³. Similar to the US study I also found that the participants generally rated private labels as low status brands and national brands as high status brands.

Study 1

For this study participants were drawn from households representative of the general US consumer-population. However, I focused primarily on low income consumers. I tasked a marketing research company (Qualtrics) the responsibility of recruiting low-income participants (annual household income less than \$40,000)²⁴. They recruited 250

¹⁸ Pleasant/unpleasant, agreeable/disagreeable, happy/sad

¹⁹ Valuable/worthless, helpful/unhelpful, agreeable/disagreeable

²⁰ Ketchup brands (Hunts, Heinz, Delmonte, Great Value, Kroger, Market Pantry), Yogurt brands (Chobani, Oikos, Yoplait, Kroger, Great Value, Market Pantry). Soft drink brands (Coca cola, Pepsi, Dr Pepper, Sam's cola, Big K, Refresh), Ice-cream brands (Blue Bell, Haggen Dasz, Blue Bunny, Great Value, Kroger, Market pantry

²¹ Toilet Paper brands (Charmin, Quilted Northern, Angel Soft, Kroger, Great Value, Market Essentials), Bottled water brands (Aquafina, Fiji, Dasani, Kroger, Great Value, Market Pantry), Paper towel brands (Bounty, Brawny, Viva, Kroger, Great Value, Signature Home), Laundry detergent brands (Gain, Tide, All, Kroger, Great Value, Up & Up).

²² Laundry detergent brands (Surf, Omo, Sunlight, PnP, Spar, Ritebrand), Bath Soap brands (Protex, Lux, Dettol, PnP, Spar, Ritebrand), Household Cleaners brands (Handy Andy, Domestos, Dettol, PnP, Spar, Ritebrand)

²³ Yogurt (Nutriday, Parmalat, Clover, PnP, Spar, Woolworths), Ketchup brands (All Gold, Heinz, All Joy, PnP, Spar, Ritebrand), Cookie brands (Bakers, Baumanns, Moirs PnP, Spar, Ritebrand)

²⁴ The Bureau of Labor Statistics classifies households with annual income that is below \$40,000 as being in the low income tier along with 29% of all households in the Phoenix-Mesa-Scottsdale area.

participants from the Phoenix, Arizona metropolitan area. The ages of the participants ranged from 18 to 82 (mean 45.47, median 44). 42.4% were male and 57.6% were female. The average household size was 2.55 persons and the average education was 19.03 years.

Procedure

My experiment had four between-subjects conditions: aspirational descriptive appeal, in-group descriptive appeal, informational appeal, and a control group. In the aspirational descriptive appeal condition, the participants read an article that included statistics highlighting that high income households are the major consumers of private labels. For example, the article included statements such as: “studies show that 85% of high-income households consume the most private labels”. In the in-group descriptive appeal condition, respondents read an article similar to the one read by respondents in the aspirational descriptive appeal with the only difference being that the statistics described the preferences of low-income households. For example, the article included statements such as: “studies show that 85% of low-income households consume the most private labels”. In the informational appeal condition, participants read an article describing how private labels’ objective quality has improved and is now close to, if not equal to or greater than, the objective quality of comparable national brands. The article also highlighted that some private labels are produced by the same manufacturers who make leading national brands. Last, in the control condition, participants read an ostensibly unrelated news article. In this case, they read an article mundanely describing the game of cricket.

I then asked the participants to quantify their purchase intentions and willingness to pay for 6 brands (3 national brands and 3 private labels) drawn from 8 products (4 hedonic and 4 utilitarian). However to avoid ordering effects and fatigue, I split the participants into two groups with each group only responding to brands from 4 products (2 hedonic and 2 utilitarian).

Purchase intentions were measured using a seven-point scale which asked participants to indicate how likely they would be to buy the product (1 = very unlikely to buy, 7 = very likely to buy).

In addition, I measured the participants' perceived childhood socioeconomic status (childhood SES) and their current socioeconomic status (current SES). I used these measures to validate the participants' socioeconomic status. These two were assessed using measures established by Griskevicius, Delton et al (2011) and Griskevicius, Ackerman et al (2013). To determine childhood SES, I asked participants to respond to the following three statements on a 9-point scale from 1, *strongly disagree*, to 9, *strongly agree*: "My family usually had enough money for things when I was growing up," "I grew up in a relatively wealthy neighborhood," and "I felt relatively wealthy compared to the other kids in my school." The Cronbach's alpha, calculated across participants for childhood SES averaged 0.78. The mean score was 4.7 (SD = 1.65), which was slightly above the midpoint of the scale. Scores ranged from 1 to 8.33, with 65.3% of participants scoring below 4 and 3.7% scoring just above 7.

To determine current SES, participants responded to three other items. "I have enough money to buy things I want," "I don't need to worry too much about paying my bills," and "I don't think I'll have to worry about money too much in the future." The

Cronbach's alpha, calculated across participants for current SES averaged 0.85. In this case, the mean score was 3.69 (SD = 1.88), which was slightly below the midpoint of the scale. Scores ranged from 1 to 7.6, with 74.3% of participants scoring below 4.0 and 1.7% of participants scoring above 7. The correlation between current and childhood SES was 0.29. Both measures confirmed that indeed the participants were low socioeconomic status consumers.

Results

Preliminary Analyses. I performed a series of t-tests and found that on average, the participants' purchase intentions were higher for national brands as compared to private labels ($M = 6.31$ vs. $M = 4.75$), $p < 0.001$). Moreover, they were willing to pay more for national brands as compared to private labels ($M = 6.15$ vs. $M = 3.6$, $p < 0.001$). This provided cursory evidence that low-income consumers prefer national brands to private labels.

Test of Hypotheses To examine the effects of the appeals on private label purchase intentions, I conducted an analysis of variance (ANOVA), using the appeals as the independent variable and a purchase intentions index as the dependent variable. I found a significant main effect of the experimental conditions on purchase intentions. ($F(2, 04) = 60.42$, $p < 0.001$). I then conducted post hoc tests. My results revealed that purchase intentions of the participants from descriptive appeals and informational appeals conditions were significantly different from the control group. Specifically, the purchase intentions of participants in the aspirational descriptive appeal condition ($M = 3.05$, (t)8.26, $p < 0.001$) were significantly higher than for those in the control. I also found that the purchase intentions of the participants within the in-group

descriptive appeal condition were significantly lower ($M = -0.39, (t) - 2.08, p < 0.05$) than the control group suggesting that low-income consumers dissociate from other low-income consumers. Last, my results showed that, participants in the informational appeal condition also had purchase intentions that are significantly higher than those in the control group condition ($M = 3.44, (t)9.34, p < 0.001$). In fact, the participants in this condition had the highest purchase intentions of all the groups.

Last, I evaluated the effect of product category on purchase intentions for private labels. I conducted a two-way mixed ANOVA with repeated measures on the product category. There was a significant main effect of product category ($F(26, 95) = 21.54, p < 0.001$). This effect suggests that if we ignore the treatments, purchase intentions were significantly different between the product categories. In fact, the participants' purchase intentions were higher in the hedonic product categories as compared to the utilitarian product categories ($M = 4.876$ vs $4.461, p < 0.001$). However, there was no significant interaction between the product category and the conditions ($F(1, 37) = 1.373, p < 0.251$). This suggests that of the effect of the appeals on purchase intentions were not different for hedonic and utilitarian product categories.

To determine whether participants' private label willingness to pay was also significantly influenced by the appeals I conducted another ANOVA. I found a significant main effect of the experimental conditions on willingness to pay ($F(4.93) = 2.59, p < 0.05$). I then conducted post hoc tests, here, I found that participants in the aspirational descriptive appeal condition and the informational appeal conditions were willing to pay more for private labels ($M = 1.78, (t)2.00, p < 0.05$) and

($M = 1.86, (t)2.09, p < 0.05$) respectively, than participants in the control condition. However, I did not find a significant effect for the in-group descriptive appeal condition ($M = 0.17, (t)0.20, p < 0.124$). As in the purchase intentions model, the informational appeal condition had the largest impact on private label willingness to pay. I also evaluated the effect of product category on private labels willingness to pay. Specifically, I conducted another two-way mixed ANOVA and found a significant main effect of product category ($F(24, 94) = 61.79, p < 0.001$) suggesting that, private label willingness to pay was significantly different between the product categories. In fact, the participants' willingness to pay was higher in the hedonic product categories as compared to the utilitarian product categories ($M = 3.88, vs 2.751, p < 0.001$). However, there was also no significant interaction between the product category and the conditions ($F(6, 06) = 24.03, p < 0.612$) implying that the effect of the appeals on willingness to pay was not different for hedonic and utilitarian product categories.

Discussion

Study 1 provided empirical support for my hypotheses. Consistent with the first hypothesis, I found that low-income consumers are upward comparing; that is, they consider higher income households as an aspirational reference group. Therefore, descriptive appeals that match consumptions patterns of high income households result in increased private label purchase intentions willingness to pay. The results also showed that descriptive appeals that match consumption patterns of low-income consumers negatively impact private label preferences. Taken together these results confirm the role of social influence on consumption patterns of low-income households and suggest that one of the reasons low-income consumers are not currently purchasing private labels is

they believe that high-income consumers buy national brands, and as such, they desire to emulate their consumption patterns. Moreover, low-income consumers also avoid buying private labels because they associate them with not only low status but also other low-income individuals which they seek to dissociate from.

Importantly, Study 1 also revealed that informational appeals are the most effective method of increasing private labels preferences for low-income households. This result suggests that the main reason low-income consumers are not buying private labels is that they may be lacking information about private labels. Evidently, highlighting the salient attributes of private labels motivates low-income consumers to buy them. Moreover, the effect of this appeal is stronger than that of descriptive appeals.

These results, however, describe behavior among consumers in a highly developed consumer market. In study 2, I conduct the analysis in an emerging market. This allows me to investigate why low income consumers in emerging economies do not consume private labels, and why private label market shares are low in emerging economies. Therefore, I test which is more effective, descriptive appeals or informational appeals at motivating low-income households to increase their private labels consumption in South Africa.

Study 2

For this study, the experiment participants were drawn from households representative of the lower-income strata of the general South African consumer-population. The participants were recruited through a marketing research company (Acentric). In total 244

low-income participants (annual household income less than \$15,000)²⁵ from the Johannesburg metropolitan area were recruited. The ages of the participants ranged from 18 to 76 (mean 36.03, median 32). 66.04% were female and 33.96% male. The average household size was 3.66 persons and most had more than 15.9 years of education. The participants, childhood SES scores ranged from 1 to 9, and the mean score was 4.33 (SD = 2.19), which was as expected lower than that of consumers in the US. Similarly, the mean score for the current SES was 3.73 (SD = 1.97), was again lower than that of US consumers.

The experimental set-up was a direct replication of the US experiment, albeit with a different manipulation in the control group where participants read an article about how the National Football League (NFL) was founded.

Results

Preliminary Analyses. I performed a series of t-tests and my results revealed that contrasted to private labels the participants' purchase intentions for national brands were higher ($M = 6.76$ vs. $M = 4.79$, $p < 0.001$). In addition, the participants' willingness to pay for national brands ($M = 18.42$ vs. $M = 13.22$, $p < 0.001$) was also much higher than that of private labels. This also provided cursory evidence that low-income consumers prefer private labels.

Test of Hypotheses. I conducted an analysis of variance (ANOVA), using the appeals as the independent variable and a purchase intentions index as the dependent variable. I found a significant main effect of the experimental conditions on purchase

²⁵ The South African Audience Research classifies households with annual income that is below R15, 000 as being in the low income tier.

intentions ($F(1, 46) = 16.40, p < 0.001$). I then conducted post hoc tests and, found that, the participants' purchase intentions within the conditions were also significantly different from the control group. Specifically, the purchase intentions of participants in the aspirational descriptive appeal ($M = 1.51, (t)5.34, p < 0.001$) and informational appeal condition ($M = 1.88, (t)6.29, p < 0.001$) are were significantly higher than for those in the control condition. These results are not only consistent with hypotheses 1 and 3 but they are also qualitatively similar to my findings in the US market.

Contrary to the results from Study 1, however, the purchase intentions of the participants within the in-group descriptive appeal were significantly higher ($M = 1.47, (t)5.26, p < 0.001$) than the control group suggesting that low-income households conform to group preferences. I also examined the effect of product category on purchase intentions for private labels. Here, I conducted a two-way mixed ANOVA with repeated measures on the product category. There was a significant main effect of product category ($F(19, 11) = 23.57, p < 0.001$). This effect suggests that if the treatments are disregarded, purchase intentions were significantly different between the product categories. However, unlike in the US study, the participants' purchase intentions were higher in the utilitarian product categories as compared to the hedonic product categories ($M = 5.025$ vs $4.545, p < 0.001$). I also found that, there was no significant interaction between the product category and the conditions ($F(0, 54) = 0.67, p < 0.654$) suggesting that of the effect of the appeals on purchase intentions were not different for hedonic and utilitarian product categories.

To determine whether participants' private label willingness to pay was also significantly influenced by the type of appeal I conducted a second ANOVA. I found a

significant main effect of the experimental conditions on willingness to pay ($F(6, 67) = 3.78, p < 0.05$). I followed that with post hoc tests. The results indicated that the appeals' impact on willingness to pay for private labels are generally similar to the purchase intentions results. Much like in the US market, I found that participants in the informational appeal and the aspirational descriptive appeal conditions are willing to pay more for private labels ($M = 4.51, (t)3.01, p < 0.05$) and ($M = 2.42, (t)2.14, p < 0.05$) respectively, than participants in the control condition. I also found that participants in the dissociative appeal condition were willing to pay more for private labels ($M = 2.64, (t)2.37, p < 0.05$) than participants in not only the control condition but also the aspirational descriptive appeal condition. Last, I evaluated the effect of product category on willingness to pay for private labels. A two-way mixed ANOVA with repeated measures on the product category revealed a significant main effect of product category ($F(49, 95) = 20.06, p < 0.001$) implying that the participants' willingness to pay was significantly different between the product categories. I also found that the participants' willingness was higher in the utilitarian product categories as compared to the hedonic product categories ($M = 14.367$ vs $M = 5.131, p < 0.001$). Moreover, I also found a significant interaction between the product category and the conditions ($F(10, 39) = 1.05, p < 0.001$). This implies that the effect of the appeals on willingness to pay were significantly different for hedonic and utilitarian product categories. Post hoc analysis revealed that in the aspirational descriptive appeal condition participants' willingness to pay was higher in the hedonic product categories as compared to the utilitarian product categories ($M = 15.42, vs M = 7.99, p < 0.001$). This was also true for the participants within the in-group descriptive appeal condition ($M =$

19.98, *vs* $M = 12.23, p < 0.001$) and the informational appeal ($M = 17.52, vs M = 10.32, p < 0.001$).

Discussion

In sum, study 2 provided further support that the informational appeals are most effective at motivating low-income consumers to buy private labels. These results suggests that low-income consumers may not be buying private labels simply because they are not well informed about them. This paucity of information on private labels arises mainly because low income consumers generally have limited market knowledge, and rarely attend to product panel information (Sullivan 2003; Berman and Evans 2010). In fact, some low income consumers in the South African market are illiterate such that they cannot read panel information and product labelling (Wyma et al 2012), thus they end up buying well-known category leaders which are typically national brands. This result is also consistent with current research which finds that highly educated consumers are more likely to buy the private labels, while less-educated individuals are more likely to buy national brands of an otherwise homogenous product (Bronnenburg et al (2015).

I also found that aspirational descriptive appeals favorably impact low-income consumers' willingness to pay and purchase intentions for private labels. In conjunction with study 1, this result supports the notion that social influence plays a pivotal role in shaping the consumption decisions of low-income consumers in a grocery retail setting. Importantly, this highlights that low income consumers preferences for private labels are influenced by the preferences of high-income consumers. In view of the fact that low income consumers have limited information on private labels it is reasonable that their

brand choices are influenced by an aspirational reference group. Moreover, they may infer that private labels are high quality because high income consumers are buying them.

However, contradictory to the US study results, I also found that descriptive appeals that highlight the consumption patterns of low-income consumers (i.e. in-group descriptive appeals) were also effective at motivating other low-income consumers to buy private labels. This implies, that consumers in this market conform to the choices of their peers and considering that low income consumers lack knowledge on private labels, learning that in-group members purchase private labels may signal the brand's efficacy thereby motivating purchase. This is also in line with prior research which shows that consumers learn from in-group members (Carlson, Suter, and Brown 2008). Last, in contradiction to the fourth hypothesis, results partially showed that the appeals were more effective in increasing participants' private label willingness to pay for utilitarian products as compared to hedonic products. This may be due to the fact that low-income consumers in emerging markets rarely spend on discretionary items; thus when they do, they may prefer to purchase national brands that are high in status.

General Discussion

The current research focuses on finding out how to persuade low-income consumers to buy private label products. Using results from two studies, in two different countries, I provide different explanations and processes for why, social influence together with informational appeals, may be a good way to persuade low-income individuals to purchase more private labels. In addition, the fact that my results are consistent across two different countries (US and South Africa) that not only differ in the retailing environment but also socioeconomic conditions highlights the generalizability of my

findings. Together the two studies provide convergent evidence that informational appeals are the most effective technique of motivating low-income households to buy private labels. This suggests that consumer knowledge on brand attributes, and brand quality plays an important role in the formation of private label preferences.

I also found empirical support that descriptive appeals that highlight consumption patterns of aspirational reference groups also effectively motivate low-income consumers to buy private labels, though to a lesser degree than informational appeals. Both these findings are consistent not only in the US but also in South Africa. However, my results reveal that descriptive appeals that highlight consumption patterns of low-income consumers are only effective at prompting low-income consumers to buy private labels in the South African Market. In fact, in the US market, they result in low-income consumers avoiding private labels all together. This may be due to the fact that low income consumers in the US may feel a greater need to dissociate with fellow low income consumers more than low income consumers in the South African market. Prior studies find that the “poverty shaming” is more apparent in wealthier economies as having little money in a society where ‘everyone’ is thought to be rich suggests that you are not hard-working (Aamodt 2008). Moreover, low income individuals in individualistic cultures are more likely to veer away from group expectations as compared to individuals of collective cultures (Bian and Forsythe 2011).

Taken together, the findings from this study suggest that low-income consumers prefer national brands to private labels for two main reasons. First, they do not consume private labels because they are generally unaware of private label attributes and quality. This may be due to the fact that private labels are rarely advertised and because of

financial constraints low-income consumers may be wary about trying new and unfamiliar brands because of the relative risk associated with them (Sinha and Batra 1999). Second, low-income may prefer national brands to private labels because of social influence. More specifically, the preferences of low-income consumers are influenced by associative and dissociative reference groups. Several lines of evidence lead to this conclusion.

First, I found that low-income individuals are upward comparing as their preferences for private labels are increased in the aspirational descriptive appeal condition. Ultimately, these comparisons result in them desiring products associated with higher income individuals. In both the US and South African markets low-income consumers readily associate national brands with high status and private labels with low status suggesting that they believe high-income individuals consume national brands. Evidently, low-income consumers' choice between private labels and national brands is influenced by high-income consumers. This is because low-income consumers aspire to be like high-income individuals who are treated more favorably, are more influential, gain leadership roles and receive more social opportunities than low-income individuals (Huberman et al 2004).

Second, the results I obtain for in-group descriptive appeals highlight that consumers, may not be buying private labels in an effort to dissociate themselves from other low-income consumers. However, I only found evidence for this result in the US market and not the South African market. This may be due to the fact that there is a large proportion of low-income consumers in South Africa hence group identification maybe stronger. Whereas in the US where there are fewer low-income consumers the desire to

dissociate maybe greater. Nonetheless, this result and the fact that low-income consumers' preferences for national brands are influenced by the desire to associate with higher income households highlights the role of social influence in non-durable product categories consumed in private.

Importantly, this shows the role of social influence in areas where it has not been studied before. As a matter of fact, the majority of prior research primarily focuses on publicly consumed durable products, hence in this study I take a first attempt to understand how status seeking behavior impacts brand choice in non-durable products such as grocery items. My research also contributes to the existing literature by showing the effectiveness of different types of appeals when marketing presumably low status products to low-income individuals. Notably, this also an area current research is mute on, therefore I also provide initial insights as to why compared to high-income consumers, low-income consumers do to not purchase less expensive generic brands, particularly those privately consumed.

Managerial Implications

Knowledge gained from this research can be utilized for developing targeting strategies by private labels marketers. The study reveals that retailers can appeal to low-income consumers by highlighting improvements in private label quality. This suggests that informational advertising that provides consumers with factual relevant brand data in a clear and conscience way will most likely increase private label sales. Therefore retailers can design ad campaigns which provide consumers relevant brand information. For example, their campaigns can reference reports by consumer advocacy groups comparing their products with national brands. Moreover, this information could be

made available at the point of purchase. Retail brand managers can also conduct blind taste test with both private labels and national brands within their stores. This will increase consumer knowledge on private labels and also purchase likelihood.

Granted that, the study also confirmed that, low-income consumers purchase national brands because of social influence (i.e. aspirational reference groups) it is therefore imperative for retailers to position their private labels as aspirational or premium products that are consumed by high income people. For example, they can start marketing campaigns with central themes that reveal the consumption patterns of high-income consumers. This targeting will not only increase private label market share but can also increase overall consumer welfare as private labels are almost always less expensive than national brands.

Conclusion

In this essay I find that informational appeals are the most effective persuasive technique of motivating low income consumers to buy private labels. I also find that descriptive appeals have mixed effects as they can either motivate or dissuade low income consumers from buying private labels. Importantly, in this essay I explain how consumer perceptions about private labels contribute to the low penetration rates of private labels in emerging economies. I highlight the role of consumer knowledge and social influence in brand choice. Specifically, I find that low-income consumers prefer national brands over private labels for two main reasons. First, low-income consumers are uninformed about private labels, they are generally unaware that private quality advances hence they avoid buying them. Second, low-income consumers buy national brands so as to enhance their social standing. They, fervently believe that high-income

consumers buy national brands and thus they desire national brands as well. Taken together these results suggest that private labels in emerging economies are low because consumers prefer national brands to private labels.

As with most studies, this research is also subject to limitations despite its contribution. The primary limitation of this research is that it does not distinguish between private labels in different quality-tiers, potentially limiting the generalizability to other product classes. Most retailers now manage their private labels as part of a portfolio. They often carry in their portfolios three private labels that target premium quality, standard quality and economical shoppers at three different price points thus the effectiveness of the appeals may depend on the tier of the private labels. For example, aspirational appeals may be more effective in motivating consumers to buy upper-tier private labels as they are positioned as premium brands, and are likely to be high status. Whereas informational appeals may be effective at motivating low-income individuals to buy low-tier private labels where functionality is more important. Therefore, this is an area that future studies can consider.

Future studies may also look into the whether the effectiveness of the appeals vary with the retailers store image. For example, consumers may view differently private labels from Target and Walmart. Therefore, the effectiveness of the appeals maybe different based on the retailers' store image. For example, informational appeals may be more effective with Walmart brands which are mostly positioned as "no frill" private labels. Last future research can also look into whether low-income households' choice of brands are affected by social presence (i.e., the presence of another person or group of individuals). More specifically, does the presence of other consumers' impact low

income individuals' choice between private labels and national brands? This would aid in further understanding the effect of social influence on private label preferences which I have put forward in this study.

CHAPTER 5

CONCLUSION

In this dissertation, I provide a better understanding of why private labels have yet to succeed in emerging economies. In three essays I highlight how large national brand manufacturers, retailers, and consumers each contribute in inhibiting private label growth in emerging markets. I contribute to current literature on private label proliferation by first, explaining the link between manufacturer bargaining power and private label market shares in emerging economies.

In most emerging markets national brand manufacturers produce both national brands and private labels, this arrangement favors manufacturers, allowing them to set relatively high wholesale prices on private labels, which in turn leads to high private label retail prices, and low private label market shares. Partly explaining why private label market shares are low in emerging economies. Importantly, these results generalize beyond the markets and the product category considered here. They provide broader insights into manufacturer-retailer relationships. Specifically, they highlight that national brand manufacturers with bargaining power can influence not only private label market shares but also retail prices of both national brands and private labels. This phenomenon can occur in any market where there are dominant manufacturers. For example, in China where private label market shares averages about 1.3% a few national brand manufacturers are responsible for private label manufacturing (Song 2011). Therefore, it is likely that they have bargaining power over retailers as in the South African market. These results can also translate to in any industry that it is “top heavy” with a few upstream firms and a relatively larger number of downstream firms. In that case the

upstream firms may have bargaining power over the downstream firms, and they may be able to impact retail prices and market shares of the downstream firms. For example, large pharmaceutical drug manufacturers may have bargaining power over private label distributors approved by the US Food and Drug Administration (FDA).

Last, in essay 1 I find that even though national brand manufacturers have bargaining power, sophisticated retailers in emerging economies can realize higher margins on private labels by either producing their own private labels or by partnering with contract manufacturers. This may not only increase their profitability but also it may improve consumer welfare in that a competitive private label market may result in the growth of private labels and lower overall retail prices. Moreover, the growth of private labels will create competitive pressure on national brands thereby restricting bargaining power of dominant brands and engendering better quality, and more innovation (Meza and Sudhir 2009).

Prior studies also find that when the category share of private labels increase, national brand manufacturers guard their brands by reducing their prices, undertaking in extensive promotional activities, and differentiating their products which in turn benefits consumers (Nelson and Hilke 1991; Lenius 1997; Rao and Mills 1999; Richards and Pofahl 2001; Steiner 2004). Importantly, the expansion of private labels can aid households in developing economies to fight food insecurity. According to the FAO rising food prices triggered an increase in hunger across developing countries, the number of chronically hungry people in 2013 increased by 75 million a 6% rise from 2011. In fact, evidence points to the fact that food prices are higher in the least developed

countries of the world as compared to the wealthier nations, thus, they can benefit from less expensive food (World Bank 2011).

Second my work contributes to the theoretical literature on private label portfolios and brand portfolios in general. In my second essay, I find evidence that the price-gap between upper-tier and low-tier brands in a retailer's portfolio impacts market shares. More specifically, I find that a narrow price-gap results in increased cannibalization between the brands particularly when their prices frequently overlap. Further, the results show that a narrow price-gap increases brand similarity, reduces portfolio differentiation, and importantly results in lower market shares. This suggests that retailers' private label portfolio management strategies may also in part explain the relatively low private label market shares in emerging markets.

The results from this second study also generalize beyond the market and products considered here. In that they highlight that a narrow price-gap between brands in a portfolio, private label or otherwise results in high cross-brand sales and market shares. For example, a narrow price-gap between Procter & Gambles' disposable diaper brands Luvs and Pampers may result in increased cannibalization between the brands. Likewise, a small price-gap between Hilton Hotel's brands Embassy Suites Hotels and Hilton Garden Inn may also result in high cross-brand sales and lower market share. Importantly, the small price-gaps may result in increased portfolio similarity which may negate the effectiveness of the portfolio. It may also result in loss of revenue as the low-quality brand may "dilute" the brand image of the high-quality brand.

My results also point to a positive relationship between highly differentiated portfolios and market shares. This result is in line with the principle of maximum

differentiation (d'Aspremont et al 1979) and confirms the need for variety within any type of portfolio. This may also partly explain why auto-manufacturers such as Honda who have smaller but more differentiated portfolios outperform companies such as General Motors and Nissan who have larger but less differentiated portfolios. Last, in my second study I also find that differentiation between brands in a portfolio should encompass attributes as they aid in defining customer segments and positioning. As such firms can differentiate their brands on attributes as well.

In my third essay I find that informational appeals and descriptive appeals are effective at motivating behavior change among low income consumers. More specifically, I find that informational appeals are the most effective technique of encouraging low income consumers to buy private labels and that descriptive appeals that draw from aspirational reference groups are also effective. As in my previous studies these results can also be transferred to other product categories. For example, policy makers can use both descriptive and informational appeals when attempting to motivate low-income individuals to adopt healthier eating habits. For informational appeals they can focus on providing objective benefits that can be derived from healthy eating. Then for descriptive appeals they inform low income individuals about the consumption patterns of aspirational reference groups.

In my third essay I also find that low-income consumers buy national brands instead of private labels because mainly because they have limited information on private labels and because of social influence. In so doing, I also provide insight into the underlying reason why low income consumers do not purchase less expensive products or brands from which they would benefit significantly. Moreover, my results also show that

low-income consumers buy national brands in order to either emulate high-income households, dissociate from fellow low-income consumers or to conform to group preferences. This result validates the role of social influence in non-durable products such as grocery items that are mostly consumed in private. An area current research was yet to investigate.

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APPENDIX A
ELASTICITIES FOR LIMITED MODEL

Table 13. Own and Cross Price Elasticity Matrix

	V1	V2	V3	V4	V5	V6	V7	V8	V9	V10	V11	V12	V13	V14	V15
V1	-3.290	0.048	0.049	0.048	0.048	0.048	0.092	0.294	0.133	0.095	0.048	0.048	0.115	0.093	0.087
V2	0.048	-2.297	0.226	0.023	0.227	0.318	0.431	0.138	0.062	0.045	0.023	0.023	0.054	0.144	0.041
V3	0.048	0.226	-2.058	0.020	0.203	0.203	0.386	0.124	0.056	0.040	0.021	0.020	0.048	0.039	0.037
V4	0.048	0.023	0.020	-3.668	0.036	0.036	0.069	0.221	0.100	0.072	0.037	0.036	0.086	0.070	0.065
V5	0.048	0.227	0.203	0.036	-2.719	0.027	0.051	0.164	0.074	0.053	0.273	0.127	0.064	0.052	0.048
V6	0.048	0.318	0.203	0.036	0.027	-2.595	0.487	0.156	0.070	0.051	0.026	0.026	0.161	0.049	0.046
V7	0.092	0.431	0.386	0.069	0.051	0.487	-4.255	0.259	0.117	0.084	0.043	0.043	0.101	0.181	0.076
V8	0.294	0.138	0.124	0.221	0.164	0.156	0.259	-4.410	0.126	0.091	0.047	0.046	0.109	0.088	0.082
V9	0.133	0.062	0.056	0.100	0.074	0.070	0.117	0.126	-4.397	0.087	0.045	0.044	0.105	0.085	0.079
V10	0.095	0.045	0.040	0.072	0.053	0.051	0.084	0.091	0.087	-5.024	0.051	0.050	0.119	0.096	0.090
V11	0.049	0.023	0.021	0.037	0.273	0.026	0.043	0.047	0.045	0.051	-3.980	0.040	0.094	0.076	0.016
V12	0.048	0.023	0.020	0.036	0.127	0.026	0.043	0.046	0.044	0.050	0.040	-5.935	0.140	0.113	0.105
V13	0.115	0.054	0.048	0.086	0.064	0.161	0.101	0.109	0.105	0.119	0.094	0.140	-4.508	0.087	0.081
V14	0.093	0.144	0.039	0.070	0.052	0.049	0.181	0.088	0.085	0.096	0.076	0.113	0.087	-2.146	0.038
V15	0.087	0.041	0.037	0.065	0.048	0.046	0.076	0.082	0.079	0.090	0.016	0.105	0.081	0.038	-4.846

APPENDIX B
SURVEY QUESTIONS

Instructions: please answer the questions listed below.

Section 1 (Demographic Information)

1. How old are you? _____ years
2. Please indicate your gender: Male ____ Female ____

3. Which category best represents your income?

Less than \$10,000	
\$10,000 to \$29,999	
\$30,000 to \$49,999	
\$50,000 to \$69,999	
\$70,000 to \$99,999	
More than \$100,000	

4. How many people are in your household? ____

5. What is the highest level of education you have achieved?

High School Diploma	
Some College	
Technical School Diploma	
Associate Degree	
Bachelor's Degree	
Graduate Degree	

6. Please respond whether you agree or disagree with the following statements

	Strongly Agree					Strongly Disagree			
My family usually had enough money for things when I was growing up.	1	2	3	4	5	6	7	8	9
I grew up in a relatively wealthy neighborhood.	1	2	3	4	5	6	7	8	9
I felt relatively wealthy compared to the other kids in my school.	1	2	3	4	5	6	7	8	9
I have enough money to buy things I want	1	2	3	4	5	6	7	8	9
I don't need to worry too much about paying my bills	1	2	3	4	5	6	7	8	9
I don't think I'll have to worry about money too much in the future.	1	2	3	4	5	6	7	8	9

Section 2 (Manipulations)

Instructions:

In this study we are interested in your inherent comprehension skills. Below is a passage taken out of a recent Washington Post publication, please read it carefully and answer the questions that follow.

Informational Appeal

*Store brands or private labels are brands owned, controlled, and sold exclusively by a retailer. Their existence can be traced back centuries where they were found in a few product categories such as tea and cleaning materials. However, over the years they have evolved from low quality generics packaged mostly in white packaging with black lettering to “real brands”. Currently private labels are available in over 60 % of all grocery categories in the USA and according to the Private Label Manufacturers Association over the past 5 years, annual sales of private-label products have risen by over 40% in supermarkets and by 96% in drug chains, reaching more than \$100 billion in 2014. The growth of private labels can be attributed to their improvement in quality, in fact, numerous industry reports points to evidence that shows that private labels’ objective quality is now, equal to or even greater than, the objective quality of comparable national brands. The rise in popularity in private labels has also spurred national brand manufacturers to enter into contracts with retailers in which they produce the private labels for them. According to a recent survey by Private Label Manufacturers Association 75% of the private labels are produced by national brand manufacturers. (*Excerpt from the Washington Post May, 2015).*

Aspirational Appeal Manipulation

Store brands or private labels are brands owned, controlled, and sold exclusively by a retailer. Their existence can be traced back centuries where they were found in a few product categories such as tea and cleaning materials. However, over the years they have evolved from low quality generics packaged mostly in white

*packaging with black lettering to “real brands”. Currently private labels are available in over 60 % of all grocery categories in the USA and according to the Private Label Manufacturers Association over the past 5 years, annual sales of private-label products have risen by over 40% in supermarkets and by 96% in drug chains, reaching more than \$100 billion in 2014. The growth of private labels can be attributed to high income households. Numerous industry reports points to evidence that shows that private labels’ are mostly consumed by high income households. In fact, more than 85% of high-income households have acknowledged that they purchase private labels on each shopping trip (*Excerpt from the Washington Post May, 2015).*

In-group Appeal

*Store brands or private labels are brands owned, controlled, and sold exclusively by a retailer. Their existence can be traced back centuries where they were found in a few product categories such as tea and cleaning materials. However, over the years they have evolved from low quality generics packaged mostly in white packaging with black lettering to “real brands”. Currently private labels are available in over 60 % of all grocery categories in the USA and according to the Private Label Manufacturers Association over the past 5 years, annual sales of private-label products have risen by over 40% in supermarkets and by 96% in drug chains, reaching more than \$100 billion in 2014. The growth of private labels can be attributed to low income households. Numerous industry reports points to evidence that shows that private labels’ are mostly consumed by low income households. In fact, more than 85% of low-income households have acknowledged that they purchase private labels on each shopping trip (*Excerpt from the Washington Post May, 2015).*

Control Group

Cricket is a team sport played between two teams of eleven players on each side. It is a bat-and-ball game played on a roughly elliptical grass field, in the center of

which is a hard, flat strip of ground 22 yards (20.12 m) long, called a pitch. A player from one team (the bowler) propels a hard, fist-sized leather ball from one set of wooden stumps, called a wicket, towards the other. A player from the opposing team (the batsman) attempts to defend the wicket from the ball with a wooden cricket bat. Another batsman (the partner of the defending player) stands in an inactive role near the bowler's wicket. If the batsman hits the ball with his bat, he may run to the other wicket, exchanging places with his partner. This scores a run. While the batting team attempts to score as many runs as it can, members of the bowling team gather the ball and return it to either wicket. If the ball that is thrown by a fielder strikes a wicket while the nearest batsman is still running, the batsman is out, or "dismissed". Batsmen can also be out by other means, such as failing to defend the bowled ball from hitting the wicket, or hitting a catch to a fielder. Once out, a batsman is replaced by the next batsman in the team. As there must always be two batsmen on the field, if and when the tenth batsman is out, the team's turn to bat (innings) is over, and the other team may bat while the first team takes the field.

*(*Excerpt from the Washington Post May, 2015).*

SECTION 3 (Brand Choice) **the brands and products used here were determined in a pretest*

7. Imagine on one of your trips to the grocery store to you are presented with the choices listed below. Please indicate your purchase intention for each choice.

Not	Yes Certainly								Certainly
	1	2	3	4	5	6	7	8	
Yoplait yogurt	1	2	3	4	5	6	7	8	9
Oikos yogurt	1	2	3	4	5	6	7	8	9
Chobani yogurt	1	2	3	4	5	6	7	8	9
Great Value yogurt	1	2	3	4	5	6	7	8	9
Kroger yogurt	1	2	3	4	5	6	7	8	9
Market Pantry yogurt	1	2	3	4	5	6	7	8	9
Viva paper towels	1	2	3	4	5	6	7	8	9
Bounty paper towels	1	2	3	4	5	6	7	8	9
Brawny paper towels	1	2	3	4	5	6	7	8	9
Great Value paper towels	1	2	3	4	5	6	7	8	9
Kroger Home paper towels	1	2	3	4	5	6	7	8	9
Up & Up paper towels	1	2	3	4	5	6	7	8	9

8. Please indicate your **Willingness To Pay** for each of the brands listed below

Yoplait yogurt	
Oikos yogurt	
Chobani yogurt	
Great Value yogurt	
Kroger yogurt	
Market Pantry yogurt	
Viva paper towels	
Bounty paper towels	
Brawny paper towels	
Great Value paper towels	
Kroger Home paper towels	
Up & Up paper towels	

SECTION 3 (SHOPPING TRENDS)

9. How often do you shop for groceries?

More than 4 times a week	
3 to 4 times a week	
1 to 2 times a week	
Once every other week	
Once a month	
Less than once a week	

10. Which store do you usually buy your groceries from? _____

11. Have you ever purchased any one of the following brands?

Wal-Mart Store Brands	
Kroger/Fry's Store Brands	
Target Store Brands	
Safeway Store Brands	
Trader Joes Store Brands	
Whole Foods Store Brands	

12. On average, how often do you consume yogurt?

More than 4 times a week	
3-4 times week	
1-2 times a week	
Once a week	
Less than once a month	

13. On average, how often do you shop for paper towels?

More than 4 times a week	
3-4 times week	
1-2 times a week	
Once a week	
Less than once a month	

14. Please indicate which of the following promotional activities you look for when purchasing yogurt?

	Dislike it very much			Like it very much	
Weekly special at grocery store	1	2	3	4	5
Coupons	1	2	3	4	5
Manufacturer's rebate	1	2	3	4	5
Club price	1	2	3	4	5

15. Please indicate which of the following promotional activities you look for when purchasing paper towels?

	Dislike it very much			Like it very much	
Weekly special at grocery store	1	2	3	4	5
Coupons	1	2	3	4	5
Manufacturer's rebate	1	2	3	4	5
Club price	1	2	3	4	5