

Does Private-Label Production by National-Brand Manufacturers

Create Discounter Goodwill?

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Abstract

Discounters have a private-label dominated assortment where national brands have only limited shelf access. These limited spots are in high demand with national-brand manufacturers. We examine whether private-label production by leading national-brand manufacturers for two important discounters (one hard and one soft) creates discounter goodwill. We estimate a selection model on a sample of 450 manufacturer-category combinations from two leading discounters (Aldi in Germany and Mercadona in Spain), and show that private-label production is indeed rewarded: national-brand manufacturers involved in such practice have a higher likelihood of procuring shelf presence for their brands. Moreover, while powerful manufacturers are intrinsically more likely to obtain shelf presence with soft discounters, manufacturers with lower power can compensate this by producing private labels. No such dependence on power exists for the hard discounter.

However, not all national-brand manufacturers are equally likely to produce private labels for discounters. We find that national-brand manufacturers are less likely to do so when they experience more sales growth, when it is more difficult to produce high-quality products in the category, when they invest more advertising support into their brands, and when they introduce more innovations. Moreover, a higher price differential relative to the discounter's private labels makes national-brand manufacturers less likely to engage in private-label production for hard discounters.

Keywords: private label, shelf allocation, sourcing decisions, discounters, channel relationships.

1. INTRODUCTION

Private labels are becoming increasingly important in grocery retailing. They already account for 43% of the total consumer packaged goods (CPG) consumption in the U.K., for 32% in Germany, 31% in Spain, and 17% in the U.S. (ACNielsen, 2011). Absolute sales numbers are equally impressive. Wal-Mart's U.S. PL sales, for example, were expected to generate approximately \$90 billion in 2012 (PlanetRetail, 2012a). In 2011, the value of the European private-label food market reached €436 billion (PlanetRetail, 2011).

In the face of these large volumes, private-label production opportunities arise. A substantial part of this production is accounted for by dedicated private-label manufacturers. However, several national-brand manufacturers – such as Alcoa (which owns Reynolds Wrap aluminium foil), Parmalat, and H.J. Heinz – have adopted an “if you can't beat them, join them” attitude, and are engaging in their production (Dunne & Narasimhan, 1999; Quelch & Harding, 1996). In the U.S., it has been estimated that over half of the national-brand manufacturers pursue a dual strategy, and engage in private-label production next to their national-brand activities (Kumar & Steenkamp, 2007).

A major motivation for national-brand manufacturers to engage in private-label production is, as the former CEO of Ontario Foods testified, “to cultivate a better relation with retailers” (Littman, 1992, p. 2). According to Dunne and Narasimhan (1999), private-label production represents a neglected option for those who seek closer ties with their retailers, offering an opportunity to create retailer goodwill. IGD's European Private Label Survey revealed that 47% of all suppliers surveyed believe that strengthening their relationship with the retailer could be a major advantage of supplying private labels (IGD, 2006). However, there is substantial variability in the willingness of brand manufacturers to produce private labels. While some manufacturers,

like Dole and Kraft, are eager to do so, other manufacturers, like Coca-Cola and Heineken, have explicitly stated to never engage in private-label production. This variation in willingness may be driven by differences in the manufacturers' sales growth (Kumar & Steenkamp, 2007), in their ability to influence the produced private-label quality (e.g., by lowering private-label quality or by producing a private label that imitates a competitive national brand to preserve their own sales) (Dunne, 1999), or in their level of brand image at stake (de Jong, 2007). Moreover, the retailer may be more inclined to collaborate with some national-brand manufacturers to produce its private labels than with others, as some may provide more quality assurance (Sethuraman, 2009), or have higher innovative capacity (Kumar & Steenkamp, 2007) than others. In other instances, the retailer may prefer to assign its private-label production to a dedicated producer (who does not have any national brands of his own), rather than to a dual brander, as the former are known to be more cost-focused. Whether or not a given national-brand manufacturer produces private labels for a given retailer is therefore driven by manufacturer as well as retailer considerations. This will be reflected in our subsequent theorizing.

In this study, we look at the antecedents and consequences of private-label production by national-brand manufacturers for retailers. This topic has recently been recognized as being of great managerial interest, but seriously lacking in empirical research (Sayman & Raju, 2007, p. 147; Sethuraman, 2009, p. 771; Sethuraman & Raju, 2012, p. 331). The lack of empirical insights can be attributed to the secrecy surrounding who produces retailers' private labels, which makes it notoriously difficult to obtain the required data (Sethuraman & Raju, 2012). We undertook a massive data collection effort, covering detailed information on over 400 manufacturer-category combinations and two retailers, to empirically test whether private-label production by national-brand manufacturers indeed leads to retailer goodwill, while also considering the potential drivers

of this private-label production.

We test our hypotheses in a discount setting, where we focus on the prototypical hard discounter, Aldi, and Europe's largest soft discounter, Mercadona. Discounters are characterized by a limited assortment dominated by private labels, relatively small shopping areas, and very competitive prices.¹ To offer lower prices, they use a simplified, 'no-frills', store format. Hard discounters typically offer fewer than 1,400 SKUs in stores of around 1,000 square meters. Soft discounters, in contrast, have a more extended range of between 1,400 and 7,000 SKUs, which are sold in stores of around 1,500 square meters. In addition, the store environment is somewhat better, and also the fraction of national brands in the assortment is larger compared to hard discounters (IGD, 2002).

We chose the discount setting for two reasons. First, it has clear contemporary value. Discounters are the fastest growing retail format, with worldwide revenues forecasted to increase by roughly 60% over the next five years (PlanetRetail, 2010). Discounters de-emphasize national-brand offerings in their assortment, and focus predominantly on their private labels. Only recently, they have started to allow a limited number of national brands into their assortment (Deleersnyder, Dekimpe, Steenkamp, & Koll, 2007).² Given their impressive market share growth, brand manufacturers have come to realize that they cannot afford the luxury of not doing business with discounters (Thomson Reuters, 2009). This results in a very competitive setting with numerous candidate brand manufacturers competing for a limited number of spots (BusinessWeek, 2005). One way in which manufacturers hope to gain a discounter's goodwill, and thereby improve the odds of obtaining shelf presence for their national brands, is by producing private labels for the discounter.

¹ As such, they are distinct from large-scale every-day-low-price (EDLP) retailers such as Wal-Mart in the U.S., and from large supermarkets as Carrefour and Tesco in Europe (Cleeren, Verboven, Dekimpe, & Gielens, 2010).

² Aldi relied even exclusively on its private labels for many years (Brandes, 2005).

Second, the discount setting allows us to test our ideas in a more controlled, natural experiment-like, setting. While many alternative manifestations of retailer goodwill (besides shelf presence) should be taken into account at traditional retailers, such as reduced slotting allowances, lower promotional fees, a higher extent of pass-through, and/or more promotional feature/display support (most of which are also hard-to-get data), this is not the case for discounters. Discounters typically do not charge slotting allowances or promotional fees, and their format is characterized by very limited promotional activity (PlanetRetail, 2010). Since especially one form of retailer goodwill (viz., shelf presence) is plausible for brand manufacturers dealing with discounters, the discount setting offers a cleaner and more controlled environment for studying the effects of private-label production by national-brand manufacturers on retailer goodwill.

We develop a model that allows to test whether brand manufacturers who are involved in private-label production for a discounter have a higher likelihood of procuring shelf presence for their national brands. The paper is organized as follows. First, we review the limited literature on private-label production by brand manufacturers. Then, we present our conceptual framework and hypotheses. Next, we discuss the research method, data, and empirical findings. The final section discusses implications for researchers and managers, and provides suggestions for further research.

2. LITERATURE REVIEW

Despite “the richness of the phenomenon and the high level of managerial interest,” surprisingly little research has studied private-label (PL) production by national-brand (NB) manufacturers (Sethuraman, 2009, p. 771). A first set of papers has developed game-theoretic models to study the issue. Kumar, Radhakrishnan, and Rao (2010), for example, consider the retailer’s decision to

work with either a dedicated PL supplier or a dual brander. They focus on a two-level supply chain including a retailer, a NB manufacturer, and a dedicated (independent) manufacturer. Depending on whether the dedicated supplier or the NB manufacturer produces the retailer's PLs, a two-vendor or one-vendor regime emerges. Based on the size of the retailer's quality- versus price-sensitive customer segment, the retailer is shown to be better off with either the NB manufacturer or a dedicated PL manufacturer. Retailers with a large price-sensitive customer segment would not prefer a NB manufacturer to supply their PLs: NB manufacturers would lower PL quality (to preserve their own sales), and this is only profitable for the retailer if the quality-sensitive (NB-prone) segment is large. Interestingly, Kumar et al. (2010, p. 156) point out that their analysis does *not* apply to discount stores, as these are very much focused on the low-end, highly price-sensitive, segment.

Other studies have approached the PL-production decision from the point of view of a manufacturer who has to decide whether or not to engage in PL production for a given retailer. Using a model of vertical differentiation, Gomez-Arias and Bello-Acebron (2008) derive that, depending on the PL's quality positioning, a NB manufacturer might be more or less willing to supply the PL. They distinguish between high-quality and low-quality NB manufacturers. The pressure to produce PLs is the highest when the PL enters the market at a quality level similar to the manufacturer's NB quality. A high-quality NB manufacturer then wants to produce a high-quality PL to pre-empt competition and to be able to position the PL such that it competes with other NBs and not his own. Wu and Wang (2005), in turn, show analytically how PL production by one NB manufacturer can be used to mitigate promotional competition with other NB manufacturers. However, also this study may be less applicable in a typical EDLP-based discount setting where promotions are largely absent to start with.

Moreover, none of the aforementioned studies provides empirical support for the various contentions. This is not surprising, given that most manufacturers keep their involvement in PL production confidential (de Jong, 2007), out of fear for the impact that such knowledge may have on their main brands (Gomez-Ariaz & Bello-Acebron, 2008) and on their other retail relations. This makes empirical research on the topic difficult, and has prompted Sethuraman (2009, pp. 771-773) to call for more empirical research on both the *antecedents* and *consequences* of dual branding (i.e. the practice of NB manufacturers to also engage in PL production). More recently, Sethuraman and Raju (2012, p. 351) again conclude that “we need a better understanding of why a manufacturer would supply private labels and why a retailer would accept the same.” In line with these calls, Chen, Narasimhan, John, and Dhar (2010) estimated a structural model to derive the profit implications for various PL supply arrangements, and showed through a number of policy simulations, in the context of a single market (fluid milk), how engagement in PL production may be beneficial to NB manufacturers.

Our analysis differs from the aforementioned studies in a number of ways. First, while previous studies (e.g., Chen et al., 2010; Gomez-Arias & Bello-Acebron, 2008; Kumar et al., 2010) considered the (expected) profit consequences from various PL-supply schemes, we focus on the potential goodwill creation of a PL-production decision, which has been recognized as a key strategic consideration in both the academic literature (Dunne & Narasimhan, 1999) and the business press (IGD, 2006). Second, we empirically examine why certain NB manufacturers are more likely to be involved in the production of a discounter’s PLs than their competitors, and this across a broad set of grocery categories and manufacturers. We study this problem at two leading European discounters. To the best of our knowledge, no such large-scale empirical research is available on the determinants of a manufacturer’s engagement in PL production. Finally, several

of the aforementioned analytical models (e.g., Kumar et al., 2010; Wu & Wang, 2005) are less suited in an (EDLP-based) discount context. We focus on discounters, and therefore contribute to the (thus far) limited empirical literature (Cleeren et al., 2010; Deleersnyder et al., 2007) on this fast-growing retail format. As such, our study also differs substantially from ter Braak, Dekimpe, and Geyskens (2013), who study the implications of dual branding on retail profit margins in the context of a conventional supermarket, which follows a very different business model than discount stores.

3. CONCEPTUAL FRAMEWORK AND HYPOTHESES

Figure 1 summarizes our theorizing, both on the relationship between PL production and shelf presence, and on the determinants of a NB manufacturer's participation in such production.

--- Insert Figure 1 about here ---

3.1. The Effect of PL Production on Shelf Presence

PL production by a NB manufacturer may be seen by the discounter as a pledge by the NB manufacturer. "Pledges" are actions undertaken by channel members that demonstrate good faith, and that bind channel members to the relationship (Anderson & Weitz, 1992, p. 20). The offering of pledges functions as a signal of goodwill and invites reciprocal action. By making the pledge of PL production, the NB manufacturer effectively signals his cooperative behavior (Dunne & Narasimhan, 1999). This may lead to retailer goodwill, which can originate during the negotiation process and/or can become more pronounced as the relationship develops. This is consistent with the reciprocity literature (see e.g., Uhl-Bien and Maslyn, 2003, p. 514) which has argued that the time span of reciprocation can range from high immediacy (i.e. instantaneous) to low immediacy. Following this logic, PL production may represent a good opportunity for NB manufacturers to

enhance the likelihood of obtaining access to the discounter's most valued, yet scarce, resource, i.e. shelf presence. Hence:

H1: PL production by a NB manufacturer increases the likelihood of shelf presence.

3.2. The Effect of NB Manufacturer Market Power on Shelf Presence

When testing H1, we control for the intrinsic market power of the NB manufacturer. Following Shervani, Frazier, and Challagalla (2007), we define manufacturer market power as a manufacturer's ability to influence the actions of others in a product market. The industrial-organization literature has argued that a firm's market power is based upon the firm's market position, as reflected by its market share. If a firm operates in multiple product markets, its market power can vary considerably across them.³ Empirical research has shown that powerful firms are able to secure relatively high levels of influence on the behavior of related channel members (e.g., Anderson, Lodish, & Weitz, 1987; Shervani et al., 2007; Sudhir & Rao, 2006). In a similar vein, we argue that more powerful manufacturers – with a larger volume share in the category obtained from more and stronger brands – are generally in a better position to secure shelf space. The addition of their NB is expected to improve the discounter's perceived assortment quality and variety, as these brands will stand out more against an otherwise PL-dominated assortment (Deleersnyder et al., 2007). Because of their expected contribution to the discounter's financial goals, discounters will be more receptive to brands offered by powerful NB manufacturers. We therefore postulate:

H2: NB manufacturer market power increases the likelihood of shelf presence.

Moreover, this variable may interact with PL production. Specifically, the positive effect

³ Power has been examined at different levels in the strategy literature. In contrast to a firm's overall power position within the manufacturer-discounter interfirm relationship, our focus is on a firm's market power in a product market or product category (see Shervani et al., 2007 for a similar approach).

of PL production on the likelihood of shelf presence is expected to be more pronounced for less powerful NB manufacturers. Relationship quality has been shown to have a larger impact on new-product acceptance when products are moderately attractive than when they are very attractive (as when offered by the most successful manufacturer) (Kaufman, Jayachandran, & Rose, 2006). In a similar vein, retailers have been found to prefer the leading NB manufacturer as category captain, *unless* smaller players can (or are willing to) offer a special service (Subramanian, Raju, Dhar, & Wang, 2010). As such, PL production can be used by smaller NB manufacturers as a tool to overcome an inherent market-power disadvantage. In other words, when a NB manufacturer's market power is smaller, the likelihood that a discounter will grant this NB manufacturer shelf presence increases considerably when the manufacturer establishes a strong relationship with this discounter (i.e. produces PLs for the discounter). When his market power is very high, a NB manufacturer is already likely to be granted shelf presence, regardless of PL production. The latter then has less incremental impact. Following this line of reasoning:

H3: Manufacturer market power diminishes the effect of PL production in increasing the likelihood of shelf presence for a NB manufacturer.

3.3. Drivers of PL Production

We include three major drivers of PL production by a NB manufacturer for a discounter, reflecting three categories of motives: the extent of sales growth (economic motive), the relative ease of producing high-quality products in the category (quality/positioning motive), and the marketing tools used to support the manufacturer's brands (brand-equity motive).

3.3.1. Manufacturer sales growth. PL production often starts on an opportunistic basis when a manufacturer has idle capacity (Gomez-Arias & Bello-Acebron, 2008; Kumar &

Steenkamp, 2007), which may, for example, be caused by increased competition from other manufacturers, or by reduced demand during tough economic times (Sethuraman & Raju, 2012). A PL order is then used to complement the lower NB sales. PL production can increase/maintain NB manufacturers' total sales volumes, and thereby safeguard profits (Quelch & Harding, 1996; Soberman & Parker, 2006).

For the discounter, we could argue that (all else equal), it may also prefer a manufacturer with lower NB sales growth. Indeed, such manufacturers could be perceived as an easier target to achieve good supply conditions, thereby increasing the discounter's profitability.

We therefore hypothesize that higher sales growth decreases a manufacturer's likelihood of engaging in PL production. Negative NB sales growth, in contrast, may lead to costly excess capacity for a manufacturer, and hence increase a manufacturer's likelihood of producing PLs.

H4: Manufacturer sales growth decreases the likelihood of observing PL production by the manufacturer for the discounter.

3.3.2. Ease of producing high-quality products. A second key consideration for NB manufacturers is the possibility to manage/influence PL quality (Dunne, 1999; Kumar & Steenkamp, 2007). When it is difficult to produce high-quality products in the category, discounters will have a harder time to match the intrinsic quality of the NBs, which gives the latter a competitive advantage. To preserve that advantage, NB manufacturers will be reluctant to enter into a PL-production relationship with a discounter. When it is relatively easy for discounters to match NB quality, in contrast, NB manufacturers will be more willing to produce, as there is no sustainable competitive advantage at stake. Gomez-Arias and Bello-Acebron (2008) showed that a NB manufacturer's incentive to produce PLs is particularly high if the PL matches a manufacturer's NB quality, which is more likely when the ease of producing high-quality

products is high. NB manufacturers then have the ability to influence the positioning of the PL (Gomez-Arias & Bello-Acebron, 2008; Kumar et al., 2010), for example by producing a PL that imitates a competitive NB to preserve their own sales (Sayman, Hoch, & Raju, 2002). Moreover, if they do not produce a discounter's PL, a competitor is likely to do so, giving them an incentive to pre-empt the competition (Steenkamp & Dekimpe, 1997).

However, to come to actual PL production for a given discounter, both the manufacturer and the discounter must agree. Indeed, the latter must decide whether to work with a dedicated PL manufacturer (who does not sell any NBs) or to select a dual brander. Dual branders are said to have more innovative capacity (Kumar & Steenkamp, 2007) and to offer more quality assurance (Sethuraman, 2009) than dedicated manufacturers. Clearly, the second issue is especially relevant when it is difficult to produce high-quality products. Hence, when it is difficult to produce high-quality products, a discounter will more likely opt for a leading NB manufacturer for its PL production. In contrast, when it is easy, the discounter may well opt for a dedicated manufacturer, who is more price-focused (Kumar & Steenkamp, 2007).

Depending on the relative strength of both arguments, the observed choice will be driven more by manufacturer (positive association between ease of producing and PL production) or discounter (negative association between ease of producing and PL production) considerations. If the effect is positive, the manufacturer considerations dominate; if it is negative, the discounter rationale prevails. In sum:

H5a/b: The higher the ease of producing high-quality products in the category, the higher/lower the likelihood of observing PL production by a NB manufacturer for the discounter.

3.3.3. Manufacturer marketing tools. Numerous studies discuss how NB manufacturers

could battle PLs. According to Kumar and Steenkamp (2007), there are three distinct tools used by NB manufacturers to create winning value propositions for their NBs versus PLs. First, NB manufacturers may try to differentiate themselves from cheaper PL imitations by conveying unique emotional benefits and signaling future demand through advertising (Desai, 2000; Steenkamp & Dekimpe, 1997). However, this carefully built-up image may be damaged if their customer base would find out that they also produce PLs (Gomez & Benito, 2008; Hoch, 1996), making NB manufacturers who rely heavily on advertising reluctant to engage in PL production. Second, charging a hefty price premium in the market over PLs is another way to position the NBs away from PLs (Ailawadi, Lehmann, & Neslin, 2003). Manufacturers may, again, not be willing to put this competitive advantage on the line by producing a cheaper variant for the discounter. Finally, they can introduce innovations, and thereby offer products that are distinct from any existing PL. Maintaining this quality edge curbs PL growth, as it puts retailers in the position of imitating yesterday's favorites (Lamey, Deleersnyder, Steenkamp, & Dekimpe, 2012). NB manufacturers heavily involved in developing new products will be less inclined to produce PLs, as this may put them in a position where the discounter can exert pressure to share the latest technologies (Dunne & Narasimhan, 1999), which would undermine their competitive advantage. Each of the marketing tools is therefore predicted to decrease the likelihood of observing PL production by that NB manufacturer for the discounter. As indicated before, some manufacturers motivate their willingness to participate in the PL production process through an "if you can't beat them, join them" reasoning (Sethuraman & Raju, 2012). The three aforementioned arguments reflect this idea, in that they describe conditions where NB manufacturers are more/less able to withstand the impact of PL growth on their own performance.

Given the secrecy surrounding the identity of the actual PL producers, discounters should

not be concerned about the amount of advertising support given by the NB manufacturer to his own brands, nor about the price differential between a manufacturer's NBs and the discounter's PLs when deciding on their PL sourcing. However, given that dual branders are thought to provide more innovative capacity when producing PLs (Kumar & Steenkamp, 2007), the innovativeness of a NB manufacturer may play an important part in the discounter's preference (i) for a dedicated supplier versus a dual brander, and (ii) in case the latter option is selected, its preference for some NB manufacturers over others. The more innovative a manufacturer is, the higher a discounter's interest in that manufacturer as the preferred option to produce its PLs. In sum:

H6: The more a NB manufacturer advertises, the lower the likelihood of observing PL production by the manufacturer for the discounter.

H7: The higher the price premium a NB manufacturer charges over a discounter's PLs, the lower the likelihood of observing PL production by the manufacturer for the discounter.

H8a/b: The more innovative a NB manufacturer is, the lower/higher the likelihood of observing PL production by the manufacturer for the discounter.

For the latter hypothesis, depending on the relative strength of both arguments, the observed choice will be driven more by manufacturer (negative association between a manufacturer's innovativeness and PL production) or discounter (positive association between a manufacturer's innovativeness and PL production) considerations.

3.3.4. Manufacturer market power. Finally, we also consider the effect of manufacturer market power on the PL-production decision. We propose that manufacturer market power may have an impact on the NB manufacturer's likelihood of producing PLs. According to Dunne and

Narasimhan (1999), producing PLs is especially interesting for small manufacturers of non-leading NBs aiming to increase their sales volume. Alternatively, one could argue that PLs have become so successful that NB manufacturers who want to produce PLs for discounters need sufficient capacity (size) to handle the large volumes (IGD, 2005). Because good arguments are available to support an increased likelihood of PL production for lower/higher manufacturer market power, we offer competing hypotheses:

H9a/b: Manufacturer market power decreases/increases the likelihood of observing PL production by the manufacturer for the discounter.

4. RESEARCH SETTING AND MEASURES

4.1. Setting

Consumer packaged goods (CPG) companies regard Germany and Spain as two key European markets with respect to discounters. They are both among the largest consumer markets in Western Europe. Not only does the discount format originate from Germany, its current market share already exceeds 40% (PlanetRetail, 2012b). Further, discounter share is rapidly increasing in Spain, where it sums up to around 30% (PlanetRetail, 2012c).

In Germany, we study Aldi, the “mother of all discounters.” Aldi’s market share in Germany equals about 15% in 2012 (PlanetRetail, 2012d). Across Europe, Aldi operates a total of over 8,000 stores, in 16 countries. With current global sales of \$80 billion, Aldi is ranked among the top 10 grocery retailers in the world. Although Aldi’s PL assortment differs *across* countries, it follows a centralized, national approach to its assortment management, with the same offering present in each outlet *within* a country (ACNielsen, 2007).⁴ Traditionally, Aldi did not carry any NBs in its assortment. However, it recently started accepting NBs on a limited basis. Although

⁴ This feature is important when collecting data through store visits (cf. *infra*).

more than 90% of Aldi's range still consists of PLs, recent NB additions in Germany include Snickers candy bars (Masterfoods), Del Monte canned fruit (Del Monte), and Quality Street sweets (Nestlé).

In Spain, we study the leading discounter Mercadona. Mercadona has been the key winner in this country in recent years. It is the largest grocery retailer in Spain, operating around 1,400 outlets, and was ranked the 9th most reputable company in the world in 2009 by Forbes Magazine. The firm's strategy is built around consistently offering value for money, rather than short-term price promotions. Its sales in Spain have almost doubled over the last five years and amount to \$24 billion (PlanetRetail, 2012c). Currently, Mercadona sells around 2,000 PL products. Shelf space for NBs is limited, as Mercadona tries to achieve a 50-50% mix between PLs and popular brands (Bain & Company, 2008), with typically just one or two NBs facing each PL (Fernandez Nogales & Gomez Suarez, 2005). As a result, 30% fewer product varieties tend to be available at Mercadona than in traditional supermarkets (Bain & Company, 2008). While Mercadona can be classified as a soft discounter, Aldi is a prototypical hard discounter.

Clearly, NB shelf space is a scarce resource with both discounters, which is sought after by many NB manufacturers. Interestingly, discounters typically do not charge slotting allowances or promotional fees (PlanetRetail, 2010). Hence, these issues do not enter channel (goodwill) negotiations. By considering both Europe's leading hard (Aldi) and soft (Mercadona) discounter, we can infer to what extent our findings differ (are common) across both format types.

4.2. Sample and Measures

Our unit of analysis is the NB manufacturer in a certain category at the discounter. We only consider categories that contained at least one NB and thus, where the discounter made the

deliberate decision to extend its assortment with a NB offering. For Aldi, we collected data on 37 grocery categories. For each category, we determined the top-5 NB manufacturers in terms of their 2005 category purchases in Germany, based on panel data from GfK. For Mercadona, we obtained through Kantar Worldpanel data on 53 categories where at least one NB was available. We retained the top-5 NB manufacturers in terms of their 2009 category sales volume in Spain.⁵ To illustrate the range of products available in our dataset, we grouped the categories into broader product groups. Table 1 shows these groups, along with some illustrative examples of included categories. For each of the resulting 450 manufacturer-category combinations (the top-5 NB manufacturers for 90 categories, with 37*5 observations for Aldi and 53*5 observations for Mercadona), we combined a wide variety of data sources to operationalize our variables.

--- Insert Table 1 about here ---

4.2.1. Shelf presence. We measure shelf presence on the basis of GfK/Kantar consumer panel data for Germany and Spain, which covers all grocery purchases made by a representative national sample of 20,000+ German and 8,000+ Spanish households. Shelf presence captures whether or not a NB owned by one of the top-5 NB manufacturers in a category was available in that category at the discounter (1 = yes, 0 = no). For Aldi, this information was available between January 2002 and June 2008. For the 185 (37*5) manufacturer-category combinations, we checked whether these NB manufacturers own a NB for which a purchase record in the category at Aldi could be found during the time frame of our data. We observed such shelf presence for 46 (out of 185) manufacturer-category combinations. For Mercadona, shelf presence was measured in the year 2009. In this case, shelf presence was observed for 139 (out of 265) manufacturer-

⁵ For Aldi, PL production data covered the 2002-2008 period (cf. *infra*) – we determined the top-5 NB manufacturers for the midpoint of this time frame (2005). Since PL production data for Mercadona pertained to 2009, we determined the top-5 NB manufacturers for 2009. No PL production data on preceding years was available for Mercadona.

category combinations. Proportionally, more instances of shelf presence for the top-5 NB manufacturers are seen with Mercadona, which is consistent with its positioning as a soft discounter. Table 2 provides more details on the distribution of the number of top-5 NB manufacturers with shelf presence at the discounter across categories.

--- Insert Table 2 about here ---

4.2.2. PL production. We measure “PL production” as a binary variable that is coded 1 if the NB manufacturer engaged in PL production for the discounter in the category, and 0 otherwise. In spite of the secrecy surrounding Aldi (Brandes, 2005) and the reluctance to acknowledge PL production by NB manufacturers (de Jong, 2007), we were able to obtain information on PL production for Aldi through extensive field research. Between January 2002 and June 2008, approximately 650 PLs were sold in the 37 categories under investigation at Aldi. For each of those 650 PLs, we determined the producer. Because this data was not readily available through conventional channels, various sources were consulted. As a starting point, we obtained four books with information on the manufacturers of 200 popular PLs sold at Aldi (Bertram, 2006; Schaab & Eschenbek, 2008; Schneider, 2005, 2006). For the remaining 400+ products, we replicated their procedure to uncover the manufacturers of all PLs in the 37 categories studied. To that extent, we exploited the fact that Aldi is one of the rare retailers that states the address of the manufacturer on its packages (de Jong, 2007). To extend and/or validate this information, we also consulted various websites (including www.ciao.de, www.yopi.de, www.discounter-archiv.de, and www.wer-zu-wem.de) devoted to consumer product reviews, company profiles, and/or discounter products. Specifically, for each PL, we recorded (through numerous store visits and online searches) the manufacturer’s address. We then checked whether the manufacturer’s address matched the address of one of the top-5 NB manufacturers in the

category. In case of no address match, we looked up the name of the manufacturer located at this address, and assessed whether it was a subsidiary of one of the top-5 NB manufacturers. As such, we account for the situation that NB manufacturers may produce PLs for a discounter at a different address or location, and/or at a subsidiary with a different firm name. For 68 (out of 185) manufacturer-category combinations, we found evidence of PL production for Aldi (see Table 3, panel A). For 63 (93%) of them, more than one data source was found confirming this PL production activity. In 32 (or 86%) of the 37 categories examined at Aldi, at least one of the top-5 NB manufacturers was involved in the production of Aldi's PLs.⁶ Examples for Aldi include Campina (yoghurt), Dr. Oetker (dessert), and Bonduelle (canned vegetables).

For Mercadona, we were fortunate to obtain, with the help of Kantar Worldpanel, internal category-level PL producer information for the year 2009. Still, we again implemented an extensive online search to detect any less obvious dependence between the listed producer and the 53*5 NB manufacturers in our sample. For 24 (out of 265) manufacturer-category combinations, we found evidence of PL production for Mercadona (see Table 3, panel B). In 23 (or 43%) of the 53 categories examined at Mercadona, at least one of the top-5 NB manufacturers was involved in the production of Mercadona's PLs.⁷ For reasons of confidentiality, no Mercadona examples can be revealed. A simple bivariate χ^2 test provides initial evidence of a relationship between PL production and shelf presence ($\chi^2(1) = 21.33, p < .01$ for Aldi and $\chi^2(1) = 16.27, p < .01$ for Mercadona), a finding to be validated in our subsequent multivariate analyses.

--- Insert Table 3 about here ---

4.3. Predictors

We measured the covariates for Aldi in the year preceding shelf presence. When no brand of the

⁶ In the other five categories, where none of the top-5 players produced one of the discounter's PLs, we found evidence of PL production by a non-top-5 NB manufacturer.

⁷ In 12 out of the 30 remaining categories, Mercadona chose a non-top-5 NB manufacturer to produce its PLs.

NB manufacturer was listed at Aldi, we used 2005 as the base year for the covariates. For Mercadona, we measured the covariates in the year 2008 (i.e. the year before we observe shelf presence). For a complete overview of the timing, source, and operationalization of our variables, we refer to Table 4.

--- Insert Table 4 about here ---

4.3.1. Manufacturer sales growth. This is measured as the maximum growth in a manufacturer's NB volume sales across three consecutive years in the category, and obtained from the panel data. Whereas positive sales growth signals sufficient NB demand and perhaps the need for investment in additional production capacity, negative sales growth signals idle production capacity (Lieberman, 1987). We also specified sales growth as the average growth in a manufacturer's NB volume sales in the category across the three consecutive years. Our results remain the same.

4.3.2. Ease of producing high-quality products. We measure the perceived ease of producing high-quality products through a 5-point reverse-scored survey item: "In the category XXX, making good quality products is difficult." We combined this country-specific information (i.e. from German consumers for the Aldi observations and from Spanish consumers for the Mercadona observations) from regular users of the category (where each consumer could provide information on at most four categories),⁸ with information from four industry experts (who had to rate all categories).⁹ Both groups had similar assessments, evidenced in a highly significant correlation ($r = .41, p < .01$) between their respective averages.

4.3.3. Manufacturer marketing tools. We measure the extent of "advertising" support by

⁸ Consumer perceptions on the difficulty to make high-quality products in the category were also used in Aaker and Keller (1990) and Steenkamp, van Heerde, and Geyskens (2010), among others.

⁹ Specifically, the chairman of IPLC (a consultancy firm specializing in international PL production issues), the director Strategic Initiatives from GfK Benelux, the director of the EFMI Business School (knowledge center for the food sector), and a knowledgeable practitioner with ample experience working on the PL supply side, participated.

means of the annual national advertising expenditures (in €) in the category by the NB manufacturer.¹⁰ The German advertising data is obtained from Thomson Media Control, a provider of market data on advertising spending across all media in Germany. The Spanish advertising data is obtained from InfoAdex, a company that measures advertising investments across the various media in Spain. Second, a manufacturer's "price premium over PLs" is obtained from the panel data, and measured as the market-share-weighted average national unit price of all NBs of a manufacturer in the category compared to the market-share-weighted average unit price of the discounter's PLs in the category (Ailawadi et al., 2003). Finally, to measure a NB manufacturer's innovativeness, we counted the number of "innovations" launched in the category by the manufacturer in the German market (for the Aldi observations) or the Spanish market (for the observations from Mercadona) using data from Product Launch Analytics. Product Launch Analytics, formerly known as Productscan, is a subscription-based database that tracks CPG introductions (see e.g., Sorescu & Spanjol, 2008, for an in-depth discussion on this data source). The vast majority of the NB manufacturer-category combinations in our sample are characterized by either no innovation (62% of the sample) or one innovation (23%) in the relevant category per year. Only 15% of the sample had more than one innovation per year in the category.

4.3.4. Manufacturer market power. We measure manufacturer market power as the national "category share" of all brands of a NB manufacturer in terms of volume, using the panel data (Gielens & Steenkamp, 2007). Given that we interact this variable with PL production, we

¹⁰ The German advertising data were only available from 2005 onwards, so for some of the Aldi observations we could not use the year before the NB listing for this covariate. Instead, we used the year 2005 for all observations. However, in the years 2005-2007, the average correlation between the NB manufacturers' advertising spending in two consecutive years was >.95.

grand-mean-center it to facilitate interpretation (Irwin & McClelland, 2001).¹¹

4.3.5. Control variables. Apart from the above variables, we also control for differences between the two discounters by including a discounter dummy. Moreover, we control for PL production by the NB manufacturer for the discounter beyond the focal category (1 = yes, 0 = no PL production is observed in another category in our sample at that discounter). We expect a NB manufacturer to be more likely to produce PLs in the focal category if he also does so in one of the other categories. Moreover, we allow for PL production by the NB manufacturer in one category to also affect NB shelf presence in another category. On the one hand, one could expect that producing a PL in one category would also facilitate shelf presence in another category. On the other hand, as retailers embrace category management practices (e.g., Basuroy, Mantrala, & Walters, 2001), the pledge of PL production may not lead to goodwill in another category (for which a different category manager is responsible) or only to a lesser extent. Perhaps, if PL production in a category is already rewarded in that same category, it could even lead to a lower likelihood of shelf presence in another category.

In addition, we also control for the relative strength of the specific discounter in the category. This factor may affect a discounter's willingness to accept stronger, or to prefer weaker, NB opponents in its assortment. Moreover, it may affect a manufacturer's willingness to produce PLs for the discounter in that category. To control for the relative strength of the discounter, we include the discounter's (volume) share in the total (national) sales in the category. Given that we want to control for a discounter's relative strength in a category (compared to the other categories), we centered this covariate within the discounter.

Finally, we include two product-class dummies (one to indicate household care and personal care, and one to indicate beverages, with food products as the base-level category) to

¹¹ We also used mean-centering within a discounter, and all findings remained perfectly stable.

control for unobserved category effects (see e.g., Lamey et al., 2012 or Steenkamp et al., 2010 for a similar practice). The covariates are not the focus of our study, but controlling for them provides a stronger test of our hypotheses (Greene, 2000).

We conducted formal tests to assess the skewness of all continuous covariates in our model. Following Tabachnick and Fidell (1996), we determined whether the skewness statistic exceeded twice the standard error of the statistic. Based on these tests, all continuous variables were found to be skewed and were log-transformed.¹² None of the VIF statistics exceeded 3, suggesting that multicollinearity is not an issue (Cohen, Cohen, West, & Aiken, 2003).

5. MODEL

PL production is not a purely exogenous variable, but the result of strategic considerations from both the NB manufacturer's and the discounter's side. A failure to statistically correct for this endogeneity may not only lead to biased estimates, but also to faulty conclusions about our key propositions (Hamilton & Nickerson, 2003). If manufacturers who produce PLs self-select themselves and/or are selected by the discounter on the basis of unobservable characteristics that affect both shelf presence and PL production, a problem of selection bias may arise. Selection bias can be corrected for through the traditional two-step estimation technique proposed by Heckman (1979) or, alternatively, by using Maximum Likelihood (ML) estimation on a system of equations. Since ML estimates are more efficient and have smaller standard errors than the two-stage estimates (Breen, 1996), we opt for that procedure.

To allow for, respectively, the potential inter-correlation among observations (within a discounter) from multiple manufacturers within the same category, and among observations from

¹² Since innovations could have a value of zero, the transformation $\ln(\text{innovations} + 1)$ was used. A similar transformation was used for the advertising expenditures.

the same manufacturer across multiple categories, we use robust two-way clustered-error term estimation on the system of equations (Cameron, Gelbach, & Miller, 2011).

Preliminary pooling tests failed to reject the assumption of homogeneity across both discounters ($p > .05$) for all but four effects: the impact of (i) manufacturer market power and (ii) its interaction effect with PL production on shelf presence, and the impact of (iii) price premium and (iv) PL production in a non-focal category on the PL-production decision. Hence, we pool the data across the two discounters, but allow for discounter-specific effects in these four instances (along with a discounter-specific fixed-effects correction).

We estimate the following system of equations, where the first and the second equation are referred to as the outcome equation and the strategy-selection equation, respectively:

$$\begin{aligned}
 (1) \quad \text{PRESENCE}_{ijd} &= \beta_0 + \beta_0' D_MERC_d + \beta_1 \text{PLPROD}_{ijd} + \beta_2 (\text{M_POWER}_{ijd} * D_ALDI_d) \\
 &+ \beta_2' (\text{M_POWER}_{ijd} * D_MERC_d) + \beta_3 (\text{PLPROD}_{ijd} * \text{M_POWER}_{ijd} * D_ALDI_d) \\
 &+ \beta_3' (\text{PLPROD}_{ijd} * \text{M_POWER}_{ijd} * D_MERC_d) + \Gamma Z_{ijd} + \varepsilon_{ijd} \\
 (2) \quad \text{PLPROD}_{ijd} &= \delta_0 + \delta_0' D_MERC_d + \delta_1 \text{GROWTH}_{ijd} + \delta_2 \text{EASE}_{jd} + \delta_3 \text{ADV}_{ijd} \\
 &+ \delta_4 (\text{PPREM}_{ijd} * D_ALDI_d) + \delta_4' (\text{PPREM}_{ijd} * D_MERC_d) \\
 &+ \delta_5 \text{INNOV}_{ijd} + \delta_6 \text{M_POWER}_{ijd} + \Omega Z_{ijd} + \varepsilon_{ijd}
 \end{aligned}$$

with D_MERC_d a discounter-specific fixed effect and Z_{ijd} a vector containing all other control variables (PL production in a non-focal category, discounter category share, and two product-class dummies), and Γ and Ω the corresponding vector of coefficients in the outcome and strategy-selection equation, respectively.

In the outcome equation, PRESENCE_{ijd} captures whether NB manufacturer i obtained shelf presence in category j with discounter d . PLPROD_{ijd} reflects whether NB manufacturer i

produces PLs in category j for discounter d . Moreover, this equation includes discounter-specific parameters for both the main effect (β_2 and β_2') of a manufacturer's market power in the country of discounter d (M_POWER_{ijd}) and for its interaction (β_3 and β_3') with PL production.

The strategy-selection equation includes the observable drivers of PL production by a NB manufacturer, viz. a manufacturer's category sales growth ($GROWTH_{ijd}$) in the country of discounter d , the perceived ease of producing high-quality products in the category ($EASE_{jd}$) in that country, and the marketing tools used by a NB manufacturer to position his NBs in each country: a manufacturer's advertising (ADV_{ijd}), price premium ($PPREM_{ijd}$), and innovations ($INNOV_{ijd}$) in the category. Based on the preliminary pooling tests, this equation has discounter-specific parameters for a manufacturer's price premium (δ_4 and δ_4') and his PL production in a non-focal category. We further include a manufacturer's market power (M_POWER_{ijd}).

The strategy-selection equation takes the form of a probit model. To reflect the dichotomous nature of shelf presence, the outcome equation is also estimated through a probit specification, so that the system of equations becomes a bivariate probit model. This specification is often referred to as a recursive bivariate probit model with the treatment variable (in our case, the PL production) as endogenous regressor in the outcome equation (see e.g., Guo & Fraser, 2010; Jones, 2007). To allow for the possibility that unobserved characteristics drive both shelf presence and PL production, no restrictions are imposed on the correlation (ρ) between ε_{ijd} and ε'_{ijd} . Therefore, ρ can take on any value between -1 and 1. A significant ρ underscores the importance of explicitly considering selection. A significant positive (negative) ρ implies that the PL-production effect estimated without the correction would be biased upward (downward) (Briggs, 2004). When ρ is not significant, there is no selection problem (Breen, 1996).

6. ESTIMATION RESULTS

The *significance* of the error correlation ρ indicates that unobservable variables exist that affect the dependent variable in both equations, and thus that a selection correction is needed ($\rho = -.87$, $p < .01$). The *negative sign* of ρ indicates that the PL-production coefficient without the correction would be biased downward, and that unobserved factors that make selection more (less) likely, tend to have an opposite effect in the outcome equation. The negative sign therefore shows that, on average, unobserved factors that make a NB manufacturer intrinsically less likely to produce PLs increase the likelihood that the discounter reciprocates by granting shelf presence if this production nevertheless takes place. PL production under such circumstances is seen as a larger pledge from the manufacturer, which makes it more likely to be rewarded by the discounter in return. In the context of our study, an unobserved factor that may have such opposite effects is brand quality: manufacturers owning high-quality brands may be less interested in producing PLs, but these brands are intrinsically more valuable to the discounter to have in its assortment. However, we can only speculate on the potential causes of ρ as these factors are by nature unmeasured.¹³ Table 5 reports the parameter estimates for the outcome and strategy-selection equation. In both instances, a satisfactory hit rate is obtained, as the model is able to correctly identify PL production in 85% and shelf presence in 73% of all manufacturer-category combinations. In case our hypotheses are directional, we report one-sided significance levels.

--- Insert Table 5 about here ---

6.1. Outcome Equation Estimates

Turning first to the outcome equation, we find that PL production by a NB manufacturer for a discounter leads, at the average level of manufacturer market power, to a significantly higher

¹³ While there is a general agreement on the importance of controlling for sample selection issues, some authors (see e.g. Lemke & Reed, 2001; Guo & Fraser, 2010) have warned to not over-interpret the actual size of the correction parameter (in our setting, the correlation ρ).

likelihood of obtaining shelf presence in the category at that discounter ($\beta_1 = 2.26, p < .01$).

Hence, H1 is supported. Also when a manufacturer already produces PLs in another category, his acceptance probability in the focal category remains increased ($\beta_1 + \gamma_1 = 1.53, p < .01$), albeit to a lesser extent. Hence, while production in the focal category still creates additional goodwill, the incremental effect if the manufacturer already did so in another category is smaller (as evidenced by the negative γ_1), as there is less signaling value to this additional pledge. Similarly, when already producing in another category, a refusal to do so in the focal category sends a quite negative signal, and jeopardizes the probability of gaining shelf access in the latter.

As to H2 and H3, no significant effect of manufacturer market power is found for Aldi, neither in the produce condition ($\beta_2 + \beta_3 = .04, p > .10$) nor in the no-produce condition ($\beta_2 = -.07, p > .10$). For Mercadona, in contrast, we do find a significant effect of manufacturer power in the no-produce condition ($\beta_2' = .51, p < .01$). In the case of PL production, however, NB manufacturer power has no longer a significant effect on the likelihood of obtaining shelf presence with Mercadona ($\beta_2' + \beta_3' = -.10, p > .10$). Hence, manufacturer market power diminishes the effect of PL production on the likelihood of NB shelf presence, supporting H3. As for the control variables, we also find a significant positive discounter-specific fixed effect for Mercadona ($\beta_0' = 1.21, p < .01$). This result is in line with the fact that Mercadona is a soft discounter, and thus more inclined to accept NBs than Aldi, a hard discounter. Finally, we find no effect of discounter category share or of the product-class dummies on shelf presence.

6.2. Strategy-Selection Equation Estimates

We find evidence that a NB manufacturer's sales growth negatively affects the PL production decision ($\delta_1 = -.37, p < .05$). Hence, we can support H4. Ease of producing high-quality products

in the category also has an impact. The easier it is to produce high-quality products, the higher the likelihood of observing PL production by a NB manufacturer for the discounter ($\delta_2 = 2.69, p < .10$). As such, H5a is supported. This provides support for the manufacturer's rationale, as opposed to the discounter's rationale.

Concerning the marketing tools used by the NB manufacturer, we find that advertising expenditures have the expected negative effect. The likelihood that a NB manufacturer engages in PL production decreases as he spends more on advertising ($\delta_3 = -.02, p < .10$). Thus, H6 is supported. As to H7, a higher price premium over hard discounter Aldi's PLs reduces a manufacturer's probability of producing PLs ($\delta_4 = -.80, p < .01$). For soft discounter Mercadona, the price premium does not have an effect. Concerning H8, we find that the innovativeness of a NB manufacturer on the likelihood of PL production has a negative effect ($\delta_5 = -.18, p < .10$). As such, we find that the manufacturer's rationale for PL production prevails over the discounter's rationale.

To get some insights into the relative importance of the three (economic, quality/positioning, and brand-equity) motives of PL production by a NB manufacturer, we conducted a "what-if" analysis (see Inman, Winer, & Ferraro, 2009 for a similar practice) that examines the impact on a NB manufacturer's PL-production propensity when increasing each of the variables by one standard deviation above its mean,¹⁴ while the other variables are held fixed at their baseline level (i.e. mean for continuous variables and zero for dummy variables). Among the marketing-mix variables (the brand-equity motive), NB manufacturers dealing with Aldi are primarily concerned when a price premium is at stake (a one standard deviation increase in price premium reduces their propensity to produce with 11.8%, i.e. from 24.2% to 12.4%). Advertising and innovation-related concerns have a roughly equivalent, yet smaller, effect (advertising: -4.4%;

¹⁴ Because of the skewness of the data, we use the mean and the standard deviation of the log-transformed variables.

innovation: -3.3%). Marketing mix concerns are much less an issue when dealing with soft discounter Mercadona: the price-premium argument becomes insignificant, while the impact of advertising (-1.7%) and innovation (-1.3%) becomes substantially smaller. Sales growth (the economic motive) and ease of production (the quality/positioning motive) have an impact of similar magnitude, yet again more pronounced for Aldi than for Mercadona (Aldi: -7.0% and +5.4%; Mercadona: -2.6% and +2.4%).

The effect of manufacturer market power provides some additional insights: the likelihood of observing that a NB manufacturer produces PLs increases when the NB manufacturer's category share increases ($\delta_6 = .21, p < .10$). Hence, H9b is supported.¹⁵ This provides support for the discounter's rationale (see Table 6 for a summary of the arguments and the corresponding empirical evidence).

--- Insert Table 6 about here ---

As to the control variables, we observe that PL production by leading NB manufacturers is more likely for Aldi than for Mercadona ($\delta'_0 = -1.16, p < .01$). Second, we find that PL production in one category enlarges the likelihood of producing in another. The effect is significantly positive for both Aldi ($\omega_1 = .83, p < .05$) and Mercadona ($\omega'_1 = 2.69, p < .01$), although it differs in magnitude. Finally, the covariate related to discounter category share shows that the likelihood that a NB manufacturer engages in PL production in a certain category increases when the discounter has a higher share of the market in that category ($\omega_2 = .99, p < .01$), as there is more at stake for the manufacturer in his effort to obtain shelf presence.¹⁶

¹⁵ We also examined whether the non-directional effects of ease of producing high-quality products and innovations are dependent on the level of manufacturer market power. Specifically, we added the interaction terms to Equation 2 (again, taking into account whether these interactions could be pooled or not based on preliminary pooling tests). The interactions were not significant, neither individually nor jointly ($p > .10$).

¹⁶ We also tested for an interaction effect of PL production and discounter category share in the outcome equation. However, this effect was found not to be significant ($p = .33$). Moreover, all other results remained stable. For ease of

6.3. Robustness Checks

Several tests were performed to substantiate the robustness of our findings.

6.3.1. Brand versus manufacturer power. Consistent with our conceptual framework, we measured a firm's market power by its total market share in the category. However, a manufacturer's high market power can be derived through multiple moderately-strong brands, or through one very popular main brand. Retailers may be especially interested in listing the latter. We therefore re-estimate our model using brand rather than manufacturer power, with brand power defined as the volume share of the manufacturer's largest brand.¹⁷ All results remain substantively the same.

6.3.2. Absolute versus relative measures. In line with Ailawadi and Harlam (2004) and Slotegraaf and Pauwels (2008), we used absolute measures to operationalize a manufacturer's extent of advertising support and innovation activity. However, some authors (see e.g., Lamey et al., 2012; Reibstein & Wittink, 2005) have advocated the use of relative measures, given the importance of knowing how a manufacturer performs relative to competitors operating under the same economic conditions. Therefore, we re-estimate our model measuring a manufacturer's extent of advertising and innovations relative to the total level of all five leading NB manufacturers in that category. Our findings remain stable. The only exception is that the effect of the extent of advertising on PL production, while similar in sign and magnitude, fails to reach significance ($p = .19$).

6.3.3. Timing of PL production and shelf presence. In our theorizing and empirical analysis, we implicitly assumed that PL production influences shelf presence (rather than the

interpretation and because we had no theoretical foundation for the interaction with discounter category share, we report the model with just the interaction of PL production and manufacturer market power.

¹⁷ Even though the correlation between brand and manufacturer power equals .89, we find some noticeable differences in power for some NB manufacturers. For example, while Campina's largest brand has a market share of 3.5% in the German yoghurt category, its total share in the category amounts to 7.3%. Its competitor Ehrmann, in contrast, has a similar market share (7.9%), but with only one brand.

other way around). Hence, the timing of PL production should precede (or coincide with) NB shelf presence. Given the aforementioned secrecy surrounding PL production, it was impossible to identify the exact starting date of that activity. However, the temporal ordering of both events is not an issue for 398 (out of 450) manufacturer-category combinations (i.e. observations), as these NB manufacturers did not engage in PL production and/or did not obtain shelf presence in the category. Of the remaining 52 (12%) observations, where both PL production and shelf presence occurred, 30 (22) observations involved Aldi (Mercadona). For the 30 Aldi observations, we adopted an extensive procedure to eliminate as good as possible any ambiguity surrounding the temporal ordering between both events. This was not possible for the 22 Mercadona observations, given prior agreements with our data provider that we would not contact the manufacturers. By comparing the date of the first PL-production documentation for Aldi (based on the aforementioned sources, among which Bertram, 2006; Schaab & Eschenbek, 2008; and Schneider, 2005, 2006) with the date that the NB manufacturers managed to obtain new shelf presence for at least one of their brands in the category (obtained from the GfK data), we observed that for ten observations PL production unambiguously preceded the listing of a brand within the category. For the remaining 20 observations, we contacted the manufacturers. For seven observations, we could deduce from their information that PL production definitely preceded shelf presence within the category, while in two instances, the reverse order was confirmed. For the remaining 11 observations, the manufacturers refused to reveal the required information.

To test the robustness of our insights to this timing issue, we drop the two observations for which we obtained confirmation of a reverse order. This does not affect any of our substantive insights, the only exception being that the effect of innovations became less significant (p -value

of .17 rather than .09). In addition, to account for the fact that we could not resolve unambiguously the timing issue for 11 Aldi observations, we also implement a more conservative test. Assuming that the same proportion (2/19) would apply to those 11 observations, we drop an additional observation.¹⁸ We did this 11 times, each time dropping a different observation (on top of the two that were consistently excluded). The results are once more very robust. In every instance, the parameter for the PL-production dummy remains highly significant ($p < .01$) in the outcome equation, while also the other findings remain very stable. Looking at the median p -value across the 11 estimations, the same substantive conclusions as before are obtained, except for the effect of innovations that was significant at a p -value of .09 in the main estimation but now obtains a p -value of .19. Across all 26 parameters listed in Table 5, the correlation between the original p -values and the median p -value obtained in this exercise was a high .98. Hence, even though the aforementioned secrecy surrounding PL production precluded us from obtaining the exact timing, we feel confident that this did not substantively affect our results.

6.3.4. *Shelf presence versus shelf breadth.* We also explore whether our results remain stable when looking at the number of NBs with which a NB manufacturer obtains shelf presence, i.e. the *extent* of his presence, instead of only looking at *whether* a NB manufacturer was admitted. Manufacturers who offer better services to retailers may not only be rewarded with shelf presence per se (i.e. a 0/1 decision), but also with a *more extensive* presence (Mangold & Faulds, 1993). To that extent, we consider “shelf breadth,” which captures the number of NBs listed of a given manufacturer in the category, as an alternative dependent variable in the outcome equation. Again, using ML estimation, we estimate a recursive model with the treatment variable (PL production) as endogenous (binary) regressor in the outcome equation, but the dependent variable in this outcome equation now takes the form of a continuous performance metric (see

¹⁸ For 19 (= 10 + 7 + 2) observations, the ambiguity could be resolved.

e.g., Guo & Fraser, 2010; Jones, 2007). The major advantage of shelf breadth over shelf presence is that no discretization (which may involve an information loss) is needed. On the other hand, shelf presence has the attractive feature of being more stable over time, a non-negligible advantage given the cross-sectional (snapshot) nature of our study. In 47 out of the 185 manufacturer-category combinations, a NB manufacturer obtains shelf presence for more than one NB in a category, with a maximum of six brands. The results for the shelf breadth equation largely corroborate the shelf presence findings, with the exception of the effects of sales growth, ease of producing high-quality products, and manufacturer market power: while they are of the same sign, these variables now fail to reach statistical significance ($p = .19$, $p = .30$, and $p = .36$, respectively). Most importantly, however, we find that PL production, evaluated at the average level of manufacturer market power, positively affects shelf breadth in the category at the discounter ($\beta_1 = 1.53$, $p < .01$). Hence, although it is not likely that multiple NBs from the same manufacturer will be accepted, the odds are better for a PL producing manufacturer than for a manufacturer who does not do so.

6.3.5. Including direct pull effects. We also test for a direct ‘pull’ effect of the three marketing tools on shelf presence. No such evidence is found for a NB manufacturer’s price premium ($p = .99$) and innovations ($p = .27$). Only for advertising, a direct effect on the likelihood to obtain NB shelf presence is obtained ($\beta = .02$, $p < .10$). When allowing for potential pull effects, all other results are again very stable. The one change is that the effect of innovations in the production equation, while having the same sign as before, is no longer significant ($p = .39$).

6.3.6. Correlated errors across countries. We allowed for dependencies between observations using two-way clustering (i.e. for manufacturers and for categories *within* a country) in our main model. It is also possible that certain NB manufacturers are active in both countries.

Ten such international NB manufacturers were found in our dataset (among which Unilever and Nestlé). To allow for a potential correlation among observations from the same manufacturer *across* the two countries, we adopt an alternative two-way clustering approach (i.e. for categories within a country as before, but for manufacturers across both countries). Our results remain perfectly stable.

To summarize, across the various robustness checks, our results are found to be very stable, as detailed in Table 7. Foremost, the focal effect that PL production leads to a higher likelihood of obtaining shelf presence at discounters, is stable across all robustness tests. Also, all other parameters in the outcome (shelf presence) equation consistently give the same substantive insights. Not only the main effect of manufacturer market power, but also its interaction effect with PL production, and all control variables have similar effects across all checks. For the strategy-selection (PL production) equation, we get very robust results (with only one exception) for the effect of a manufacturer's sales growth, the ease of producing high-quality products in a category, and a manufacturer's market power. For the manufacturer marketing tools, we get equally robust results for a manufacturer's price premium and for advertising. For the number of innovations, some variation in the significance of the effect is found, even though the sign of the parameter remains the same across all validation checks. Finally, also the control variables show very consistent results. Across the 168 parameters estimated in the various robustness checks, over 95% result in the same substantive insight as in our focal model.¹⁹

--- Insert Table 7 about here ---

7. DISCUSSION

Faced with soaring PL shares and volumes, PL production has become increasingly attractive to

¹⁹ Detailed results are available from the first author upon request.

CPG manufacturers, particularly in the light of the current economic downturn. The decision of whether or not a NB manufacturer should engage in PL production is, however, not an easy one. Hence, it is not surprising that most NB manufacturers are still struggling with the issue (de Jong, 2007). In this article, we empirically investigated the determinants, as well as the effect on discounter goodwill, of NB manufacturers' engagement in PL production. We tested our hypotheses on a sample of 450 NB manufacturer-category combinations for two leading discounters in the German and Spanish market, using a uniquely assembled dataset that combines extensive field research with various secondary data sources.

Our analyses offer important insights to both NB manufacturers and discounters. First, while many NB *manufacturers* now regard the discount sector as “an essential channel they proactively approach” (IGD, 2005, p. 34), they should realize that gaining access to that channel is far from straightforward/automatic. Even though we focused on the leading manufacturers in the German and Spanish market, for close to 60% of all manufacturer-category combinations, no shelf presence was obtained for any of their brands. Given that managers of convenience goods strive to distribute their brands as intensively as possible (Coughlan, Anderson, Stern, & El-Ansary, 2001, p. 288), missing out on some of the fastest-growing retailers represents a substantial set-back. To make matters worse, discounters (and especially hard discounters) tend to be influenced less by the manufacturers' power status than conventional supermarkets, and also the tools that manufacturers are most familiar with to ensure shelf access, such as the payment of slotting allowances (Sudhir & Rao, 2006) and/or increased trade promotions (Narasimhan, 2009), are hardly used by discounters (PlanetRetail, 2010).

However, we find strong support for the (thus far untested) notion that PL production for a discounter substantially increases the likelihood of obtaining shelf presence in that category.

While quite some NB manufacturers are still reluctant to produce PLs, they should be aware that a refusal to engage in PL production for a discounter may seriously jeopardize their chances of gaining access to the limited spots on that discounter's shelves. Moreover, unlike the aforementioned tools (such as slotting allowances and promotional support) which entail a direct monetary transfer from the manufacturer to the retailer (Scott Morton & Zettelmeyer, 2000), PL production, when instrumental in securing NB shelf access, contributes positively to the manufacturer's bottom line in various ways: (i) revenues from the NB(s) sold through the discount channel, (ii) revenues from the PLs (which could, potentially, take place through otherwise unused, and therefore costly, over-capacity), and (iii) positive margin implications that may result from the more intense relationship with the retailer (ter Braak et al., 2013).

In spite of these potential benefits, many managers remain concerned with the potential downsides to such a dual-branding (PL production along with NB development) strategy. Foremost, they fear the reaction of their customer base if it would become known that they also produce (cheaper) PLs. This fear is reflected not only in the lower PL-production likelihood that we obtained for manufacturers who currently charge a higher premium for their brands (especially when dealing with very price-oriented hard discounters), and/or who invest heavily in advertising in an effort to differentiate their brands, but also in the efforts that those who do produce take to conceal this practice. Many companies go even one step further, and separate both activities not only commercially, but also in the location of their physical production facilities. Firms as Reckitt Benckiser (a leading manufacturer of household products) and McCain (manufacturer of, among other, frozen potato products), for example, have completely separated all their PL activities from those for their own brands, even to the extent of creating separate companies (de Jong, 2007). Not only does this restrain the flexibility on how to utilize the total production capacity (Bergès &

Bouamra-Mechemache, 2011), manufacturers should also be careful that this does not hurt potential relational (goodwill-related) benefits.

Apart from these customer-equity concerns, we find that manufacturers are also afraid that they will become pressured to share their latest technologies and innovations with the retailer/discounter, which becomes even more likely when only few players can assure high-quality production. In spite of this concern, PL production can be an attractive opportunity to innovation-oriented manufacturers as well. Apart from the aforementioned financial benefits, they can use such production as “a chance to try out product ideas at much lower costs” (Dunne & Narasimhan, 1999, p. 42; ter Braak et al., 2013). Indeed, launching a new product is risky and costly. When manufacturers are not sure if the new product will work (which is the case for many new products), they can limit their risk through an upfront involvement of the discounter (while also bringing shelf presence for their NBs into the negotiations), and subsequently supply a product that substitutes primarily with their competitors’ NBs (Dunne, 1999).

Finally, many manufacturers operate in multiple categories, and may be more/less reluctant to engage in PL production in some categories than in others, if only because their advertising intensity differs across categories, or because they have more intellectual property to protect in some categories than in others. Such firms should be aware of the fact that the impact of PL production in one category (which they themselves may perceive as an initial pledge towards a better relationship with the discounter) may actually amplify the negative implications of refusing to do so in other categories.

Our analyses also offer some key insights for *discounters*. Given their historically almost exclusive focus on PLs, they may have very limited knowledge on (or even interest in) NB manufacturers. Deleersnyder et al. (2007) already discussed that it may pay off for them to

monitor the NB scene more closely, in order to identify which brands to add to their assortment to maximally increase their overall category performance. However, apart from these more demand-driven considerations, it may also be useful to identify which NB manufacturers will be most eager to obtain shelf space for their NBs, and/or least reluctant to engage in PL production, as this will reflect on their bargaining position when negotiating supply terms. Declining sales for the other party's NBs, for example, may signal over-capacity, and a higher willingness to not only produce PLs, but also to do so at lower wholesale costs. Similarly, when looking to add more premium PLs to the assortment (which involves vertical and horizontal differentiation from existing alternatives; Kumar & Steenkamp, 2007), they may want to approach primarily manufacturers known for their innovative capabilities. To overcome these manufacturers' initial reluctance to do so, offering shelf presence for their NBs may be an appealing option.

Limitations and Further Research. In line with Kaufman et al. (2006) and Ailawadi, Pauwels, and Steenkamp (2008), we considered two different retailers to test our hypotheses. It was encouraging to see that most of our findings generalized across both discounters, even though they have a different positioning (hard vs. soft discounter), and come from two different countries (Germany vs. Spain).²⁰ Moreover, the observed differences (i.e. the role of manufacturer market power in the outcome equation, and the role of price premium in the selection equation) had considerable face validity in light of the discounters' different positioning. Still, it would be interesting to investigate to what extent our findings can be generalized to (i) other product categories, (ii) other countries, and (iii) other retail formats. Also, the recent economic crisis may contribute both to a further growth (and hence, stronger negotiation position) of the discounters, while NB manufacturers may become more inclined to engage in PL production.

²⁰ In addition, also the economic situation may have been different, given the later year of the Spanish data collection. We thank an anonymous reviewer for this observation.

Since discounters operate with a limited assortment, shelf space given to NBs is presumably the most important dimension of retailer goodwill. For traditional retailers, shelf space might not be such a good measure of goodwill. To them, slotting allowances provided by NB manufacturers play a key role in a retailer's decision to carry a NB (Sudhir & Rao, 2006), while they are rarely used in a discounter setting (PlanetRetail, 2010). Future research could investigate to what extent our findings generalize to traditional retail formats on other dimensions of retailer goodwill, such as the extent of pass-through of trade promotions (Ailawadi & Harlam, 2009), the size of the slotting allowances (Sudhir & Rao, 2006), the NB manufacturer's influence on the retailer's promotional calendar (Dunne & Narasimhan, 1999), and/or the likelihood of being appointed "category captain" (Subramanian et al., 2010).

Similar to previous studies (see e.g., Nijs, Dekimpe, Steenkamp, & Hanssens, 2001; Pauwels, Srinivasan, & Franses, 2007), we focused on the top players in each category to keep the data-collection effort manageable. Due to our focus on the top-5 NB manufacturers in the category, the more limited variation in the manufacturer market-power variable may have contributed to the non-significant effect of that variable for Aldi. Future research could also investigate non-top-5 manufacturers. Our data is further limited in that it offers only a historical snapshot. While we took great care to ensure that PL production precedes shelf presence, we did not have precise information on the starting dates of both events. The addition of a longitudinal dimension would undoubtedly offer additional insights.

Furthermore, future research could investigate potential cross-country effects. For example, a top NB manufacturer could supply PLs to a discounter in a country in which the NB manufacturer is not active. Such PL production would create goodwill with the focal discounter, while the negative implications (reputational and competitive disadvantages) for the NB

manufacturer would be limited. In addition to these cross-country effects, future research could also investigate cross-retailer effects of NB manufacturers' PL production decisions. IGD (2005) reported that a concern mentioned by PL suppliers of the discount channel was how this engagement would impact their relation with other retailers. Although the goodwill of the discounter for which the NB manufacturer starts to produce may increase, this could come at the expense of deteriorated relations with other retailers. Similarly, should PL production be restricted to a single discounter? Such exclusivity could create even more goodwill with the focal discounter, but also the negative implications with other retailers (discounters) may become more pronounced. Finally, while we provided initial evidence that the implications of PL production may extend beyond the focal category (through the γ_1 parameter), it may be interesting to quantify the net implications across all categories a manufacturer is active in. In so doing, it would pay off to also consider the moderating influence of the manufacturer's power across all categories.

We have only begun to scratch the surface of research possibilities in an area that warrants more attention. We hope this article will provide a stimulus for more research on PL production.

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TABLE 1
CATEGORY COVERAGE

Product Group	Examples
Assorted foods	noodles, jam, rice
Beverages	beer, mineral water, juice
Candy	candy bars, chocolate, bonbons
Canned/bottled foods	fish, beans, tomato
Care products	shampoo, diapers, toilet tissue
Cleaning products	bleach, detergent, fabric conditioner
Cooking fats	butter, olive oil, margarine
Dairy products	milk, yoghurt, ice cream
Household supplies	basket bin bags, toilet tablets, celluloses
Instant meals	ready desserts, ready meals, salad
Pastry	cakes, sweet biscuits
Pet products	wet dog food, dry dog food
Taste enhancers	ketchup, salad dressing, mayonnaise

TABLE 2
DISTRIBUTION OF NUMBER OF TOP-5 NB MANUFACTURERS WITH SHELF PRESENCE AT THE DISCOUNTER

Number of Top-5 NB Manufacturers with Shelf Presence in the Category	% of Categories at Aldi	Representative Examples	% of Categories at Mercadona	Representative Examples
0	38%	jam, ketchup	2%	honey
1	27%	yoghurt, tinned soup	21%	instant coffee, basket bin bags
2	14%	cream, canned vegetables	30%	bleach, tea
3	16%	butter, canned fish	19%	canned tuna, pasta
4	5%	sweet biscuits, chocolate	17%	deodorant, fruit juice
5	0%	n.a.	11%	biscuits, cereals

Note: n.a. = not applicable

TABLE 3
RELATION BETWEEN PL PRODUCTION AND NB SHELF PRESENCE

Panel A: ALDI

		NB Shelf Presence		
		Yes	No	Total
PL Production	Yes	30	38	68
	No	16	101	117
	Total	46	139	185

Note: Each cell presents the number of manufacturer-category combinations;
 $\chi^2(1) = 21.33$ ($p < .01$)

Panel B: MERCADONA

		NB Shelf Presence		
		Yes	No	Total
PL Production	Yes	22	2	24
	No	117	124	241
	Total	139	126	265

Note: Each cell presents the number of manufacturer-category combinations;
 $\chi^2(1) = 16.27$ ($p < .01$)

TABLE 4
OVERVIEW VARIABLES

Variable	Operationalisation	Sources		Timing	
		<i>Aldi</i>	<i>Mercadona</i>	<i>Aldi</i>	<i>Mercadona</i>
Shelf presence	Is a NB of the NB manufacturer present on the discounter shelves in the category? yes/no	GfK panel	Kantar Worldpanel	2002-2008	2009
PL production	Does the NB manufacturer engage in PL production for the discounter in the focal category? yes/no	Various (see section 4.2.2)	Kantar Worldpanel	2002-2008	2009
Manufacturer sales growth	Maximum [volume sales growth of the NB manufacturer in the category in year t / year $t-1$, volume sales growth of the NB manufacturer in the category in year $t-1$ / year $t-2$]	GfK panel	Kantar Worldpanel	2003-2004 and 2004-2005 or 3 years before NB shelf presence	2007-2008 and 2008-2009
Ease of producing high-quality products	5-point reverse-scored survey item: “In the category XXX, making good quality products is difficult”	- Consumers: Steenkamp, van Heerde, and Geyskens (2010) - Experts: primary data		--	
Advertising	Total national advertising expenditures of the NB manufacturer in the category (in €)	Thomson Media Control	InfoAdex	2005	2008
Price premium	Market-share-weighted average national unit price of all NBs of the NB manufacturer in the category / market-share-weighted average PL unit price of the discounter in the category	GfK panel	Kantar Worldpanel	2005 or the year before NB shelf presence	2008
Innovations	Number of innovations of the NB manufacturer in the category	Product Launch Analytics		2005 or the year before NB shelf presence	2008
Manufacturer market power	Volume sales of all NBs of the NB manufacturer in the category / national category volume sales	GfK panel	Kantar Worldpanel	2005 or the year before NB shelf presence	2008
Discounter category share	Volume sales of the discounter in the category / national category volume sales	GfK panel	Kantar Worldpanel	2005 or the year before NB shelf presence	2008
PL production in a non-focal category	Does the NB manufacturer engage in PL production for the discounter in a different category in our sample than the focal category? yes/no	Various (see section 4.2.2)	Kantar Worldpanel	2002-2008	2009

TABLE 5
PARAMETER ESTIMATES FOR THE SHELF-PRESENCE AND PL-PRODUCTION EQUATIONS

Variable	Coefficient		(t-value)
Outcome Equation (Shelf Presence)			
Intercept (β_0)	-1.28	†††	(-6.63)
PL production (β_1)	2.26	***	(11.25)
Manufacturer market power Aldi (β_2)	-.07		(-.46)
Manufacturer market power Mercadona (β_2')	.51	***	(5.86)
PL production * Manufacturer market power Aldi (β_3)	.11		(.56)
PL production * Manufacturer market power Mercadona (β_3')	-.61	***	(-4.97)
<i>Control variables</i>			
Discounter dummy (0 = Aldi, 1 = Mercadona) (β_0')	1.21	†††	(5.93)
PL production in a non-focal category (γ_1)	-.73	††	(-2.48)
Discounter category share (γ_2)	.05		(.23)
Beverages dummy (food = baseline) (γ_3)	-.02		(-.13)
Non-food dummy (food = baseline) (γ_4)	.06		(.25)
Strategy-Selection Equation (PL Production)			
Intercept (δ_0)	-3.35	†	(-1.74)
Manufacturer sales growth (δ_1)	-.37	**	(-1.91)
Ease of producing high-quality products (δ_2)	2.69	†	(1.70)
Manufacturer marketing tools			
Advertising (δ_3)	-.02	*	(-1.43)
Price premium over PLs Aldi (δ_4)	-.80	***	(-3.45)
Price premium over PLs Mercadona (δ_4')	.19		(1.64)
Innovations (δ_5)	-.18	†	(-1.67)
Manufacturer market power (δ_6)	.21	†	(1.82)
<i>Control variables</i>			
Discounter dummy (0 = Aldi, 1 = Mercadona) (δ_0')	-1.16	†††	(-5.07)
PL production in a non-focal category Aldi (ω_1)	.83	††	(2.22)
PL production in a non-focal category Mercadona (ω_1')	2.69	†††	(6.30)
Discounter category share (ω_2)	.99	†††	(2.78)
Beverages dummy (food = baseline) (ω_3)	-.37		(-1.32)
Non-food dummy (food = baseline) (ω_4)	-.27		(-1.09)
Selection parameter (ρ)	-.87	†††	(-2.62)
Log-likelihood	-377.63		

*** $p < .01$, ** $p < .05$, * $p < .10$ (one-sided). ††† $p < .01$, †† $p < .05$, † $p < .10$ (two-sided). Significant effects are indicated in bold.

TABLE 6
MANUFACTURER VERSUS DISCOUNTER RATIONALE FOR PL PRODUCTION

	Manufacturer's Rationale	Discounter's Rationale	Empirical Findings	
			Aldi	Mercadona
Manufacturer sales growth (H4)	-	-	-	-
Ease of producing high-quality products (H5)	+	-	+	+
Manufacturer marketing tools				
Advertising (H6)	-		-	-
Price premium over PLs (H7)	-		-	ns
Innovations (H8)	-	+	-	-
Manufacturer market power (H9)	-	+	+	+

Note: For the manufacturer, a + (-) signifies the manufacturer is more (less) willing to produce PLs for the discounter. For the discounter, a + (-) signifies the discounter is more (less) interested to work with a particular leading NB manufacturer to produce its PLs. 'ns' means that no significant effect was observed.

TABLE 7
ROBUSTNESS CHECKS

		Focal Model Results	Alternative Operationalization		Alternative Sample		Shelf Breadth	Direct 'Pull' Effects	Alternative Two-Way Clustering	
			Brand Power	Relative Measures	N = 448	N = 447 ^a				
Outcome Equation	PL production	✓	✓	✓	✓	✓	✓	✓	✓	
	Manufacturer market power Aldi									
	Manufacturer market power Mercadona	✓	✓	✓	✓	✓	✓	✓	✓	
	PL production * Manufacturer market power Aldi									
	PL production * Manufacturer market power Mercadona	✓	✓	✓	✓	✓	✓	✓	✓	
	<i>Control variables</i>									
	Discounter dummy (0 = Aldi, 1 = Mercadona)	✓	✓	✓	✓	✓	✓	✓	✓	
	PL production in a non-focal category	✓	✓	✓	✓	✓	✓	✓	✓	
	Discounter category share									
	Beverages dummy (food = baseline)									
Non-food dummy (food = baseline)						✓				
Advertising	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	✓	n.a.	
Price premium over PLs	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.		n.a.	
Innovations	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.		n.a.	
Strategy-Selection Equation	Manufacturer sales growth	✓	✓	✓	✓	✓		✓	✓	
	Ease of producing high-quality products	✓	(✓)	(✓)	(✓)	(✓)		✓	✓	
	Manufacturer marketing tools									
	Advertising	✓	(✓)		✓	✓	✓	✓	✓	
	Price premium over PLs Aldi	✓	✓	✓	✓	✓	✓	✓	✓	
	Price premium over PLs Mercadona									
	Innovations	✓	(✓)	(✓)			✓		✓	
	Manufacturer market power	✓	✓	✓	✓	✓		✓	✓	
	<i>Control variables</i>									
	Discounter dummy (0 = Aldi, 1 = Mercadona)	✓	✓	✓	✓	✓	✓	✓	✓	
	PL production in a non-focal category Aldi	✓	✓	✓	✓	✓	✓	✓	✓	
	PL production in a non-focal category Mercadona	✓	✓	✓	✓	✓	✓	✓	✓	
	Discounter category share	✓	✓	✓	✓	✓	✓	✓	✓	
Beverages dummy (food = baseline)										
Non-food dummy (food = baseline)										
Selection parameter (ρ)	✓	✓	✓	✓	✓	✓	✓	✓	✓	

A '✓' indicates that a significant effect is found. 'n.a.' means that the variable is not applicable.

A '(✓)' indicates that even though the parameter for this effect is robust in both sign and magnitude, its p -value is $<.15$.

^aThe p -values reported are the median p -values across 11 estimations (i.e. when randomly deleting one additional observation for which the timing issue could not be resolved).

FIGURE 1
CONCEPTUAL FRAMEWORK

