Journal of Marketing Article Postprint

THE EFFECT OF BUSINESS-CYCLE FLUCTUATIONS ON PRIVATE-LABEL SHARE: WHAT HAS MARKETING CONDUCT GOT TO DO WITH IT?

Lien Lamey

Barbara Deleersnyder

Jan-Benedict E.M. Steenkamp

Marnik G. Dekimpe*

June 19, 2011

* Lien Lamey is Assistant Professor of Marketing, Lessius University College, Belgium and Affiliated Researcher, Catholic University Leuven, Belgium (e-mail: lien.lamey@lessius.eu). Barbara Deleersnyder is Associate Professor of Marketing, Tilburg University, the Netherlands (e-mail: b.deleersnyder@uvt.nl). Jan-Benedict E.M. Steenkamp is C. Knox Massey Distinguished Professor of Marketing and Marketing Area Chair, University of North Carolina at Chapel Hill (e-mail: JBS@unc.edu). Marnik G. Dekimpe is Research Professor of Marketing, Tilburg University, the Netherlands, and Professor of Marketing, Catholic University Leuven, Belgium (e-mail: m.g.dekimpe@uvt.nl).

The authors thank AiMark and Peter Fader for providing the data, and greatly appreciate the valuable suggestions by Harald van Heerde, the editor and the anonymous reviewers. They gratefully acknowledge financial support from the Flemish Science Foundation (F.W.O.) under grants nr. G.0116.04 and nr. G.0751.11, from the Marketing Science Institute through the Alden G. Clayton Doctoral Dissertation Competition, and the Zyman Institute of Brand

Science through the ZIBS Doctoral Dissertation Competition. Finally, the authors also gratefully acknowledge the Netherlands Organization for Scientific Research (NWO) and the Royal Society New Zeeland (Marsden fund 10-UOW-068) for research support.

THE EFFECT OF BUSINESS-CYCLE FLUCTUATIONS ON PRIVATE-LABEL SHARE: WHAT HAS MARKETING CONDUCT GOT TO DO WITH IT?

Abstract

The authors investigate whether, and to what extent, marketing conduct varies over the business cycle, and how this contributes to the growing popularity of private labels. To address this, a unique dataset is examined that combines a broad set of seven marketing-mix instruments with private-label share, using data covering two decades for 106 consumer-packaged-goods categories in the U.S. The results show that private-label share behaves counter-cyclically, and that part of the boost in private-label share during contractions is permanent. Retailers' observed practice of supporting their own labels in contractions while cutting back in expansion periods helps this cyclical sensitivity even further. Also national brands' pro-cyclical behavior in terms of (i) major new-product introductions, (ii) advertising, and (iii) their promotional pressure relative to private labels, is associated with more pronounced cyclical fluctuations in private-label share, and even with permanent private-label market-share gains. While brand managers cannot be held responsible for the occurrence of economic downswings, they can be held accountable for how much contractions help strengthen their fiercest competitor, the store brands owned by their very customers.

KEYWORDS: Private Labels – National Brands – Business Cycle – Marketing Conduct – Advertising – Innovation – Promotion – Pricing

In the last decades, private labels have emerged as a fierce competitor of national brands in the consumer-packaged-goods (CPG) industry. The market share of private labels in most CPG categories has grown strongly, and private labels now account for over 20% of global grocery sales (*M+M Planet Retail* 2009). In the U.S., private labels have outperformed national brands in 11 out of the last 12 years in terms of sales growth. As such, private labels have gained market share over national brands. And there appears no end in sight. Retailers aim to further increase their private-label share, because private labels command higher profit margins (Ailawadi and Harlam 2004), increase store loyalty (Ailawadi, Pauwels, and Steenkamp 2008), and put pressure on national brands to give better deals (Meza and Sudhir 2010). Consequently, it is not surprising that the question how to fight private labels has become a key challenge for national-brand manufacturers (Kumar and Steenkamp 2007).

While private-label share tends to grow in the long term, previous research has shown that this growth is not evenly spread across time. Rather, Lamey et al. (2007) show that private-label share grows disproportionally in periods of economic contraction, and that much of this share gain persists in better times. Thus, while national brands recover part of the loss in the subsequent expansion period, this recovery is not complete. It is understandable that consumers become more receptive to (cheaper) private-label offerings in difficult times. Consumers do not operate in a vacuum, however, but rather respond to marketing activities of companies. This raises the question whether the conduct of national brands and private labels over the business cycle contributes to the cyclical sensitivity of private-label share and, even more importantly, to the long-term growth of private labels? If so, which marketing instruments have the greatest impact? Which instruments have only a temporary effect on private-label share, and which instruments, if any, contribute to a permanent increase in private-label share? If private-labels' long-term growth rate is found to be systematically affected by the conduct of the market players over the business cycle, a platform is

offered to suggest marketing strategies to either fight (national brands) or boost (retailers) private labels in different parts of the business cycle.

Our purpose is to shed light on these issues by investigating the relationship between national-brand and retailer conduct over the business cycle on the one hand, and private-label share on the other hand. We focus on the generic battle between national brands versus private labels, rather than on specific national brands or particular private labels (see Dhar and Hoch 1997, and Steenkamp, Van Heerde, and Geyskens 2010 for a similar generic perspective). As such, our focal variable is private-label share in a category, which is a measure of how the national brands fare vis-à-vis their fiercest enemy, viz., the store brands owned by their very customers. We look at market players' conduct with respect to seven of the most important marketing instruments: *innovation* activity, where we distinguish between major and incremental innovations; (regular) *pricing*; *advertising* spending; and *consumer promotions*, where we distinguish between temporary price reductions (TPRs), features, and display activity.

Our empirical setting is a carefully assembled, longitudinal data set on 106 CPG product categories in the U.S., covering 21 years. The scope of these data provides a unique opportunity to study how marketing conduct varies across the business cycle, and what implications this has for private-label share. Specifically, our paper addresses the following research questions:

- *How do managers of national brands and private labels adjust their behavior in response to economic up- and downswings?* Do cyclical adjustments in marketing conduct go *with* the business cycle (increase during expansions and decrease during contractions), or *against* the business cycle (decrease during expansions and increase during contractions)? Moreover, are these adjustments more or less pronounced than the corresponding movements in the economy itself? And finally, are the adjustments similar in direction and magnitude across all instruments, or do managers react more (and differently) with some instruments (e.g.,

advertising) than with others (e.g., feature support)?

- *Do these business-cycle-induced adjustments in marketing support contribute to temporary gains (losses) in private-label share during contractions (expansions)?* If so, which marketing instruments have the greatest impact? For example, does changing innovation activity have more effect than changing advertising, or vice versa? Or, are they both inconsequential?
- *Do any of these business-cycle-induced adjustments also contribute to permanent gains in private-label share*. Might the conduct of national brands and private labels have effects on private-label share that persist, even after the contraction is long over*?* For example, if manufacturers cut their advertising support during the contraction, will this result in higher private-label shares in the subsequent expansion years as well, or will private-label share in good times revert back to its pre-contraction level? Or if national-brand manufacturers reduce the number of new-product introductions during contraction periods, will this undermine their competitive position even when the economy is growing again?

Answering these questions allows us to assess which instruments might be cut in economic downturns, and which ones should be spared to the maximum extent possible. We contrast what is happening in the marketplace versus what national-brand managers and retailers should do, and do so for seven key marketing instruments. Since contractions represent a deviation from the "norm" of economic expansion (Steenkamp and Fang 2011), we will focus relatively more on what happens in contractions, using expansions as the benchmark.

RESEARCH FRAMEWORK

Figure 1 provides the framework that guides our research. We begin by describing cyclical adjustments in the conduct of national brands and private labels over the business cycle. Then, we examine the likely effect of these adjustments on *temporary* changes in private-label share during

the corresponding phase of the business cycle. Finally, we consider whether any *permanent* changes in private-label share are likely to occur as a consequence of business-cycle-induced changes in private-label share and marketing conduct. Table 1 provides an explanation of the constructs included in our framework.

In our conceptualization and measurement of marketing conduct, we were inspired by Reibstein and Wittink (2005), who advocate the use of measures *relative* to that of competitors. These authors argue that the important question to ask is: "How we are doing relative to our competitors who operated under the same economic conditions?" (Reibstein and Wittink 2005, p. 8). Our use of relative measures of marketing conduct is conceptually consistent with our dependent variable, which is also a relative measure, viz., (change in) private-label *share*.

Our promotion and price variables are national-brand promotion intensity (prices) relative to private-label promotion intensity (prices). We do not use relative measures for innovation and advertising. The reason is that these instruments are not widely used by private labels yet, and hence a relative measure is not meaningful. Corstjens and Steele (2008) and Kumar and Steenkamp (2007) observe that while some retailers have recently started to introduce their own innovations (as opposed to copycat, me-too products) and advertise their private labels, the intensity of these activities is still minor compared to national brands. Moreover, private-label advertising, if present, is almost always generic rather than being category specific (this is also corroborated by our data, as detailed later). Brand economics argue against such category-specific investments. Brand manufacturers have a much greater stake in their categories than retailers, who after all carry hundreds of categories. Retailers also operate on thinner margins, and consequently lack the financial resources to support any specific *category* with sustained innovation or advertising (Hoch and Banerji 1993). Consequently, for innovation and advertising activity in a category, we only consider national-brand activity.

--- Figure 1 and Table 1 about here ---

Marketing Conduct over the Business Cycle

Academic research has documented the pro-cyclical behavior of advertising expenditure (Deleersnyder et al. 2009; Srinivasan, Lilien, and Sridhar 2011) and innovation activities (Axarloglou 2003). There is also academic evidence that managers raise prices during contractions, and reduce them during expansions (Chevalier and Scharfstein 1996; Taylor 1999), i.e., prices behave counter-cyclically. However, prior studies have typically examined the aggregate intensity of a particular marketing-mix instrument. Aggregate patterns are not necessarily descriptive of the behavior in the CPG industry, let alone specific CPG categories. Further, we do not know much about the cyclical conduct of promotions, nor whether the above results also apply to private labels.

Given previous work, we expect that national-brand innovation and advertising, and relative promotion activity (i.e., national-brand promotions relative to private-label promotions) behave pro-cyclically: they are cut in contractions and ramped up again in expansionary periods. We further expect that the relative price behaves counter-cyclically in that the price gap between national brands and private labels increases in contractions and decreases in expansions. We note that national-brand innovation and advertising are largely (innovation) or completely (advertising) under the control of the manufacturer. The observed national-brand conduct for promotion and pricing are much more a shared manufacturer-retailer decision, with retailers having the final say (Ailawadi et al. 2009, p. 43).

Impact of Cyclical Marketing Conduct on Temporary Changes in Private-Label Share

Much purchase behavior in CPG categories is based on habit (Hoyer 1984). Consequently, in expansionary periods, consumers spend little cognitive effort on the choice task, and exhibit a high degree of inertia in their purchases. In bad times, however, many consumers have to live on tighter

budgets and face financial insecurity due to increased job uncertainty. They respond to these challenges by postponing discretionary purchases (Cook 1999), but that is not an option for most CPG products. Rather, consumers will think more carefully about their purchases each time they enter the marketplace. In short, contractions have the effect of shaking consumers out of their habitual decision making. In contrast, consumers have little incentive to reconsider their habitual decisions (and consider lower-priced alternatives) during economic expansion periods.

Moreover, in economic slowdowns, consumers are more inclined to acquire price information (Wakefield and Inman 1993), and become more price sensitive (Estelami, Lehmann, and Holden 2001). Private labels sell for 20%-60% less than national brands (Dhar and Hoch 1997). Consequently, compared to expansionary periods, the increased tendency to acquire price information and its increased weight in decision making in contractions create powerful incentives for consumers to switch from national brands to private labels, *unless in contractions, national brands provide compelling reasons to consumers to stick to their favorite national brand*. We consider four types of "compelling reasons": (i) innovation by national brands, (ii) advertising by national brands, (iii) promotion activity by national brands vis-à-vis private labels, and (iv) pricing of national brands vis-à-vis private labels.

Innovation by national brands. Innovative products provide more value to consumers by offering new benefits. This should reduce the price focus of consumers in contractions since the brand offers an alternative purchase rationale. However, not all innovations may be equally effective in fighting private labels. A common distinction is made between major and incremental innovations. *Incremental* innovations, like extensions and updates of existing products, are easy to understand, but do not offer significant advantages vis-à-vis existing products, including private labels (Sorescu and Spanjol 2008). Hence, we can expect that they will reach their sales potential relatively soon (as they are easy to understand), that is in the contraction itself. However, their

permanent effect on fighting private labels *after* the contraction is likely to be modest (as they offer few new benefits).

Major innovations, in contrast, offer significant advantages vis-à-vis existing products. They often originate from technical breakthroughs by bringing real new value to the consumer or creating a new consumption experience. They include new technologies, new-to-the world products, new applications, and new packaging that significantly affects the use of the product (Sorescu and Spanjol 2008). As put eloquently by Steiner (2004), a true innovation leaves the category's private labels in the unfortunate position of imitating yesterday's favorites. However, major innovations have as drawback that they take more time to establish themselves in the marketplace. After all, major innovations require more behavioral change and are often relatively high on complexity (Gielens and Steenkamp 2007). Consequently, major innovations offer a platform for long-term growth, but it can easily take a year or more for their effect to be felt in the marketplace. Thus, it is likely that the introduction of major innovations will not have a strong effect on short-term, cyclical, private-label share. In sum, we expect that pro-cyclical introductions of incremental innovations by national brands induce more counter-cyclical fluctuations in private-label share, but that no such effect is found for major innovation activity.

Advertising by national brands. Mela, Gupta, and Jedidi (1998) find that brands can use advertising to 'insulate' themselves from competition. This should reduce price sensitivity and curtail switching from national brands to lower-priced private labels. Moreover, advertising also plays a big role in building brand image, which is difficult to copy by private labels (Kumar and Steenkamp 2007). These factors should play a greater role in contractions than in expansions. Reducing price sensitivity is especially important when the tendency of consumers is to become more price focused (Estelami et al. 2001), and providing difficult-to-copy intangible imagery offers additional value to consumers that can help offset the negative utility of higher prices

(Steenkamp et al. 2010). In expansion periods, consumers tend to be less price sensitive, making this "insulation function" of advertising less impactful, especially when we consider that advertising clutter in expansions is higher, which reduces the effectiveness of advertising (Danaher, Bonfrer, and Dhar 2008; Steenkamp and Fang 2011). Thus, the expected pro-cyclical advertising activity by national brands induces counter-cyclical fluctuations in private-label share.

Relative promotion activity. Promotions are a mechanism to bring the product to the attention of the consumer at the point of purchase. Given the fact that many purchase decisions for CPG goods are made in the store, drawing attention to a specific brand has an immediate sales effect, a major part of which comes from brand switching (Bell, Chiang, and Padmanabhan 1999). Three important promotional instruments in the CPG sector are TPRs, features, and displays.

In contractions, people weigh price more heavily than in expansions, and hence, the effect of TPRs should be larger. Consequently, we posit that pro-cyclical TPR behavior by national brands relative to private labels leads to larger private-label-share gains in contractions and larger private-label-share losses in expansions. That is, stronger pro-cyclical TPR behavior by national brands relative to private labels is associated with stronger counter-cyclical behavior in private-label share. Conversely, if relative TPR behavior is counter-cyclical rather than pro-cyclical, we expect this to dampen the cyclical swings in private-label share.

Two prominent behavioral reasons have been forwarded in the marketing literature to explain why display and feature can significantly increase brand choice (Zhang 2006).[1] First, consumers may interpret a promotion marker (a feature ad or in-store display) as a proxy for a price cut. This phenomenon is referred to as the *price-cut-proxy effect*. Second, display and feature promotions are utilized to form consideration sets. This is referred to as the *consideration-set-formation effect* (Zhang 2006). Of course, both effects apply to national brands (suggesting a higher likelihood to

[1] We thank an anonymous reviewer for this suggestion.

buy the national brand) and private labels (suggesting a higher likelihood to buy the private label). Following this line of thought, we expect that stronger pro-cyclical (counter-cyclical) feature and display activity by national brands relative to private labels is associated with stronger (weaker) counter-cyclical behavior in private-label share.

Zhang (2006) further shows that consumers who are more involved in evaluating price and promotional information (as is the case during an economic contraction (Estelami et al. 2001)), strongly react to a TPR, but are less affected by display and feature ads. As such, we expect that cyclical adjustments in TPR have a stronger effect than comparable adjustments in feature and display activity.

Price premium. It is an empirical observation that (manufacturers') regular prices tend to behave counter-cyclically (Chevalier and Scharfstein 1996; Taylor 1999), while Estelami et al. (2001) establish empirically that consumer price sensitivity is higher in adverse economic conditions than in good times. Counter-cyclical price-premium adjustments are therefore expected to reinforce counter-cyclical fluctuations in private-label share.

Impact on <u>Permanent</u> Gains in Private-Label Share

The effect of private-label cyclicality. In economics, business-cycle volatility has been found to affect the average long-term growth in output across countries (Döpke 2004; Mills 2000; Ramey and Ramey 1995). Applied to our context, the critical question is whether the cyclical fluctuations in private-label share lead to permanently lower market shares for the national brands? At first sight, there appears little reason to expect permanent effects. One could argue that private labels gain during a contraction, but lose during the subsequent expansion, making it a zero-sum game in the long run. However, this reasoning ignores consumer learning. Consumer perceptions of private-label quality tend to lag improvements in their actual quality (Apelbaum, Gerstner, and Naik 2003; Steenkamp et al. 2010). From their actual product experience with

private labels in the contraction, consumers may learn that true private-label quality exceeds their prior perceptions. If consumers update their quality perceptions (e.g., through direct consumption experience in a contraction), store brands will gain more customers, and it will be difficult for manufacturers to win them back, even when the economy recovers in the subsequent expansion. Moreover, as outlined above, while contractions shake consumers out of their habitual decision making, expansionary periods are associated with an increase in consumer inertia (Gijsenberg et al. 2010). But for a number of consumers, purchasing a private-label product has become the habit, so an increase in habitual decision making helps the private label, even when the economy is booming again. This gives rise to a permanent positive effect of an economic contraction on private-label performance, as documented in Lamey et al. (2007).

The effect of cyclical marketing conduct. Does the cyclical marketing conduct of national brands and private labels have a *direct* effect on long-term private-label share over and above the hypothesized *indirect* effect via the cyclical fluctuations in private-label share? We believe that for most marketing instruments, this is not likely. This has to do with the duration of the impact of most marketing instruments.

The pervasive practice of national brands to cut back advertising in contractions is likely to (inadvertently) boost private-label share in the contraction itself, but the duration interval for advertising is relatively brief, typically between 6 and 9 months (Leone 1995). Also the increased spending during expansions will only have a short-lived effect, on average. So, any effect of cyclical advertising behavior on long-term private-label growth is likely to go through short-term (temporary) private-label changes. Similarly, the duration interval of incremental innovations is relatively short (Gielens and Steenkamp 2007). Finally, the duration interval of promotions is very short, typically a few weeks (Srinivasan et al. 2004). So, any effect of cyclical behavior in these instruments on permanent changes in private-label share is likely to go through the cyclical

fluctuations in private-label share.

The situation for major innovations is quite different. While they offer a platform for long-term growth, more complex innovations that require more behavioral changes take a considerably longer time before their effect is felt in the marketplace (Gielens and Steenkamp 2007), so any effect on private-label share will emerge in the longer run. The question emerges whether the anticipated pro-cyclical behavior in major innovation activity by national brands has any ramifications for the long-term share of national brands versus private labels. Previous research suggests that pro-cyclical innovation activity is less effective in generating long-term sales than a-cyclical or even anti-cyclical behavior. By going against the grain, there is less competitive clutter and the quality of production is higher (Steenkamp and Fang 2011). Thus, we submit that pro-cyclical introduction of major innovations by national brands will add to long-term private-label growth directly, rather than working via its effect on cyclical fluctuations in private-label share.

METHOD

General outline

Our methodological approach consists of five steps. In steps 1-3, we derive measures for the different *variables* included in our research framework (represented by the boxes in Figure 1). In steps 4 and 5, we estimate the proposed *relations* between the different components of this framework (represented by the arrows in Figure 1).

As for the boxes (*variables)*, we (i) need to quantify how managers of national brands and private labels adjust their behavior in accordance with economic up- and downswings (step 1), (ii) have to determine how much private-label share varies during economic up- and downswings (step 2), and (iii) require a measure of how private labels' long-term share is affected by economic downswings (step 3).

It is important to recognize that the relationship between two series can differ across different periodicities. Given our interest in fluctuations at business-cycle periodicities, we will first use business-cycle filtering to extract the cyclical component in each of the marketing-mix series, and subsequently relate this cyclical component in the marketing-mix series to the corresponding cyclical component in the state of the economy. This relationship is expressed through the marketing instrument's cyclical comovement elasticity, which quantifies the *cyclical conduct of the marketing instrument*. This comovement elasticity can be positive (in case of pro-cyclical adjustments in the instrument) or negative (in case of counter-cyclical adjustments).

The same methodological procedure is followed to derive our measure *for the temporary changes in private-label share due to the business cycle* (i.e., the middle box of Figure 1), in that we first isolate the fluctuations in a private label's market share that occur at business-cycle periodicities, and then link them to the corresponding cyclical fluctuations in the state of the economy. This gives us the private-label cyclical comovement elasticity, which quantifies how private-label share changes with cyclical up- and downswings in the economy. As such, it measures the extent of temporary gains (losses) in private-label share in contractions (expansions).

To obtain a measure of the permanent impact of economic cycles on private- label share (the right-hand box of Figure 1), we focus on the underlying long-term trend in the private-label series. Following a similar logic, we now have to filter out fluctuations happening at business-cycle periodicities, and keep fluctuations at lower periodicities (as these correspond to longer-term movements). Next, we consider whether the trend's growth rate is strengthened because of the contraction as our measure for *the permanent impact of business cycles on private-label share*.

Finally, we estimate the structural relations between the different building blocks in our conceptual model. We first estimate the effect of the cyclical conduct of the marketing-mix instruments on temporary changes in private-label share over the business cycle (step 4), and the

effect of the cyclical conduct of the marketing-mix instruments and temporary changes in private-label share on permanent gains in private-label share due to contractions (step 5). We now proceed with the technical details of each step.

Step 1: Quantifying the Cyclical Conduct of Marketing-Mix Instruments

Prior research has shown that the relationship between variables can differ across different periodicities (Baxter 1994; Bronnenberg, Mela, and Boulding 2006). Given our interest in managerial adjustments that are aligned with the business cycle, we first need to extract those fluctuations from the series that occur at business-cycle periodicities. Second, we need to relate the cyclical component in the marketing-mix series to the business cycle (Deleersnyder et al. 2009).

Extracting the cyclical component in each marketing-mix series. We use the well-known Hodrick and Prescott (1997) filter to extract the cyclical component from each marketing-mix series. The HP filter decomposes a time series in (i) a gradually-evolving trend component, and (ii) cyclical fluctuations around it (Lamey et al. 2007). To obtain the cyclical component in marketing-mix instrument k ($MM^{c}_{k,t}$), one first models the trend ($MM^{trend}_{k,t}$), which is subsequently removed from the observed series ($MM_{k,t}$):

$$MM^{c}_{k,t} = MM_{k,t} - MM^{trend}_{k,t}, \quad (1)$$

with $MM_{k,t}$ being the log-transformed time series for marketing-mix instrument k. Log transformation facilitates the comparison across series. $MM^{trend}_{k,t}$ in Eq. (1) is obtained by minimizing:

$$\sum_{t=1}^{T}(MM_{k,t} - MM^{trend}_{k,t})^2 + \lambda\sum_{t=2}^{T-1}((MM^{trend}_{k,t+1} - MM^{trend}_{k,t}) - (MM^{trend}_{k,t} - MM^{trend}_{k,t-1}))^2 . \quad (2)$$

The first quadratic term in Eq. (2) provides a measure of "goodness of fit," while the second quadratic term determines the smoothness of the derived trend. Note that the HP filter does not

impose that this trend is linear or even monotonic. The solution to Eq. (2) implies a trade-off between fit and smoothness, as determined by the parameter λ. The larger the value of λ, the smoother the trend series becomes (Hodrick and Prescott 1997). We follow current practice, and set λ =10 for annual data (Baxter and King 1999; see also Deleersnyder et al. 2009; Lamey et al. 2007). To account for a structural break in some of our marketing-conduct series (which might arise because of a change in the measurement methodology adopted by one of the data providers), we can reformulate the HP filter into a state-space representation to which we add two pulse dummies, as detailed in the Web Appendix. We extract the cyclical component $MM_{k,t}^{c}$ for each of the different marketing-mix elements (7) for each of the CPG categories (106) in our sample.

Relating the cyclical component in each marketing-mix series to the business cycle. To quantify the sensitivity of each marketing-mix instrument to the state of the economy, we derive the *cyclical comovement elasticity*, which measures the extent to which business-cycle fluctuations in the economy as a whole translate into cyclical fluctuations in a particular marketing instrument. Data on U.S. real GDP are used as a proxy for the general economic activity. Business-cycle fluctuations across many sectors are reflected in aggregate (national) output, making the cyclical component of GDP an appropriate indicator for the overall economic cycle (Stock and Watson 1999). We use the same HP filtering procedure to extract the cyclical fluctuations in the economic activity. In line with Deleersnyder et al. (2009) and Lamey et al. (2007), we regress the cyclical component of each marketing-mix instrument ($MM_{k,t}^{c}$) on the cyclical component in real GDP:[2]

$$MM_{k,t}^{c} = \beta^{MM_k} GDP_t^{c} + \varepsilon_t, \quad (3)$$

[2] Business-cycle filters may induce serial correlation in the data (Deleersnyder et al. 2009). To account for this, one can add an autoregressive error term to Eq. (3). Extending the comovement equation with an AR error term also accounts for potential delayed effects of the business cycle. Using AIC as model selection criterion, an autoregressive term was added in 27% of the series. As both series are zero-reverting after filtering, it is not necessary to include an intercept in Eq. (3).

with $MM_{k,t}^{c}$ and GDP_t^c the cyclical components in, respectively, marketing-mix instrument *k* and real GDP. As the time series are log-transformed prior to filtering, the cyclical components used in Eq. (3) express the percentage deviations from the respective underlying growth paths, giving β^{MM_k} an elasticity interpretation (Stock and Watson 1999). Note that the purpose of Eq. (3) is *not* to remove cyclical GDP from our marketing-mix series (in which case ε_t would be the construct of interest), but rather to estimate the extent to which the marketing instrument in question moves with the business cycle. The sign and significance of β^{MM_k} indicate whether the series evolves pro-cyclically (β^{MM_k} >0) (i.e., increases during expansions and decreases during contractions), counter-cyclically (β^{MM_k} <0) (i.e., decreases during expansions and increases during contractions), or a-cyclically (β^{MM_k} =0). The magnitude of β indicates whether fluctuations in the variable in question are more (elastic, $|\beta^{MM_k}|$>1) or less (inelastic, $|\beta^{MM_k}|$ <1) pronounced than fluctuations in the economy. Eq. (3) is estimated for each of the seven marketing-mix instruments and for each of the 106 CPG categories in our sample. Hence, parameter $\beta_i^{MM_k}$ becomes the cyclical comovement elasticity of marketing-mix element *k* in category *i*.

Step 2: Quantifying Temporary Changes in Private-Label Share due to the Business Cycle

The same procedure is adopted to quantify the temporary gains in private-label share in contractions, i.e., the cyclical sensitivity of private-label share. First, we use the HP filter to separate the (log-transformed) observed private-label-share series in each category into its trend and cyclical component:

$$PLS_t^c = PLS_t - PLS_t^{trend}. \quad (4)$$

Next, we regress the cyclical component in private-label share (PLS_t^c) on the cyclical component in real GDP:

(5) $$PLS_t^c = \beta^{PLS} GDP_t^c + \eta_t .$$

Eq. (5) is estimated for each of the 106 CPG categories in our sample. Hence, the parameter β_i^{PLS} is the cyclical comovement elasticity of private-label share in category *i*. It reflects *temporary* changes in private-label share in response to the business cycle. Under the assumption that private-label share tends to behave counter-cyclically, β_i^{PLS} is expected to be negative.

Step 3: Quantifying the Permanent Gains in Private-Label Share due to Contractions

The cyclical comovement elasticity of private-label share does not yet answer the question whether the severity of the cyclical fluctuations influences the underlying trend in the private-label series. After all, the comovement elasticity, β^{PLS}, quantifies the relationship between temporary (cyclical) fluctuations in, respectively, private-label share and the economic activity, *after the long-term trend has been removed from the series* (i.e., through Eq. (4)). To quantify private labels' long-term growth trajectory, we consider the long-term trend series PLS_t^{trend} in Eq. (4), and assess whether the growth rate in this series (i.e., ΔPLS_t^{trend}) is amplified when a contraction occurs (see Kontolemis 1997 for a similar methodological approach):

(6) $$\Delta PLS_t^{trend} = \delta^{PLS} + \phi^{PLS} cont_t + \mu_t .$$

The dependent variable in Eq. (6) is the *change* in the long-term private-label trend. Previous research has documented the non-stationary nature of the long-term private-label trend (Lamey et al. 2007). This was confirmed by the Levin-Lin-Chu panel-unit-root test on our long-term private-label-share series, which revealed that the presence of a unit root in the series cannot be rejected (t =.649; p =.742). Hence, we need to difference the data to avoid spurious findings that result from statistical analyses on non-stationary data (Dekimpe and Hanssens 1995). The intercept δ^{PLS} is a drift parameter, which accounts for all other factors that are not explicitly included in the model, but that contribute to the long-term growth in private-label share, such as, the increasing quality of

private labels, the growing number of private labels, better shelf space, and greater retailer sophistication in managing their private-label operations (Kumar and Steenkamp 2007).

The contraction dummy, $cont_t$, is set to one when the economy is contracting (i.e., $\Delta GDP_t^c \leq 0$), and zero when the economy is expanding ($\Delta GDP_t^e > 0$).[3] With this coding, the parameter δ^{PLS} ($\delta^{PLS} + \phi^{PLS}$) reflects the average annual long-term growth in private-label share when the economy is growing (contracting). The parameter ϕ^{PLS}, in turn, quantifies the *incremental* long-term growth in private-label share in a contraction year *that is not cancelled out in future expansion periods*. We use ϕ^{PLS} as our metric for the permanent gains in private-label share due to contractions. Since contractions differ in length, using an annual metric ensures the comparability across successive business cycles. Eq. (6) is estimated for each category *i* in our sample.

Step 4: Estimating the Effects of Cyclical Marketing Conduct on Temporary Changes in Private-Label Share

To assess if cyclical marketing conduct affects temporary changes in private-label share, we estimate:

$$\hat{\beta}_i^{PLS} = \alpha + \sum_{k=1}^{7} \tau_k \hat{\beta}_i^{MM_k} + \sum_{l=1}^{2} \varphi_l X_i^l + \upsilon_i \quad , \tag{7}$$

where $\hat{\beta}_i^{PLS}$ is the comovement elasticity estimate of private-label share for category *i* derived from Eq. (5), and $\hat{\beta}_i^{MM_k}$ the comovement elasticity estimate of marketing-mix element *k* in category *i* obtained from Eq. (3). We include two product-class dummies (household care,

[3] An alternative approach to identify contraction periods in the U.S. economy would be to use the recession periods as declared by the NBER Business Cycle Dating Committee. However, their judgment-based procedure has been criticized for a lack of statistical foundation, and for their rigid focus on *absolute declines* (as opposed to growth slowdowns) in output and other measures (Stock and Watson 1999). For these reasons, business-cycle filters have become the norm to study cyclical phenomena in contemporary business-cycle research in economics (e.g., Baxter and King 1999; Christiano and Fitzgerald 2003) and marketing (Deleersnyder et al. 2004, 2009; Lamey et al. 2007).

personal care, with food & beverages as base-level categories) to control for unobserved category effects. Our theorizing predicts that τ_k is negative for all marketing-mix instruments except major innovations (which are likely to have an effect on permanent rather than on temporary gains in private-label share) and price premium (where a positive effect is expected). A negative coefficient indicates that stronger pro-cyclical behavior with that marketing instrument ($\hat{\beta}_i^{MM_k}$ is more positive) increases counter-cyclical private-label share ($\hat{\beta}_i^{PLS}$ is more negative). Or in other words, cutting back in bad times and ramping up in good times increases private-label share in contractions, and reduces their share in expansions. For the price premium, the effect is exactly the reverse. Pro-cyclical behavior means that the relative price of national brands vs. private labels increases in expansions and decreases in contractions, which should decrease counter-cyclical changes in private-label share – leading to a positive coefficient.

Because the dependent variable in Eq. (7) is an estimated parameter, ordinary least squares (OLS) may yield biased estimates of the standard errors. We therefore use weighted least squares (WLS), with the inverse of the dependent variables' standard error as weights. Even though WLS estimation will provide consistent parameter estimates, the standard errors of these parameters may still be biased, because the marketing-mix comovement elasticities on the right-hand side of Eq. (7) are estimated parameters as well, and therefore measured with error. We derive corrected standard errors by a bootstrap bias-correction algorithm, using 250 Monte Carlo simulations on each of 1,000 random resamples with replacement (see the Web Appendix for details).

Step 5: Estimating the Effects on Permanent Gains in Private-Label Share

To test whether cyclical private-label performance and cyclical marketing conduct lead to an increase in the long-term private-label growth rate due to contractions, we estimate:

$$\hat{\phi}_i^{PLS} = \kappa + \gamma_{PLS}\hat{\beta}_i^{PLS} + \sum_{k=1}^{7}\gamma_k\hat{\beta}_i^{MM_k} + \sum_{l=1}^{2}\lambda_l X_i^l + \omega_i \,, \tag{8}$$

where $\hat{\phi}_i^{PLS}$ is the estimated incremental long-term growth in private-label share during a contraction year in category *i* derived from Eq. (6). $\hat{\beta}_i^{MM_k}$ and $\hat{\beta}_i^{PLS}$ are the comovement elasticity estimates of marketing-mix element *k* in category *i* (obtained from Eq. (3)) and private-label share (obtained from Eq. (5)), respectively. As before, we control for unobserved product-class effects, use WLS estimation, and derive bootstrap-corrected standard errors.[4]

Our theorizing predicts that counter-cyclical private-label share (i.e., β_i^{PLS} <0) stimulates long-term private-label growth. Thus, we expect γ_{PLS}<0. Our theorizing further leads us to expect that the γ for major innovations is positive. This indicates that stronger pro-cyclical behavior with major innovations ($\hat{\beta}_i^{MM_k}$ is more positive) increases long-term private-label share ($\hat{\phi}_i^{PLS}$ is more positive). Or in other words, a strategy of cutting back the introduction of major innovations in bad times and ramping them up in good times increases long-term private-label share compared to a more contrarian strategy of using contractions as an opportunity to launch major new products. For the other marketing instruments, our theorizing leads us to expect that cyclical conduct has an *indirect* effect, through their impact on the private-label comovement elasticity. To quantify this indirect effect, we compute for each marketing-mix element *k* the Sobel product:

$$\sigma_k = \gamma_{PLS} * \tau_k \tag{9}$$

where τ_k is taken from Eq. (7) and γ_{PLS} is taken from Eq. (8). The Z statistic of σ_k is given by:

$$Z = \frac{\gamma_{PLS} * \tau_k}{\sqrt{(\gamma_{PLS})^2 * (SE_{\tau_k})^2 + (\tau_k)^2 * (SE_{\gamma_{PLS}})^2 + (SE_{\tau_k})^2 * (SE_{\gamma_{PLS}})^2}} \tag{10}$$

where *SE* refers to the standard error of the estimate and Z ~ N(0,1). Under the assumption that stronger pro-cyclical behavior, or less counter-cyclical behavior, in marketing-mix instrument *k*

[4] Cross-equation effects between Eq. (7) and Eq. (8) are captured through γ_{PLS} . Hence, the error terms of the equations are assumed to be uncorrelated, which precludes the need for a system estimation (Dekimpe and Hanssens 1995).

(i.e., larger $\beta_i^{MM_k}$) increases the long-term private-label growth indirectly through the latter's comovement elasticity (γ_{PLS}<0), we expect σ_k to be positive for all marketing instruments except for the price premium where we expect a negative effect. While our theorizing does not lead us to expect strong *direct* effects of cyclical behavior in the other marketing instruments, we will nevertheless test for the existence of such direct effects.

DATA

We use annual information from 1985 through 2005 for 106 CPG categories sold in the U.S. The data cover a wide range of dry grocery (both food and non-food), frozen and refrigerated foods, health and beauty aids, and some general merchandise bought by consumers at grocery stores. Table 1 provides information on the measures and their data source, while Table 2 provides an overview of the products, grouped into broader product fields.

-- Insert Table 2 about here --

Information on the *private-label share* in each of the categories is obtained from the Marketing Factbooks, published annually by Information Resources, Inc (IRI). The private-label share in a given category pertains to the annual volume share aggregated across a wide range of retailers, but the set of retailers included changed during the time period. Up to 1998, retailers included only grocery outlets, such as supermarkets, mass merchandisers, hypermarkets, and discounters. From 1999 onwards, the set of retailers was broadened to other kinds of outlets, such as drugstores. The HP filter used in our subsequent analyses was adjusted to account for a potential level and/or slope shift in the underlying trend because of this change in store coverage (see the Web Appendix). Likewise, we extended Eq. (6) with a pulse and step dummy. Our substantive results were found to be insensitive to this issue.

Information on the relevant marketing-mix variables was obtained from three data sources: (i) the Marketing Factbooks, (ii) Kantar Media Intelligence, and (iii) Product Launch Analytics. We used the Marketing Factbooks to obtain information for each category on *relative promotional activity* for TPRs, in-store displays, and print-ad features. The data express the ratio between the volume sales sold with a national-brand promotion and the volume sales sold with a private-label promotion.[5] While this reflects consumer usage of different deals instead of how frequently manufacturers as well as retailers offer those deals, it is generally accepted that there is a strong link between both measures (Fader and Lodish 1990, p. 54). Moreover, the amount of observed retailer support for the national brands is used as a surrogate for the amount of wholesale support offered by the manufacturers as the latter information is not available for our long time span and broad set of categories.[6]

Marketing Factbooks data were also used to compute for each category a *relative regular price* (or price premium) of national brands versus private labels. The relative price is calculated as the average regular (unit) price for all national brands in a category divided by the average regular (unit) private-label price for all private labels in that category.[7] Likewise, the observed regular national-brand prices in the stores are used as a surrogate for the suggested retailer price by the national-brand manufacturers.

Total *national-brand advertising* expenditures at the category level were supplied by Kantar Media Intelligence. From the same data provider, we obtained retailer advertising expenditures.

[5] Since promotional information for the years 1995 and 1997 was missing, we interpolated the missing data using a state-space representation for the best fitting ARMA model (based on the AIC), computed with the Kalman filter (Harvey and Pierse 1984). For four categories, there were at least two consecutive years of missing data, which made the Harvey and Pierse method no longer applicable. In those cases, we opted to use linear interpolation. The same substantive findings were obtained when we excluded those four categories from our analyses.

[6] We thank an anonymous reviewer for this insight.

[7] Due to measurement inconsistencies over time, we could not use the regular price data for national brands and private labels separately. For instance, unit prices switched from price per pound to price per ounce, or to other equivalent units in certain years. Information on the measurement units, however, was not available to us. Note that a ratio-based measure is not susceptible to this problem.

Kantar Media Intelligence does not provide retailer advertising expenditure by category, the main reason being that most retailer advertising is generic and does not focus on single categories. Therefore, a relative measure for advertising does not make sense. However, aggregated retailer advertising across all CPG categories, by year, is available, allowing us to derive the overall retailer advertising comovement elasticity. We adjusted all advertising expenditures for inflation, using the 2000-constant-prices deflator obtained from the U.S. Bureau of Economic Analysis.

Information on major and incremental *innovation* activity by national brands versus retailers per year into the U.S. in each of the categories was obtained from Product Launch Analytics, a subscription-based service of Datamonitor, that focuses on the commercialization of innovations (i.e., market introductions itself) rather than the development of those innovations (i.e., R&D expenditures).[8] The same data source was used in Sorescu and Spanjol (2008).

Consistent with Corstjens and Steele (2008) and Kumar and Steenkamp (2007), we find that retailers are rarely involved in innovation activities (as opposed to me-too products). Thus, a relative measure for innovation does not make sense. However, we will derive an aggregate private-label innovation comovement elasticity including all retailer innovations across the categories by year. While we cannot use either of the aggregate comovement measures in our regression models (7) and (8), which are specified at the category level, we provide for the first time important information to what extent retailers exhibit pro- or counter-cyclical advertising and innovation behavior. Finally, GDP figures, expressed in constant 2000 prices, were obtained from the U.S. Bureau of Economic Analysis.

RESULTS

We first report the results on the three building blocks of our research framework (Figure 1) – viz.,

[8] The number of retailer innovations is operationalized as the number of innovations introduced in the U.S. by the (2000 and 2005) top 100 U.S. grocery retailers.

the cyclical sensitivity of marketing conduct ($\beta_i^{MM_k}$), the cyclical sensitivity of private-label share (β_i^{PLS}), and the incremental effect contraction years have on the growth of long-run private-label share (ϕ_i^{PLS}). Next, we provide evidence on the relations, represented by the arrows in Figure 1.[9]

How Sensitive Are Marketing Conduct and Private-Label Share to Business Cycles?

Cyclical marketing conduct: $\beta_i^{MM_k}$ (Eq. (3)). Table 3 summarizes the cyclical behavior of our seven marketing instruments. We focus on the meta-analytic results that combine evidence across all categories, rather than on the individual, category-specific, parameter estimates. The meta-analysis is performed on comovement elasticities derived from Eq. (3), using the method of adding weighted *Z*'s (Rosenthal 1991). Each of the individual parameter estimates is based on a maximum of 21 observations, which limits the statistical power of the tests. By combining the evidence across 106 categories, the statistical power is increased considerably, and more generalizable insights are obtained (Lipsey and Wilson 2001).

Our results show that marketing conduct does indeed vary systematically across the business cycle. For six of the seven instruments, the overall comovement elasticity is significant and positive, indicating a generalized tendency toward pro-cyclical marketing conduct. As the economy goes down, national-brand managers tend to reduce the number of incremental innovations (mean comovement elasticity = 1.62, $p < .01$), the number of major innovations ($\overline{\beta}$ = 1.28, $p < .10$) and advertising expenditures ($\overline{\beta}$ = .57, $p < .01$), while they increase them during expansion years. We also find pro-cyclical behavior patterns for all three relative promotion types: display ($\overline{\beta}$ = 4.25, $p < .01$), feature ($\overline{\beta}$ = 1.75, $p < .01$) and TPR ($\overline{\beta}$ = 5.07, $p < .01$), implying that when the economy winds down the relative intensity of national brands' promotions

[9] For hypothesis testing, we use one-tailed tests of statistical significance. Considering the small sample size (106 CPG categories), in addition to tests of significance at $p < .01$ and .05, we also report tests of statistical significance at $p < .10$. See Grewal, Chakravarty, and Saini (2010) for a similar practice.

compared to private labels is decreased, while the reverse occurs in expansions.

Regular price premium is the only instrument for which the expected generalized effect is not significant (p = .88). Unlike the other instruments, there is no dominant adjustment pattern to changes in the economy for price, with 52 (54) exhibiting a negative (positive) comovement elasticity, of which 22 (16) were significant.

The magnitude of the comovement elasticities is also instructive. Most elasticities exceed |1|, which indicates that in the CPG industry, market players react strongly to changes in general economic conditions. The strongest effect is found for the promotion weapon, especially for TPR and display. The *relative* promotion pressure of national brands declines during economic downturns, just when brands need it the most to hold their own against private labels. As national-brand promotions are a shared manufacturer-retailer decision, with the retailer having the final say, the observed decline in relative promotion activity can be affected both by manufacturers cutting back on price promotions and retailers reducing the percentage of pass-through. Both factors are plausible. In contractions, managers feel the urgent need to protect the bottom line, and many promotions are not profitable (Srinivasan et al. 2004). Retailers feel the financial pressure too, and may be inclined to reduce the pass-through to support their bottom line, or to use this money to subsidize promotions for their own private label. In an expansion period, there is less pressure on both parties' bottom line, which could make them more prone to either spend more on promotions, or to be more lenient in terms of pass-through.

The correlation between comovement elasticities is generally low (Table 4), the exception being the moderately-sized correlations between the three promotional instruments. This suggests some uniformity in response to the business cycle across promotional instruments. But note that correlations are standardized measures, and thus do not take the magnitude of the elasticities into account, which is managerially at least as important. Table 3 already shows that the magnitude of

the cyclical fluctuations in feature promotions is much smaller than that of the other two promotion instruments.

As mentioned earlier, there are only few instances of private-label innovations per category. This makes it impossible to estimate category-specific comovement elasticities for relative innovation activity. Nonetheless, our data allow us to provide for the first time preliminary insights into the cyclicality of private-label innovation activity, albeit at an aggregate level (i.e., combined across all categories). We summed all private-label innovations introduced across all 106 CPG categories, as identified by Product Launch Analytics. Next, we applied the HP filter to this time series, and we regressed the cyclical component of this series on the cyclical component in real GDP. We find that retailers introduce private-label innovations counter-cyclically ($\beta^{PL\_innov} = -9.11, p < .10$). This shows that retailers use economically difficult times as an opportunity to attract consumers by strengthening their private-label lines. In more affluent periods, this may be more difficult, which results in a lower incentive for retailers to rejuvenate their private-label offering.

We followed the same approach for aggregate retailers' advertising expenditures. Even though retail advertising may not necessarily feature store brands, it is still instructive to look at this measure to get insight into how retailers change their behavior because of economic fluctuations. Here, we find that retailers, like national-brand manufacturers, exhibit pro-cyclical advertising behavior ($\beta^{retailer\_adv} = 3.88, p < .01$).

-- Insert Tables 3 and 4 about here --

Temporary changes in private-label share due to the business cycle: β_i^{PLS} (Eq. (5)).

Manufacturers suffer temporarily when consumers switch to private labels during a contraction, but switch back in the following expansion period. The combined evidence across the 106

categories reveals that private-label share behaves counter-cyclically ($\overline{\beta}^{PLS}$ = -1.37, $p < .01$): it increases during contractions and decreases again during expansions. The weighted average comovement elasticity of -1.37 indicates that each time the economic activity falls 1% below (increases 1% above) the value predicted by its long-term trend line, private-label share will be 1.37% higher (lower) than its expected long-term value.

Permanent gains in private-label share due to contractions: ϕ_i^{PLS} (Eq. (6)). Table 5 reports the meta-analytic results for Eq. (6). We find that the mean drift parameter δ^{PLS} is 2.26 ($p < .01$). This indicates that private labels are not just a contraction phenomenon, but rather exhibit long-term growth of 2.26% per year. It is important to note that this growth figure is expressed in relative terms. For example, if current private-label share is 20%, a long-term growth rate of 2.26% in expansion years implies a total increase of .45% to 20.45%. The over-time growth of private labels is due to a variety of factors, including a gradual improvement in private-label quality, an increasing number of retail chains adopting a private-label program, and the deepening (multiple tiers of store brands) and broadening (more SKUs within a tier) of private-label assortments (Kumar and Steenkamp 2007).

Economic contractions result in an additional *permanent loss* for manufacturers. During contraction years, the incremental annual private-label growth rate (ϕ_i^{PLS}) is 5.39% (meta-analytic $p < .01$) for a total annual growth rate of 7.65%, on average. To illustrate, if current private-label share is 20%, a growth rate of 7.65% in a contraction year implies a total increase of 1.53% to 21.53%. This incremental effect is not reversed in subsequent expansions. Hence, we can conclude that contraction periods have a long-lasting impact on private-label share.

Next, we present the relations between the building blocks of our research framework, represented by the arrows in Figure 1.

-- Insert Table 5 about here --

The Effects on Temporary Changes in Private-Label Share due to the Business Cycle

Table 6 (columns 2-4) reports the effects of the cyclical variation in the marketing-mix instruments (τ_k) on *temporary* fluctuations in private-label share (β_i^{PLS}), along with their expected sign.

-- Insert Table 6 about here --

We find that neither cyclical fluctuations in the number of incremental national-brand innovations nor cyclical fluctuations in the number of major national-brand innovations induce cyclical movements in private-label share (τ_{INCREM_INNOV} = .0205, p = .196; τ_{MAJOR_INNOV} = -.0238, p = .212). While the non-significant effect of major innovations was expected, this is not the case for minor innovations. However, we find that cutting back advertising support for national brands in contractions contributes to private-label share in these difficult times (τ_{ADV} = -.1162, p < .05).

Cyclical variations in the promotion weapon exhibit the strongest effects on temporary private-label share. If the relative feature pressure of national brands vs. private labels is strongly pro-cyclical, this significantly adds to the (counter-)cyclical sensitivity of private-label share ($\tau_{FEATURE}$ = -.1043, p < .01). The effect of relative display effort goes in the same direction, but is weaker ($\tau_{DISPLAY}$ = -.0328, p < .10). By far the strongest effect is found when promotions directly involve the element that is foremost on the minds of consumers in contractions: price. The more national brands cut back on price promotions in contractions relative to their store-brand competitors, the stronger the temporary gains for private labels (τ_{TPR} = -.2355, p < .01). Finally, a more pro-cyclical price premium (i.e., a larger price premium of national brands over private labels during expansions compared to the contraction premium) adds to a pro-cyclical behavior in private-label share ($\tau_{PRICE\_PREMIUM}$ = .0618, p < .10).

The Effects on Permanent Gains in Private-Label Share due to Contractions

Table 6 (columns 5-10) also reports the effects of the cyclical variation in the marketing-mix instruments and the cyclical variation in private-label share on *permanent* gains in private-label share due to contractions (ϕ_i^{PLS}), along with their expected sign. Columns 5-7 report direct effects (γ_k and γ_{PLS}), derived from Eq. (8). Columns 8-10 report the indirect effects of the marketing instruments, via cyclical variation in private-label share (σ_k), derived from Eq. (9).

Direct effects: γ_{PLS} and γ_k (Eq. (8)). As expected, categories with higher temporary private-label-share increases in a contraction (i.e., more counter-cyclical, and thus more negative β^{PLS}) are also more likely to suffer permanent damage (γ_{PLS} = -.2022, p < .01). Moreover, if national-brand manufacturers tie the introduction of major innovations more strongly to the business cycle, this will result in a larger direct permanent share loss to private labels (γ_{MAJOR_INNOV} = .0547, p < .05). No significant direct effects are found for the other marketing-mix variables, which is consistent with the shorter duration interval of these instruments.

Indirect effects: σ_k (Eq. (9)). We find strong evidence of indirect effects of marketing-mix instruments, through their impact on the cyclical sensitivity of private-label share. Cyclical behavior in national-brand advertising contributes to the long-term private-label growth (σ_{ADV} = .0235, p < .10). Cyclical advertising behavior adds to the cyclical sensitivity of private-label share (τ_{ADV} = -.1162, p < .05), which in turn contributes to the long-term growth in private-label share (γ_{PLS} = -.2022, p < .01). Taken together, this results in an *indirect* positive effect of cyclical national-brand advertising adjustments on long-term private-label share (σ_{ADV} = .0235, p <.10). Thus, the dominant pattern of cutting back national-brand advertising in contractions (Table 3) leaves permanent scars on their market share.

We also find indirect effects for two of the three promotion instruments. The cyclical sensitivity of both relative feature activity and relative TPRs are significantly related to the long-lasting effect of a recession on private-label share. In particular, pro-cyclical behavior of relative feature promotions ($\sigma_{FEATURE} = .0211; p < .05$) and relative TPRs ($\sigma_{TPR} = .0476, p < .05$) contribute to the long-term growth in private-label share.

Differences between Product Classes

The focus in this paper is on deriving generalized insights on the relation between marketing conduct, the business cycle, and private-label share, rather than on specific product categories. Nevertheless, it is instructive and managerially relevant to examine whether there are differences between product classes, where we distinguish between food & beverages, personal care, and household care. Table 7 reports for each product class the mean values on the variables included in our research framework. Given the modest number of categories in household care and personal care, the results should be regarded as indicative rather than definitive.

We find that food & beverages exhibit stronger pro-cyclical behavior with respect to major innovations, TPR and feature promotions than household care and personal care, while advertising behaves less pro-cyclical and price premium behaves less counter-cyclically. Personal care stands out in that incremental innovation and feature activity are counter-cyclical, while they are pro-cyclical in the other two product classes. Personal care also exhibits the strongest degree of counter-cyclical behavior with respect to pricing, indicating that in this product class, the price premium of national brands over private labels varies more strongly over the business cycle than in the other two product classes. The comovement elasticities for household care are typically in between the comovement elasticities of the other two product classes, the clear exception being display activity which is significantly more pro-cyclical than the other two product classes.

In terms of private-label share, we find that personal care behaves most counter-cyclically,

and has the highest incremental long-term growth in private-label share due to contractions, while household care is lowest.

In our regression analyses, we control for mean differences between the three product classes using dummies. However, it might be possible that the effect of marketing-mix instruments differs between product classes. This could be tested by adding interactions between the two product-class dummies and each predictor to Eqs. (7) and (8), but given the total number of observations, this is not feasible. Instead, we opted for a piece-meal approach in which we tested for each marketing instrument separately whether its effect differed between the three product classes by adding interactions with the household-care and personal-care dummies. For each equation, only 1 out of 14 interactions was significant at $p < .10$, a result that would be obtained by chance alone.

-- Insert Table 7 about here --

Robustness Checks

Alternative values of the smoothing parameter. We assess the sensitivity of our results to alternative values of the smoothing parameter λ (i.e., -50% and +50% of its original (yearly) value of $\lambda = 10$). Our substantive findings remain unchanged across alternative specifications, both in terms of the weighted average comovement elasticities, and in terms of the effects found for our multivariate regression models.

Endogeneity. There might be a loop of causality between marketing behavior and private-label share in that marketing behavior of national brands and private labels may both affect and be affected by private-label share movements over the business cycle. This gives rise to endogeneity between marketing behavior and private-label share. To test for endogeneity in our models, we derived instruments from auxiliary regressions for each of the marketing variables by regressing the marketing-mix comovement elasticity vector on the weighted average comovement of all

categories excluding the focal category (and this for each of the 106 observations in our sample).[10] The predicted values from these regressions represent appropriate instruments, as they correlate highly with the original regressors (r's ranging from .79 to .98), while being unrelated to the error terms. The Hausman test indicates that endogeneity is not a problem in either Eq. (7) ($\chi^2(7) = 4.77$; $p > .10$) or Eq. (8) ($\chi^2(7) = 7.10$; $p > .10$).

Multicollinearity. The modest correlation between comovement elasticities (Table 4) and the low VIF values (< 2) suggest that multicollinearity is not a serious problem. However, to examine this issue in more detail, we perform an additional analysis in which we randomly drop 10% of our observations from the cross-sectional analysis in Eqs. (7) and (8), and re-estimate the parameter estimates. This procedure is repeated 10 times. Table 8 reports the average of the estimates across the 10 reduced samples, and the Mean Average Deviation (MAD) and the Root Mean Squared Error (RMSE) between the full-sample estimates and each of the reduced-sample estimates. Our findings reveal a high degree of stability of the parameter estimates across subsamples.

-- Insert Table 8 about here --

DISCUSSION

We summarize our findings around the research questions this study set out to address.

How do managers of national brands and private labels adjust their behavior in response to economic up- and downswings? We document that six out of seven marketing instruments exhibit cyclical patterns. The introduction of incremental and major innovations, as well as advertising by national brands, increase in expansions, while they are cut back again in contractions. Similarly, promotional pressure of national brands relative to private labels is pro-cyclical. With the exception of advertising, market behavior is elastic, in that the intensity of these marketing instruments exhibits greater fluctuations than the economy at large. The widest fluctuations can be

[10] The average is weighted by the precision of the comovement estimates using the inverse of the standard errors.

observed for the promotional weapon, with display and TPR exhibiting average fluctuations in relative intensity that are more than four times larger than the magnitude of the corresponding fluctuations in the state of the economy. This indicates that promotions are the marketing instrument that is most influenced by the state of the economy. Finally, the price premium of national brands over private labels is, on average, insensitive to business-cycle fluctuations. We document some interesting differences in marketing conduct across the product classes of food & beverages, personal care, and household care as well.

Do these business-cycle-induced adjustments in marketing contribute to (i) temporary changes in private-label share, and (ii) permanent gains in private-label share? We find that the observed cyclicality of marketing conduct indeed impacts private-label share, and this in a variety of ways. Pro-cyclical advertising spending leads to counter-cyclical adjustments in private-label share, which in turn leads to a permanent increase in private-label share. This is also the case when the level of promotional support for national brands relative to private labels closely follows the business cycle. Pro-cyclical movements in the price premium of national brands over private labels also add positively to the extent of cyclical variation in private-label share, but have no significant long-term impact. Further, pro-cyclical activity with respect to major new-product introductions by national brands is associated with a permanent loss of share to private labels. That the magnitude of the loss in market share to private labels should be of paramount concern to brand managers is highlighted by our findings. In expansions, long-term private-label share grows, on average, by 2.26% per year; in contractions, the annual growth rate accelerates to 7.65%.

Managerial Implications

Managers cannot prevent economic contractions from happening. However, our results indicate that they can mitigate or attenuate the impact they feel from macro-economic developments. In contractions, consumers increasingly switch to private labels, if only because they need to save

money. Some of these contraction-induced losses to private labels are permanent, i.e., they are not recovered in a subsequent expansion. However, by pursuing particular strategies, national-brand managers can limit the extent of their losses to private labels, whereas retailers can further boost the extent of these gains for their private labels.

Implications for National-Brand Manufacturers

We find that national brands tend to delay launching new products until demand expands again. Our results show that this current practice is justified for incremental innovations. While incrementally new products are less costly to introduce, they are easier to quickly imitate, and do not reduce private-label share. We find that *major* innovations are needed to limit private-label growth. They are more difficult to imitate, and keeping up their rate prevents national brands from losing a unique expertise/skill set that is difficult and time-consuming to recoup in the subsequent expansion (Fatás 2000). However, this is not what brand manufacturers do. We document that the introduction rate of major new products is pro-cyclical, while a more evenly spread strategy would help to counter long-term private-label growth.

The prevailing practice to let *advertising* budgets swing with the business cycle also contributes to the erosion of the market share of national brands. Again, a missed opportunity can be identified. When the economy winds down, manufacturers should try to maintain their current spending, or even raise advertising if that is financially feasible. In expansion periods, consumers are intrinsically less inclined to buy private labels, and advertising is less needed to insulate consumers from focusing too much on price. While advertising may still be called for as a competitive weapon against other national brands, it becomes relatively less relevant in the battle against private labels.

Third, we see that in contractions, national-brand *promotional activity* declines relative to private-label activity, just when brands need it the most. This results in a significant increase in

private-label share in recessions, which subsequently leaves permanent scars on national-brand performance. The effect of TPRs is particularly strong. In fact, cyclical behavior with this instrument has the strongest effect of all instruments considered.

The pro-cyclical patterns in *relative* promotional activity disguise whether this observed behavior is due to national-brand manufacturers, private labels, or any combination where one channel partner adjusts more or less than the other. To enhance our understanding on what is happening, the comovement elasticities for national brands and private labels separately are calculated, measured as the national brands' (private labels') volume sold in a specific promotional condition (i.e., display, feature or TPR) divided by total national-brand (private-label) volume sales. This yields the following patterns:

	Weighted mean comovement elasticity	**Meta-analytic Z^b**	**Meta-analytic *p***	**Nature of cyclicality**
% Display PL	-6.99	-9.65	<.01	Counter-cyclical
% Display NB	-3.32	-10.81	<.01	Counter-cyclical
% Feature PL	-.97	-4.12	<.01	Counter-cyclical
% Feature NB	-.28	-2.48	<.01	Counter-cyclical
% TPR PL	-.30	.27	>.20	A-cyclical
% TPR NB	3.21	6.64	<.01	Pro-cyclical

These findings shed light on the causes of the observed nature of the cyclicality of the relative promotional activity of national brands versus private labels.[11] The observed pro-cyclical pattern in relative display and feature activity is not due to the fact that in contractions national brands cut back on these activities while private labels intensify them, while the reverse happens in expansions, but rather that display and feature activity by private labels is much more counter-

[11] A cautionary note is warranted. The comovement elasticities for national brands and private labels separately should be treated as indicative rather than definitive because they suffer from endogeneity concerns. The denominator of national-brand (private-label) promotion activity is national-brand (private-label) sales, which co-moves with the business cycle. This would create endogeneity in our model. Our ratio-based approach - where we divide national-brand volume bought on promotion by private-label volume bought on promotion - does not include such a direct linkage to volume sales, and is therefore less susceptible to the issue. As reported earlier in the paper, we explicitly test for reverse causality with our measures, and found this not to be an issue. The endogeneity issue is the main reason why we did not include these separate measures in Eqs. (7) and (8), another reason being that our model is already at the lower bound of the number of observations to number of parameters ratio.

cyclical than display and feature activity by national brands. On the other hand, pro-cyclical behavior with TPR is only observed for national brands (as an a-cyclical pattern is found for private-label TPRs). These promotion results put brand managers in a bind. TPRs directly hit the bottom line - which is already under pressure in contractions - and we can therefore speculate that retailers may be less inclined to pass on the entire promotion to consumers. This would mean that in tough times, brand managers need to work even harder to negotiate a high pass-through.

Previous research has argued that a growing focus by national brands on price promotions hurts national brands' share in the longer run, as it stimulates price sensitivity (Mela, Gupta, and Lehmann 1997) and decreases brand distinctiveness (Mela et al. 1998), which over time might enhance private-label popularity (Kumar and Steenkamp 2007). Our findings, however, show that national brands should nevertheless consider increasing TPRs during contraction years, as such counter-cyclical behavior helps to attenuate the popularity of private labels induced by the downturn. We do not recommend to *permanently* increase the intensity of price promotions, but rather suggest that national-brand managers *reallocate* some of the price-promotion budget from good times to bad times, i.e., reduce the extent of pro-cyclicality of their TPRs.

Finally, the national-brand *price premium* over private labels is, on average, insensitive to economic ups and downs. Still, temporary decreasing one's regular price for the national brands in contractions helps to prevent consumers from switching to the private labels during contractions. A caveat should be noted though. Similar to promotional tools, the manufacturer sets wholesale prices, while consumer prices are set by the retailer. Nevertheless, it is reasonable to assume that brand managers can influence consumer prices in their negotiations with the retailer (cf. Ailawadi et al. 2009, p. 43). But given that both TPRs and reductions in regular price have a strong and immediate effect on the bottom line, and considering that price promotions have a much stronger

temporary and permanent effect on private-label performance than the price premium, we recommend that managers spend their limited resources on the former.

Implications for Retailers

Contractions offer a golden opportunity for retailers to boost the share of their own brands. By judiciously using the right strategies, they can enhance private-label share even more, both during the contraction and afterwards. Our finding that promotional support for private labels is more counter-cyclical than promotional support given to national brands is right "on target". Private labels shift their promotional resources to that period in the business cycle when consumers are most susceptible to their lure. Overall, price premiums are found to be insensitive to economic contractions and expansions. Still, temporary broadening the price gap (i.e., decreasing the private-label prices and/or increasing national-brand prices) in their stores could even further convince consumers to switch to their store-brand alternatives.

Given the only sporadic use of innovations and category-specific advertising to support their private labels in our sample period, we were unable to derive category-specific comovement elasticities for these instruments. When aggregating across all CPG categories, the total number of new-product introductions carrying a store-brand name increases during contractions and decreases during expansions. This counter-cyclical new-product activity is speculated to enhance store-brand popularity in contractions and beyond, implying that retailers are doing a good job. As for advertising, retailers' spending (which is mostly generic) mimics national brands' behavior in that it is pro-cyclical. Given that also national brands increase their spending during economic expansions, the competitive clutter will be considerably higher (Danaher et al. 2008). As consumers are also less sensitive to private labels' most favorable attribute (i.e., a low price) during such times, one may wonder whether this is the most appropriate strategy for private labels. Instead, a counter-cyclical spending strategy may be advisable, as this would allow one to spend

more when competitive clutter is lower, when consumers are more open to the price argument, and when retailers need to communicate their increased private-label offering.

Limitations and Directions for Further Research

The promotional and price measures used in our analyses are relative measures, which can result from a variety of responses of national brands versus private labels to the business cycle. Above, we report comovement elasticities for national brands and private labels separately, but these findings are indicative rather than definitive due to endogeneity concerns, which need to be addressed in future research. Moreover, the promotional and pricing data are the net effect of manufacturer and retailer behavior. It would be interesting to see whether retailer pass-through rates for manufacturer promotions change over the business cycle. For instance, retailers might command higher wholesale support for a given level of retail support when power shifts in favor of the retailers (e.g., during an economic downturn).

Our analyses were conducted at the category level. Within a category, individual brands will differ in their ability to fight store brands. For example, do market leaders react differently to economic swings than small brands? Are those leaders better able to sustain in a contraction when consumers face significant adjustments in their grocery budgets (Ma et al. 2011)? And, are they better positioned, compared to smaller players, to recoup any losses in the subsequent expansion period? Also, private-label market share in a category is not the only performance metric for national brands. Future research could consider brand-level performance metrics such as brand profitability, loyalty, and price sensitivity over the business cycle.

Conclusion

In sum, valuable lessons can be learned from marketing practice over the last 20+ years. During that period, successive generations of national-brand managers and retail managers were confronted with economic contractions. The economic hardship caused by contractions provides a

powerful impetus for private-label growth. Retailers' observed practice of supporting their own labels in contractions helps this contraction-enhanced private-label popularity even further. In contrast, national-brand manufacturers have been partially responsible for how much these contractions helped strengthen their fiercest enemy, the private labels owned by their very customers. National brands' tendency to reduce major new-product introductions, advertising, and relative promotional pressure in contractions, while ramping them up only when the economy is again improving, is associated with temporary as well as permanent gains for private labels. Thus, opportunities to limit private-label growth have been missed.

We do *not* argue that national brands should just spend more on marketing in bad times. That may not be realistic and in fact, would play to a criticism frequently levied against marketing managers, viz., that they always want to spend more. Rather, we recommend that national brands reallocate some marketing investments from good times to bad times. By spending *not more* but *more smartly*, national brands can be more effective in fighting private labels for the same marketing budget. This requires that national-brand manufacturers take a business cycle, multi-year, perspective on marketing *investments*, rather than a short-term quarterly perspective on marketing *expenditure*. Like slumps in the stock market offer great investment opportunities, slumps in the real economy offer great opportunities for those managers that invest in marketing. Our evidence indicates that a counter-cyclical strategy is associated with greater success in fighting the enemy you love to hate. If you wait till the good times come back again, you ignore the advice given by the legendary ice-hockey player Wayne Gretzky: "I skate to where the puck is going to be, not to where it has been." We hope that our findings provide an impetus to follow Gretzky's advice.

REFERENCES

Ailawadi, Kusum L. and Bari A. Harlam (2004), "An Empirical Analysis of the Determinants of Retail Margins: The Role of Store-Brand Share," *Journal of Marketing*, 68 (January), 147-165.

-----, J.B. Beauchamp, Naveen Donthu, Dinesh K. Gauri, and Venkatesh Shankar (2009), "Communication and Promotion Decisions in Retailing: A Review and Directions for Future Research," *Journal of Retailing*, 85 (March), 42-55.

-----, Koen Pauwels, and Jan-Benedict E.M. Steenkamp (2008), "Private-Label Use and Store Loyalty," *Journal of Marketing*, 72 (November), 19-30.

Apelbaum, Eidan, Eitan Gerstner, and Prasad A. Naik (2003), "The Effects of Expert Quality Evaluations versus Brand Name on Price Premiums," *Journal of Product and Brand Management*, 12 (2/3), 154-165.

Axarloglou, Kostas (2003), "The Cyclicality of New Product Introductions," *Journal of Business*, 76 (January), 29-48.

Baxter, Marianne (1994), "Real Exchange Rates and Real Interest Differentials: Have We Missed the Business-Cycle Relationship?" *Journal of Monetary Economics*, 33 (February), 5–37.

-----and Robert G. King (1999), "Measuring Business Cycles: Approximate Band-Pass Filters for Economic Time Series," *The Review of Economics and Statistics*, 81 (November), 575-593.

Bell, David R., Jeongwen Chiang, and V. Padmanabhan (1999), "The Decomposition of Promotional Response: An Empirical Generalization," *Marketing Science*, 18 (Fall), 504-526.

Bland, J. Marin and Sally M. Kerry (1998), "Weighted Comparison of Means," *British Medical Journal*, 316 (January 10), 129.

Bronnenberg, Bart J., Carl F. Mela, and William F. Boulding (2006), "The Periodicity of Competitor Pricing," *Journal of Marketing Research*, 43 (August), 477-493.

Chevalier, Judith A. and David S. Scharfstein (1996), "Capital-Market Imperfections and Countercyclical Markups: Theory and Evidence," *American Economic Review*, 86 (September), 703-725.

Christiano, Lawrence J. and Terry J. Fitzgerald (1998), "The Business Cycle: It's Still a Puzzle," *Economic Perspectives*, 22 (4th Quarter), Federal Reserve Bank of Chicago, 56-83.

Cook, Steven (1999), "Cyclicality and Durability: Evidence from U.S. Consumers' Expenditure," *Journal of Applied Economics*, 11 (November), 299-310.

Corstjens, Marcel and Richard Steele (2008), "An International Empirical Analysis of the Performance of Manufacturers and Retailers," *Journal of Retailing and Consumer Services*, 15 (May), 224-236.

Danaher, Peter J., André Bonfrer, and Sanjay Dhar (2008), "The Effect of Competitive Advertising Interference on Sales for Packaged Goods," *Journal of Marketing Research*, 45 (April), 211-225.

Dekimpe, Marnik G. and Dominique M. Hanssens (1995), "The Persistence of Marketing Effects on Sales," *Marketing Science*, 14 (Winter), 1-21.

Deleersnyder, Barbara, Marnik G. Dekimpe, Miklos Sarvary, and Philip M. Parker (2004), "Weathering Tight Economic Times: The Sales Evolution of Consumer Durables over the Business Cycle," *Quantitative Marketing and Economics*, 2 (December), 347-383.

----, Marnik G. Dekimpe, Jan-Benedict E.M. Steenkamp, and Peter S.H. Leeflang (2009), "The Role of National Culture in Advertising's Sensitivity to Business Cycles: An Investigation across Continents," *Journal of Marketing Research*, 46 (October), 623-636.

Dhar, Sanjay D. and Stephen J. Hoch (1997), "Why Store Brand Penetration Varies by Retailer," *Marketing Science*, 16 (Summer), 208-227.

Döpke, Jörg (2004), "How Robust is the Empirical Link between Business-Cycle Volatility and Long-Run Growth in OECD Countries?" *International Review of Applied Economics*, 18 (January), 103-121.

Ernst&Young/ACNielsen (2000), *New Product Introduction, Successful Innovation/Failure: A Fragile Boundary*, Paris: Ernst&Young Global Client Consulting.

Estelami, Hooman, Donald R. Lehmann, and Alfred C. Holden (2001), "Macro-Economic Determinants of Consumer Price Knowledge: A Meta-Analysis of Four Decades of Research," *International Journal of Research in Marketing*, 18 (December), 341-355.

Fader, Peter S. and Leonard Lodish (1990), "A Cross-Category Analysis of Category Structure and Promotional Activity for Grocery Products," *Journal of Marketing,* 54 (October), 52-65.

Fatás, Antonio (2000), "Endogenous Growth and Stochastic Trends," *Journal of Monetary Economics*, 45 (February), 107-128.

Gielens, Katrijn and Jan-Benedict E.M. Steenkamp (2007), "Drivers of Consumer Acceptance of New Packaged Goods: An Investigation across Products and Countries," *International Journal of Research in Marketing*, 22 (June), 97-111.

Gijsenberg, Maarten J., Harald J. van Heerde, Marnik G. Dekimpe, and Jan-Benedict E.M. Steenkamp (2010), "Price and Advertising Effectiveness over the Business Cycle" *Research Report*, Leuven: K.U.Leuven. Faculty of Business and Economics.

Grewal, Rajdeep, Anindita Chakravarty, and Amit Saini (2010), "Governance Mechanisms in Business-to-Business Electronic Markets," *Journal of Marketing*, 74 (July), 45-62.

Harvey, Andrew C. and Richard G. Pierse (1984), "Estimating Missing Observations in Economic Time Series," *Journal of the American Statistical Association,* 79 (March), 125-131.

Hoch, Stephen J. and Shumeet Banerji (1993), "When Do Private Labels Succeed?" *Sloan Management Review,* 34 (Summer), 57-67.

Hodrick, Robert J. and Edward C. Prescott (1997), "Postwar U.S. Business Cycles: An Empirical Investigation," *Journal of Money, Credit and Banking*, 29 (February), 1-16.

Hoyer, Wayne D. (1984), "An Examination of Consumer Decision Making for a Common Repeat Purchase Product," *Journal of Consumer Research*, 11 (December), 822-829.

Kontolemis, Zenon G. (1997), "Does Growth Vary over the Business Cycle? Some Evidence from the G7 Countries," *Economica,* 64 (August), 441-460.

Kumar, Nirmalya and Jan-Benedict E.M. Steenkamp (2007), *Private Label Strategy: How to Meet the Store Brand Challenge*, Boston, MA: Harvard Business School Press.

Lamey, Lien, Barbara Deleersnyder, Marnik G. Dekimpe, and Jan-Benedict E.M. Steenkamp (2007), "How Business Cycles Contribute to Private-Label Success: Evidence from the United States and Europe," *Journal of Marketing,* 71 (January), 1-15.

Leone, Robert P. (1995), "Generalizing What is Known about Temporal Aggregation and Advertising Carry-Over?" *Marketing Science*, 14 (Summer), 141-150.

Lipsey, Mark W. and David B. Wilson (2001), *Practical Meta-Analysis*. Thousand Oaks, CA: Sage Publications.

M+M Planet Retail (2009), "Private Label Trends Worldwide, 2009," report, Planet Retail.

Ma, Yu, Kusum L. Ailawadi, Dinesh K. Gauri, and Dhruv Grewal (2011), "An Empirical Investigation of the Impact of Gasoline Prices on Grocery Shopping Behavior," *Journal of Marketing*, 75 (March), 18-35.

Mela, Carl F., Sunil Gupta, and Donald R. Lehmann (1997), "The Long-Term Impact of Promotion and Advertising on Consumer Brand Choice," *Journal of Marketing Research,* 34 (May), 248-261.

-----, -----, and Kamel Jedidi (1998), "Assessing Long-Term Promotional Influences on Market Structure," *International Journal of Research in Marketing,* 15 (May), 89-107.
Meza, Sergio and K. Sudhir (2010), "Do Private Labels Increase Retailer Bargaining Power?" *Quantitative Marketing and Economics*, 8 (September), 333-363.
Mills, Terence C. (2000), "Business Cycle Volatility and Economic Growth: a Reassessment," *Journal of Post Keynesian Economics*, 23 (Fall), 107-116.
----- (2001), "Business Cycle Asymmetry and Duration Dependence: An International Perspective," *Journal of Applied Statistics*, 28 (August), 713-724.
Neslin, Scott A. (2002), *Sales Promotion*, Cambridge, MA: Marketing Science Institute.
Nijs, Vincent R., Shuba Srinivasan, and Koen Pauwels (2007), "Retail-Price Drivers and Retailer Profits," *Marketing Science,* 26 (Summer), 473-487.
Ramey, Garey and Valerie A. Ramey (1995), "Cross-country Evidence on the Link between Volatility and Growth," *The American Economic Review*, 85 (December), 1138-1151.
Reibstein, David and Dick Wittink (2005), "Competitive Responsiveness," *Marketing Science*, 24 (Winter), 8-11.
Rosenthal, Robert (1991), *Meta-Analytic Procedures for Social Research.* Newbury Park: Sage.
Sorescu, Alina B. and Jelena Spanjol (2008), "Innovations' Effect on Firm Value and Risk: Insights from Consumer Packaged Goods," *Journal of Marketing,* 72 (March), 114-132.
Srinivasan, Shuba, Koen Pauwels, Dominique M. Hanssens, and Marnik G. Dekimpe (2004), "Do Promotions Benefit Manufacturers, Retailers, or Both?", *Management Science*, 50 (May), 617-629.
Srinivasan, Raji, Gary L. Lilien, and Shrihari Sridhar (2011), "Should Firms Spend More on Research and Development and Advertising During Recessions?" *Journal of Marketing*, 75 (May), 49-65.
Steenkamp, Jan-Benedict E.M. and Eric Fang (2011), "The Impact of Economic Contractions on the Effectiveness of R&D and Advertising: Evidence from U.S. Companies Spanning Three Decades," *Marketing Science*, 30 (in press).
Steenkamp, Jan-Benedict E.M., Harald J. van Heerde, and Inge Geyskens (2010), "What Makes Consumers Willing to Pay a Price Premium for National Brands over Private Labels?" *Journal of Marketing Research*, 47 (December), 1011-1024.
Steiner, Robert L. (2004), "The Nature and Benefits of National Brand/ Private Label Competition," *Review of Industrial Organization,* 24 (March), 105-127.
Stock, James H. and Mark W. Watson (1999), "Business Cycle Fluctuations in US Macroeconomic Time Series," in J. Taylor and M. Woodford (eds.), *Handbook of Macroeconomics*. Amsterdam: Elsevier Science B.V., 3-64.
Taylor, John B. (1999), "Staggered Price and Wage Setting in Macroeconomics," *Handbook of Macroeconomics*, in: J. B. Taylor & M. Woodford (ed.), Handbook of Macroeconomics, 1st ed., Elsevier, 1009-1050.
Wakefield, Kirk. L. and Jeffrey J. Inman (1993), "Who Are the Price Vigilantes? An Investigation of Differentiating Characteristics Influencing Price Information Processing," *Journal of Retailing*, 69 (Autumn), 216-233.
Zhang, Jie (2006), "An Integrated Choice Model Incorporating Alternative Mechanisms for Consumers' Reaction to In-Store Display and Feature Advertising," *Marketing Science,* 25 (Spring), 278-290.

Figure 1
Research Framework

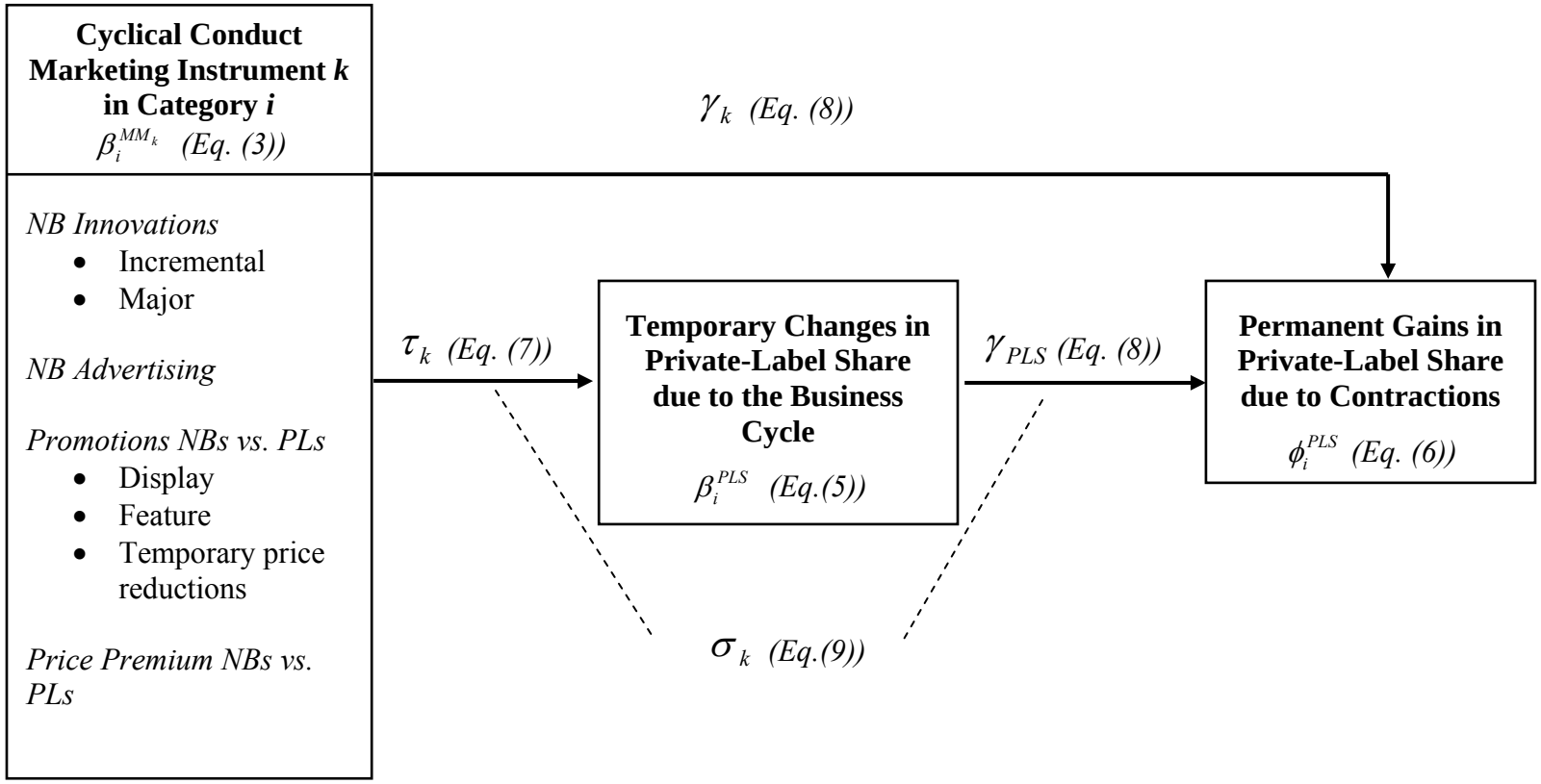

Table 1
Constructs and Operationalization

Construct	Explanation	Reference	Operationalization	Data Source
Private-label share	The percentage of the total volume in a category sold under a private label.	Dhar and Hoch (1997)	Combined percentage share of all private labels in a category sold in the U.S. based on volume sales: [Category volume sales sold under a private label] / [Total category volume sales sold]	IRI Marketing Factbooks
Major national-brand innovations	New products introduced by national brands that are the first to bring novel and significant consumer benefits to the market, including new-to-the-world products, new technologies, new applications, or new packaging that affects the use of the product.	Ernst&Young/ ACNielsen (2000); Sorescu and Spanjol (2008)	All major innovations in a category launched on the U.S. market minus the number of major innovations in that category introduced in the U.S. by the top 100 grocery retailers	Product Launch Analytics
Incremental national-brand innovations	New products introduced by national brands that deliver slight modifications to existing products, such as slightly different flavors, new forms and/or sizes of existing products.	Ernst&Young/ ACNielsen (2000); Sorescu and Spanjol (2008)	All incremental innovations in a category launched on the U.S. market minus the number of incremental innovations in that category introduced in the U.S. by the top 100 grocery retailers	Product Launch Analytics
National-brand advertising	All above-the-line activities that emphasize a specific national brand, including TV, radio, print, outdoors, and internet advertising.		Cumulative dollars spent on TV, radio, print, outdoors, and internet advertising in the U.S. by manufacturers in a category	Kantar Media Intelligence
Display promotions for national brands vs. private labels	In-store promotions for a national brand or private-label product, usually at the end of the aisle or in-aisle.	Neslin (2002)	[Category's volume sales sold with national-brand display support] / [Category's volume sales sold with private label display support]	IRI Marketing Factbooks
Feature promotions for national brands vs. private labels	Promotions which emphasize a national brand or private-label product in a store flyer, which are often distributed through local newspaper inserts.	Neslin (2002)	[Category's volume sales sold with national-brand feature support] / [Category's volume sales sold with private label feature support]	IRI Marketing Factbooks
Temporary price reductions for national brands vs. private labels	A price cut for a national brand or private-label product that typically lasts one to five weeks.	Neslin (2002)	[Category's volume sales sold with a national-brand temporary price reduction] / [Category's volume sales sold with a private-label temporary price reduction]	IRI Marketing Factbooks
Price premium national brands over private labels	The difference between the price of national brands and private labels per equivalent unit of product.	Steenkamp, van Heerde, and Geyskens (2010)	[Weighted average regular price of the national brands] / [Weighted average regular price of the private labels]	IRI Marketing Factbooks
Cyclical conduct of marketing instrument *k*	The extent that marketing instrument *k* temporary changes with cyclical up- and downswings in the economy.	This study	β^{MM_k} (Eq. (3))	N.A.
Temporary changes in private-label share due to the business cycle	The extent that private-label share temporary changes with cyclical up- and downswings in the economy.	This study	β^{PLS} (Eq. (5))	N.A.
Permanent private-label-share gains due to contractions	The gains in the market share of private labels that are permanent and which can be attributed to the economic contraction.	This study	ϕ^{PLS} (Eq. (6))	N.A.

Table 2
Data Coverage

Product Fields	Examples	# Categories
Assorted foods	Rice, pasta	19
Beverages	Carbonated beverages, tea	5
Cakes	Cakes & pies, cookies	6
Candy	Marshmallows, salty snacks	6
Canned/bottled foods	Canned/bottled fruit, canned vegetables	6
Care products	Feminine needs, toothpaste	17
Cleaning products	Bleach, dishwasher detergent	7
Dairy products	Ice cream, yogurt	6
Frozen foods	Juices, pizza, seafood	16
Households supplies	Air fresheners, paper towels	4
Pet products	Cat food, dog food	2
Taste enhancers	Mayonnaise, sugar substitutes	12
Total		*106*

Table 3
Cyclical Marketing Conduct and Private-Label Share

	Expected sign	Weighted mean comovement elasticity[a]	Meta-analytic Z[b]	Meta-analytic p	Nature of cyclicality
Marketing instruments					
Innovation activity NBs					
Incremental innovations	+	1.62	3.64	<.01	Pro-cyclical
Major innovations	+	1.28	1.40	<.10	Pro-cyclical
Advertising activity NBs					
Total advertising	+	.57	5.89	<.01	Pro-cyclical
Relative promotion activity NBs vs. PLs					
Display	+	4.25	3.63	<.01	Pro-cyclical
Feature	+	1.75	2.96	<.01	Pro-cyclical
Temporary price reductions	+	5.07	7.24	<.01	Pro-cyclical
Relative price NBs vs. PLs					
Price premium	-	-3.24	-.15	.88	A-cyclical
Private-label share	-	*-1.37*	*-3.80*	<.01	Counter-cyclical

N=106.
[a] The average is weighted by the precision of the parameter estimates, using the inverse of the standard errors (Lipsey and Wilson 2001).
[b] The meta-analysis reports Z-values and one-sided p-values, obtained by the method of adding weighted Zs (Rosenthal 1991).

Table 4
Correlations Between Marketing-Mix Comovement Elasticities

	Incremental NB innovations	Major NB innovations	NB advertising	Relative display NBs vs. PLs	Relative feature NBs vs. PLs	Relative TPR NBs vs. PLs	Price premium NBs vs. PLs
Incremental NB innovations	1						
Major NB innovations	.233	1					
NB advertising	.178	.132	1				
Relative display NBs vs. PLs	-.087	.256	-.088	1			
Relative feature NBs vs. PLs	-.050	.139	-.245	.409	1		
Relative TPR NBs vs. PLs	.056	.202	-.124	.458	.561	1	
Price premium NBs vs. PLs	.096	.095	.018	-.050	.243	.023	1

N=106.

Table 5
Long-Term Private-Label Share Growth in Expansion and Incremental Long-Term Private-Label Share Growth in Contraction

	Expected sign	Weighted mean[a]	Meta-analytic Z[b]	Meta-analytic p
Long-term annual growth in expansion (δ^{PLS})[c]	+	2.26%	10.68	<.01
Incremental long-term annual growth in contraction (ϕ^{PLS})[c]	+	5.39%	6.61	<.01

N=106.

[a] The average is weighted by the precision of the parameter estimates, using the inverse of the standard errors.

[b] The meta-analysis reports Z-values and one-sided p-values, obtained by the method of adding weighted Z's.

[c] The parameters δ^{PLS} and ϕ^{PLS} are obtained from Eq. (6).

Table 6
Private-Label Share and Cyclical Marketing Conduct

Predictors	*PL share comovement elasticity*[a,b] *(Eq. (7))*			*PL share incremental contraction growth*[a,c] *(Eqs. (8),(9) & (10))*					
	Expected Sign	Coefficient	*t*-value	Expected sign	Direct effect	*t*-value	Expected sign	Indirect effect	*Z*-value
Intercept		.4333	1.06		.5059*	1.55			
Cyclical private-label share									
Private-label share comovement				-	-.2022***	-2.43			
Cyclical innovation national brands									
Incremental innovations comovement	-	.0205	.68		.0139	.65	+	-.0041	-.61
Major innovations comovement		-.0238	-.65	+	.0547**	2.06		.0048	.59
Cyclical advertising national brands									
Advertising comovement	-	-.1162**	-1.95		.0245	.56	+	.0235*	1.45
Cyclical relative promotion NBs vs. PLs									
Display comovement	-	-.0328*	-1.42		-.0131	-.83	+	.0066	1.15
Feature comovement	-	-.1043***	-2.62		.0090	.28	+	.0211**	1.72
TPR comovement	-	-.2355***	-5.37		-.0031	-.09	+	.0476**	2.18
Cyclical relative price NBs vs. PLs									
Price premium comovement	+	.0618*	1.49		-.0058	-.16	-	-.0125	-1.20
Category control variables									
Dummy household care		.1922	.30		1.4209	2.74		-.0389	-.28
Dummy personal care		-.5863	-.74		1.0121	1.58		.1186	.66

N=106; * $p < .10$, ** $p < .05$; *** $p < .01$ (one-sided, except for control variables for which no hypothesis was developed).

[a] *t*-values based on the bootstrap-corrected standard errors (Nijs et al. 2007); *Z*-values for the indirect effects are based on Eq. (10).

[b] A negative (positive) sign for a predictor indicates that the temporary loss (gain) to private labels in a contraction (expansions) is increased when the predictor behaves more pro-cyclically (counter-cyclically).

[c] A positive (negative) sign for a predictor indicates that the permanent loss to private labels due to contractions is increased when the predictor behaves more pro-cyclically (counter-cyclically).

Table 7
Cyclical Marketing Conduct and Private-Label Share for Three Product Classes

	Household care	Personal care	Food & beverage
Weighted comovement elasticities			
Major innovation activity by NBs	0.59[a]	0.54[a]	1.64[b]
Incremental innovation activity by NBs	2.24[a]	-2.84[b]	1.98[a]
Advertising by NBs	0.94[a]	1.13[a]	0.37[b]
Display activity by NBs vs. PLs	5.11[a]	3.31[b]	4.35[c]
Feature activity by NBs vs. PLs	1.17[a]	-1.12[b]	2.59[c]
TPR activity by NBs vs. PLs	3.87[a]	3.13[a]	5.78[c]
Price premium of NBs over PLs	-4.04[a]	-7.85[b]	-1.84[c]
PL share	-.38[a]	-2.22[b]	-1.35[c]
Incremental long-term annual growth in private-label share in contraction	12.90%[a]	8.40%[b]	2.68%[c]
Number of categories	14	16	76

Note: Means with different superscripts are significantly different from each other ($p < .033$, after Bonferroni correction), using the weighted two sample *t*-test (Bland and Kerry 1998). All means are weighted by the precision of the parameter estimates, using the inverse of the standard errors.

Table 8
Stability of the Parameter Estimates

Predictors	Original coefficient (Table 6)	Average of the 10 coefficients	MAD	RMSE
Cyclical innovation NBs				
Incremental innovations comovement	.0205	.0285	.0048	.0100
Major innovations comovement	-.0238	-.0247	.0032	.0078
Cyclical advertising NBs				
Advertising comovement	-.1162	-.1283	.0098	.0251
Cyclical relative promotion NBs vs. PLs				
Display comovement	-.0328	-.0344	.0028	.0059
Feature comovement	-.1043	-.1082	.0052	.0028
TPR comovement	-.2355	-.2424	.0050	.0133
Cyclical relative price NBs vs. PLs				
Price premium comovement	.0618	.0684	.0057	.0126

The Effect of Business-Cycle Fluctuations on Private-Label Share:
What Has Marketing Conduct Got to Do With It?

WEB APPENDIX

CONTROLLING FOR STRUCTURAL BREAKS IN THE HP FILTER

An attractive feature of the HP filter is that it is a special case of a *structural time-series* model (Boone and Hall 1999; Harvey and Jaeger 1993):

(W1) $$y_t = y_t^{trend} + y_t^c \quad , \quad y_t^c \sim N(0,1) ,$$

where y_t, is the (log-transformed) time series, y_t^{trend} is the trend component, which varies *smoothly* over time, and y_t^c is the cyclical component, which fluctuates at business-cycle periodicities. The trend component y_t^{trend} can be modeled in general state-space form as:

(W2) $$y_t^{trend} = y_{t-1}^{trend} + \beta_{t-1}$$

$$\beta_t = \beta_{t-1} + \varepsilon_t \quad , \quad \varepsilon_t \sim N(0, \frac{1}{\lambda}) ,$$

with λ the "smoothing" parameter in the HP filter. Maximum likelihood estimates of the trend component can then be obtained using the Kalman filter. This conversion of the HP filter proves to be useful as we want to control for a potential break in the series obtained from the Marketing Factbooks due to a change in store coverage in 1999 (i.e., from grocery outlets only to all outlets). To control for a potential break in the series after a certain point in time T, the HP filter can be extended with two pulse-dummies to account for a potential change in the level and the trend of the series, respectively. The resulting state-space form of the trend, y_t^{trend}, in W2 then becomes (see Boone and Hall 1999 for a similar extension of the business-cycle filter with break dummies):

(W3) $$y_t^{trend} = y_{t-1}^{trend} + \beta_{t-1} + \gamma_1 D_t ,$$

$$\beta_t = \beta_{t-1} + \gamma_2 D_t + \varepsilon_t \quad , \quad \varepsilon_t \sim N(0, \frac{1}{\lambda}) ,$$

$$\text{with} \quad D_t \quad \begin{cases} = 0 & if\ t \neq T \\ = 1 & if\ t = T \end{cases} .$$

BOOTSTRAP ALGORITHM TO CORRECT THE STANDARD ERROR BIAS

Step1. Select a random sample, with replacement, of size I from the cross-sectional data set containing the comovement estimates for private-label share ($\hat{\beta}_i^{PLS}$) and all the marketing-mix elements ($\hat{\beta}_i^{MM_k}$), the estimate of the incremental long-term private-label-share growth in a contraction ($\hat{\phi}_i^{PLS}$), and the corresponding category dummies (X_i^l) for each category *i* (*i*=1,…, I).

Step2. Add measurement error to each estimated independent variable, i.e., each comovement elasticity estimate of marketing-mix element *k* ($\hat{\beta}^{MM_k}$) and the comovement elasticity estimate of private-label share ($\hat{\beta}^{PLS}$), which come up as independent variables in Eq. (7) and Eq. (8):

(W4) $$\tilde{\beta}^{MM_k} = \hat{\beta}^{MM_k} + error\,,$$

(W5) $$\tilde{\beta}^{PLS} = \hat{\beta}^{PLS} + error\,,$$

where $\tilde{\beta}^{MM_k}$ is the error-added comovement elasticity estimate of marketing-mix element *k* and $\tilde{\beta}^{PLS}$ is the error-added comovement elasticity estimate of private-label share. The errors are obtained through Monte Carlo simulations drawn from a standard normal distribution. This step is repeated 250 times, each time creating a variation of the data set obtained in Step 1.

Step 3. Calculate the parameter estimates for each of the 250 augmented data sets created in Step 2 by estimating the following two equations:

(W6) $$\frac{\hat{\beta}_j^{PLS}}{SE(\hat{\beta}_j^{PLS})} = \frac{\alpha}{SE(\hat{\beta}_j^{PLS})} + \sum_{k=1}^{7} \tau_k \frac{\tilde{\beta}_j^{MM_k}}{SE(\hat{\beta}_j^{PLS})} + \sum_{l=1}^{2} \varphi_l \frac{X_j^l}{SE(\hat{\beta}_j^{PLS})} + \upsilon_j \qquad \text{for } j=1,\ldots,I$$

(W7) $$\frac{\hat{\phi}_j^{PLS}}{SE(\hat{\phi}_j^{PLS})} = \frac{\kappa}{SE(\hat{\phi}_j^{PLS})} + \gamma_{PLS} \frac{\tilde{\beta}_j^{PLS}}{SE(\hat{\phi}_j^{PLS})} + \sum_{k=1}^{7} \gamma_k \frac{\tilde{\beta}_j^{MM_k}}{SE(\hat{\phi}_j^{PLS})} + \sum_{l=1}^{2} \lambda_l \frac{X_j^l}{SE(\hat{\phi}_j^{PLS})} + \varpi_j \quad \text{for } j=1,\ldots,I$$

with $SE(\hat{\beta}_j^{PLS})$ the standard error of the comovement elasticity estimate of private-label share and $SE(\hat{\phi}_j^{PLS})$ the standard error of the incremental long-term growth during a contraction. Index *j* represents the *j*th row of the in step 2 created dataset.

We repeat Step 1 through 3 1,000 times. The standard deviations across the 250,000 parameter estimates are then our new estimates of the standard errors of the WLS estimated parameters.

REFERENCES NOT INCLUDED IN THE MAIN TEXT

Boone, Laurence and Stephen G. Hall (1999), "Stylized Facts of the Business Cycle Revisited: A Structural Modeling Approach," *International Journal of Financial Economics*, 4 (July), 253-268.

Harvey, Andrew C. and A. Jaeger (1993), "Detrending, Stylized Facts and the Business Cycle," *Journal of Applied Econometrics*, 8 (July–September), 231-247.