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Email address corresponding author	bdeleersnyder@rsm.nl
Address	Erasmus Research Institute of Management (ERIM) RSM Erasmus University / Erasmus School of Economics Erasmus Universiteit Rotterdam P.O.Box 1738 3000 DR Rotterdam, The Netherlands Phone: + 31 10 408 1182 Fax: + 31 10 408 9640 Email: info@erim.eur.nl Internet: www.erim.eur.nl

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Lien Lamey

Barbara Deleersnyder

Marnik G. Dekimpe

Jan-Benedict E.M. Steenkamp*

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*Lien Lamey is a doctoral candidate in Marketing, Catholic University of Leuven, Belgium (e-mail: lien.lamey@econ.kuleuven.be). Barbara Deleersnyder is Postdoc Research Fellow in Marketing, Rotterdam School of Management, Erasmus University, the Netherlands (e-mail: bdeleersnyder@rsm.nl). Marnik G. Dekimpe is Professor of Marketing, Catholic University of Leuven, Belgium and Professor of Marketing Management, Rotterdam School of Management, Erasmus University, the Netherlands (e-mail: marnik.dekimpe@econ.kuleuven.be). Jan-Benedict E.M. Steenkamp is CentER Research Professor of Marketing and GfK Professor of International Marketing Research, Tilburg University, the Netherlands (e-mail: j.b.steenkamp@uvt.nl). The authors thank the participants of the 2005 Marketing Science Conference for their valuable comments on a previous version of the article. They also thank AiMark, Stephen Hoch, and Hilde Vanderheyden (AC Nielsen) for providing the data. Finally, the authors gratefully acknowledge financial support from the Flemish Science Foundation (F.W.O.) under grant nr. G.0116.04.

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Abstract

This study investigates the cyclical dependence of private-label success in four countries. The results show that private-label share behaves countercyclically. Moreover, asymmetries are present in both the extent and speed of up- and down-ward movements in private-label share over the business cycle. Finally, part of private-labels' share gain during contractions is found to be permanent.

INTRODUCTION

Private-label products now account for over 20% of global grocery sales, and are expected to grow to 30% by 2020 (M+M Planet Retail 2004). Even though there still exist considerable cross-country differences -- a 2003 AC Nielsen survey reports an aggregate private-label share of around 15% in the United States, which is below the level in many Western-European countries as Switzerland (38%), Spain (23%) and France (21%) -- all developed countries have witnessed a steady increase in the share commanded by store brands over the last decades. In the United Kingdom, for example, private-label share rose from 21.5% in 1980 to 39.3% in 2003, while Belgium witnessed a growth from 11.4% in 1983 to 30.1% in 2003. This growing success poses a serious challenge to manufacturers of consumer goods, and has been attributed to a variety of factors, such as a gradual shift in the communication budget from advertising to sales promotions (Hoch, Montgomery and Park 2002), the growing concentration in the retail sector (Hoch and Banerji 1993), a narrowing of the perceived quality gap (Steenkamp and Dekimpe 1997), and the increasing efforts retailers put in their private-label program (Hoch 1996).

Various authors have also linked private-label performance to economic conditions. Quelch and Harding (1996, p. 99), for example, observe that "private-label market share generally goes up when the economy is suffering and down in stronger economic periods". Likewise, Nandan and Dickinson (1994) state that during hard economic times, the popularity of private labels tends to increase, while in periods of relative economic prosperity, the share of national brands increases. A similar feeling is echoed in many business reports. A 2003 Deloitte & Touche report argues that "Private labels have typically experienced significant growth in times of recession, due to their low prices, and the reduced disposable income of households". This does not bode well to national-brand manufacturers. Unlike other drivers of private-label success, the general economic

conditions are largely beyond their control. Of course, it is possible that the opposing effects during contractions and expansions could cancel each other out. However, there is a growing belief that, despite the economic recovery, legions of consumers are no longer automatically willing to pay up for big brands – even when they can again afford them (Deveney 1993).

Furthermore, one can wonder whether the rate of change in private-label share is symmetric across expansion versus contraction periods. For instance, do grocery shoppers quickly switch to less expensive private-label brands as the economy deteriorates, while they are more hesitant to switch back to national brands when economic prospects start to improve? Such asymmetric switching behavior would be consistent with various psychological theories of consumer behavior, as discussed in the Hypotheses section.

In this article, we formally investigate the relationship between private-label success and the aggregate business cycle across several countries (Belgium, the United Kingdom, the United States, and West Germany). Specifically, we address the following three key research questions:

(i) Does private-label success behave countercyclically?

(ii) Does private-label performance behave differently (asymmetrically) over expansion and contraction periods?

(iii) Does the aggregate business cycle contribute to long-term private-label success?

The central message of our study is that store brands gain ground during recessions due to consumers' purchase adjustment decisions in favor of these cheaper alternatives. Consumer inertia and learning effects cause part of this boost in store-brand sales to be permanent. Accordingly, from a national-brand perspective, it is advisable to partly off-set this stimulating effect of an economic slowdown by intensifying their marketing actions, such as advertising and new-product

introductions, in recessions. Thus far, however, this is not an often-observed strategy, as most manufacturers tend to cut back severely on their marketing expenses once the economy turns sour.

The remainder of this paper is organized as follows. First, we review existent literature on the relationship between private-label success and economic conditions. Based on this review, we develop a set of hypotheses on, respectively, the nature (counter- or procyclical) of the cyclical sensitivity of private labels, the existence of cyclical asymmetries in private-label share, and the impact of the business cycle on private-labels' long-run growth. Next, the methodology and data are described, followed by the empirical results. Finally, managerial implications and suggestions for future research are presented.

PREVIOUS RESEARCH

Some prior literature has already suggested a negative link between private-label success and the business cycle. Quelch and Harding (1996) observed that U.S. private-label success increased remarkably during the economic recession of 1981-1982. During that period, U.S. private-label share peaked at 17%, compared to 14% the previous years. In their study on the impact of the recent Asian economic crisis, Ang, Leong and Kotler (2000) observed an increasing trend towards buying store brands during the recession, while in a longitudinal study on U.S. data, Hoch and Banerji (1993) concluded that the variation in private-label share is closely linked to the business cycle. Using annual data from 1971 to 1993, they found that changes in aggregate private-label share are negatively related to both contemporaneous and previous changes in disposable income.

Our study differs from previous work on several key dimensions. First, to the best of our knowledge, no study has systematically analyzed the relationship between private-label share and the economy from a business-cycle perspective. Existing knowledge on this relationship is often limited to the analysis of a single recession period (e.g. Ang, Leong and Kotler 2000), which may

lead to idiosyncratic conclusions. Only Hoch and Banerji (1993) looked at a longer time span covering multiple contraction and expansion phases. However, they emphasized the short-run rather than the business-cycle relationship, as they differenced their data prior to regressing one variable on the other, which has been shown to be a less appropriate choice from a business-cycle perspective (Baxter and King 1999).[1]

Furthermore, unlike previous studies, we do not presume that consumers react to the same extent and with the same speed to increases and decreases in economic activity, in that we explicitly allow for asymmetric consumer buying behavior in economic up- and down-ward periods. Moreover, while there is general agreement that consumers switch towards private labels in economic downturns, no study has formally investigated to what extent this increase is cancelled out in the subsequent recovery period, or whether part of it is long-lasting, which is a key question of interest to national-brand manufacturers and retailers alike.

Thus, to formally study the link between private-label success and the general state of the economy, we (i) analyze the over-time evolution of private-label share *across multiple recession and expansion periods* (ii) for *several* key private-label *countries*, (iii) apply a business-cycle filter to the data in order to make inferences about the *cyclical relationship* between the aggregate economy and store-brand success, and (iv) explore the presence of *asymmetries in consumers' buying behavior*. Overall, we investigate a set of issues that are of significant importance to both manufacturers and retailers, and not yet addressed in previous research.

[1] The first-difference filter re-weights strongly towards the higher frequencies (associated with short-run fluctuations), while down-weighting lower frequencies typically associated with business-cycle fluctuations (Baxter 1994).

HYPOTHESES

Drivers of Private-Label Cyclical Sensitivity

Consumers' ability and willingness to buy goods decrease during economic contractions (Katona 1975). The former tends to be reduced as income levels move together with developments in the aggregate economy (Stock and Watson 1999). Accordingly, consumers become more inclined to buy store-brand alternatives whenever the economy turns sour, as less affluent households exhibit higher propensity to buy private-label brands (e.g. Ailawadi, Neslin and Gedenk 2001; Richardson, Jain and Dick 1996, Kalyanam and Putler 1997). However, even if consumers' actual income remains largely unaffected, mere changes in attitude (e.g. out of fear of an impending lay-off) during an economic contraction can already trigger important reductions in their spending (Katona 1975; Kumar, Leone and Gaskins 1995).

Consumers can economize on their expenditures by reducing the quantity bought, or by switching to lower-priced products. The former strategy may be less of an option in many grocery categories because of their more necessary nature. Indeed, income elasticities for food (0.2) tend to be considerably lower than for consumer durables (1.8) (Lipsey, Steiner and Purvis 1984). Thus, to save on grocery purchases, consumers are more likely to economize on price. Shama (1981), for instance, reports that 35% of all consumers look for cheaper products during economic slowdowns as a way to cut back on their total expenses. Store brands are, on average, priced 25-30% below national brands (e.g. Hoch and Lodish 1998; Steenkamp and Dekimpe 1997). Hence, they become an obvious candidate to switch to during bad economic times.

Moreover, during economic slowdowns, consumers become more inclined to acquire price information (Wakefield and Inman 1993), making them more price conscious (Lumpkin, Hawes and Darden 1986). Estelami, Lehmann and Holden (2001) found that economic contractions

indeed increase consumer price knowledge. As price consciousness has been found to be a good predictor of private-label success (Ailawadi, Neslin and Gedenk 2001; Sinha and Batra 1999), this further increases the cyclical sensitivity of private-label shares. We therefore propose the following hypothesis:

H1: Private-label share behaves countercyclically, as it increases in contractions, and decreases in expansions.

Cyclical Asymmetries

Many studies have found that cyclical fluctuations in macroeconomic aggregates such as GDP (Razzak 2001), unemployment (Bodman 2001; Verbrugge 1997) and consumption (Holly and Stannett 1995) behave asymmetrically. Similarly, we have reasons to believe that also the evolution in private-label share behaves differently across expansion versus contraction periods. During contractions, consumers' willingness to buy premium-priced national brands is expected to decrease sharply, as people get a strong incentive to start limiting their spending while waiting for better times. But as consumer wealth tends to attain its lowest level right after the downturn, consumers may continue to economize on their expenditures even after the economy starts to recover in order to take full advantage of the anticipated increase in their future income and wealth (Gale 1996).

Asymmetric adjustments may also arise from the way consumers gain or lose trust in the economic climate. During bad economic times, trust in the economy is lost easily. As a consequence, consumers may switch quickly to private labels to cut their shopping expenditures. Once lost, however, trust is known to take much longer to restore (Nooteboom, Berger and Noorderhaven 1997). Consumers' pessimistic expectations tend to be prolonged, as people have a tendency to selectively process information that confirms their own (negative) attitudes (Kramer

2002; Zand 1972). This slow recovery of trust may lead to a more gradual switching-back towards national brands. Moreover, as purchase decisions are heavily influenced by habit, consumers who have become used to buying private labels during the recession may continue to do so even when the economic incentive becomes less pressing (Assael 1998; Corstjens and Lal 2000). As a result, we expect consumers to switch quickly to private labels during contractions, and to switch back to national brands more slowly during subsequent expansions:

H2: Private-label share increases relatively fast in a contraction, but drops more gradually in an expansion.

In the economic literature, this asymmetry in the speed of adjustment is referred to as *steepness asymmetry* (e.g. Bodman 2001; Sichel 1993).

Asymmetry in private-label-share fluctuations may not only manifest itself in a differing speed of adjustment, but also in the extent market share drops or peaks. It is well established that consumers tend to react more strongly to negative news or losses than to positive news or gains (e.g. Thaler 1985; Tversky and Kahneman 1991). Bowman, Minehart and Rabin (1999), for instance, find that consumption reacts more to declines in expected income than to comparable increases, while Shea (1995) obtains similar findings in terms of predictable wage changes. As such, we expect the switch towards private labels during the recession to be stronger than the subsequent return to national brands in the expansion period, or in other words:

H3: Private-label share increases more strongly in a contraction than it drops in an expansion.

This second asymmetry, reflected in the extent private-label share drops and peaks, has been referred to as *deepness asymmetry* (e.g. Bodman 2001; Sichel 1993).

Do Economic Contractions Lead to Permanent Private-Label Growth?

Consumers may have a tendency to switch to private labels when a recession takes place, and to only gradually move back towards national brands as the economy recovers. However, will all consumers eventually switch back?[2] Consumers of most CPGs trade off price and perceived quality (Corstjens and Lal 2000). While private labels score better on the price dimension, national brands tend to score higher on perceived quality. However, objective quality differences between private labels and national brands are often found to be smaller than perceived quality differences (Richardson, Dick and Jain 1990; Sethuraman 2000). Using data from Consumer Reports, Appelbaum, Gerstner, and Naik (2002) find that the average objective quality of store brands actually exceeds the average quality of manufacturer brands in one out of four categories.

During a contraction, the attribute price becomes more important, leading some national-brand shoppers to try the private-label brand. During that trial, consumers may experience that the private label meets their quality requirements. Based on these positive experiences and consumers' well-known tendency to exhibit inertia in their behavior (Assael 1998, Corstjens and Lal 2000), at least some consumers will not switch back to national brands once the recession is over. In a similar vein, Ailawadi and Keller (2004) recently argued that if store brands can change consumers' quality perception (for instance, through direct consumption experience), they will gain more customers, and it will be difficult for manufacturers to win them back. Therefore, we posit:

H4: Part of the increase in private-label share due to a contraction is permanent, as the increase is not completely off-set in the subsequent expansion.

[2] Note that the presence of the aforementioned asymmetries is not a sufficient condition for such a permanent effect. Indeed, if expansions last longer than contractions, national brands could still recover fully, even in the presence of deepness and steepness asymmetry.

METHODOLOGY

Our research methodology proceeds in four steps. First, we apply the well-known Hodrick and Prescott filter to isolate the cyclical component in the various time series of interest. Next, we quantify the extent of cyclical sensitivity in private-label success through the cyclical comovement elasticity. Statistics to test for deepness and steepness asymmetry are derived. Finally, we assess whether expansion and contraction periods affect the (long-run) growth rate in private-label shares differently.

Extracting the Cyclical Component

Not all over-time variation present in a series can be attributed to business-cycle movements. Therefore, in line with economic studies (e.g. Cook 1999; Holly and Stannett 1995), we adopt the Hodrick and Prescott (HP) filter to extract the business-cycle fluctuations from each individual series. The HP filter decomposes a time series, y_t, into a trend component, y_t^l, which varies smoothly over time, and a cyclical component, y_t^c, by fitting a smooth curve through a set of data points. To identify both components, one minimizes the variance of the cyclical component subject to a penalty for variation in the second difference of the trend component. The cyclical component, which fluctuates around that trend, is then obtained by subtracting the long-term trend from y_t, i.e. $y_t^c = y_t - y_t^l$. More formally, the HP filter obtains y_t^l by minimizing

$$(1) \qquad \sum_{t=1}^{T}(y_t - y_t^l)^2 + \lambda \sum_{t=2}^{T-1}((y_{t+1}^l - y_t^l) - (y_t^l - y_{t-1}^l))^2,$$

where λ is a penalty parameter that determines the degree of smoothing; the larger its value, the smoother the resulting growth component. As business cycles exhibit cycles of varying length that tend to last no longer than 8 years in duration (Christiano and Fitzgerald 1998), our smoothing

constant is chosen to generate a trend accounting for all fluctuations longer than 8 years. We follow Baxter & King (1999), who recommend a value of λ equal to 10 for annual series.

The HP filter has several attractive features. First, the HP filter has been shown to not induce asymmetries in the cyclical component when none are present in the original series (Cogley 1997; Sichel 1993), which is a necessary property when exploring the presence of cyclical asymmetries (see following subsection). Second, it induces stationarity in a series that is originally trend or difference stationary (Baxter and King 1999), which avoids the problem of a spurious relation between the variables (Granger and Newbold 1974). Finally, the HP filter can be regarded as a special case of a structural time-series model that consists of a trend and cyclical component, which will proof to be handy in our validation exercises, when we want to control for a potential break caused by the German reunification in 1990 (see Appendix A for details).

To enhance the comparability across series, y_t is analyzed in logarithms, so that the units of y_t^c, when multiplied by 100, represent percentage deviations from the series' growth path (Stock and Watson 1999).

Quantifying the Extent of Cyclical Sensitivity

To quantify the extent of cyclical sensitivity in private-label success, the cyclical comovement elasticity is derived. To that extent, we regress the cyclical component extracted from the country's private-label share, pls_t^c, on the corresponding cyclical component filtered from GDP per capita, $gdpc_t^c$. The latter has been found to be a good proxy for the country's economic activity as a whole (Stock and Watson 1999). As both cyclical components are expressed in percentage deviations, the resulting parameter is an elasticity estimate. To account for potential dynamic influences, we derive a *dynamic* comovement elasticity that allows for an instantaneous effect as well as delayed effects, resulting in the following test equation:

(2) $$pls_t^c = \alpha + \sum_{k=0}^{K} \beta_k gdpc_{t-k}^c + \varepsilon_t ,$$

with *K* determined on the basis of the Akaike Information Criterion (AIC). As in Macé and Neslin (2004), the dynamic comovement elasticity is subsequently obtained as $\beta^k = \sum_{k=0}^{K} \beta_k$. The sign of β^c indicates whether private labels evolve pro- or counter-cyclical, and its magnitude reflects to what extent fluctuations in the general economy get attenuated or amplified in private-label share.

Assessing the Presence of Deepness and Steepness Asymmetry

In order to test if private-label share displays cyclical (a)symmetries, we explore whether the filtered pls_t^c-series is *positively* skewed, or in other words, skewed to the *right*. In case of *deepness* asymmetry, the positive deviations from the mean or trend during contraction periods are expected to be larger in absolute value than the negative deviations during expansion periods, while the number of observations above the mean or trend is smaller than those below, as graphically illustrated in Figure 1a.

Similarly, if a time series exhibits *steepness* asymmetry, its first difference, representing the slope or rate of change, will exhibit positive skewness. As such, increases in the series corresponding to contractions should be larger, but less frequent, than the more moderate decreases during expansions. This behavior is illustrated in Figure 1b.

[Insert Figure 1 about here]

To identify potential asymmetries in the evolution of private-label success over contraction and expansion periods, we adopt the non-parametric Triples test proposed by Randles et al. (1980), and applied in Bodman (2001) and Verbrugge (1997), among others.[3] In that approach, one

[3] This approach has been found to be more powerful and less sensitive to outliers than the parametric counterpart of Sichel (1993), which is based on the third-order moment of the series of interest (Verbrugge 1997; Razzak 2001).

considers all possible triples (y_i, y_j, y_k) of observations of a series y_t. For a series with T observations, $\binom{T}{3}$ such triples can be identified. A triple is a right (left) triple when the middle observation is closer to the smaller (larger) observation than to the larger (smaller) observation. In a symmetric distribution, there are as many right as left triples. If there are relatively more right triples, the underlying distribution is skewed to the right. Formally, the triples test statistic is given by

(3) $$\frac{\hat{\eta}}{\sqrt{\hat{\sigma}_\eta^2 / T}},$$

with $$\hat{\eta} = \frac{\left[(number\ of\ \ right\ triples) - (number\ of\ \ left\ triples)\right]}{\left[3\binom{T}{3}\right]}$$

and $$\frac{\hat{\sigma}_\eta^{\,2}}{T} = \frac{1}{\binom{T}{3}} \sum_{c=1}^{3} \binom{3}{c}\binom{T-3}{3-c} \hat{\varsigma}_c$$ (see Appendix B for the derivation of $\hat{\varsigma}_c$).

The asymptotic distribution of the test statistic is standard normal, so conventional critical values can be used. In case of deepness asymmetry, we expect a right-skewed distribution, reflected in a positive value of the triples test statistic, for pls_t^c. As for steepness asymmetry, a comparable asymmetry statistic is derived on the first difference (or growth rate) of pls_t^c, Δpls_t^c. Again, a right-skewed distribution will be reflected in a positive test statistic.

Asymmetric Growth Model

The univariate deepness and steepness asymmetries discussed before test for differences in the (speed of the) evolution of private-label shares in contraction versus expansion phases. However, they do not yet address the question whether this differential behavior is also linked to long-run

private-label success (Beaudry and Koop 1993). If eventually all customers who switched to private labels during the contraction would gradually (albeit at a slower rate in case of steepness asymmetry) return to buying national brands once the economy recovers, no long-run growth would be observed that could be attributed to the earlier contraction. Similarly, the bivariate comovement elasticity shows whether (temporary) cyclical movements in GDP per capita translate into (temporary) cyclical movements in private-label success around an underlying long-term trend. They do not yet reveal, however, whether temporary contraction shocks cause persistent market-share increases for private labels which are only partially off-set by comparable (opposite) shocks during economic expansion periods, thereby affecting the slope of that underlying long-term trend.

To formally test this, an asymmetric growth model is specified. While the potential presence of asymmetric response patterns has long been recognized in the marketing literature (see e.g. Little 1979, Simon 1997), they have rarely been allowed for in empirical research on longitudinal data (Pauwels et al. 2004), notable exceptions being Hanssens and Levien (1983) and Simon (1982). In line with work of Beaudry and Koop (1993), Cover (1992) and Thoma (1994), we define two new variables reflecting the general state of the economy at a certain point in time *t*:

$$(4) \qquad exp_t \quad \begin{cases} = gdpc_t^c - (prior\ trough\ in\ gdpc^c) & if\ \Delta gdpc_t^c > 0 \\ = 0 & if\ \Delta gdpc_t^c \le 0 \end{cases}$$

$$contr_t \quad \begin{cases} = 0 & if\ \Delta gdpc_t^c > 0 \\ = (prior\ peak\ in\ gdpc^c) - gdpc_t^c & if\ \Delta gdpc_t^c \le 0. \end{cases}$$

Decreases (increases) in the cyclical component of GDP per capita correspond to contractions (expansions). The variable exp_t measures the magnitude of the expansion when the economy is flourishing by calculating how much the business cycle, reflected in the filtered GDP

per capita series, has increased relative to its previous trough. Similarly, the variable $contr_t$ measures the magnitude of a contraction by calculating how much the business cycle has dropped compared to its previous peak when the economy is downturning.[4] Private-label growth, Δpls_t, is subsequently linked to current and lagged values of exp_t and $contr_t$. By assessing whether they have additional explanatory power over autoregressive growth terms Δpls_{t-j} ($j = 1 \ldots J$), we test whether the business cycle Granger causes private-label growth (Granger 1969), resulting in the following equation:

$$\Delta pls_t = \alpha + \sum_{j=1}^{J} \beta_j \Delta pls_{t-j} + \sum_{k=0}^{K} \varphi_k^- contr_{t-k} + \sum_{l=0}^{L} \varphi_l^+ exp_{t-l} + \varepsilon_t, \quad (5)$$

with lag lengths *J*, *K* and *L* determined on the basis of the AIC.[5] By splitting the business cycle in two phases, we explicitly test for asymmetries in the response of private-label growth to expansions and contractions. Thus, the effect of a recession is not necessarily cancelled out in a subsequent expansion. Unlike Equation (2), we no longer assess the linkage between the *cyclical* movements in private-label share, pls_t^c, and the cyclical movements in the economy as a whole. Instead, we now test whether changes in the latter contribute to the private labels' market-share *growth* (and hence, their long-run *level*). The sum of the parameters φ_k^- (φ_l^+) associated with recessionary (expansionary) periods, i.e. $\sum_{k=0}^{K} \varphi_k^-$ ($\sum_{l=0}^{L} \varphi_l^+$), gives the combined short-run impact on private-label growth. As Equation (5) contains autoregressive terms, one can show that the long-

[4] Through this operationalization, all values for exp_t and $contr_t$ will be non-negative, making the interpretation of their corresponding coefficients in Equation (5) more straightforward.

[5] For the sake of simplicity, we do not explicitly model the fact that private-label share is bounded between zero and one, as one could argue that private-label share operates well away from it maximum level of 100%. Nonetheless, the same substantive findings are obtained when we replace Δpls_t by $\Delta(\frac{pls_t}{1-pls_t})$ in Equation (5) (see Hanssens, Parsons and Schultz 2001, p. 110). These results can be obtained from the authors on request.

run impact on the series becomes, respectively, $\frac{\sum_{k=0}^{K}\varphi_k^-}{1-\sum_{j=1}^{J}\beta_j}$ (= φ_{LT}^-) and $\frac{\sum_{l=0}^{L}\varphi_l^+}{1-\sum_{j=1}^{J}\beta_j}$ (= φ_{LT}^+) (Ben-David and Papell 1995; Franses 2005). Standard errors of these ratios can be derived using the well-known delta-method. Under the assumption that a contraction period stimulates private-label growth, we expect its impact to be positive (thus, $\sum_{k=0}^{K}\varphi_k^-$ >0). When the impact of an expansion on private-label growth is negative (thus, $\sum_{l=0}^{L}\varphi_l^+$ <0), the size of the expansions will determine to what extent the growth-stimulating effect of earlier contractions will be off-set.

DATA

Annual data on the aggregate value share of private labels in CPGs are provided by AC Nielsen for Belgium (1983-2004), by TNS for the United Kingdom (1980-2003), by SAMI and AC Nielsen for the United States (1971-2003)[6], and by GfK for West Germany (1975-2002). The data span 20-30 years, which is comparable in length to other studies on business-cycle sensitivity (Cook 1999; Mills 2001), and to the time span used by Hoch and Banerji (1993) in their study on the short-term relationship between private labels and disposable income (1971-1993).

Even though private labels have grown their share in total grocery sales in all four countries, there are some interesting differences as well, especially in terms of how this growth was obtained. In Germany, private-label growth is to a large extent driven by the success of the hard-discount format, as implemented by chains such as Aldi, Lidl and Penny. Aldi, for example, sells almost exclusively (>95%) store brands, and is one of the fastest growing retailers in the German grocery market. By 2002, it already captured close to 18% of total grocery retailing sales

[6] We are indebted to Stephen Hoch for making these U.S. data available to us.

in Germany. The absence of manufacturer brands from most hard discounters' assortments leads to an almost unobstructed growth of private labels (Bachl, 2003). In the United Kingdom, in contrast, private-label growth is mainly fueled by retailers' ability to offer an elaborate three-tier private-label range, including value, standard and premium store brands. Finally, the United States and Belgium (which is quite similar in private-label landscape to other European countries such as the Netherlands, France and Spain), are located in between Germany and the United Kingdom. Their growth in private-label sales can be attributed both to the increasing success of discount operations, and to the growing importance of elaborate, quality-oriented private-label programs by mainstream retailers.

Data on real GDP per capita are used as proxy for the general economic activity in a particular country. Business-cycle fluctuations across many sectors are reflected in aggregate output, making the cyclical component of GDP (per capita) a good indicator for the overall economic cycle (Stock and Watson, 1999). GDP per capita, expressed in constant prices, is obtained from the United Nations Statistic Divisions for Belgium, the United Kingdom and the United States. For West Germany, these data are obtained from the VGRDL (Volkswirtschaftliche Gesamtrechnungen der Länder).

EMPIRICAL RESULTS

The Extent of Cyclical Sensitivity

As expected, private-label share is found to behave *countercyclically*, as it tends to increase whenever the economy turns bad, but decreases once the economy picks up again. Based on the AIC criterion, we include a one-year lag of the filtered GDP per capita series in the dynamic-comovement-elasticity Equation (2) (thus, K is set equal to 1). The Chow test reveals that we are

allowed to pool the four countries in our sample.[7] In this pooled model, a significant dynamic comovement elasticity (β^1 = -1.20, p<0.01) is obtained, supporting Hypothesis 1. Thus, private-label share is elastic with respect to economic conditions. This confirms conventional wisdom from a business-cycle perspective, and is in line with the negative short-term relationship found in Hoch and Banerji (1993).

The comovement elasticity in private labels is notably lower in absolute value than the average comovement elasticity of 2.25 for durables, reported by Deleersnyder et al. (2004). This result has face validity. Due to CPGs' more necessary nature, their cyclical sensitivity is expected to be smaller than for durables. Indeed, purchases of a durable are more comparable to an investment decision, and can be postponed more easily.

Cyclical Asymmetries

Apart from the *extent* of cyclical sensitivity in private-label share, also the *nature* of cyclical ups and downs is considered, as reflected in the respective cyclical asymmetry statistics. The test results for the non-parametric Triples test are presented in Table 1. To avoid potential distortion that may arise from deriving asymmetry statistics after log-transforming the series (Ruppert and Aldershof 1989), all inferences on these univariate asymmetries are based on the cyclical component extracted from the *original* (non-transformed) series.[8]

[Insert Table 1 about here]

In line with Hypothesis 2 and 3, cyclical fluctuations in private-label share evolve asymmetrically across expansion and contraction phases. For all countries, the Triples test shows the expected positive sign for both deepness and steepness asymmetry, even though in few individual cases the

[7] We applied the test for common slopes and common intercepts (F(9,90)= 1.68; n.s.).
[8] Still, the same substantive findings hold when working with the log-transformed private-label-share series instead of the original series. Specifically, the meta-analytic results again confirm the presence of both deepness and steepness asymmetry at a 5% significance level.

test is significant. This is due to the low power of the test, caused by the modest number of observations per country. In such a situation, meta-analysis is especially powerful as it combines evidence from all countries, allowing for an overall significance test (Rosenthal 1991). We employed the meta-analytic method of adding weighted Z's (Rosenthal 1991). It provides evidence for asymmetric behavior in both the extent (deepness) and speed (steepness) with which private-label share fluctuates over the business cycle (p<0.05). Hence, we find support for Hypothesis 2 and 3 that *increases in private-label share during economic contractions occur more extensively and faster than the drops in subsequent expansion phases.* As argued before, this asymmetric behavior can be attributed to consumers' typical purchase adjustment decisions for private labels versus national brands across economic up- and downturns.

Do Economic Contractions Lead to Permanent Private-Label Growth

The question still remains whether cyclical ups and downs can evoke potentially different changes in the long-run evolution of private-label share. To address this issue, we estimated the asymmetric growth model of Equation (5). Prior to estimation, a pooling test confirmed that common slopes were allowed and all data were subsequently pooled across the four countries, while maintaining country-specific intercepts (F(9,82) = 1.38 n.s.). Based on the AIC criterion, one lag was included for private-label-share growth while no lags were included for real GDP per capita expansion and contraction (thus, in Equation (5), J=1 and K,L=0). Standard errors are derived using White's robust covariance estimation method (Greene, 2003).

First, the results indicate that previous-year private-label growth has a significant positive impact on private-label growth this year (β_1 = 0.34, p<0.05). Moreover, in line with Hypothesis 4, the results suggest that economic expansions and contractions affect private-label-share evolution to a different degree, with contractions causing a substantial positive impact on private-label share

that is not off-set in subsequent expansions. This finding applies to changes in both short-run and long-run private-label growth.

Impact on short-run private-label growth. Based on Equation (5), a negative, albeit insignificant, impact on the trend or growth rate in private-label share is found during economic expansions (φ^{+} = -0.18, p>0.10), whereas a contraction induces a significant positive effect on short-run private-label growth (φ^{-} = 0.80, p<0.05).[9] In combination, these results suggest that a contraction causes an up-ward shift in the evolution of private-label share, whereas the subsequent expansion period has no (significant) off-setting impact on its growth. Accordingly, this short-run up-ward lift in the trend of private-label share induced by a recession is (partly) maintained afterwards, as this shift is not fully recouped in the subsequent expansion.

Impact on long-run private-label growth. The same conclusion holds after deriving the impact on long-term private-label growth. The impact of changes in the business-cycle on the long-run evolution in private-label share during a recession is again positive and significant (φ_{LT}^{-} = 1.22, p<0.05), whereas during the expansion, the long-term growth rate is not significantly affected (φ_{LT}^{+} = -0.28, p>0.10). Hence, a fraction of the consumers who switched to store brands in a contraction stick to their choice even after the economy improves. These findings contradict the common belief that when the economy picks up, consumers automatically switch back to buying the national brands they favored before.

Robustness Checks

To validate these findings, we first determine whether the reunification of Germany has any influence on our main results. Second, we assess to what extent the findings are idiosyncratic to

[9] A parameter of 0.80 for the variable $contr_t$ can be interpreted as an elasticity since we work in log-log space. More specifically, when the cyclical GDP per capita series decreases with 1% compared to the peak right before that recession, private-label share grows with 0.80% in the short run.

the specific filtering procedure that was adopted to extract the cyclical component from both private-label share and GDP per capita.

German reunification in 1990. Germany experienced a major change during the time span under investigation, viz. its reunification in 1990. Although both the private-label-share and GDP-per-capita series of West Germany cover a constant geographic area over the period of investigation, we control for a potential break in both series in 1990 when deriving those fluctuations that can be attributed to the business cycle (see Appendix A for more details). The parameters associated with the pulse dummy in Equation (A3) are insignificant and do not affect the cyclical components derived from, respectively, the West-German private-label-share and GDP-per-capita series. Hence, the German reunification does not alter any of our earlier findings.

Alternative filtering approach. The empirical literature on business cycles contains a wide variety of competing filtering procedures (Cogley 1997). Different detrending methods tend to extract slightly different types of business-cycle information from the original series (Canova 1998). Hence, we validate our findings with the *Band-Pass (BP) filter*, developed by Baxter and King (1999) and widely used in the economic literature (see e.g. Cogley 1997; Mills 1999), as an alternative detrending procedure. Overall, the results based on BP-filtered data confirm our earlier findings obtained from HP-filtered data. The comovement-elasticity results reveal the same general pattern as before: there is combined evidence for countercyclical movement in private-label share ($\beta^0 = -1.12$, $p<0.01$), and its value closely resembles the value of -1.20 found previously. Moreover, the analyses confirm the presence of cyclical asymmetries, both in terms of deepness ($p<0.05$) and in terms of steepness ($p<0.10$). Finally, for the asymmetric growth model, we again obtain both in the short and long run a significant positive effect on private-label growth

of a contraction (φ^{-} = 1.05, p<0.01; φ^{-}_{LT} = 1.45, p<0.05), which is not off-set in the subsequent expansion period (φ^{+} = -0.11, p>0.10; φ^{+}_{LT} = -0.16, p>0.10).

DISCUSSION

In this study, we examined the sensitivity of private-label share to the aggregate business cycle for several key private-label countries. Many academics and practitioners suggest that there exists an inverse relationship between the state of the economy and private-label share. Our analysis confirms this conventional wisdom from a business-cycle perspective, in that a country's private-label share increases when the economy is suffering, and shrinks when the economy is flourishing.

However, this study also sheds light on three new important issues. First, business-cycle fluctuations induce asymmetries in both the extent and the speed of up- and downwards movements in private-label share. They imply that, due to loss aversion, consumers switch more extensively to store brands during bad economic times than they switch back to national brands once the economic conditions improve. Moreover, the (lack of) trust in the economy helps explain the faster switch towards store brands during economic downturns. Economic upturns, in contrast, bring about slower switching-back reactions in favor of national brands, as consumers tend to delay increasing their expenditures after a contraction. Finally, the sequence of contractions and expansions not only induces temporary up- and down-ward swings in private-label share. Part of the share gain during contractions is found to be permanent, due to consumer inertia and learning effects. Thus, contractions not only convince consumers to buy private labels, some of them keep buying these store-brand alternatives when bad economic times are long over.

Managerial Implications

In many countries, economic recessions partly contribute to the prolonged up-ward evolution in private-label share, as they tend to leave permanent 'scars' on national brands' performance level.

Business-cycle fluctuations are beyond the control of individual managers, as they cannot preclude the occurrence of a contraction in the economy. However, brand manufacturers' own behavior exacerbates the situation.

In order to protect their bottom line, companies are looking for fast ways to cut costs. Management's practice of reducing brand support during bad economic times tends to reinforce the impact of the business cycle in favor of store-brand alternatives. Indeed, many national-brand manufacturers reduce their advertising budget, new-product introductions, and marketing research (Ang, Leong and Kotler, 2000; Axarloglou, 2003; Devinney 1990; Picard, 2001). Expenditures on these activities are often discretionary, and cutting them directly affects the bottom line. However, advertising as well as innovations have been put forward as two of the most effective tools against the private-label threat (Ashley 1998; Hoch and Banerji 1993; Sethuraman 2000; Steenkamp and Dekimpe 1997), while market research is needed to increase the effectiveness of one's marketing activities. To further exacerbate the situation, companies quickly cut these budgets during recessions while it takes more time to restore them to pre-recession levels when the economy expands again (Axarloglou 2003; Pittevils et al. 2005). Companies cut faster than they restore. Unfortunately, given managers' short-term focus – after all, most are no longer than three years in the same job – they may not see the long-term implications of their short-term decisions.

Finally, firms are loath to reduce prices in recessions (Deleersnyder et al. 2004; Marn, Roegner and Zawada 2003), although consumers are more price sensitive in difficult economic times. Price reductions directly impact the bottom line, which is already under pressure during recessions because of reduced volume.

In sum, part of the currently observed negative effect of a recession could be off-set if manufacturers would retain their brand support and keep their prices in check during bad economic

times. A stronger focus on marketing in times of recession may offer the key for national-brand manufacturers to prevent consumers from (permanently) switching to private-label offerings. Srinivasan, Rangaswamy and Lilien (2005) recognize that some firms, who view the recession as an opportunity, invest aggressively in marketing activities at that time, a strategy which they define as 'proactive marketing.' In general, proactive marketing has been found to result in improved performance not only during contractions, but also in subsequent expansion periods (Hillier and Baxter 2001; Srinivasan, Rangaswamy and Lilien 2005). One company that has successfully followed this route is the global CPG company Reckitt Benckiser. Despite difficult economic times in many of its markets, it has managed real top line growth (and doubled profitability) through hefty product innovation – 40 % of sales are from products launched in the last three years - and by investing much more heavily in advertising than most of their competitors. Marketing research plays a key role in this process. Product development is based on ideas generated by marketing research, and are tested with consumers before launch (Financial Times 2005).[10]

Contrary to most manufacturers, retailers already seem to exploit the benefits of such proactive marketing, as they tend to increase their private-label support in recessions. When the economy softened in the early 1980s and again at the beginning of the 1990s, numerous supermarkets in the United States revamped their private-label programs with new logos, new items, and increased shelf space (Hoch 1996). Similar patterns have been observed in Europe (Walters 1994) and Asia (Davies 2000). For example, the British supermarket chain Sainsbury responded to difficult trading times in the beginning of the 1990s by increasing its promotional emphasis on own-label products with price reductions on some 300 of these items (Walters 1994). Through such countercyclical private-label support activities, retailers are expected to significantly contribute to long-term private-label performance.

[10] Examples of Reckitt Benckiser brands are Lysol, Woolite, Calgon, Veet, Air Wick, Electrosol, and Spray 'n Wash.

Hence, while the impact of the aggregate business cycle may seem uncontrollable at first, a proactive marketing strategy on the part of both manufactures and retailers may either mitigate or accentuate the observed dependency of private-label success on the general economic conditions.

APPENDIX A

The HP filter can be rationalized as the optimal estimator of the trend in the following *structural model* (Harvey and Jaeger 1993):

(A1) $$y_t = y_t^l + y_t^c \quad , \quad y_t^c \sim N(0, \sigma_{y^c}^2),$$

where the trend component y_t^l is modeled in general state-space form (see Harvey, 1989 for an in-depth discussion) as:

(A2) $$y_t^l = y_{t-1}^l + \beta_{t-1} + \eta_t \quad , \quad \eta_t \sim N(0, \sigma_\eta^2)$$

$$\beta_t = \beta_{t-1} + \varepsilon_t \quad , \quad \varepsilon_t \sim N(0, \sigma_\varepsilon^2),$$

where $\sigma_\varepsilon^2 \big/ \sigma_{y^c}^2 = 1/\lambda$, with λ the 'smoothing' parameter or penalty that determines the degree of smoothing.[i] By imposing a value for λ equal to the smoothing parameter in Equation (1), and setting σ_η^2 equal to 0 in Equation (A2), this general structural time-series model produces a trend and cyclical component identical to those obtained using the well-known Hodrick and Prescott filter (1997). The conversion of the HP filter into Equation (A2) and (A3) allows us to adopt the Kalman filter to calculate maximum likelihood estimates of the trend component (see Naik, Mantral and Sawyer (1998) for a recent marketing application of the Kalman filter).

To control for a potential break in the series after a certain point in time (τ), we can extend the HP filter formulated in Equations (A1) and (A2) with two pulse-dummies that can account for a potential change in the level and the trend of the series. The resulting state-space form of the trend, y_t^l, in (A2) then becomes (see Boone and Hall (1999) for a similar extension of the business-cycle filter with break dummies):

[i] In line with Boone and Hall (1999), we normalize $\sigma_{y^c}^2$ equal to 1.

(A3)
$$y_t^l = y_{t-1}^l + \beta_{t-1} + \gamma_1 D_\tau ,$$

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

$$\text{with} \qquad D_\tau \quad \begin{cases} = 0 & if\ t \neq \tau \\ = 1 & if\ t = \tau \end{cases} .$$

Thus, when filtering out the fluctuations due to the business-cycle, the above state-space formulation (A3) allows us to control for a potential break in a series (for example, the German reunification in 1990).

APPENDIX B

The quantities $\hat{\zeta}_1$, $\hat{\zeta}_2$ and $\hat{\zeta}_3$ are expressed in terms of probabilities and are computed as

$$\hat{\zeta}_1 = \frac{1}{N}\sum_{i=1}^{N}(f_1^*(X_i) - \hat{\eta})^2$$

$$\text{where} \quad f_1^*(X_i) = \frac{1}{\binom{N-1}{2}} \sum_{\substack{j<k \\ i\neq j,\, j\neq k}} \sum f^*(X_i, X_j, X_k)$$

$$\text{and} \qquad f^*(X_i, X_j, X_k) = \frac{1}{3}\begin{bmatrix} sign(X_i + X_j - 2X_k) \\ + sign(X_j + X_k - 2X_i) \\ + sign(X_i + X_k - 2X_j) \end{bmatrix},$$

$$\hat{\zeta}_2 = \frac{1}{\binom{N}{2}} \sum_{j<k} \sum (f_2^*(X_j, X_k) - \hat{\eta})^2 \ ,$$

$$\text{where} \quad f_2^*(X_j, X_k) = \frac{1}{N-2} \sum_{\substack{i=1 \\ i\neq j\neq k \\ i\neq k}} \sum f^*(X_i, X_j, X_k) \ ,$$

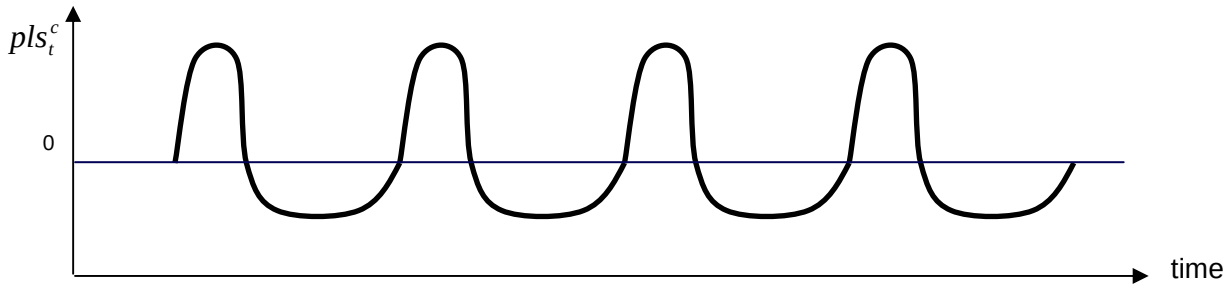
and $\hat{\varsigma}_3 = \frac{1}{9} - \hat{\eta}^2$.

Table 1: Results on deepness and steepness asymmetry[(a)]

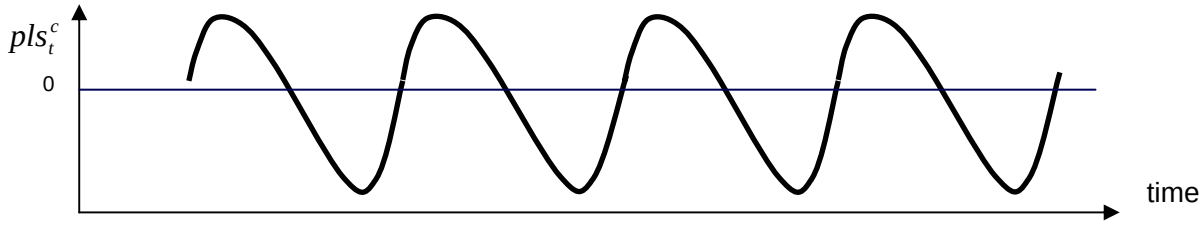
	Belgium n = 22	**United Kingdom** n = 24	**United States** n= 33	**West Germany** n = 28	**Meta-analysis[(b)]**
Deepness	0.050	0.043	0.039	0.033	1.92**
	(1.13)	*(1.16)*	*(0.93)*	*(0.76)*	
Steepness	0.042	0.061*	0.034	0.067*	2.13**
	(0.83)	*(1.31)*	*(0.74)*	*(1.50)*	

(a) z-statistics between parentheses. * and ** indicate significance at, respectively, the 10% and the 5% level. Reported significance tests are all one-tailed.
(b) The meta-analysis reports z-values obtained by the method of adding weighted Z's (Rosenthal 1991).

Figure 1: Deepness and steepness asymmetry



(a) Deepness asymmetry



(b) Steepness asymmetry

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