

# RETAILING IN TOUGH ECONOMIC TIMES: THE IMPACT OF RECESSIONARY SHOCKS ON DISCOUNTERS' SUCCESS

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*DATE OF COMPLETION: JUNE 20, 2016*

**Abstract:** This paper investigates the link between the success of the rapidly growing US discount retail channel and business cycle fluctuations. It is examined whether discounters gain market share in economic contraction periods and whether these discounters permanently benefit from the occurrence of a crisis. Due to decreasing households' disposable incomes in adverse economic conditions, this study hypothesizes that US consumers are more likely to shop in the price-aggressive discount outlets during recession periods. The "no-frills" format of discounters may not only be temporarily popular in contractions. Unchanged crisis-induced shopping behavior in post-recession periods may have a long-lasting impact on discounters' success. Over the 1967-2014 period, a sample of US retailers is studied for the relationship between the US economic climate and discounters' success. Principal component analysis, cluster analysis, and a business cycle filtering procedure are used to classify retailers according to their strategic approach and to subsequently determine the market shares of discounters. In line with the hypotheses, regression results indicate that the discount outlets gain market share during hard economic times and remain permanently popular after such a downswing. The successful discounters permanently capture market share from structurally ill-positioned traditional retailers. The findings clearly signal to conventional retailers that these companies should take firm action to avoid losing market share in recession and non-recession periods.

**Keywords:** discount retailing, market share, traditional retailers, business cycles, time series econometrics

## 1. INTRODUCTION

In the previous financial crisis that started in 2007 and reached a climax in 2008, several sectors in the economic system were severely hit. While the developments in the housing sector and

the banking industry were probably the most noticeable events, the slump in the retail sector has not gone unnoticed either. Salerno (2012) notes that the 2008 US retail sales decreased by almost eleven percent compared to 2007. Data in other contraction periods does not show such a large fall in retail sales as in the last economic downturn (Federal Reserve Bank of St. Louis 2010). In addition, Goodman and Mance (2011) and McCall (2011) observe that the previous crisis was very damaging to US retail trade employment, with more than one million job losses. However, bad economic conditions also offer opportunities for retailers. Deleersnyder, Dekimpe, Steenkamp, and Koll (2007) indicate that discounters are better positioned in the market than traditional retailers during an economic recession, when consumers watch their pennies due to decreasing households' disposable incomes. Walmart's financial performance in 2008 is an example that shows that discounters perform better than other more expensive retailers in tough economic times. While the total US grocery sales declined in that crisis year, the American low-cost retailer reported a significant sales *increase* (Williamson and Zeng 2009). Moreover, a study of Lamey (2014) points out that European discount groceries perform better during economic contraction years and remain successful when the economy picks back up. In addition, Lamey, Deleersnyder, Dekimpe, and Steenkamp (2007, 2012) show that consumers are more likely to buy private-label brands in a recession, after which consumers do *not* switch back to premium-priced national brands in a flourishing economy. These observations suggest that consumers do not change their recession-induced shopping patterns in post-crisis periods. The short- and long-term success of low-cost retailers is also discussed in other qualitative research (Heerde, Gijsenberg, Dekimpe, and Steenkamp 2013; Little, Little, and Coffee 2009; Little, Mortimer, Keene, and Henderson 2011; Zielke and Komor 2015).

This empirical study investigates two main issues: it will be examined (i) whether the market shares of US discount retailers show temporary upward swings in crisis periods and temporary downward swings in prosperous economic times (a counter-cyclical effect), and (ii) whether these discounters remain permanently popular after recessionary shocks. Consequently, the twofold research question that this paper addresses, is the following: *to what extent does the market share of US discount retailers evolve cyclically (counter-, pro- or a-cyclically), and to what extent does the occurrence of a crisis have a long-lasting impact on the US discounters' market share?* It is expected that discounters gain temporary market share in a contraction period, due to more price-conscious consumers which can spend less money. These market share gains of discounters are predicted to consolidate after economic downswings, due to consumer's crisis-induced shopping patterns which are not reversed in prosperous economic times. In the little exposed academic area of discount retailing, this study extends literature by

(i) including more retail firms in the sample, (ii) covering multiple economic up- and downswings in a longer period (1967-2014), (iii) analyzing performances of all types of US retail stores, and (iv) investigating whether the occurrence of a recession has a long-lasting impact on the popularity of low-cost retailers.

Over the 1967-2014 period, this paper uses a sample of US retailers to investigate the relationship between the state of the US economy and discounters' success. Principal component analysis, cluster analysis, and the business cycle filtering procedure of Hodrick and Prescott (1997) are performed to identify the group of discounters in the entire sample of US retailers and to subsequently determine the quarterly market shares of discounters in the US retail market. Regression results indicate that the "no-frills" format of discounters gains market share during harsh economic times and shows a positive (average) sales growth in every quarter. The results also reveal that the growth of the discounters' market share in recessions is long-lasting, in a way that the gained market share of discounters does *not* dissipate after economically difficult times. Additional analyses show that the increasing popularity of low-cost retailers leads to permanently diminishing market shares of structurally ill-positioned retailers. With these research findings, this study enhances the understanding of the impact of recessions on the retail business. It is clearly signaled to conventional retailers that losing ground to discounters in economic downturns leads to permanently decreasing market shares of these traditional companies. In order to avoid losing market share, firm action should be taken by this retail segment in both recession and non-recession periods. Examples of actions which can be taken by these middle-market retailers are extending aggressively priced private-label lines, increasing marketing budgets, moving up or down in the strategy spectrum, and creating and capturing uncontested market spaces.

The structure of the remainder of this paper is as follows. Section 2 reviews relevant academic literature and develops the hypotheses. Section 3 and 4 describe the methodology and the data collection, respectively. Section 5 documents and interprets the findings. The conclusions are reported in section 6.

## **2. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT**

Firstly, this section provides an overview of existing business strategy research, with particular attention to the discounters' strategic approach in this literature (2.1). Then, hypotheses are developed for the temporary effect of a contraction period on discounters' success (2.2), as well as the permanent effect of an economic downturn (2.3).

## ***2.1 Discounters in the business strategy literature***

Several business strategy frameworks exist in traditional management literature. Porter's (1980) model is best-known and most-cited for business-level strategies. The typologies in the studies of March (1991), Miles and Snow (1978, 2003), and Treacy and Wiersema (1995) are used to a lesser extent in academic research. Although all these different theoretical models assume different strategy classifications, all frameworks have in common that organizations at both ends of the strategy continuum are clearly identified. Porter (1980) finds a trio of *generic* strategic approaches that gain sustainable competitive advantage, namely *differentiation*, *cost leadership* and *focus* strategies. The focus strategy concerns the competitive scope (narrow or niche segment) and is either based on differentiation or on cost leadership. It results in a differentiation focus or a cost focus strategy. "Generic" refers to the fact that Porters' model is generalizable across different industries. Porter (1980) does not state that one of the three generic strategic approaches is better than others. All three have equal chances of success in outperforming the competition. In Porter's framework, it is crucial that a firm makes a fundamental choice which of the three strategies it is going to develop. Failing to make such a choice leads to strategic mediocrity, whereby an unfavorable situation of "stuck in the middle" arises (Morschett, Swoboda, and Schramm-Klein 2006). Below-average profitability is almost guaranteed in this case.

When making a distinction between the differentiation and the cost leadership strategy, retailers with a differentiation strategy aim to differentiate their products to achieve competitive advantage. Brand management plays a crucial role in this strategy. After all, making customers aware of the uniqueness of a differentiated product results in a price premium (Colla 1994). Dent (1990) reports that other characteristic features of this strategic approach are decentralized control systems, a relatively broad domain of products, and the focus on change and innovation. Alternatively, a cost leadership strategy is focused on gaining sustainable competitive advantage by offering products to customers at a lower cost than competitors. Cost efficiency can be achieved through optimizing production processes, keeping overhead costs under tight control, experience effects, making optimal use of economies of scale, and standardizing products (Little et al. 2011). Standardization is achieved by removing peripheral advanced features from a product. Focusing on the product key features, which are instrumental to the perceived product performance, allows a discounter to price their "no-frills" products in an aggressive manner (Deleersnyder et al. 2007).

Andersen and Poulfelt (2007) argue that the discounters' combination of stripping peripheral product features and focusing on essential features does not necessarily result in

declining perceived product performance. Just offering core products at discount prices may even lead to an increasing price/quality measure perceived by customers (Anderson and Poulfelt 2007). Research of Kukar-Kinney and Carlson (2015) documents that the low prices for qualitatively acceptable goods are the main characteristic of the discount retail format. For a basket with comparable goods, price differences of around thirty per cent are observed between discount outlets and traditional formats (Kukar-Kinney and Carlson 2015). While customers in discount shops value this price level most, they accept both the absence of well-known brand names and the relatively limited assortment in the shop (Colla, 2003). Moreover, Zurawicki and Braidot (2005) note that the discounter's basic and simple store layout does not only aim to reduce costs and to keep selling prices low, but also aims to create spatial perception in the shop. It contributes to the desired discounter's store image, namely "low prices for satisfactory quality" (Zurawicki and Braidot 2005).

## ***2.2 Temporary effect: switching to discounters during recession periods***

The US retail industry severely slumped in the previous financial crisis. The largest fall in retail sales was observed in 2008, with an eleven percent decrease compared to 2007 (Salerno 2012). In this period, more than one million people lost their jobs in the retail trade (Goodman and Mance 2011). These observations illustrate that macro-economic developments have a significant impact on retailers. The retail firms face challenging times in such economic slowdowns, since consumer behavior in recessions turned out to be different from the behavior of consumers in favorable economic times (Colla 1994). Therefore, having insight in consumers' shopping trends is crucial for all retailers in the market place.

One of the main trends during crisis periods is the decreasing ability of recession-hit consumers to purchase goods. It is caused by an average decline in households' disposable income in these periods, which reduces the consumption budget (Stocks and Watson 1999). Constraining expenditures or changing purchase habits are the two options which consumers have in these situations (Lamey et al. 2007). Deleersnyder et al. (2004) show that buying decisions are significantly affected by adverse economic conditions. These researchers report that consumers mostly tend to save money on relatively expensive durables in recessions. Purchases of these consumer durables are postponed until more stable economic conditions are ahead. However, cutting back on the *quantity* of so-called frequently purchased consumer goods (FPCG) is a less logical option for the majority of shoppers in a time of frugality (Kamakura and Du 2012). Most of these non-durables, such as clothing and food, are necessary and

essential to buy. Kamakura and Du (2012) find that consumers are going to focus more on *prices* then, in order to reduce total expenditures in FPCG categories. People's behavior to economize on prices partly explains the counter-cyclical popularity of lower-priced private-label brands (Lamey et al. 2012). In addition, academic research shows that the price-conscious consumers do not only want to improve price knowledge through a more thorough search for price information, but also want to compare a particular product more carefully to its alternatives (Lamey 2014).

Kukar-Kinney and Carlson (2015) document that discount retail formats set prices thirty percent lower than conventional retailers for a shopping basket with comparable goods. Given the increasing importance of the price attribute in consumers' decision-making processes during recessions, the observation of Kukar-Kinney and Carlson (2015) suggests that low-cost retailers become more popular when the economy sours. Switching from traditional retailers to price-aggressive discount stores namely results in a reduction of expenditures. Diminishing confidence and trust in the economy also contribute to adjustments in buying behavior, and consequently affect switching behavior (Ang, Leong, and Kotler 2000). Furthermore, Deleersnyder et al. (2007) note that shoppers get out of their purchase habits more quickly and drastically in times of a recession than in times of an expansion. Budget-conscious consumers exhibit less inertia when making shopping decisions during adverse economic conditions (Deleersnyder et al. 2007). As an example of this crisis phenomenon, González-Benito (2001) finds that consumers become less loyal to brands and stores for making purchases in an economic downswing. The recession-hit shoppers – characterized as multi-store shoppers – simply hunt for bargains in stores with the lowest prices (González-Benito 2001).

Prior research indicates that consumers' increasing focus on low prices and diminishing consumer inertia during recessionary shocks have a positive impact on discounters' popularity in contraction periods. Therefore, the following hypothesis is formulated:

***H1: US discounters' market share behaves counter-cyclically, going up in recessions and going down in economic expansions***

### ***2.3 Permanent effect: a positive long-lasting effect of recessions on discounters' popularity***

Once a crisis period is over and the economic climate starts to improve, it can be questioned whether consumer behavior in the new situation is influenced by the adverse economic conditions. Will consumers keep shopping in discount stores after an economic slowdown *or* will they switch back to conventional retailers? It can be argued that post-recession consumers

are less incentivized to focus on low prices. That may lead to diminishing popularity of discounters in economic expansions. However, recent observations demonstrate that low-cost retailers continue to be successful in stable economic times. For instance, Dollar Three, Dollar General, and Family Dollar – the three main (listed) US dollar stores – showed a steady sales growth in the last decade (Dutt and Padmanabhan 2011). Net sales of the well-known American discounter Walmart increased as well, from USD 404 billion in recovery year 2010 to USD 482 billion in 2015 (Walmart 2015).

The observed phenomenon that discounters are also successful in economic upswings can be explained by the role of habits in the consumers' decision-making process. The formation of habits is discussed in a large body of academic literature (e.g., Christiano, Eichenbaum, and Evans 2005; Fuhrer 2000). This research stream states that buying decisions in a particular time period are influenced by buying decisions in the prior time period. These correlated preferences apply to all kinds of products, both addictive and non-addictive products. Several papers link the role of habit formation to the continued success story of discounters in a flourishing economy. For example, Lamey (2014) and Rhee and Bell (2002) state that consumers' status quo affects the permanent discounters' popularity. Shoppers become used to do purchases in price-aggressive discount outlets during crisis periods and do not reverse this recession-induced shopping pattern in prosperous economic times (Lamey 2014; Rhee and Bell 2002). In addition, Chou and Chen (2004) argue that the occurrence of a crisis "helped" shoppers to gain a positive actual experience with the discount format. The shopping trips to low-cost retailers in tough economic times positively contributed to consumers' perceptions. Shoppers learned that discount outlets offer lower-priced products of almost the same quality compared to traditional retailers (Chou and Chen 2004). Actions of discounters may also affect the shoppers' perceptions. Marketing campaigns of both American and German low-cost retailers in the past – especially aimed at consumers in the middle-class segment – were intended to permanently remove the former discounters' image of "cheap" and "low-quality", and to take away social stigma that was associated with visiting discount outlets (Zielke and Komor 2015). Gijbrecchts et al. (2008) finds that shoppers do not attach great importance to the discounters' basic store-layout and the limited customer service. Only the absence of some special goods in the discount outlets, such as local and "green" products, induces people to switch to the traditional retail channel (Gijbrecchts et al. 2008).

The sharp increase in the number of discount outlets, as observed over the last decades, also contributes to the discounters' success story (Lamey 2014). This growing number makes consumers permanently aware of the presence of the discount channel, while the mostly

convenient locations of the stores also make the discounters more accessible for consumers. Consequently, low-cost retailers “do not fly under the radar any longer” (Lamey 2014). As an example of the accelerated growth of discounters’ shops, the highly profitable Dutch low-cost retailer Action has significantly increased the number of outlets in the Netherlands, at an average annual rate of five percent over the last ten years (Zielke and Komor 2015). In addition, new large discount corporations emerged in this century, such as the big UK supermarket Asda (Cronin and Kelley 2015). The trend also applies to the US retail trade. Food discounters Aldi and Lidl want to gain further momentum in the US market and are planning expansion of the number of outlets in operation. In Aldi’s case, Cronin and Kelley (2015) hypothesize that it is possible that the German retailer, having nearly 1,500 US stores in 2015, become the largest supermarket chain in the US by 2020.

On this point, it should be noted that both Aldi and Lidl can be characterized as hard discounters, rather than soft discounters. Hard discounters have a more limited range of available products, mainly carry private-label products, and are more price-aggressive than soft discounters (Gijsbrechts, Campo, and Nisol 2008). Soft discounters, such as the US supermarket chain Save-A-Lot and the French hypermarket Carrefour, offer a broader assortment. These retailers do not only sell their own labels, but branded products are also available in their outlets (Heerde et al. 2013). In this way, the soft discount format resembles traditional retailers to some extent. However, soft discounters are relatively more attractive due to their lower-priced products, as argued in the study of Heerde et al. (2013).

Because of consumers’ status quo, positive experiences during recessions, changed consumers’ perceptions of discounters, and the increasing number of discount outlets over time, it seems likely that shoppers see no or little reason to switch back to the more expensive conventional retailers in a post-recession recovery period. Based on these factors, it is thus expected that recessionary shocks have a positive permanent impact on the success of low-cost retailers. The following hypothesis is formulated:

***H2:** the occurrence of a recession has a positive long-lasting impact on US discounters’ market share*

### **3. RESEARCH METHOD**

The empirical analysis starts with categorizing the sample of all US retailers according to their strategy. At this point, it will be examined whether a particular retail firm can be classified as a discounter or not. Principal component analysis and cluster analysis separate the group of

discounters from all other retailers (3.1). Then, the *quarterly* market shares of discounters over the sample period will be determined (3.2). Finally, section 3.3 analyzes the temporary and permanent effects of recessions on discounters' market share.

### **3.1 Stage 1: Identifying US discounters**

Companies follow different strategic approaches to gain sustainable competitive advantage. Each pursued strategy is positioned along the strategy continuum and has some characteristic features. Table 1 presents the 10 most relevant strategic variables which capture the firm's competitive strategy along the strategy spectrum. These strategy operationalization metrics are all based on prior literature (e.g., Andersen and Poulsen 2007; Bentley, Omer, and Sharp 2013; Dent 1990; Evans and Green 2000; Gibcus and Kemp 2003; Hambrick 1983; Higgins, Omer, and Phillips 2014; Little et al. 2009, 2011; Nissim and Penman 2009; Soliman 2008).

*Table 1: strategic variables in PCA analysis*

	<b>Variable</b>	<b>Definition</b>
1	Research and development costs to sales ratio (RD/SALES)	Capturing to which extent a firm engages in innovative development of new products.
2	Selling, general and administrative expenses to sales ratio (SGA/SALES)	Measuring the effort that a firm put in marketing activities. The metric is a proxy for product differentiation.
3	Quarterly percentage sales change (CHANGESALES)	Capturing the growth increase and the opportunities for growth.
4	Operating profit margin (OPM)	Measuring the firm's profitability. The ratio scales the operating income by sales revenue.
5	Gross margin (GM)	Measuring the firm's profitability by dividing the gross profit by sales revenue.
6	Employees to sales ratio (EMPL/SALES)	Measuring efficiency in the production process. Is the firm able to do more with less people employed?
7	Asset turnover (AT)	Showing the operating efficiency within the company. It is calculated by dividing the sales by total assets.
8	Inventory turnover (IT)	Scaling the sales by inventory shows the firm's efficiency in managing inventory.
9	Operating expense ratio (SALES/OPEXP)	Capturing the efficiency of a company in the production of goods and/or services. The metric divides sales revenue by total operating expenses.
10	Property, Plant and Equipment to total assets ratio (PPE/ASSETS)	This capital intensity metric shows whether an organization has an automated and capital intensive production processes or a more labor intensive process.

Retailers with a differentiation approach are expected to have a relatively higher score on the first six ratios (1-6) in Table 1. Hambrick (1983) and Higgins et al. (2014) report that differentiation firms put greater emphasis on both R&D and marketing activities, resulting in relatively higher RD/SALES and SGA/SALES ratios. The study of Higgins et al. (2014) also states that the growth of differentiators (due to fast product-market development) occurs in spurts, while the growth of cost leaders (due to increased market penetration) can be characterized as steady. As a result, the CHANGESALES metric is predicted to be relatively higher for differentiators. Drawing on previous papers (Little et al. 2009, 2011; Nissim and Penman 2009; Soliman 2008), it is also expected that differentiators are relatively more profitable. A differentiator that offers a (unique) distinguished product should be able to charge a price premium. The relatively higher priced products may result in relatively higher OPM and GM ratios. Moreover, since the processes of differentiators are more labor intensive (rather than capital intensive), it is also likely that the EMPL/SALES metric is relatively higher for retailers with a differentiation strategy (Bentley et al. 2013).

It is expected that discounters score relatively higher on the last four metrics (7-10) in Table 1. The reduction of costs is key for these retailers, and can be achieved by optimizing production processes, experience effects, making optimal use of economies of scale, keeping overhead costs under tight control, and standardizing products (Little et al. 2011). The three metrics IT, AT and SALES/OPEXP are all related to efficiency in production and distribution processes, and are thus expected to be relatively higher for low-cost retailers. Bentley et al. (2013) state that cost leaders also tend to invest more in technological efficiency, resulting in mechanization and routinization. Therefore, the capital intensity PPE/ASSETS is also predicted to be relatively higher for cost leaders.

Based on relevant strategic characteristics (10 in this study), researchers use several statistical techniques for grouping firms according to their strategy. Frequently used techniques are factor analysis, a priori groupings, generalized multidimensional scaling, and linear discriminant analysis. Following existing academic research (e.g. Harrigan 1985; Utrilla, Torraleja, Vázquez, and Ogáyar 2012), this paper executes 2 stages in the process of categorizing retailers according to their strategic approach, in order to identify the group/cluster of retail discounters. Firstly, a principal component analysis (PCA) is performed. The Varimax rotated method with Kaiser normalization is used to make interpretation easier. By examining the structure in relationships among the strategic variables, PCA reduces the ten strategic standardized variables into a smaller group of common strategy components. Secondly, the extracted components in the PCA are used as the input in a cluster analysis. The goal of

clustering is to identify homogeneous groups (each group having a similar strategy), whereby this paper is interested in the identification of the discounters' group. This study executes a hierarchical cluster analysis to find the number of clusters and subsequently undertakes a non-hierarchical K-means cluster analysis in which the retailers are divided in the different clusters.

### ***3.2 Stage 2: Calculating discounters' market share***

Once PCA and cluster analysis separated the group of discounters from the group(s) of all other retailers, the market shares of these discounters in the retail sector will be determined. For each quarter, this paper compares the total sales (in US dollars) of the US discounters group to the total sales (in US dollars) of all US retailers. It results in a series of discounters' market shares over the sample period. The aggregated market shares show how low-cost retailers perform in the US retail market.

### ***3.3 Stage 3: Temporary and permanent recession effects on market share***

After categorizing the sample of retailers according to their strategy and calculating the series of discounters' market shares, analyses can be carried out on the two effects of recessions on discounters' success. These two expected effects are the temporary and the permanent effect, which are both included in the research question. The *temporary* effect relates to (potential) upward swings in discounters' market share during crisis periods and (potential) downward swings in market share during post-recession recovery periods. The *permanent* effect reflects the extent to which recessionary shocks contribute to a long-lasting impact on discounters' market share. Before determining whether there are temporary effects (stage 3b) and permanent effects (stage 3c), a business cycle filtering procedure is used to decompose the time series of the different variables into cyclical and non-cyclical/trend/long-term components (stage 3a).

#### ***3.3.1 Stage 3a: Cyclical and trend components in time series***

The reason that observed economic time series should be decomposed into cyclical and non-cyclical components, is that these two different times series patterns have different characteristics and different forces which influence the components. The trend component reflects the long-run movement in the series and varies smoothly and slowly over time periods; the cyclical component includes the periodic fluctuations around this trend and represents booms and recessions (Holly and Stannett 1995). Certain shocks may cause that variables deviate from the trend, but the trend is ultimately restored over time.

Since this research focuses on the relationship between economic climate and market shares of discounters, fluctuations in the series of discounters' market share which relate to periodicities in the business cycle, should be extracted. To separate the cyclical component from the non-cyclical component, this study uses the Hodrick-Prescott filter (1997) (henceforth, HP filter). This business cycle filtering procedure is incorporated in many other economic studies (e.g., Deleersnyder et al. 2004, 2007, 2009; Harvey 2006; Holly and Stannett 1995; Lamey et al. 2007, 2012; Lamey 2014; Mills 2001; Stock and Watson 1999). The HP filter shows that the log-transformed  $y_t$  (economic series) can be divided in  $y_t^C$  (the cyclical component) and  $y_t^{LT}$  (the long-term component). It results in the equation:

$$y_t = y_t^C + y_t^{LT} \quad [1]$$

The HP filter formally determines the long-term component  $y_t^{LT}$  by *minimizing*:

$$\sum_{t=1}^T (y_t - y_t^{LT})^2 + \lambda \sum_{t=2}^{T-1} ((y_{t+1}^{LT} - y_t^{LT})(y_t^{LT} - y_{t-1}^{LT}))^2 \quad [2]$$

As analyzed by Deleersnyder et al. (2004), the first part of equation [2] is the summation of the squared deviations of the economic series ( $y_t$ ) from the long-run trend ( $y_t^{LT}$ ) and reflects a “goodness of fit measure”. The second part of the equation provides a penalty for changes in the growth rate of this trend and reflects the smoothness of the long-term trend. If the non-negative smoothing parameter  $\lambda$  increases, the trend  $y_t^{LT}$  will be smoother. Baxter and King (1999) suggest that setting  $\lambda$  to a level of 100 is reasonable for annual data, while setting  $\lambda$  equal to 1600 is a justified choice for quarterly data. As a significant amount of research follows this approach (e.g., Deleersnyder et al. 2004; Lamey et al. 2012; Lamey 2014; Mills 2001), this study also sets  $\lambda$  to 1600 for the quarterly data. In the results section, sensitivity checks are performed to check the robustness of the results for different values of  $\lambda$ .

Once the long-term component  $y_t^{LT}$  is determined, rewriting equation [1] gives the following equation for calculating the cyclical component  $y_t^C$  in the time series of a particular variables.

$$y_t^C = y_t - y_t^{LT} \quad [3]$$

### 3.3.2 Stage 3b: Temporary recession effect on market share

For examining the temporary impact of a crisis on discounters' performance, the cyclical component in the logarithmic series of quarterly discounters' market share ( $DISSHARE_t^C$ ) should be isolated from the long-term component (see equation [2] and [3]). Cyclical fluctuations in the discounters' market share should then be linked to cyclical fluctuations in economic activity. The state of the US economy is represented by US real GDP, as this measure is considered as the best proxy for overall economic activity (Colla 1994; McCall 2011). Regressing the cyclical component in quarterly discounter's market share ( $DISSHARE_t^C$ ) on the cyclical component in quarterly US GDP ( $GDP_t^C$ ) results in the following equation for the temporary effect of hard economic times on discounters' market share:

$$DISSHARE_t^C = \alpha + \beta_1 GDP_t^C + \beta_2 DISSHOP_t + \beta_3 INEQ_t + \beta_4 CONF_t + \varepsilon_t \quad [4]$$

This equation gives the so-called *cyclical co-movement elasticity*, represented by  $\beta_1$ . It is allowed to interpret  $\beta_1$  as an elasticity coefficient, since the variables' time series are log-transformed prior to the HP filtering procedure. As a result,  $\beta_1$  indicates to which degree discounters' quarterly market share fluctuates (thereby deviating from the underlying trend) during economic contractions and economic booms. If the cyclical co-movement elasticity is smaller than zero (i.e.,  $\beta_1 < 0$ ), discounter's market share behaves counter-cyclically, with upward swings in discounters' market share in crisis periods and downward swings in market share in a prosperous economy. If the cyclical co-movement elasticity is larger than zero (i.e.,  $\beta_1 > 0$ ), the market share behaves pro-cyclically. There is an a-cyclical relationship if the cyclical co-movement elasticity is equal to zero (i.e.,  $\beta_1 = 0$ ).

Three control variables are included in equation [4], namely the number of discount stores in the US ( $DISSHOP_t$ ), US income inequality ( $INEQ_t$ ), and US consumer confidence ( $CONF_t$ ).  $DISSHOP_t$  reflects the total number of discount shops in operation in the US. Lamey (2014) states that the increasing number of discount outlets does only make people more aware of the presence of the discount format, but also makes the low-cost retailers more accessible for consumers. Therefore, it can be stated that opening more discount outlets boosts discounters' popularity and consequently boosts discounters' market share.  $INEQ_t$  measures US income inequality by the Gini coefficient. This coefficient takes a value between 0 and 1. The extreme value of 1 indicates *complete inequality* in income distribution, while the other extreme value of 0 indicates *complete equality* in income distribution. A more unequal income distribution leads to a widened gap between high-income and low-income consumers. In that situation,

people tend to shop more at the two ends of the retail spectrum (higher-end and lower-end) (Zielke and Komor 2015). Discounters and differentiators probably reap the benefits.  $CONF_t$  measures US consumer confidence by the score on the Consumer Confidence Index (CCI). The confidence of shoppers in the economic environment influences purchase behavior. A lower CCI score suggests that people are concerned about the current and future economic climate, even when GDP grows (Ang et al. 2000). Consumers watch their pennies and become more price-focused in this situation. It may have a positive impact on discounters' market share.

For the control variables  $DISSHOP_t$  and  $INEQ_t$ , only annual data is available. To convert this annual data to quarterly data, several advanced statistical techniques can be used, such as cubic spline interpolation. However, this paper makes the assumption that the two control variables do not change within a particular year. It means that the number of discount outlets in operation ( $DISSHOP_t$ ) is assumed to be same over the four quarters and that the level of income inequality ( $INEQ_t$ ) is also assumed to be the same over the four quarters.

### 3.3.3 Stage 3c: Permanent recession effect on market share

By excluding the permanent trend from the series, the previous section (3.3.2) focused on the cyclical co-movement elasticity for examining the link between temporary fluctuations in economic activity and quarterly discounters' market share. This section discusses the permanent effect that relates to the growth in the long-term component. Consistent with procedures in existing literature (e.g., Franses, 2001; Kontolemis, 1997; Lamey et al. 2007, 2012; Lamey 2014; Mills 2001), the following equation should be tested for this permanent effect of a recession on discounters' market share:

$$\Delta DISSHARE_t^{LT} = \gamma + \delta_1 DUMCRIS_t + \delta_2 DISSHOP_t + \delta_3 INEQ_t + \delta_4 CONF_t + \varepsilon_t \quad [5]$$

The HP business cycle filtering procedure gives the trend component in the discounters' market share ( $DISSHARE_t^{LT}$ ) (see equation [2]). The quarterly growth in this market share is represented by  $\Delta DISSHARE_t^{LT}$ . If the economy is in a crisis period, the crisis dummy ( $DUMCRIS_t$ ) is set to 1, while the dummy is set to 0 if the economy is booming. The three control variables, which were introduced in the previous section, are also included as controls in this equation. Drift parameter  $\gamma$  (the intercept) reflects all unobserved factors which contribute to the long-run growth in the discounters' market share, but which are not included in the equation.

Consequently, if the economy is in an expansion period (i.e.,  $DUMCRIS_t = 0$ ), the sum  $(\gamma + \delta_2 + \delta_3 + \delta_4)$  reflects the mean quarterly trend growth in the discounters' market share. If the economy is in a contraction period (i.e.,  $DUMCRIS_t = 1$ ), the sum  $(\gamma + \delta_1 + \delta_2 + \delta_3 + \delta_4)$  reflects the mean quarterly trend growth in the market share. As a result,  $\delta_1$  equals the mean *incremental* trend growth in the discounter's market share in a crisis quarter that does not dissipate after a recessionary shock. Therefore,  $\delta_1$  will be used as a measure for permanent growth in discounters' performance due to adverse economic conditions. If  $\delta_1$  is larger than zero, it implies a permanent gain of a downturn on discounters' market share.

#### 4. DATA

The sample includes all types of US retailers and is based on fiscal years 1967 to 2014. Several sources are used to gather data. This study uses the database in Statista that provides *quarterly* financial data for US retailers. As a result, this paper can determine the quarterly discounters' market shares, as a percentage of total US retail sales. The state of the US economy is measured by real US GDP, as this measure is considered as the best proxy for overall economic activity (Colla 1994; McCall 2011). Quarterly real GDP series are used to calculate the cyclical component of GDP (reflecting cyclical fluctuations in the economy), and to subsequently determine the cyclical co-movement elasticity in equation [4]. GDP data is gathered from the US Bureau of Economic Analysis (BEA). For the control variables, data on the US Gini coefficients and US consumer confidence is collected from the Organization for Economic Co-operation and Development (OECD), while Statista also provides data on the number of discount outlets in the US.

To measure permanent growth in discounter's performance in equation [5], contraction and expansion periods in the US economy should be determined. It is common practice to use the dates of these periods which are identified by the Business Cycle Dating Committee, part of the National Bureau of Economic Research (NBER) (e.g., Baxter and King 1999; Christiano and Fitzgerald 2003; Lamey et al. 2007; Stock and Watson 1999). However, the same papers also state that there are some points of criticism regarding the NBER method. It is argued that the NBER methodology is not only characterized by a lack of transparency and reproducibility, but also misses statistical foundation to a certain extent. Nevertheless, this paper uses NBER on the moments of business cycle turning points, as it is the most widely accepted approach in academic literature.

## 5. RESULTS

The empirical results of this study are reported in this section. Firstly, PCA and cluster analysis are performed to identify the discounters' group in the large sample of all US retailers (5.1 and 5.2). Once the group of discounters is separated from all other retailers, the market shares of these low-cost retailers are calculated over the sample period (5.3). Then, in order to answer the twofold research question, section 5.4 analyzes the temporary and permanent effects of a contraction period on discounters' market shares. Finally, additional analyses and robustness checks are reported (5.5).

### 5.1 *Principal component analysis*

The ten most relevant strategic variables – as presented in Table 1 (see section 3.1) – capture a firm's competitive strategy along the strategy continuum. PCA is performed to find a smaller set of similar strategic dimensions, which can indicate underlying relationships with groups of strategic variables. Thereby, PCA reduces the number of strategic variables. Before conducting this PCA, several issues will be discussed to check whether PCA is an appropriate statistical technique for this study. A discussion is followed for respectively (i) the Pearson correlation coefficients among the strategic variables, (ii) Bartlett's test of sphericity, (iii) the determinant of the Pearson correlation matrix, and (iv) the Kaiser-Meyer Olkin (KMO) measure of sampling adequacy.

Table 2 gives the correlation matrix that shows the associations between the ten strategic variables. The variables are not all measured on the same scale. Therefore, each variable is standardized by subtracting the mean and dividing by the standard deviation. As can be seen in the matrix, there is a positive correlation between RD/SALES and SGA/SALES ( $\rho = 0.643$ ). It suggests that firms which engage in R&D activities to a large (small) extent, engage in marketing activities to a large (small) extent as well, and vice versa. Relatively strong positive associations are also found between cost efficiency metrics AT and IT ( $\rho = 0.337$ ), between AT and the cost efficiency ratio SALES/OPEXP ( $\rho = 0.322$ ), and between IT and SALES/OPEXP ( $\rho = 0.411$ ). The Bartlett's test of sphericity examines intercorrelation by testing the correlation matrix' significance. The results of the performed test allow to *reject* the null hypothesis that states that the correlation matrix is an identity matrix, in which there are no intercorrelated variables ( $\chi^2 = 27123.91$ ,  $p < 0.001$ ).

Table 2: correlation matrix for the 10 strategic variables

	RD/ SALES	SGA/ SALES	CHANGE SALES	OPM	GM	EMPL/ SALES	AT	IT	SALES/ OPEXP	PPE/ SALES
RD/SALES	1									
SGA/SALES	0.643	1								
CHANGESALES	0.002	0.093	1							
OPM	0.292	0.361	-0.088	1						
GM	0.113	0.225	-0.110	0.621	1					
EMPL/SALES	0.112	0.215	-0.044	-0.125	-0.211	1				
AT	-0.013	0.021	-0.020	-0.031	-0.185	0.211	1			
IT	-0.001	0.004	-0.025	-0.002	-0.145	0.144	0.337	1		
SALES/OPEXP	0.248	0.206	0.074	-0.814	-0.520	0.285	0.322	0.411	1	
PPE/SALES	0.165	0.250	0.064	-0.409	-0.333	-0.401	0.029	0.128	0.398	1

While the strategic variables should be intercorrelated and are actually intercorrelated, too highly intercorrelated variables may result in singularity and multicollinearity (Friend 2000). The determinant of the correlation matrix shows whether there is an indication for multicollinearity. Since this matrix yields a determinant value of 0.095, that is greater than the critical value of 0.00001 (Harrigan 1985), there is no indication for multicollinearity. Finally, the KMO statistic is calculated, as the last step for determining the PCA appropriateness. This KMO overall measure for sample adequateness takes a value between 0 and 1. An extreme value of 0 shows that the sum of partial correlations is *large* relatively to the sum of the original correlations, which suggest that the correlations patterns are diffused. PCA is inappropriate in that case. An extreme value of 1 indicates that the sum of partial correlations is *small* relatively to the sum of the original correlations, which indicate that the variables share common components. Doing a PCA is useful in that latter situation. In any case, the KMO value should exceed 0.5 (Hair, Anderson, Tatham and Black 1995). Because of the fact that this criterion is fulfilled as well – the calculated KMO value is 0.542 –, it can be concluded that PCA is an appropriate technique for the data.

Subsequently, PCA is conducted on the ten standardized strategic variables, in order to extract components which have an eigenvalue larger than 1. Table 3 reports the PCA results. Three components emerge and explain 61.9% of the variance in the data. Drawing on prior research (Dent 1990; Hair et al. 1995), strategic variables loading at 0.40 or more are included in the components. One variable (CHANGESALES, the change in quarterly sales) does not load into any component and is therefore excluded from further analysis and interpretation. Table 3 suggests that the pattern of the calculated component loadings are in line with Porter's (1980) generic organizational strategies of differentiation and cost leadership.

Table 3: results PCA analysis

<i>Variables</i>	<i>Component 1</i>	<i>Component 2</i>	<i>Component 3</i>
RD/SALES	0.608		
SGA/SALES	0.754		0.420
OPM	0.522		
GM			0.855
EMPL/SALES			0.582
AT		0.717	0.471
IT		0.630	
SALES/OPEXP		0.412	
PPE/SALES			0.591

Component 1 seems to correspond to the differentiation approach. This component is namely highly related to both R&D and marketing activities which differentiators put relatively great emphasis on. Relatively high differentiators' willingness to develop new products and their brand management approach result in higher R&D expenses and higher SG&A expenses (Andersen and Poulfelt 2007; Hambrick 1983; Higgins et al. 2014). The finding that the operating profit margin is also associated with this component, can be explained by observations in existing academic research as well (Little et al. 2009, 2011; Nissim and Penman 2009; Soliman 2008). These papers report that differentiators are, on average, relatively more profitable. Component 2 appears to represent the cost leadership strategy that is focused on cost efficiency. The three variables which load highly into this component – AT, IT, and SALES/OPEXP – support this strategy. Component 3 is harder to interpret since this component is not dominated by variables with similar characteristics. Therefore, this component can be classified as the “residual component”.

### **5.2 Cluster analysis: identifying discounters**

In order to identify the homogeneous discounters' group in the large sample of all US retailers, the PCA is followed by a two-stage cluster analysis. The extracted component scores of PCA are used as input in this cluster analysis. Firstly, a hierarchical cluster analysis is undertaken to find an appropriate number of clusters and to identify outliers. Secondly, an executed non-hierarchical K-means cluster analysis divides the US retailers into different groups.

Following previous academic papers (Harrigan 1985; Utrilla et al. 2012), this study uses Ward's (1963) hierarchical clustering method that yields relatively homogeneous clusters. The component scores from the three-component rotated solution in the PCA are used for this analysis. No outliers are detected, since all scores are within the critical range between -3 and

3. Both the coefficients of the dendrogram and the record clustering data indicate the presence of three clusters. Then, the component scores are used for conducting the non-hierarchical K-means cluster analysis. Table 4 shows the resulting cluster centroids, which are mean component scores in a particular cluster. For clarification of the presented numbers in the table: the 0.05 value in the fourth column indicates for example slightly above-average activity on Component 1, that corresponds to the differentiation strategy.

*Table 4: cluster centroids and ANOVA results*

	<i>Cluster 1</i>	<i>Cluster 2</i>	<i>Cluster 3</i>	<i>F-value</i>
Component 1	1.85	-0.37	0.05	521.254***
Component 2	-0.02	1.35	-0.17	854.547***
Component 3	-0.52	-0.25	0.31	424.452***

Note: \*\*\* denotes statistical significance at 1%, all one-tailed

Retailers in Cluster 1 (43.2% of the sample) have adopted the differentiation approach, given the relatively high mean score of Component 1 in this cluster. Cluster 2 (34.1% of the sample) has a relatively high mean score of Component 2 (representing the cost leadership strategy), which suggest that retailers in this group can be characterized as discounters. It appears that corporations in Cluster 3 (22.7% of the sample) show a lack of strong commitment to a differentiation or a cost leadership strategy. These firms do not follow a clear identifiable strategy. The last column in Table 4 shows the results of the one-way analysis of variances (ANOVA). This analysis is performed to test whether the three clusters are significantly different from each other. Since the mean component values turn out to be significantly difference across the three clusters – all p-values are smaller than 0.001 –, it can be stated that the clusters are distinguishable.

Table 5 presents a more detailed comparison between the different strategic approaches of the firms in the sample. For every standardized strategic variable that is included in the analysis, the mean and standard deviation are presented by cluster. This table is complementary to Table 4, in the way that Table 5 confirms the basis of the significant differences across the three clusters. Cluster 1 (the differentiators group) is characterized by relatively high means for RD/SALES, SGA/SALES, OPM, GM, and EMPL/SALES. In Cluster 2 (the discounters group), relatively high means are reported for AT, IT, SALES/OPEXP, and PPE/SALES. In that way, Cluster 1 is the opposite of Cluster 2. It is important to mention that for the remainder of the analysis in this section, this study mainly focuses on the discount retailers in Cluster 2. This cluster represents the discounters.

*Table 5: descriptive statistics of the strategic variables, by cluster*

	<i>Cluster 1</i>	<i>Cluster 2</i>	<i>Cluster 3</i>
RD/SALES	0.034 (0.014)	0.021 (0.010)	0.014 (0.008)
SGA/SALES	0.142 (0.049)	0.095 (0.045)	0.139 (0.048)
OPM	0.085 (0.032)	0.068 (0.015)	0.067 (0.021)
GM	0.328 (0.085)	0.285 (0.062)	0.269 (0.079)
EMPL/SALES	0.055 (0.018)	0.037 (0.011)	0.038 (0.022)
AT	2.125 (0.715)	3.114 (1.032)	2.855 (0.899)
IT	7.992 (1.002)	9.751 (1.442)	9.554 (0.952)
SALES/OPEXP	4.452 (1.521)	5.124 (0.841)	5.113 (1.339)
PPE/SALES	0.332 (0.075)	0.547 (0.068)	0.365 (0.055)

Note: the presented numbers are the mean and standard deviation (in parentheses), respectively

### ***5.3 Business cycles and quarterly discounters' market shares***

The following two graphs (Figure 1 and 2) show the up- and down-movements in US GDP and US discounters' market share over the sample period (1967-2014). In these business cycles, the NBER identifies seven contraction periods: (i) Q4 1969 – Q4 1970, (ii) Q4 1973 – Q1 1975, (iii) Q1 1980 – Q3 1980, (iv) Q3 1981 – Q4 1982, (v) Q3 1990 – Q1 1991, (vi) Q1 2001 – Q4 2001, (vii) Q4 2007 – Q2 2009. The dark regions in the figures reflect recession periods in the US business cycle.

Figure 1 shows the fluctuations in the US business cycle through isolating the cyclical component in the logarithmic US real GDP series from its long-term component. The HP filter is used to obtain this component. The graph suggests that the cyclical component in the US real GDP series decreases during downswings and increases when the aggregate economy picks back up. The permanent component grows smoothly and slowly over the time periods. Figure 2 suggests that the discounters' market share behaves counter-cyclically, with upward swings in discounters' market share when the economy winds down and downward swings in market share in post-recession recovery periods. Regression analyses are needed to give decisive answers on the twofold research question whether the market share of low-cost retailers evolves counter-cyclically (temporary effect), and whether these discounters remain permanently popular after harsh economic times (permanent effect).

Figure 1: up-and down-movements in the US business cycle

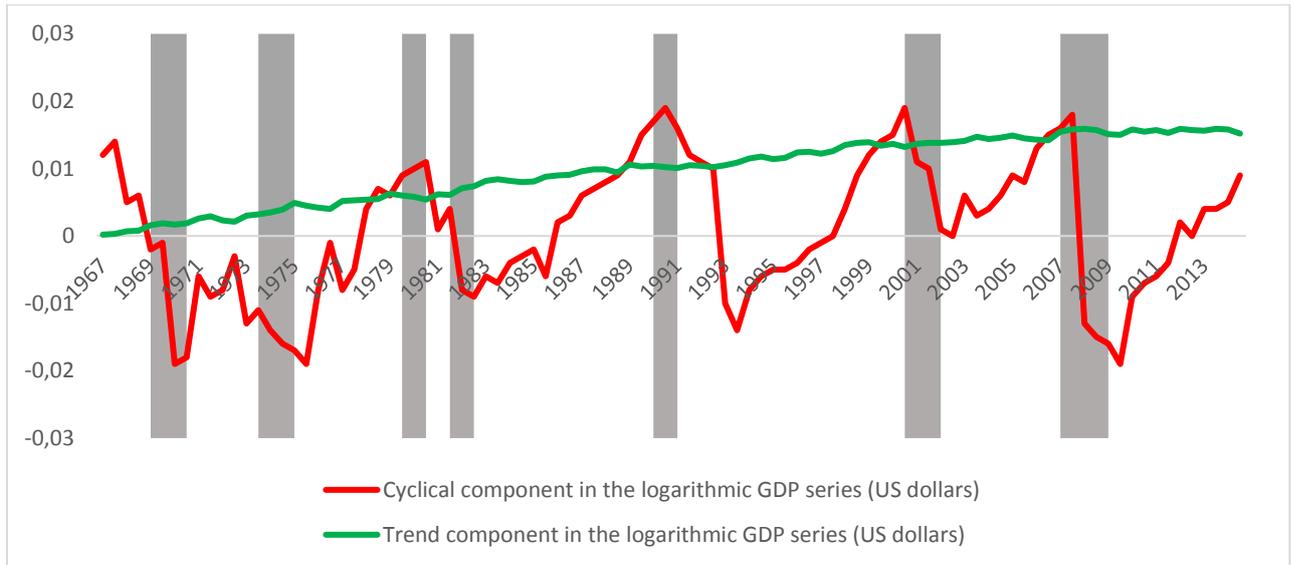
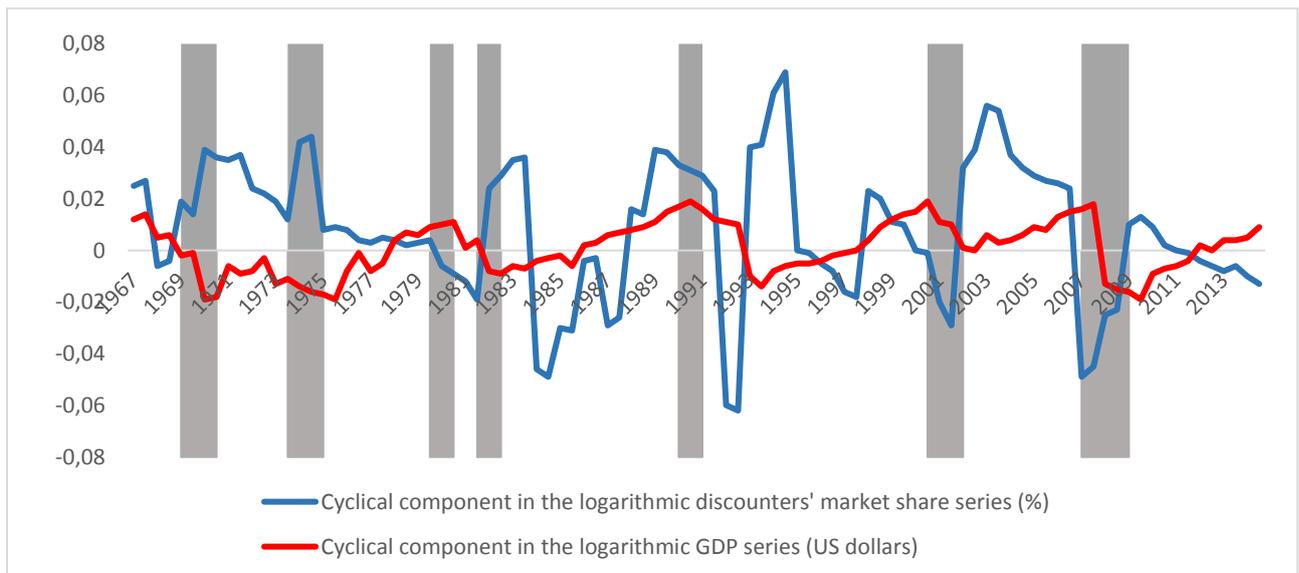


Figure 2: relationship between aggregate economy and discounters' market share



#### 5.4 Temporary and permanent effects of recessions on market share

For examining the *temporary* effect of a recession on discounters' market share (first hypothesis), equation [4] will be tested. The cyclical co-movement elasticity, represented by  $\beta_1$  in the equation, is the relevant coefficient in this case. This coefficient indicates to which extent the discounters' market share fluctuates during economically difficult times and more affluent periods. It is expected that the discounters' market share evolves counter-cyclically (i.e.,  $\beta_1 < 0$ ), with upward swings in discounters' share when the economy turns sour and downward swings when the economic climate improves. In line with these predictions, the empirical regression

results (documented in Table 6) reveal that the cyclical co-movement elasticity is indeed negative and significant ( $\beta_1 = -1.510$ ,  $p = 0.038$ ). Consumer confidence has a significantly negative association with discounters' market share ( $\beta_4 = -0.879$ ,  $p = 0.061$ ).

The results indicate that the quarterly discounters' market share behaves counter-cyclically: if US economic activity decreases (increases) by one percent, it is predicted that, on average, the quarterly US discounters' market share increases (decreases) by 1.51 percent. In other words: if quarterly US GDP decreases (increases) one percent below (above) its estimated long-run average, it is expected that, on average, the quarterly US discounters' market share is 1.51 percent higher (lower) than its estimated long-run average.

*Table 6: regression analysis on temporary and permanent effects of recessionary shocks on discounters' market shares*

	Temporary effect <sup>a</sup>	Permanent effect <sup>b</sup>
<i>CONSTANT</i>	0.009 (0.013)***	2.134 (0.045)**
<i>GDP<sub>t</sub><sup>C</sup></i>	-1.510 (0.038)**	
<i>DUMCRIS<sub>t</sub></i>		0.844 (0.077)*
<i>DISSHOP<sub>t</sub></i>	0.099 (0.211)	0.412 (0.038)**
<i>INEQ<sub>t</sub></i>	0.425 (0.109)	0.612 (0.093)*
<i>CONF<sub>t</sub></i>	-0.879 (0.061)*	-0.693 (0.155)
Number of observations	192	191
Adjusted R <sup>2</sup>	0.212	0.185
F-statistic	28.541 (0.001)***	22.167 (0.001)***
Highest VIF <sup>c</sup>	3.854	3.009

<sup>a</sup>This model tests equation [4] for the temporary effect of a recession on discounters' market share, with  $DISSHARE_t^C$  as dependent variable

<sup>b</sup>This model tests equation [5] for the long-lasting impact of a recession on discounters' market share, with  $\Delta DISSHARE_t^{LT}$  as dependent variable

<sup>c</sup>Given the observation that none of the Variance Inflation Factors (VIF's) exceeds the critical level of ten (Field 2000), it can be stated that multicollinearity is not an issue in both models

Notes: \*, \*\*, \*\*\* denote statistical significance at 10%, 5% and 1%, respectively, all one-tailed. The corresponding p-values are given in parentheses.

Table 6 also contains the regression results for equation [5], relating to the *permanent* growth in the discounters' share due to an economic downswing (second hypothesis). The results reveal that the occurrence of a crisis has a positive long-lasting impact on the performance of US low-cost retailers. Firstly, the sum ( $\gamma + \delta_2 + \delta_3 + \delta_4$ ) reflects the mean trend growth in the discounters' market share in an *economic expansion quarter* (see section 3.3.3) and is equal to 2.465 ( $2.134 + 0.412 + 0.612 - 0.693$ ). It implies that the discounters' market share shows a mean quarterly growth of 2.465 percent. This growth rate is expressed in relative terms. It means that if, for example, the current quarterly discounters' share is 20 percent, the 1.865

percent mean growth during an *economic expansion quarter* indicates that the market share increases – in absolute terms – by 0.49 percent ( $2.465\% \cdot 20$ ) to 20.49 percent. This finding confirms conventional knowledge that the discount retail segment is not only a phenomenon in recession periods, but is successful in both economic expansion and contraction quarters.

Secondly, testing equation [5] also provides the evidence that hard economic times lead to *incremental* permanent boosts for low-cost retailers. In *economic contraction quarters*, the mean additional discounters' growth is 0.844 percent ( $\delta_1 = 0.844$ ,  $p = 0.077$ ). This growth rate – significant at a level of 0.10 – is permanent, in a way that these gains in market share tend to consolidate and are thus not cancelled out in subsequent expansions. Moreover, higher numbers of discount shops in the US ( $\delta_2 = 0.412$ ,  $p = 0.038$ ) and higher levels of US income inequality ( $\delta_3 = 0.612$ ,  $p = 0.093$ ) also have a long-lasting impact on discounters' performance. Thus, where the discounters' market share increases, on average, with 1.865 percent in an *economic expansion quarter*, the growth of the market share in an *economic contraction quarter* (the sum  $\gamma + \delta_1 + \delta_2 + \delta_3 + \delta_4$ ) is, on average, 3.309 percent ( $2.134 + 0.844 + 0.412 + 0.612 - 0.693$ ). These growth rates are all expressed in relative terms.

In sum, the empirical results indicate that, on average, the discounters' market share behaves counter-cyclically and shows a positive long-term growth every quarter. The findings also reveal that the growth in the discounters' market share in recessions is long-lasting, in a way that the discounters' market share does not dissipate after economically difficult times. These results are in line with the two formulated hypotheses.

### **5.5 Additional analyses and robustness checks**

*Serial correlation.* Several studies state that business cycle filtering procedures, such as the HP filter in this study, may induce persistent serial correlation in the data (Engle 1974; Singleton 1988). The assumption that the error terms are independent of each other, would be violated then. This issue is particular relevant in time series research, since the error term in a given time period may be correlated with the error term in the adjacent time period. In other words: the error in a particular time period can be influenced by the error in the prior period. If there is an overestimate at a point of time (a positive error, since the observation is larger than predicted), it is likely that an overestimate also occurs in the subsequent time period. An upward bias in the error in the next period is then created.

If there is serial correlation in the data, equation [4] can be extended with an autoregressive (AR) error term. The Breusch-Godfrey serial correlation LM test and the well-known Durbin-Watson statistic give decisive answers on the question whether serial

correlation is present, and whether an AR error term should be therefore included. The Breusch-Godfrey test does not only check for first-order autocorrelation among the error terms, but also checks for higher-order autocorrelation (King and Rebelo 1993). Given the results of the Breusch-Godfrey test ( $\chi^2 = 91.82$ ,  $p > 0.10$ ) and the Durbin-Watson test ( $d = 1.897 > d_U = 1.828$ ;  $4-d = 2.103 > d_U = 1.828$ ), the null hypotheses (stating that there is *no* autocorrelation) *cannot* be rejected in both tests. Hence, no further action is required for the potential issue of serial correlation.

*Heteroscedasticity.* Ordinary Least Squares (OLS) is used for testing the two hypotheses and assumes homogeneity of the variance of the error terms. The residual variance is heteroscedastic if the variance of the error terms is non-constant. Firstly, a plot of the residuals against the independent variable in equation [4] is visually inspected for the presence of heteroscedasticity. This eye-ball test indicates that there is an uneven pattern of residuals, suggesting that the homogeneity assumption of OLS would be violated. Two formal tests are carried out to investigate whether heteroscedasticity is an issue in equation [4]. The results in both the Breusch-Pagan test ( $p < 0.10$ ) and the White test ( $p < 0.10$ ) allow to *reject* the null hypotheses (stating in both tests that the variance of error terms is homoscedastic). It reveals the presence of heteroscedasticity in the data. Therefore, White's robust/heteroscedasticity-consistent standard errors are used in this study and are already reported in Table 6.

*Endogeneity.* The issue of endogeneity arises when there is correlation between the independent variable and the error term. Reverse causality problems and an omitted variable bias are the main factors which lead to endogeneity. It ultimately leads to biased and inconsistent regression coefficients in the model. Firstly, several important control variables are included in both equation [4] and [5] to mitigate the problem of an omitted variable bias. Secondly, this paper does not expect that the issue of reverse causality drives the regression results. It is considered to be unlikely that discounters' market share has a causal impact on either GDP (equation [4]) or the occurrence of an economic downturn (equation [5]). In this respect, Lee, Singal, and Kang (2013) note that successful firms (discounters in this study) can stimulate economic activity by, for instance, creating new jobs. On the other hand, these well performing firms may beat underperforming rivals in the market. Employees in the underperforming companies consequently lose their jobs in this situation, which have a negative impact on economic activity (Lee et al. 2013). This reasoning rules out that a strong effect of discounters' market share on the aggregate economy exists.

*Effects on market share other retailers.* As already documented in sections 5.1 and 5.2, this paper obtained three different retailer groups by performing PCA and cluster analysis. Retailers in Cluster 1 represents the differentiator group, discounters are present in Cluster 2, and Cluster 3 corporations do not show a clear identifiable strategy. Given the empirical findings in section 5.4 – low-cost retailers gain ground during tough economic times and these gains tend to consolidate after such a contraction –, it can be intuitively argued that discounters' success affects the market share of the other retailers in Cluster 1 and Cluster 3. The favorable long-lasting impact of a recession on the popularity of US discounters is predicted to take away market share from at least one of the other two retail groups. In that way, a contraction period leads to an *incremental permanent loss* for the other retailers. Table 7 documents the regression results for the temporary and permanent effects of bad economic times on the market shares of the retailers in Cluster 1 and Cluster 3 (see equations [4] and [5]).

*Table 7: regression analysis on temporary and permanent effects of recessionary shocks on market shares of other retailers*

	<b>Cluster 1: retailers with a differentiaton approach</b>		<b>Cluster 3: retailers without a clear strategic approach</b>	
	Temporary effect <sup>a</sup>	Permanent effect <sup>b</sup>	Temporary effect <sup>a</sup>	Permanent effect <sup>b</sup>
<i>CONSTANT</i>	0.062 (0.004)***	2.148 (0.044)**	0.179 (0.035)**	-0.631 (0.086)*
<i>GDP<sub>t</sub><sup>c</sup></i>	0.931 (0.077)*		-0.142 (0.194)	
<i>DUMCRIS<sub>t</sub></i>		-0.108 (0.188)		-0.619 (0.072)*
<i>DISSHOP<sub>t</sub></i>	-0.082 (0.287)	-0.424 (0.251)	-0.071 (0.352)	-0.815 (0.041)**
<i>INEQ<sub>t</sub></i>	0.511 (0.090)*	0.561 (0.079)*	-0.655 (0.067)*	-0.926 (0.047)**
<i>CONF<sub>t</sub></i>	0.514 (0.089)*	0.657 (0.121)	0.026 (0.158)	0.138 (0.179)
Number of observations	192	191	192	191
Adjusted R <sup>2</sup>	0.198	0.180	0.171	0.148
F-statistic	38.574 (0.001)***	37.571 (0.001)***	22.846 (0.039)**	22.484 (0.029)**
Highest VIF <sup>c</sup>	2.149	2.477	1.185	1.527

<sup>a</sup>This model tests equation [4] for the temporary effect of a recession on the market share of a particular cluster. The *original* dependent variable in the equation (*DISSHARE<sub>t</sub><sup>c</sup>*) is replaced by the cyclical component in the market share series of the particular cluster as *new* dependent variable

<sup>b</sup>This model tests equation [5] for the long-lasting impact of a recession on the market share of a particular cluster. The *original* dependent variable in the equation (*ΔDISSHARE<sub>t</sub><sup>LT</sup>*) is replaced by the quarterly growth in market share of that particular cluster as *new* dependent variable

<sup>c</sup>Given the observation that none of the Variance Inflation Factors (VIF's) exceeds the critical level of ten (Field 2000), it can be stated that multicollinearity is not an issue in both models

Notes: \*, \*\*, \*\*\* denote statistical significance at 10%, 5% and 1%, respectively, all one-tailed. The corresponding p-values are given in parentheses.

For retailers in *Cluster 1* (the differentiators group), the regression results indicate that the cyclical co-movement elasticity is significantly positive for this cluster ( $\beta_1 = 0.931$ ,  $p = 0.077$ ).

It shows that the quarterly market share of differentiation retailers evolves pro-cyclically. If US GDP increases (decreases) by one percent, it is predicted that, on average, the quarterly US differentiators' share increases (decreases) by 0.931 percent. The value of the coefficient of the permanent recession effect ( $\delta_1$ ) is -0.108 ( $p = 0.188$ ). Since this value does not significantly differ from zero, it means that differentiators do not permanently benefit or suffer from the occurrence of a crisis. Furthermore, the coefficients of the control variables  $INEQ_t$  and  $CONF_t$  suggest that higher levels of both US income inequality and US consumer confidence have a positive impact on short- and long-term differentiators' performance.

For retailers in *Cluster 3* (not following a clear strategic approach), there is no significantly temporary effect of cyclical GDP fluctuations on their market shares ( $\beta_1 = -0.142$ ,  $p = 0.194$ ). Regarding the permanent recession effect, the value of  $\delta_1$  equals -0.619 ( $p = 0.072$ ). It means that the *incremental permanent loss* of Cluster 3 firms due to an economic downswing is, on average, 0.619 percent. Thus, where their mean market share decreases by 2.234 percent in an *economic expansion quarter* ( $-2.234$  equals the sum  $\gamma + \delta_2 + \delta_3 + \delta_4$ ), their mean market share decreases by 2.853 percent in an *economic recession quarter* ( $-2.853$  equals the sum  $\gamma + \delta_1 + \delta_2 + \delta_3 + \delta_4$ ). This last finding is in line with the model of Porter (1980). Consistent with Porter's framework, the result provides evidence that not making a fundamental choice for one of the proposed generic strategic approaches, leads to a situation of strategic mediocrity and below-average profitability in the long-run. These badly positioned retailers are doomed to be outperformed by rivals at both end of the strategy spectrum.

*Different values for  $\lambda$  (smoothing parameter).* This paper uses the de-trending HP filter to separate cyclical components from non-cyclical components. The trend component in variables' series is formally determined by minimizing equation [2]. As already discussed in section 3.3.1, the second part of this equation provides a penalty for changes in the growth rate of the long-term trend. This part reflects the smoothness of the stochastic trend. Drawing on most prior studies (e.g., Baxter and King 1999; Deleersnyder et al. 2004, 2009; Lamey et al. 2012; Lamey 2014; Lee, Singal, and Kang 2013; Mills 2001), this paper sets the smoothing parameter  $\lambda$  to 1600 for the quarterly data. However, some other academics argue that lower or higher smoothing values are more suitable for quarterly data (Canova 1994; Harvey and Jaeger 1993; Ravn and Uhlig 2001). Varying the value of  $\lambda$  results in different non-cyclical components and cyclical components which will be derived. This may also change the conclusions. Therefore, a sensitivity analysis is performed to check the robustness of the choice of parameter  $\lambda$ . Similar to the analysis of Harvey (2006), the alternative values of  $\lambda$  are set to

minus 50 percent of the original value of 1600 (i.e.,  $\lambda$  equals 800 then) and to plus 50 percent of the original value (i.e.,  $\lambda$  equals 2200 then). Table 8 documents the regression results for these alternative values of  $\lambda$ .

Table 8: regression analysis on temporary and permanent effects for other values of  $\lambda$

	If $\lambda=800$		If $\lambda=2200$	
	Temporary effect <sup>a</sup>	Permanent effect <sup>b</sup>	Temporary effect <sup>a</sup>	Permanent effect <sup>b</sup>
<i>CONSTANT</i>	0.105 (0.006)***	2.514 (0.038)**	0.101 (0.011)**	2.381 (0.054)**
<i>GDP<sub>t</sub><sup>c</sup></i>	-1.572 (0.029)**		-1.44 (0.046)**	
<i>DUMCRIS<sub>t</sub></i>		0.614 (0.081)*		0.998 (0.052)*
<i>DISSHOP<sub>t</sub></i>	0.119 (0.168)	0.473 (0.053)**	0.085 (0.247)	0.502 (0.031)**
<i>INEQ<sub>t</sub></i>	0.587 (0.083)*	0.633 (0.117)	0.439 (0.121)	0.711 (0.058)*
<i>CONF<sub>t</sub></i>	-1.113 (0.040)**	-0.861 (0.103)	-0.772 (0.071)*	-0.829 (0.137)
Number of observations	192	191	192	191
Adjusted R <sup>2</sup>	0.229	0.194	0.227	0.181
F-statistic	30.214 (0.001)***	22.797 (0.001)***	33.002 (0.001)***	24.528 (0.001)***
Highest VIF <sup>c</sup>	3.289	2.281	3.509	2.521

<sup>a</sup>This model tests equation [4] for the temporary effect of a recession on the market share of the discounters group, with *DISSHARE<sub>t</sub><sup>c</sup>* as dependent variable

<sup>b</sup>This model tests equation [5] for the long-lasting impact of a recession on the market share of the discounters group, with *ΔDISSHARE<sub>t</sub><sup>L</sup>* as dependent variable

<sup>c</sup>Given the observation that none of the Variance Inflation Factors (VIF's) exceeds the critical level of ten (Field 2000), it can be stated that multicollinearity is not an issue in both models

Notes: \*, \*\*, \*\*\* denote statistical significance at 10%, 5% and 1%, respectively, all one-tailed. The corresponding p-values are given in parentheses.

The results in Table 8 indicate that the main empirical findings only slightly change across the choice of the smoothing parameter. If  $\lambda$  is set to 800, the cyclical co-movement elasticity is negative and significant ( $\beta_1 = -1.572$ ,  $p = 0.029$ ). The mean *additional* growth rate of discounters during a contraction quarter ( $\delta_1$ ) is 0.614 ( $p = 0.081$ ). If  $\lambda$  is set to 2200, it turns out that  $\beta_1$  equals -1.44 ( $p = 0.046$ ) and  $\delta_1$  equals 0.998 ( $p = 0.052$ ). Compared to the original findings, both the intercepts and the control variables also exhibit only slightly changes in the coefficients and significance levels. Thus, it can be stated that the main conclusions of this paper are robust for the choice of the value of  $\lambda$ .

## 6. CONCLUSION AND DISCUSSION

This empirical study examines the relationship between business cycle fluctuations and discounters' popularity. It is investigated whether the market share of US low-cost retailers behaves counter-cyclically and whether the occurrence of a downturn contributes to a long-

lasting impact on discounters' market share. Principal component analysis, cluster analysis, and the HP business cycle filtering procedure are used to classify US retailers according to their strategic approach and to subsequently determine the market shares of the retail discount segment in the 1967-2014 period. In line with the two formulated hypotheses, regression results reveal that the market share of the discount retail format indeed evolves counter-cyclically and thus increases in tough economic times. This suggests that crisis-hit consumers pay more attention to prices in their decision-making process during recessions and are more inclined to shop in the price-aggressive discount outlets. Moreover, the findings indicate that low-cost retailers show a positive (average) sales growth in every quarter. The growth in the discounters' market share in recessions is permanent, in a way that the gained market share of discounters does not evaporate after economically difficult times. It indicates that consumers do not change their recession-induced shopping behavior in post-recession recovery periods. In addition, regression results show that the increasing success of the discount channel leads to permanently diminishing market shares of structurally ill-positioned conventional retailers. The study also provides evidence that retailers in the differentiation segment do *not* suffer or benefit – in terms of losing/gaining market share – from the occurrence of recessions. All conclusions are robust for different values of the HP smoothing parameter.

### ***6.1 Managerial implications***

With the aforementioned outcomes, this research is valuable in the little exposed academic area of discount retailing. The study enhances the understanding of the impact of recessions on the retail business. It signals to traditional retailers that losing market share to discounters in an economic slowdown leads to a permanent decreased market share of these traditional firms. Low-cost retailers even want to gain further momentum now, after they have sharply increased their number of discount shops over the last decades. Numerous leading discounters over the world have aggressive expansion plans to further increase the number of outlets in both the national and international retail market. In addition, new large discount corporations emerged in the previous decade and captured market share of the traditional formats. All these developments cause serious concerns for conventional retailers. Although these retailers do *not* have any control on macro-economic developments, such as the occurrence of economic up- and downswings, the affected companies can and should take firm action to avoid losing market share in non-recession and recession periods.

Traditional retailers can take several actions to prevent that shoppers switch to discounters during an economic downswing. As an example of such an action, the UK grocery

store Tesco developed a counter-strategy in the previous financial crisis to fight against their discount competitors. Part of this strategic approach were the introduction of a broad range of cheap store brands (called Discount Brands) and a large marketing campaign to change price perception of consumers (Lamey 2014). Dutch retailer Albert Heijn and Belgian supermarket chain Delhaize have also put lots of effort in the extension of their private-label line, in conjunction with actions to alter price perception (Heerde et al. 2013). Lamey et al. (2012) argue that spending more on advertising and promotion activities can be an effective option for retailers to survive in crisis periods. However, the same paper finds evidence that marketing budgets of retailers shrink during adverse economic conditions. It seems that retailers easily cut on marketing expenses in such periods.

Given the empirical finding that structurally ill-positioned retailers suffer most from discounters' success, these firms should take action to reverse this observed pattern. Moving to the extreme ends of the strategy continuum is one of the potential actions that the middle of the market enables to regain the lost market share. For instance, Dutch department store De Bijenkorf – positioned between the middle and high segment in the past – have heavily invested in a “premium experience strategy” for some time now. With this strategic movement to the higher-end of the spectrum, the firm has successfully differentiated itself from competitors. Moreover, badly positioned retailers also have the option to create so-called “blue oceans of uncontested market space”. This blue ocean strategy is introduced in the well-known book of Kim and Mauborgne (2005). The authors note that several retailers adopted this strategic approach of creating and capturing *new* markets, instead of competing in *existing* markets. Some of the examples they provide are Southwest Airlines (first airliner with a “no-frills” format), Cirque du Soleil (combing the circus format with theatrical acts, without animals), Tupperware (selling home products in a party setting), and Dell (directly selling computers to consumers).

## ***6.2 Research limitations and suggestions for future research***

The research findings implicate that the aforementioned strategic changes of conventional retailers – in both recession and non-recession periods – are indeed necessary to retain shoppers in their stores. However, Zielke and Komor (2015) note that a significant amount of retailers worldwide have not acknowledged the tremendous sales growth of discounters yet. These traditional companies are still positioned in the middle of the strategy spectrum and are therefore likely to be outperformed by retailers at both ends of the continuum. On this point, future research should focus on the question how, and to what extent, non-discounters can avoid

losing market share in both recession and non-recession periods. Should traditional retailers extend their line of cheaper store brands (Tesco, Albert Heijn and Delhaize), should they move to the extreme ends of the strategy spectrum (De Bijenkorf), or should they develop a sustainable blue ocean strategy (Southwest, Cirque du Soleil, Dell, and Tupperware)? Or is there another effective strategy to fight against the price-aggressive discounters? In addition, more research is also necessary to further elaborate on the success story of the low-cost retailers. For instance, which discount retail type (hard or soft discounters) is more successful in recession and non-recession periods, and why? And which traditional retail type (for example, hypermarkets or smaller supermarkets) does suffer most in these periods, and why?

There are some limitations in this paper which also offer directions for future research. *Firstly*, this study uses the HP business cycle filtering procedure to extract fluctuations in economic time series which relate to periodicities in the business cycle. Holly and Stannett (1995) state that different de-trending procedures may result in different findings. While the research findings are robust for the choice of the smoothing parameter in the HP filter, no validation exercises are performed for other more complex filters, such as the de-trending filter of Baxter and King (1999). *Secondly*, the extent to which the findings are generalizable across all countries might be a concern. Although both US and non-US discounters have enjoyed increasing popularity for a long time (Cronin and Kelley 2015), it should be noted that retail markets naturally differ across countries. Certain characteristics of a particular country – such as national culture, laws or religion – may affect the success of a retail format. *Thirdly*, this research uses retail sales on the level of the entire retail industry. Conclusions are thus made on industry-level. However, it is possible that findings are different for different types of retailers in the sector. On this point, future research can, for example, examine whether the impact of crisis periods on department stores differs from the impact on supermarkets.

*Fourthly*, this paper sheds light on the link between business cycle fluctuations and discounters' success. However, due to limited data availability, this study does not control for all potential drivers of their short- and long-term popularity. For instance, the intensity of rivalry between firms in the retail market may also affect the performance of discounters. While the severity and duration of a particular contraction period can play a role as well, this paper does not examine whether, and to what extent, a relatively severe and long-lasting crisis period influences the market share of retail segments. The structural shift to “online sales” is also not taken into account. Nowadays, consumers can easily compare prices of products between different online stores and can shop at any time of the day. Switching between different channels and between different retailers is easier. Discounters' success can also be affected by

the change in consumer behavior over the sample period (1967-2014). It is likely that current consumers' attitudes, preferences and buying behavior are different compared to the 1960s. For instance, there was no market for digital music streaming services, "video on demand", and smartphones in that period. At this moment, these goods and services are part of consumers' modern life.

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