Mental accounting in grocery settings: Evidence of Slack account from the expected cost of the basket for unplanned purchases.

Abstract

Recent evidence from field studies in retail environments suggests that slack account is part of the consumer's purchasing budget. These funds are used as a self-control mechanism so as not to exceed the budget of the consumer. The current study propose a conceptualization of the slack account as the difference between the expected cost of the basket and the itemized budget allocated for the present visit to the store. Then, this slack is explained from the composition of the customer's basket in three branches of a supermarket chain. Using data taken from a field study, it has been found evidence that slack account is used fundamentally for unplanned purchases, which is consistent with the notion that these funds are used to finance products where the decision to purchase is made in-store. In addition, the planned items with discount were not found have significantly effect on slack account and there are substitution effects between funds used to purchase unplanned items (from slack account), and the quantity of unplanned products in the basket.

Introduction

Certain factors have been studied that facilitate unplanned buying. For example, it is known that unplanned buying results from exposure to in-store stimuli. Approximately 60% to 70% of purchases made in retail correspond to unplanned purchases (Underhill, 2000). Consequently, managers make efforts in-store marketing, as for example, convenient prices or promotions and checkout lines to encourage impulse buying to stimulate these types of purchases. Customer impulsivity also plays a role in unplanned purchases. It has been shown that increased impulsivity increases the difference between the spending and planned budget on a visit to the store (Stilley *et al*., 2010) suggesting a greater number of unplanned purchases on the purchase basket. However, Bell *et al.* (2011) found that unplanned purchases are about 20% of total purchases and that most of the variation in the number of unplanned buying is across shoppers. This suggests that differences in the number of unplanned purchases could be explained by sociodemographic or inherent characteristics of the individuals (Roberts et al., 2014), and not necessarily by in-store stimulus.

Past research has shown that people tend to create and maintain various separate accounts with funds in each allocated for specific purposes, although the money available in each of those accounts is the same as if it were all in one (Cheema and Soman, 2006; Heath and Soll, 1996; Thaler and Shefrin, 1981). This behavior supposes a means of self-control to adhere to a budget, even when this entails higher maintenance and follow-up costs for several separate accounts. These studies have been carried out under controlled conditions and fictional scenarios. Additionally, the findings relative to mental accountings in retail settings are done without considering the basket composition. In this study, a step further is taken, proposing a model of the deviation between the mental budget and the expected cost of the basket, taking into account product categorization based on which of them were (or not) in the shopping list.

Similarly as indicated by Stilley *et al*. (2010), the slack account is conceptualized as the difference between the expected cost of the basket and the mental budget for the shopping list (itemized budget). This slack should include the funds for unplanned purchases. The main supposition of this study is that the expected or perceived cost of the basket reported by customers is the result of the follow-up and control of mental accounts (Heilman *et al*., 2002). In other words, the use of funds from the slack account and the itemized budget is ultimately reduced to a perceived value that represents the expected cost of the products found in the shopping basket, and that includes products from the shopping list as well as unplanned products.

In this study, a field research was conducted based on in-store mental budgets and expected costs of the basket, on three branches of a major grocery chain in Chile.

This article is organized as follows: First, the model of deviation between expected cost and budget is described, and then the hypotheses regarding the connection between the aforementioned deviation and the basket composition are proposed. Next, the hypotheses are tested from a substantial sample of more than 1000 customers of an important grocery chain, and finally the results and conclusions of this study are presented.

Background and Hypothesis

Mental accounting in retail settings

There is evidence that actual spending is closely approximated to spending intentions (POPAI, 1995). As Stilley *et al*. (2010) suggests, consumers have a mental budget (implicit or explicit) and it includes room for unplanned items. The mental budget, comprises an itemized budget, which represents money allocated to planned items, and a slack account, which represents money for unplanned purchases. According to the hypothesis of Stilley *et al*. (2010), the slack account is the mechanism by which consumers exert self-control so as not to

deviate from the budget, and this influences the tendency to overspend. The tendency to overspend or the deviation between "what I think I am going to pay for my present basket and the budget that I have allocated for this grocery trip" might be due, for example, to: 1) the mental budget failing to estimate the real prices of products on the shopping list, and in order to abide by it in-store it becomes necessary to spend a higher amount than budgeted, 2) taking unplanned products because the customer forgot to incorporate necessities on their list and 3) making impulse purchases. In all these cases, slack account is added to the budget, so that the consumer is prepared for any of these three events: in the first case allowing them to abide by the planned product list, in the second and third case responding to needs triggered by stimuli found in-store (Inmann *et al.*, 2009, Rook and Fisher, 1995). This explanation agrees with the literature on self-regulation, where consumers impose restrictions on themselves to resist or at least control wants and temptations (e.g., see Loewenstein, 1996 and Wertenbroch, 1998). The existence of slack account allows consumer to self-regulate consumption in stores and avoids the negative utility derived from spending more than was budgeted (Kahneman and Tversky, 1979; Thaler, 1985).

When the consumer plans a grocery trip, even though he does not have an explicit budget, he has a mental list of requirements to replenish the household food stock. This shopping list calls for an estimation of the cost that could be based on past purchases and experiences (Bénabou and Tirole, 2004), and it makes up the budget for the list of planned product purchases, setting the itemized budget (Heath and Soll, 1996). As the consumer recognizes that he can be mistaken in the estimation of the funds needed, he has room to allocate additional resources in an additional slack account in the event of insufficient budgetary funds. At one extreme, an undisciplined consumer may need additional resources in this slack account. By undisciplined we mean those consumers who do not have sufficient self-control; they do not usually practice self-control to limit overspending, and if they do so, the effort to

repeatedly inhibit the desire is so great that their ability to exercise self-control quickly vanishes and therefore the temptation to make impulse purchases is incurred (Maruven and Baumeister, 2000). Therefore, the slack account becomes a catalyst for expanding the necessary funds to maintain self-control.

The slack account is the key to ascertaining why there is a deviation between the total budget and the itemized budget, i.e., the difference between the "*how much I am going to pay*" factor and the planned. The former is the final result of the set of decisions made during the purchasing process where budgetary and slack funds have been used. This perception translates operationally into the expected cost of the basket, which is the result of the balance equation between different accounts and budgets for different product categories. Mathematically,

$$TB \approx EXPN = IB + SFE \tag{1}$$

where EXPN is the expected cost of the basket and SFE is the slack account derived from the expected cost of the basket. Thus, the slack account is conceptualized as the difference between the expected cost of the basket and the itemized budget, IB.

The perceived cost represents an important fact in understanding the limits of the added consumption, because this reveals the management of the mental accounts. The perceived cost of the basket represents a proxy of the consumer's total and true budget, which includes the funds utilized from the budget allocated for planned purchases, and to additional funds held in in-store slack for unplanned purchases. Thus, the slack account is based on the final result of the purchasing process, i.e., the shopping cart with all products contained in it, and not on the intentions of additional spending that the consumer may have on entering the store.

in short, we test the following hypotheses:

H1: There will be a positive association between the number of unplanned products in the basket (with and without discounts) and slack account.

H2: There will be a negative association between the number of discounted planned products and the slack account.

H3: There will be a negative association between the number of planned products outside the basket and the slack account.

Method

Sampling and Data Collection

A field study was conducted in which 1429 customers of a national supermarket chain were intercepted. Customers were approached as they were heading to the checkout with their shopping basket. Three branches located in different geographical areas of Santiago, Chile were chosen in an attempt to capture customers with different income levels. Intercepting customers as they were lining up to pay allowed the questions to be asked as they were waiting their turn, which improved their willingness to participate. At the end of their participation, respondents received an ecological grocery bag as an incentive, which was given once all the questions had been answered satisfactorily. Respondents were asked to estimate the expenditure for the products they planned to buy when they entered the supermarket (itemized portion of the budget or mental budget, MB). They were then asked to estimate cost of the basket in front of them (Expected cost, EC). They were also asked to indicate from their shopping list those products in the basket that were discounted and those that were not (Unplanned items with discounts, UNPLD, and unplanned items without discounts, UNPLWD). Finally, they were asked to indicate which products they had planned to buy but which were not in the basket (OUTBK). The time the client estimated spending in the store from entering to arriving at the checkout (TRIPL), and the supermarket's membership card number were also included. Later, this identifier allowed to find the receipt

and compare the expected cost of the basket with the real cost (RC). Customers were approached in three different branches in Santiago. Branch A is located in a sector characterized by inhabitants with a high income. Branch B is in a sector with upper-middle income inhabitants, whereas branch C is located in a sector with middle-income inhabitants.

Variables

Mental budget (MB)

The respondents were asked to estimate what they will spend on planned product purchases during the present trip to the store. This variable corresponds to the itemized budget of the total budget.

Expected Cost (EC)

Before going through the checkout, the respondents were asked to estimate the cost of the present basket. We interpreted this measurement as a proxy of the total budget.

Real cost of the basket (RC)

This is the real cost of the shopping basket. This measurement is obtained from the customer's receipt after paying.

Slack from the expected cost of the basket (SFE)

This measurement is calculated as the difference between the expected cost of the basket (EC) and the mental budget (MB).

Out-of-basket items (OUTBK)

 This indicates the number of products that outside the basket but which are part of the list of planned purchases.

Unplanned items (UNPLD)

 This indicates the number of unplanned products in the basket and recognized by the buyer as being discounted or on sale.

Unplanned items without discounts (UNPLWD)

This indicates the number of unplanned products in the basket not discounted or on sale.

Planned items with discounts (PLD)

This indicates the number of planned products in the basket that are discounted or on sale.

Trip length (TRIPL)

This is the duration perceived by the customer of the time that elapses from entering the store to reaching the checkout, measured in minutes.

Local (LOCAL)

This indicates the branch (A, B or C) where the transaction was recorded. Branch A is used as the benchmark.

Gender (GENDER)

This indicates if the purchases were made by a man, a woman or a couple. The couple is used as the benchmark.

Number of items (NITEMS)

This represents the total number of items in the customer's basket.

Average ticket (TICKET)

This is the real cost of the basket divided by the number of items. This variable represents the average cost per item in the customer's basket.

Funds used for unplanned and planned items (R)

For each basket purchased, we have identified the monetary funds used by the supermarket clients, on planned and unplanned items (with and without discounts). This information is collected from the scanner data.

Model estimation

In order to test the hypotheses, this study considered a fixed cluster effect model estimated via

Ordinary Least Square, in which the dependent variable is the slack account, SFE. This permits heteroskedasticity and correlation within a cluster. Each branch is located in a different sector of the city and serves customers from each of those sectors. Given this condition, common effects could be included for a "branch" effect that have not been taken into account in this study and therefore induce a correlation through the observations that are similar or belong to the sector where the branch is located. It must be borne in mind that the customer himself recognizes an item as discounted or not, so that the models are constructed on the basis of the buyer's knowledge about the products in his basket because he is the one who manages his accounts during the in-store purchasing process.

Findings

Models of slack account

Three alternative models were considered in order to detect the effects of unplanned purchases and the discounts on the slack account-dependent variable[1].

Model 1:

The analysis begin with model 1 in Table 1, which confirms the presumption that the conceptualization of slack account is related positively to the number of planned products on the mental shopping list ($b = 115.24, p < .001$). This is to say, the higher the number of products on the planned shopping list, the greater the slack account because it is possible that with a longer shopping list, there is an increased possibility of including complementary products (Manchanda et al., 1999; Mulhern and Leone, 1991; Walters, 1991) and/or products

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[1] As Peter et al. (1993) suggest, using the variables separately is better than the difference between the two, especially when there is a high correlation between the difference in scores and their components, and also when these three components are included in the model. In our case, the correlations between the difference in scores and their components is low (less than 0.2 in absolute value and not significant in one of them) and the components separately are not included, such that we discount problems of spurious correlation. Additionally, alternative models were estimated, taking the mental budget (itemized budget) as an independent variable and the expected cost as a dependent variable. The results are very similar to those in Table 2.

forgotten on the mental shopping list (Rock and Fisher, 1995). Thus, the buyer anticipates this possibility and comes with a greater willingness for unplanned purchases[2]. As expected, the number of unplanned purchases consumes in-store slack funds significantly, and does so in more than double the number of planned purchases ($b = 2{,}551.52, p < .001$). This provides evidence to support the idea that these funds are used primarily to finance products that were not included on the shopping list. Thus, H1 at this moment is supported.

Model 2:

Model 2, Table 1 considers the effect of the number of unplanned items without discounts (UNPLWD), the number of planned items outside the basket (OUTBK) and the products recognized to be discounted present in the basket (DISC)[3]. This model provides robustness to the previous result, breaking the basket on products with and without discounts. The covariate DISC does not discriminate between unplanned or planned products, it only identifies products that the customer recognizes as being discounted.

The effect of number of discounted products present in the basket (DISC) is positive ($b = 191.0, p > .1$), but it is not significant, which suggests that in aggregate terms the items included in the basket recognized as being on sale or discounted have no bearing on the availability of slack account funds.

Under this model, H1 is again confirmed ($b = 2{,}295.44, p < .05$), indicating a significant positive effect, which suggests that a greater number of unplanned items without discounts included in the basket makes a more intensive use of slack account.

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[2] The reader must interpret this result in terms of "number of products" and not in terms of "monetary resources".
[3] Note that: # planned items = # total items of the basket – OUTBK – DISC, so as we want to study the effects of OUTBK and DISC separately, we do not include the number of planned items in this model or in the following models.

Model 2, is also useful for testing H3 which indicates a negative relationship between the number of planned items outside the basket and in-store slack. This hypothesis is confirmed, at least in the sign ($b = -2{,}071.01, p > .10$), but it does not reach a significance of 10%.

Model 3:

It must be recognized that the discounted items can be planned (PLD) or unplanned products (UNPLD). Model 3 incorporates this differentiation for discounted items. Under this specification, the results indicate that the unplanned products without discounts promote the use of in-store slack funds ($b = 2{,}447.59, p < .01$). The same occurs for unplanned products with discounts ($b = 2{,}340.35, p < .001$) and their effect is slightly less than for the unplanned items without discounts. This is evidence in favor of H1.

Hypothesis H2 is now examined. The variable PLD represents the number of planned products with a discount. It is interesting to observe that the effect is negative according to the prediction, but is not significant ($b = -355.56, p > .1$). This result does not support the hypothesis. The studies by Arkes *et al*. (1994) and Milkman et al. (2009) showed that the discounts and windfall gains (e.g., discount coupons) produced a tendency to spend more. Nevertheless, it seems that these discounts or gains were not necessarily on planned products.

Hypothesis H3 is again supported by the results of model 3 ($b = -2{,}194.82, p < .05$). All else being constant, this result shows that leaving a planned product on the shopping list outside the basket makes no use of mental budget (itemized budget) resources. These resources are transferred to the slack account, and therefore, they are available for unplanned purchases.

Table 1 – Results for slack account model

	Model 1[a]	Model 2[a]	Model 3[a]
Intercept	-7,775.94[*]	-4,722.40	-4,732.09
Planned products	115.24[***]	-	-
Unplanned products	2551.52[***]	-	-
UNPLWD	-	2,295.44[*]	2,447.59[**]
OUTBK	-	-2,071.01	-2,194.82[**]
DISC = PLD+UNPLD	-	191.00	-
PLD	-	-	-355.56
UNPLD	-	-	2,340.35[***]
TRIPL	12.80	72.68[***]	78.86[***]
Branch: C	-869.04[*]	-1,972.24[**]	-2,203.78[***]
Branch: B	352.22[**]	-676,43	-963.82
GENDER: Female	1239.35	855,72	946.98
GENDER: Male	3088.51[*]	2,607.95[*]	2,684.65[*]
TICKET	1.96[*]	2.01[*]	1.97[**]
Model R^2	.0834	.0738	.0831
Model p-value	<.0001	<.0001	<.0001
F_statistics	$F_{(8,1161)}=13.2$	$F_{(9,1160)}=16.8$	$F_{(10,1159)}=16.5$

Notes: Levels of significance: '***' 0.001; '**' 0.01; '**' 0.05; '*' 0.1. [a]Standard errors were corrected for heteroskedasticity and intra-cluster correlations using cluster-robust standard errors (see Wooldridge (2003) and Cameron et al. (2006)). All variance inflation factors are less than 4, for all coefficients of each model. This suggests that multicollinearity is not a major concern (Hair et al, 2006). The estimations for each model take couple and branch A as the benchmarks for gender and branch, respectively.

Discussion and conclusions

The findings of this research provide new evidence in favor of the use of slack account, in the same line of investigation as Stilley and colleges, from real field data. The slack account was expressed in terms of the difference between the expected cost of the basket and the itemized budget for planned items. The slack account bears relation to the composition of the basket of products based on the consumers' recognition of unplanned items, with and without discounts, and of planned items that remained outside the basket. This study contributes to this literature by showing how this positive and systematic difference between the expected cost and the itemized budget can be explained from the characterization of the basket belonging to consumers who shop on a regular basis. The slack account is supported by the mental accounting theory (Thaler and Shefrin, 1981; Thaler, 1985; Shefrin and Thaler, 1988), where the consumers, rather than optimizing their consumption choices over a long period of time, tend to make their purchase decisions on shorter time horizons using mental accounts as a means of self-control.

It has been found a positive relationship between the number of unplanned products of the basket, and slack account, which suggests that this type of unplanned items included in the basket through impulse purchases or forgotten needs, are financed through these additional resources not included in the mental budget for the shopping list. This phenomenon also occurs independently of whether the unplanned product is recognized with or without a discount. With this result in mind, it leads one to wonder about the role of complementary products in stimulating unplanned spending. If the total budget remains constant, it is possible to postulate the substitution effects between products, including substitution effects by amount. For example, the possible effect of psychological gain on the discount of a planned product over the amount of the product the consumer decided to include is not clear. This suggests there is an underestimation of the effect of the discount on the use of the slack account. Additionally, no distinction is made between unplanned purchases due forgetfulness from those on impulse. These observations prompt possibilities of future research in this same line.

These results support the hypothesis that consumers come with extra resources for "spur-of-the-moment" purchases, maybe as an avoidance mechanism to loss aversion (Tversky and Kahneman, 1981) and as a self-control mechanism to keep costs at bay. A future investigation should investigate why the unplanned products with discounts promote greater use of slack funds than unplanned products without discounts. A possible conjecture is that the unplanned products without discounts do not correspond to products needed for the home requiring replacement, but that were not considered as part of the planned shopping list due to forgetfulness, while the unplanned products with discounts are a reflection of an impulse purchase triggered by the discount. If this were the case, the in-store stimuli, encourage the

use of the slack account. Thus, the mission of the in-store stimulus is triggering the use of these funds with a high propensity to consume.

The resources of the mental budget for planned purchases that are not used, are at the consumer's disposal. It can represent a credit to the slack account. This gives support to the idea that windfall gains from fund not used and from discounts, are transferred to the slack account. Nevertheless, in this work it is not clear if a planned product that stays outside the basket is due to a stockout, cost or quantity (there is less than what was planned). It is possible to speculate substitution effects of brands in the event of stockouts and substitution effects due to quantity in the event of high product prices.

Another interesting result is that the planned products with discounts do not have a significant effect on slack account. Further research should to investigate why there is no windfall effect on this category of product.

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