

Retailer Choice and Loyalty Schemes -

Evidence from Sweden

Johan Lundberg^{*♣}

Sofia Lundberg^{**}

Abstract

From economic theory, it is known that consumer loyalty schemes can have lock-in effects resulting in entry barriers and higher prices. This paper concerns consumer loyalty schemes where the main issue is to test the hypothesis that loyalty scheme membership affects the choice of food retailer. This choice is modeled as a random utility maximization problem estimated with maximum likelihood. Based on a data set covering 1,551 Swedish households, we find evidence supporting this hypothesis. Further, according to the results, store characteristics and geographical distance matter for the choice of retailer while household characteristics are not found to have a significant effect.

Key words: Bonus card, Conditional logit, Consumer choice, Distance, Food retailer, Loyalty scheme

JEL Code: D12, L49, L66, L81, R10

^{*}Financial support from the Swedish Research Council for Environment, Agricultural Sciences and Spatial Planning, FORMAS, is gratefully acknowledged as is insightful comments from Thomas Aronsson, Sven-Olof Daunfeldt, Henk Folmer, Lars Westin, and seminar participants at the Department of Economics at Umeå University, Centre for Regional Science, CERUM at Umeå University, Department of Economics at University of Gävle, The Swedish Research Institute of Trade (HUI), and the European Association for Research in Industrial Economics Congress in Amsterdam.

^{**}Department of Economics and the Centre for Regional Science, CERUM, Umeå University, SE-901 87 Umeå, Sweden, e-mail: johan.lundberg@econ.umu.se

^{**}Corresponding author: Department of Economics and the Centre for Regional Science, CERUM, Umeå University, SE-901 87 Umeå, Sweden, e-mail: sofia.lundberg@econ.umu.se

1. Introduction

During the last decade, consumer loyalty schemes have become increasingly common. Consumers earn points when they purchase retail trade commodities, everyday items (such as food), gas, movie visits, flights and so forth. The design of these schemes may vary, but, at least from the retailers' perspective the main purpose is usually to make consumers loyal, in other words, lock them in. On the other hand, it could be argued that consumers benefit from loyalty schemes because they 'feel selected', earn 'points' or receive rebates. However, these schemes can also impose an artificial switching cost on the consumers. Theoretically, switching costs will have negative effects on consumption as well as production and lead to welfare losses for society (Klemperer, 1987, 1995; Beggs and Klemperer, 1992). The switching costs¹ associated with a change in behavior can also deter market entry since potential new firms know that consumers enrolled in loyalty schemes are unlikely to switch to another retailer (see also Cairns and Galbraith, 1990). Theoretical evidence from Gans and King (2006) suggests that loyalty in the context of product bundling (e.g. earning of points offered by credit card companies) can make consumers buy brands other than those they actually prefer. Empirical studies of frequent flyer schemes show that they affect the behavior of the consumers and the pricing of flight tickets.² In studies of frequent flyer programs, Borenstein (1992), and Button et al (1998) point out the value of further research on consumer loyalty schemes.

In this paper we use data from 2004 to study the effect of loyalty schemes on the probability that a household will choose a specific food retailer. In particular, conditional on a broad set of other potentially important determinants, we empirically

test the hypothesis that a representative household is more likely to choose a food retailer if it is a member of a loyalty scheme associated with that retailer. Loyalty schemes associated with every day commodities (food included) began to be introduced in Europe during the 1990:s (see Sharp and Sharp, 1997; and Mauri, 2003) and the first appeared in Sweden in 1989. These loyalty schemes basically have the same qualities as the frequent flyer programs.

The choice of retailer is modeled as a random utility maximization problem and the empirical approach is the traditional conditional logit model estimated with maximum likelihood (McFadden, 1974). The analysis is based on a data set covering 1,551 households living in a well-defined area in the northern part of Sweden (the Umeå region) with approximately 140,000 inhabitants. As the geographical area is clearly defined, we have been able to collect information on all the potential alternatives (i.e. food stores associated with different retailers) that constitute the household's complete choice set within the area. The data is rich in information on household characteristics (loyalty scheme membership(s), location, income, expenditures on food, size) and store characteristics (store location, service level, opening hours, price levels etc). The detailed information in the data set on both household and store characteristics, makes it possible to control for a large set of other potentially important factors that might affect the household's choice. The focus is on large basket shopping as this constitutes the largest part of the household food budget. The empirical results suggest that the choice of food retailer for large basket shopping can be explained by the household's membership in loyalty schemes. The time lag between the introduction of the loyalty schemes and the time of our survey reduces the potential problem caused by endogenous variables.

Analyses of the effects of loyalty schemes in Sweden are motivated by the fact that 92.5 percent of all food stores in Sweden are connected to one or other of three food retailer chains (Nordic Competition Authorities, 2005). This suggests that, even though there are a large number of stores within a region, the market could be described as an oligopoly where the effects of loyalty schemes might exacerbate already existing market imperfections. In addition, studying the importance of loyalty schemes and their effect on food shopping is also motivated by the fact that food expenditures, in general, constitute a large share of a household's total expenditures.³ However, empirical studies of the effects of loyalty schemes on the special features of the food market are scarce. Results from the well-covered marketing literature (inter alia Uncles, 1994; Sharp and Sharp, 1997; Lal and Bell, 2003; and Mauri, 2003) show that loyalty schemes are of value to the supply side as they establish long term customer relationships, increase revenues, and generate valuable information about customers' shopping behavior (also supported in e.g. Ziliani and Bellini, 2004; Paurer and Dick, 2006). Loyalty, in terms of the share of visits to a specific store, and profits are actually found to be positively correlated (e.g. Mägi and Julander, 1996; Smith et al, 2003).⁴

Empirical studies in the economics literature on consumer loyalty, where loyalty is not related to loyalty schemes, find that consumers tend to be loyal in general. However, none of these studies explicitly include information on the households' possession of club cards. For instance, in a study based on household scanner data, Fox et al (2004) find households with working women tend to spend more at each food retailer and also to shop at fewer retailers. Further, differences in the degree of

loyalty in terms of visit frequency to a specific store on the basis of five different product categories are found in Knox and Denison (2000). Further, Bell and Lattin (1998) report consumer loyalty in terms of household preferences for a specific food store. Their results are based on a study in which the households were divided into large and small basket shoppers.

This paper contributes to the previous literature by including information in the analysis on the household's complete choice set. Moreover, we also add to the existing literature on consumer loyalty by including explicit information on the household's possession of club cards (see for example Kahn and Schmittlein, 1989; and Fox et al, 2004). This includes information on the household's total possession of bankcards, credit-cards, bonus-cards, etc., which, as far as we know, is unique. In this respect, our study complements Mauri (2003) who had access to data on all customers involved in the loyalty scheme for one supermarket store in Italy. Based on the small number of loyal cardholders, Mauri concludes that the loyalty scheme does not induce loyalty. However, Mauri lacked information about what other cards the customers possessed and was, thus unable to know whether they were, in fact, loyal to another store or retailer. Information from a (US) supermarket chain forms the data source in a study by Lal and Bell (2003) on the effect of promotion programs on consumer behavior. They found evidence of differences in behavior between "lower spending" customer and "best customers". This was explained by the promotion of a specific item where rewards were based on the customer's spending in the store. Difference in response to promotion programs between loyalty scheme members and non-members is also studied in Cortiñas et al (2008). Based on scanner data from 10 product categories no difference in behavior with respect to price sensitivity is found although

the results suggest non-members to be more likely to buy economy packs and spend more due to promotion.

The rest of this paper is organized as follows. A short introduction to the food market in the area studied and the loyalty schemes associated with retailers on this market is given in Section 2. The data and the variables included in the empirical analysis are presented in Section 3. This followed by Section 4 in which outlines the theoretical approach. The empirical specification is set out in Section 5 and the results and their robustness are discussed in Section 6. The paper ends with a summary and discussion in Section 7. Tables and figures are found in an Appendix.

2. Description of the food market in the Umeå region and the loyalty schemes

The market for food (or everyday commodities) in the Umeå region is dominated by the two national food retailers; ICA and Konsum/COOP. Both ICA and Konsum/COOP are represented by stores of all types, from convenience stores to hypermarkets, where the hypermarkets are located in semi external shopping centers. In addition to ICA and Konsum/COOP, the food market consists of a third national retailer and local independent stores and gas stations (that sell food). The third national retailer is Axfood and it is represented by two supermarkets, Hemköp and SPAR. In addition, there are local independent stores and gas stations that sell food. In the following, all other stores except for those connected to ICA or Konsum/COOP will be denoted “other stores”. To place the Umeå region market in a national perspective, ICA, Konsum/COOP, and Axfood had in the year 2002-2003, 92.5 percent of the food retail sector in Sweden and ICA alone had 45.2 percent. The

Herfindahl index for the food retail market in Sweden was, at the same point in time, 0.32⁵ and even higher (0.44) for the Umeå region.⁶ This suggests that even though there are a large number of stores within the region studied, the market can be described as an oligopoly where the potential lock-in effect of loyalty schemes might add to already existing market imperfections.

ICA was the first of the three largest national food retailers in Sweden to introduce a loyalty scheme in form of a member club card, “ICA Kundkort”. This loyalty scheme is designed as a bonus program where a bonus in the form of checks (cash back) that can only be used in ICA stores is paid on a monthly basis to the members. The payment is based on how much the household spend in ICA stores. In addition, discounts on selected items are also given to loyal customers. This program was introduced in 1989 and a bank card function added in 2002. Members can deposit money in their ICA account or “load their” card with money. An interest rate is paid and consumer can attach a credit function to their card (or account). Konsum/COOP followed in 1995 by introducing the “Konsum/COOP MedMera” card, which builds on the same principles as the “ICA Kundkort” card.⁷ Before that, the Konusm/COOP loyalty scheme was designed in the following way. Members were awarded with checks by the end of the year upon the presentation of receipts supporting that years spending. Axfood was at the time of this study represented by Hemköp and SPAR but only the former has a loyalty scheme attached to it. Accordingly, the food retailer loyalty schemes basically have the same qualities as the frequent flyer programs with the addition of the opportunity to deposit money. This actually adds to the switching cost. Besides switching costs in terms of cost of changing behavior the loyalty

schemes studied, potentially adds to these costs since at least parts of the household income are locked up or reserved to be spent on food at a certain retailer.

3. Data

It is reasonable to assume that household characteristics as well as store characteristics can affect the choice of food retailer. Household characteristics have been collected by means of a questionnaire sent to a representative sample with respect to age of 3,000 households in the six municipalities that form the Umeå region in Northern Sweden. The sample was stratified with respect to age and location. The mail survey was carried out in October 2004 and one person within each household was asked to answer the questionnaire on behalf of the household as a whole. In total, we received 1,589 answers (53-percent) and 38 questionnaires were excluded from the analysis mainly because they were not fully completed or readable. This leaves us with a data set covering 1,551 households. The share of questionnaires sent to each of the six municipalities comprising the Umeå region was weighted with the population. A presentation of these municipalities and response rates is found in Table 1. As can be seen in Table 1, the data is fairly representative in terms of the preserved weights attached to each municipality.

[TABLE 1 ABOUT HERE]

The questionnaire posed questions concerning the household composition, educational level, income level, possession of club cards, and so forth. It also generated data on the household's food shopping behavior with respect to its choice

of primary store for its large basket shopping. The household was asked to list one store where it primarily does its large basket shopping and grade store qualities that were important for the household in its choice, such as free parking, opening hours, quality of fresh fruit, and if the store accepts the household's club card(s). The household was also asked to report the monthly amount spent in the store. In total, by the time of the survey there were 117 food stores in the Umeå region. These were basically all the food stores of significant size in the region and constitute the choice set of the households.

3.1 Characteristics of the store associated with a specific retailer

The service level that each store associated with retailer j can offer is also accounted for in the empirical analysis. This information was collected from each store listed by the respondents in the questionnaire. The service indicators included here form a dummy variable that takes the value one if the store entrance and cash-point are accessible for disabled persons and another dummy variable that takes the value one if the store has a certificate to show that it follows good environmental practices. Further, a service index (SI_j) reflecting whether the store has a meat, a cheese, and/or a fish delicatessen counter is included, where $SI_j \in [0,3]$. A store with all three delicatessen counters is assigned the value 3. An index is used because the variables for the separate delicatessen counters were too highly correlated to enter the analysis separately. Opening hours are included to reflect household preferences for time-wise accessibility. Here, three continuous variables are used, one for the number of opening hours weekdays, Saturdays, and Sundays, respectively. On average stores are open 12 hours on weekdays, 10 hours on Saturdays, and 8 hours on Sundays.

Frequencies for opening hours weekdays, Saturdays, and Sundays are illustrated in Figure 1.

[FIGURE 1 ABOUT HERE]

Another potentially important characteristic of the store associated with retailer j that needs to be considered is the assortment it can offer its customers. One way to measure this would be to include dummy variables for store format since this probably reflects the range of the assortment offered. Here, another approach is applied giving us more detailed information on the store's actual assortment. The Swedish Consumer Agency⁸ has defined a food basket that is primarily used for measuring price levels. This basket includes 171 items and, in the empirical model, a measure of assortment is used which is defined as the share of items on the list that was stocked by each store. This data was collected on site at each store at the same time as the service level data. On average the stores in the sample can offer their customers 62 percent of the items in the food basket. Descriptive statistics on the store characteristics are presented in Table 2.

[TABLE 2 ABOUT HERE]

3.2 Potentially important household characteristics for the choice of food store

The variable vector (z) that will be used to establish whether loyalty scheme membership is important for the choice of retailer is defined as three dummy variables, one for each retailer category: ICA, Konsum/COOP, and Other (reference

category). It takes the value one if the household has a club card associated with a specific retailer, otherwise it is zero. The household's possession of different cards is shown in Table 3.

[TABLE 3 ABOUT HERE]

It is apparent from this table that the households in our data set have equipped themselves with a menu of club cards. A vast majority are members of at least three loyalty schemes. At first glance this suggests that the relationship between the choice of retailer and loyalty scheme membership is not obvious, making the empirical analysis even more interesting.

It is reasonable to assume that the household's choice of food store does not only depend on loyalty scheme membership. For instance, the distance to a store within each retailer category is likely to be one important factor with regard to the choice of store. Inherent in the distance measure is, given the road network in the Umeå region, the travel time. As in Bell and Lattin (1998), the distance measure is based on the household's and the store's 5 digit postal code. However, in contrast to Bell and Lattin (1998), who measure the distance from the centroids of each postal code area, we link the postal codes to their geographical coordinates and then calculate the distance as the Euclidian distance in ten kilometers. The effect of distance is assumed to be decreasing and therefore enters the model in a non linear form. The idea is that after a certain distance the effect of one extra kilometer is decreasing. The use of the home address as the departure point is motivated by the fact that a majority (about 75

percent) of the households reported that they never, seldom, or only occasionally shop food when commuting to or from work. See Figure 2 for an illustration.

[FIGURE 2 ABOUT HERE]

Households are heterogeneous in taste and it is reasonable to assume that such differences are of importance for their choice of retailer. According to e.g. Blattberg, et al (1978) and Hoch et al (1995), differences in taste may also reflect differences in alternative costs for time. Therefore, it is assumed that households with children, retired people, students, and people working part time have different preferences than those in full time employment. In order to control for this, a dummy variable is used which takes the value one if at least one person in the household is a full time student (which is the case for 22 percent of the households) and another dummy variable that takes the value one if at least one person in the household has a part time job (which is the case for 66 percent of the households). Following previous work (for example, see McGoldrick and Andre, 1997; and Fox et al 2004), the household composition is also accounted for by family size and education level. The latter is a dummy variable that takes the value one if at least one person within the household has some kind of higher education (which is the case for 48 percent of the households).

The number of cars that the household has in its possession is included in order to control for differences in accessibility to distant stores and flexibility with regard to the means of transportation between households. The possession of cars is defined as the number of cars to which the household has access. This definition also includes, for example leasing cars. The effect of income is also considered and is measured as

the total monthly gross household income in Swedish kronor (SEK). The income variable is originally measured in intervals, which is transformed into a continuous variable by taking the middle value in each interval.⁹ Finally, consideration is also given to the household's opportunities to store food. This is accounted for by using a dummy variable that takes the value one if the household has an additional freezer. Descriptive statistics on these household characteristics are displayed in Table 4.

[TABLE 4 ABOUT HERE]

4. Theoretical Approach

The household's choice of food retailer for its large basket shopping is modeled as a random utility maximization problem where the household is assumed to choose one retailer over another if the utility of that choice is higher than the utility from choosing any of the other alternative retailers. The representative household, i , is assumed to be able to choose among $j = 0, \dots, J$ food retailers for its large basket shopping and the random utility function is defined as

$$(1) \quad U_{ij}(x_j, q_i, z_i) = x_j' \beta_x + q_i' \beta_q + z_i' \beta_z + \varepsilon_{ij}.$$

The utility of household i is assumed to be dependent on the characteristics of the retailer (x_j), the characteristics of the household (q_i), and z_i which is a dummy variable that indicates whether household i is a member of a loyalty scheme associated with retailer j or not. The inclusion of z_i builds on the assumption that the benefits from the loyalty scheme increased the utility to household i of doing its large basket shopping associated with retailer j . The β 's are parameters to be estimated

and ε_{ij} is the error term. This setting builds on the assumption that the benefits from the loyalty scheme increase the utility to household i of doing its large basket shopping at a store associated with retailer j . This theoretical approach forms the point of departure for the empirical test of the hypothesis that membership of loyalty schemes affects the choice of retailer for large basket food shopping.

5. Empirical Specification

In order to test the hypothesis that a representative household is more likely to select a food retailer if it is a member of the retailer's loyalty scheme, the random utility function specified in equation (1) is treated as a conditional logit model and estimated with maximum likelihood (McFadden, 1974). Each household is given three choice alternatives, $j = 1, \dots, 3$ a ICA store, a Konsum/COOP store, and a store from the category "other stores".

Assumptions have to be made about the store within each retailer category that is the most relevant choice alternative to the one selected. This could be based on distance assuming that households maximize their utility by minimizing the travel time. Here the closest store irrespective of store format is included in the choice set. An alternative is to impose a store format restriction and assign alternatives based on distance and store format. In such a case, an alternative to the one selected is a store of the same or larger format than the observed choice. This is reasonable under the assumption that households would not consider a store with a more limited assortment than the observed choice to be a relevant alternative. Here we test for both specifications of the choice set. In the first specification (Spec I), the relevant choice

alternative within each category is assumed to be the store nearest to the observed choice within the same or larger store format in relation to the observed choice. However, if the observed choice is a hypermarket, we allow the alternative store within the category ‘other stores’ to be of the size format below. The reason is that there is no hypermarket within the category “other stores”.

In the second specification (Spec II), the size format restriction is relaxed which means that the relevant choice alternatives are stores within the other two categories that are nearest to the observed choice irrespective of store format. In a possible third specification, the household could be assigned a choice set that includes all 117 stores listed in the questionnaire by the households. However, due to the extensive number of interaction variables that would be needed to estimate the choice of retailer, we have chosen not to estimate a model built on $J=117$.

The probability that the household makes a choice j for its large basket food shopping is then

$$(2) \quad \Pr(U_{ij} > U_{ik}) \quad \forall k \neq j \text{ and } j = 1, \dots, 3$$

The utility function is defined by equation (1) and, if the disturbance terms are assumed to be independently and identically distributed with type I extreme value distribution $F(\varepsilon_{ij}) = \exp(-e^{-\varepsilon_{ij}})$, the probability that a choice j is made can be estimated with maximum likelihood using the conditional logit model, see McFadden (1973) and Chamberlain (1980). Assume that Y_i in expression (3) is a random variable that indicates that household i has made a choice of retailer j . The

probability that household i chooses a store associated with retailer j for its large scale food shopping is then calculated as

$$(3) \quad \Pr(Y_i = j | x_j, q_i, z_i) = \frac{\exp^{x'_j \beta_x + q'_i \beta_q + z'_i \beta_z}}{\sum_{j=1}^3 \exp^{x'_j \beta_x + q'_i \beta_q + z'_i \beta_z'}}$$

The hypothesis that households are more likely to select a retailer whose loyalty scheme it is a member of is explored by the inclusion of the club card dummy variable vector z_i . The two vectors, x_j and q_i , contains choice (store) and household characteristics, respectively. Actually, as indicated above, due to no variation across the choice set the household characteristics (q_i) conditions out of the model specified in expression (2). Therefore, interactions of household characteristics with the choice alternatives are included to incorporate the effect of household characteristics in the empirical analysis (see Greene, 2003). Interaction variables are also required for inclusion of the loyalty scheme membership (z_i). Two outcomes are needed in order to find support in favor of the hypothesis that a household is more likely to select a retailer if it is a member of that retailer's loyalty scheme. Firstly, the coefficient for the interaction variables between retailer j and membership in a loyalty scheme associated with retailer j needs to be significant and to have a positive sign. Secondly, the coefficients for interaction between retailer $k \neq j$ and membership in a loyalty scheme associated with retailer j should either be insignificant or, if significant, have a negative sign. The "other stores" category is the reference alternative to the interaction variables.

6. Results

6.1 Estimation results

The parameter estimates and corresponding t -values from the maximum likelihood estimation of equation (3) based on the first specification (Spec I) is found in the first column and results from the second specification (Spec II) is found in the second column in Table 5. Let us first discuss the parameter estimates of equation (3) displayed in column (1) in Table 5.

The results in column (1) suggest that the coefficients of primary interest, the interaction between loyalty scheme associated with retailer j and retailer category j , are positive and significant if $j=ICA$ or $j=Konsum/COOP$. That is, the probability that the household will choose a store associated with a specific retailer for its large basket shopping is positively affected if the household has a club card associated with that retailer if the retailer is ICA or Konsum/COOP. Further, the interaction coefficients for “Other stores” are not significant. This is not surprising given that this is an aggregate of retailers. Further, the cross interaction coefficients are negative but (retailer category j and club card associated with retailer $k \neq j$) not significant. We take this result as evidence in favor of the hypothesis that households are more likely to shop at a store associated with retailer j if they are members of that retailer’s loyalty scheme. This is the case at least when the store is part of either of the two dominating food retailers in Sweden.

Another strong predictor, in addition to the loyalty scheme membership, is the geographical distance between the household and the relevant store within each retailer category. The sign of the linear parameter estimate suggests that there is a negative correlation between distance and the likelihood that the household will choose retailer j . However, the positive estimate of the distance squared coefficient indicates that this effect is decreasing with distance. Hence, the distance effect on the likelihood of a certain store choice is negative but decreasing. This result is in line with the result found in Fox et al (2004) for the relationship between travel time and choice of store, although their measure of distance was linear.

The results also indicate that store characteristics matter for the household's choice of store. All the coefficients, except for the ones reflecting whether the store is accessible for disabled persons and whether it has a price information station are significant. However, the direction of their impact on the probability for the household's choice of a store associated with a specific retailer for its large basket shopping differs. For instance, the assortment the store can offer and the opening hours are estimated to have a positive effect while the service index and environment certificate coefficient are estimated to have a negative effect. Access in terms of time and the store's assortment are also important for the households in this survey. The longer the store's opening hours on weekdays and the wider the range of products it can offer, the more likely it is to be selected. Notable is that the opening-hours during weekends does not have a significant impact on the probability that household i will select a store associated with retailer j . A possible interpretation is that the time restriction is more severe during the week.

The negative sign of the service index coefficient can be explained by that delicatessen counters are not what the consumers are looking for when they are doing large basket shopping. Our data show that the two stores listed most frequently by the respondents are hypermarkets with a high profile in economy packs and pre-packed fish, meat, and cheese.

[TABLE 5 ABOUT HERE]

Turning to the impact of household characteristics, note that the parameter estimates should be interpreted as the effect on the probability relative to the reference category which, in this case, is “other stores”. An interesting result is that the likelihood that a household will choose one of the three categories over another is, in principal, not explained by the household characteristics. The exceptions are the constants, which display a significant average effect of unidentified factors and a difference in preferences between a store associated with ICA or Konsum/COOP and other stores explained by the educational level in the household.

In sum, our results suggest that households are loyal with respect to their choice of retailer for large basket shopping based on their loyalty scheme membership. Moreover, the results show that accessibility both in geographical terms and time wise (week days) matters for the probability of choice of food retailer as does the character of the store within each retailer group. Thus, it is not who the consumer is but what the retailer can offer its potential customers that matters. Almost no significant coefficients were found for household characteristics.

6.2 How robust are these results?

The results presented and discussed above are, of course, conditional on the assumptions made. How well does our model fit the data, how restrictive are our assumptions and to what extend will the results be altered if the assumptions are relaxed? One evaluation criterion of how well our model fits the data is the extent to which the predicted probabilities from our model agree with the observed probabilities. These figures are presented in Table 6 and they suggest that the model is fairly accurate. This is also what the pseudo R^2 values presented in Table 5 suggest.

[TABLE 6 ABOUT HERE]

The model specification and, in particular, the restriction imposed on the relevant alternatives with respect to store format and distance are tested using an alternative specification of the choice set (Spec II). In Spec II we relax the restriction that the alternative to the observed choice should be a store of the same size or larger. Parameter estimates and corresponding t -values based on this specification are presented in the second column in Table 5. Compared with the results based on Spec I, we find that the loyalty scheme coefficient is still positive and significant. The other estimates are also fairly robust for changes in the model specification by one exception, the distance coefficients that show the opposite signs compared to Spec I. The results based on Spec II provide no clear guidance as to which specification is the most appropriate. However, we argue in favor of the first specification (Spec I). An assignment of relevant store alternatives within the retailer categories based on store format seems reasonable. Relaxing this restriction can result in a household that is

observed to prefer a supermarket within retailer j being assigned a gas station that belongs to retailer $k \neq j$ as a relevant alternative. We do not consider a gas station, all other things equal, to be a relevant alternative to a supermarket for a household that is observed to prefer the latter store format.

7. Summary and Discussion

This paper contributes to previous studies of households' choice of food retailer through an empirical analysis of whether this choice can be explained by membership in loyalty schemes or not. The food retailer loyalty schemes studied basically have the same character as the frequent flyer programs with one major difference; the food loyalty scheme members can deposit cash on their cards. The empirical approach is a random utility model and the data includes detailed information about the loyalty schemes of which the households are members, not just the one related to the observed choice of retailer (or store). At least to our knowledge, this is a unique approach. In previous studies, the loyalty aspect is measured by budget share, visit frequency or information about loyalty scheme membership only of the observed choice of store. More than 15 years after the introduction of loyalty schemes on the Swedish food market we evaluate the impact of loyalty scheme membership on the choice of retailer. Our findings are based on data collected by a mail questionnaire sent to 3,000 households in a region in Northern Sweden in 2004. The respondents were asked to list the store where they primarily do their large basket shopping for food. In total 117 stores was listed for which we have characteristics such as association to a particular retailer (if one exists), assortment, service level, and opening hours. This covers basically all food related stores in the area studied which

means that we have information covering the household's total choice set of food stores. This information gives us a good basis to identify the relevant choice set for the households.

The main result is that the probability that the household will choose a particular retailer for its large basket shopping is found to be positively affected by the household's membership in a loyalty scheme associated with that retailer. Further, according to the empirical results, store characteristics and geographical distance matter for the choice of retailer while household characteristics with one exception do not (higher education). The results are found to be stable for the specification of the choice set. The main result of this paper indicates that this market is characterized by lock-in effects which can obstruct competition and cause market entry barriers which can potentially lead to higher prices. The oligopoly character of the market in the area studied in combination with our findings indicates that it can be particularly hard for small firms to enter the market.

References

Beggs, A., Klemperer, P., 1992. "Multi-period Competition with Switching Costs." *Econometrica* 60(3): 651-666.

Bell, D. R., Lattin, J. M., 1998. "Shopping Behavior and Consumer Preference for Store Price Format: Why "Large Basket" Shoppers Prefer EDLP." *Marketing Science* 17(1): 66-88.

Blattberg, R. C., Buesing, T., Peacock, P., Sen, S. K., 1978. "Identifying the Deal Prone Segment." *Journal of Marketing Research* 15(3): 369-377.

Borenstein, S., 1992. "The Evolution of U.S Airline Competition." *The Journal*

of Economic Perspectives 6(2): 45-73.

Button, K., Hanes, K., Stough, R., 1998. *Flying into to Future*. Aldershot and Lyme, NH: Edward Elgar.

Carlsson, F., Löfgren, Å., 2004. "Airline Choice, Switching Costs and Frequent Flyer Programs." *Working papers in Economics* no. 123. Gothenburg University.

Chamberlain, G. 1980. "Analysis of Covariance with Qualitative Data." *Review of Economic Studies* 47(1): 225-238.

Cortiñas, M., Elorz, M., Múgica, J. M., 2008. "The Use of Loyalty- cards Databases: Differences in regular Price and Discount Sensitivity in the Brand Choice Decision Between Card and Non-card Holders." *Journal of Retailing and Consumer Services* 15(1): 52 – 62.

Fox, E. J., Montgomery, A. L., Lodish, L. M., 2004. "Consumer Shopping and Spending across Retail Formats." *Journal of Business* 77(2): 25 - 60.

Gans, J. S., King, S. P., 2006. "Paying for Loyalty: Product Bundling in Oligopoly." *The Journal of Industrial Economics* 54(1): 43-62.

Greene, W. H., 2003. *Econometric Analysis*, 5ed. Upper Saddle River, N. J. Prentice-Hall.

Hausman, J., McFadden, D. L., 1984. "Specification Tests for the Multinomial Logit Model." *Econometrica* 52(5): 1219 - 1240.

Hoch, S. J., Kim, B-D., Montgomery A. L., Rossi, P. E., 1995. "Determinants of Store-level Price Elasticity." *Journal of Marketing Research* 39(1): 41-57.

Khan, B. E., Schmittlein, D. C., 1989. "Shopping Trip Behavior: An Empirical Investigation." *Marketing Letters* 1: 55-70.

Klemperer, P., 1987. "Markets with Switching Costs." *The Quarterly Journal of Economics* 102(2): 375-394.

Klemperer, P., 1995. "Competition when Consumers have Switching Costs: An Overview with Applications to Industrial Organization, Macroeconomics and International Trade." *Review of Economic Studies* 62(4): 515-539.

Knox, S. D., Denison, T. J., 2000. "Store Loyalty: Its Impact on Retail Revenue. An Empirical Study of Purchasing Behaviour in the UK." *Journal of Retailing and Consumer Services* 7(1): 33-45.

Lal, R., Bell, D. E., 2003. "The Impact of Frequent Shopper Programs in Grocery retailing." *Quantitative Marketing and Economics* 1(2): 179-202.

Mauri, C., 2003. "Card Loyalty. A New Emerging Issue in Grocery Retailing." *Journal of Retailing and Consumer Services* 10(1): 13-25.

McFadden, D. L., 1974. "Conditional Logit Analysis of Qualitative Choice Behavior." In *Frontier in Econometrics*, ed. P. Zarembka, 105-142. New York: Academic Press.

McGoldrick, P. J., Andre, E., 1997. "Consumer Misbehaviour, Promiscuity or Loyalty in Grocery Shopping." *Journal of Retailing and Consumer Services* 4(2): 73-81.

Mägi, A., Julander, C-R., 1996. "Perceived Service Quality and Customer Satisfaction in a Store Performance Framework." *Journal of Retailing and Consumer Services* 3(1): 33-41.

Nako, S. M., 1992. "Frequent Flyer Programs and Business Travellers: An Empirical Investigation." *Logistics and Transportation Review* 28(4): 395-414.

Nilssen, T., 1992. "Two Kinds of Consumer Switching Costs." *The RAND Journal of Economics* 23(4): 579-589.

Nordic Competition Authorities., 2005. "Nordic Food Markets – A Taste for Competition." November 2005. Report No 1/2005.

Pauler, G., Dick, A., 2006. "Maximizing Profit of Food Retailing Chain by Targeting and Promoting Valuable Customers Using Loyalty Card and Scanner Data." *European Journal of Operational Research* 174: 1260 – 1280.

Proussaloglou, K., Koppelman, F. S., 1999. "The Choice of Air carrier, Flight, and Fare Class." *Journal of Transport Management* 5(4): 193-201.

Sharp, B., Sharp, A., 1997. "Loyalty schemes and Their Impact on Repeat-purchase Loyalty Patterns." *International Journal of Research in Marketing* 14(5): 473-486.

Smith, A., Sparks, L., Hart, S., Tzokas, N., 2003. "Retail Loyalty Schemes: Results from a Consumer Diary Study." *Journal of Retailing and Consumer Services* 10(2): 109 - 119.

Statistics Sweden (SCB). www.scb.se

Storm, S., 1999. "Air Transport Policies and Frequent Flyer Programmes in the European Community – a Scandinavian Perspective." Report. Unit of Tourism Research at Research Centre of Bornholm, May 1999.

Swedish Competition Authority., 2003. "Smakar det så kostar det – En utredning med fokus på flygbonusprogram." *Konkurrensverkets rapportserie* 2003:1. (In Swedish)

Uncles, M., 1994. "Do You or Your Customers Need a Loyalty Scheme." *Journal of Targeting Measurement and Analysis* 2(4): 335-350.

Ziliani, C., Bellini, S., 2004. "Retail Micro-Marketing Strategies and Competition." *International Review of Retail, Distribution and Consumer Research* 14(1): 7 – 18.

Appendix, Tables and Figures

Table 1. Population in the Umeå region and response rate.

Municipality	Population in 2004	Share of questionnaires	Share of response rate
Bjurholm	2 588	1.8	1.7
Nordmaling	7 511	5.4	5.4
Robertsfors	7 106	5.0	4.5
Umeå	109 390	77.3	78.2
Vindeln	5 773	4.2	4.0
Vännäs	8 525	6.1	6.1
Total	140 893	100	100

Table 2. Number of stores within each retailer category that can offer a specific service (percent in parenthesis) and descriptive statistics for opening hours and assortment.

	ICA	Konsum/COOP	Other	All
Meat delicates counter	18 (44)	14 (70)	1 (2)	33 (28)
Cheese delicates counter	16 (39)	8 (40)	1 (2)	25 (21)
Fish delicates counter	6 (15)	10 (50)	0 (-)	16 (14)
Accessible for disabled persons	33 (80)	19 (95)	37 (66)	89 (76)
Price information station	16 (39)	15 (75)	2 (4)	33 (28)
Environment certificate	6 (15)	8 (40)	2 (4)	16 (14)
$SI_j = 3$	6 (15)	4 (20)	0 (-)	10 (8)
$SI_j = 2$	10 (24)	4 (20)	1 (2)	15 (13)
$SI_j = 1$	2 (5)	6 (30)	0 (-)	8 (7)
Total	41 (100)	20 (100)	56 (100)	117 (100)
Descriptive statistics				
Opening hour weekdays				
Min/Max	8/24	8/12	7/24	7/24
Mean	10.8	10.6	13.3	11.9
Std.dev.	2.7	1.2	3.6	3.2
Opening hour Saturday				
Min/Max	3/24	3/12	0/24	0/24
Mean	8.4	8.3	11.9	10.1
Std.dev.	3.8	3.1	4.4	4.3
Opening hour Sunday				
Min/Max	0/24	0/12	0/24	0/24
Mean	6.1	6.3	10.5	8.2
Std.dev.	5.2	4.6	5.7	5.7
Assortment				
Min/Max	62.6/96.5	77.2/97.1	1.2/97.1	1.2/97.1
Mean	85.4	90.8	35.2	62.3
Std.dev.	7.6	5.3	23.26	31.1
<i>N</i>	41	20	56	117

Table 3. Distribution of Club or Credit cards among households.

Card Name	Nr of households (percent)	Share of ICA- Kundkort Card holders that also have another card.	Share of COOP MedMera Card holders that also have another card.
No cards	34 (2.2)	-	-
ICA-Kundkort (food)	1 234 (79.5)	-	87.1
Konsum/COOP MedMera (food)	1 094 (70.4)	77.2	-
Hemköp Kundkort (food)	16 (1.0)	1.1	1.5
Statoil (gas station)	293 (18.9)	21.6	21.9
OK/Q8 (gas station)	541 (34.8)	38.5	43.3
Preem (gas station)	73 (4.7)	5.6	6.1
Shell (gas station)	118 (7.6)	8.8	9.1
Bank Card (Visa, Master card etc.)	1 194 (76.9)	80.5	81.3
Other	99 (6.4)	7.2	7.5
Total	1 553		

Table 4. Descriptive statistics. The households.

	Mean	Standard deviation	Minimum	Maximum	Nr of households
<i>Household characteristics</i>					
Family size, number of people	2.36	1.31	1	11	1 553
Total monthly income SEK	28 625.24	17 404.71	0	75 000	1 553
Number of cars	1.17	0.77	0	7	1 553
<i>Monthly spending in € and share in percent of total spending on food.</i>					
Large scale shopping (49.5)	135.40	71.10	25.80	489.70	1 539
<i>Distance in kilometers between the home and the store</i>					
Home – selected store	6.28	9.98	0.15	93.65	1 551
Home – alternative stores	9.75	13.15	0.08	98.94	3 102

Table 5. Estimation results, conditional logit.
Specification of choice set given restriction on store format $J = 3$.

	(1) Spec I (Distance and format restriction)		(2) Spec II (Distance restriction only)	
	Parameter estimate	t-value	Parameter estimate	t-value
<i>Loyalty member variables</i>				
ICA card interaction ICA	3.21	5.08	3.32	3.74
ICA card interaction COOP	0.23	0.37	-0.07	-0.08
COOP card interaction ICA	-0.74	-1.17	-1.14	-1.24
COOP card interaction COOP	2.12	3.45	2.29	2.44
Other card interaction ICA	-1.16	-1.74	-1.63	-1.68
Other card interaction COOP	-1.12	-1.68	-1.44	-1.47
<i>Store characteristics</i>				
Distance household – store	-0.48	-13.49	0.04	2.02
(Distance household – store) ²	0.00	5.27	-0.00	-0.31
Assortment	0.18	6.83	0.26	13.32
Accessibility for disabled persons	0.29	1.11	-0.67	-2.81
Service index	-0.36	-6.51	-0.28	-5.33
Opening hours weekdays	0.52	4.06	0.19	2.07
Opening hours Saturday	0.04	0.42	-0.12	-1.43
Opening hours Sunday	-0.11	-1.79	0.02	0.33
Environment certificate	-0.64	-5.06	-0.53	-3.66
Price information	0.23	0.37	0.08	0.53
<i>Household characteristics ICA</i>				
Constant	4.01	5.69	-2.42	-2.33
Family Size	-0.08	-0.34	0.29	0.87
Number of Cars	0.38	0.76	-0.26	-0.40
Household income	0.00	1.14	0.00	1.20
Higher Education Dummy (Yes = 1)	-1.35	-2.37	-1.08	-1.26
Part Time Work Dummy (Yes = 1)	-0.08	-0.13	0.57	0.58
Student Dummy (Yes = 1)	-0.32	-0.59	0.23	0.23
Extra Freezer (Yes = 1)	-0.00	-0.00	-0.73	-0.76
<i>Household characteristics COOP</i>				
Constant	3.14	4.34	-4.04	-3.82
Family Size	-0.06	-0.27	0.30	0.92
Number of Cars	0.41	0.83	-0.15	-0.82
Household income	0.00	1.23	0.00	1.30
Higher Education Dummy (Yes = 1)	-1.24	-2.17	-1.04	-1.21
Part Time Work Dummy (Yes = 1)	-0.31	-0.49	0.14	0.15
Student Dummy (Yes = 1)	-0.88	-1.57	-0.14	-0.14
Extra Freezer (Yes = 1)	0.27	0.41	-0.58	-0.60
Log likelihood value		-674.60		-494.38
Pseudo R^2		0.60		0.71
$\chi^2_{(30)}$		2058.72		2419.13
Number of observations		4 653		4 653

Table 6. Observed and predicted probabilities.

	Probabilities for large basket shopping	
	Observed	Predicted
ICA	63.3	63.3
Konsum/COOP	35.2	35.1
Other retailer	1.5	1.6
Total	100	100

Figure 1. Frequency of opening hours with respect to week days, Saturday, and Sunday.

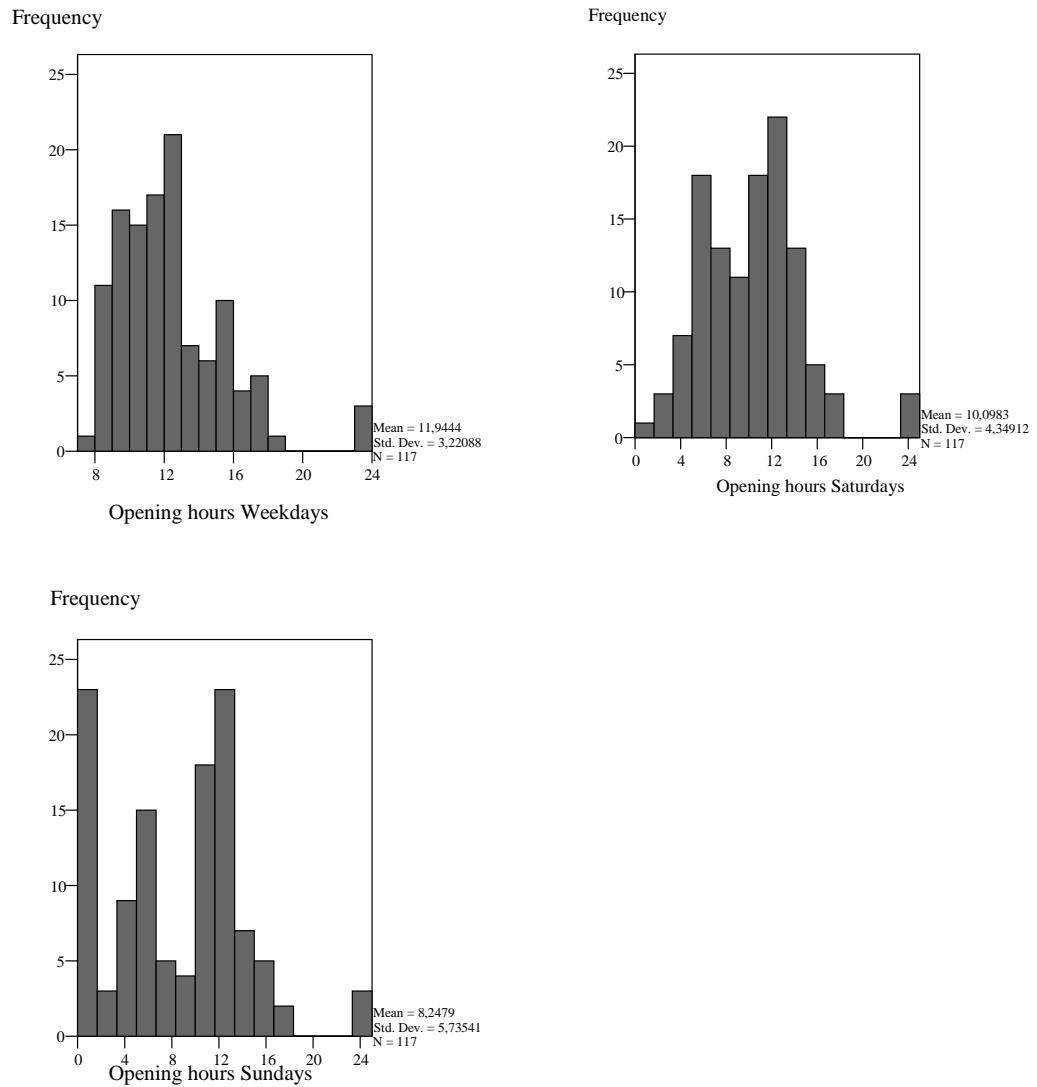
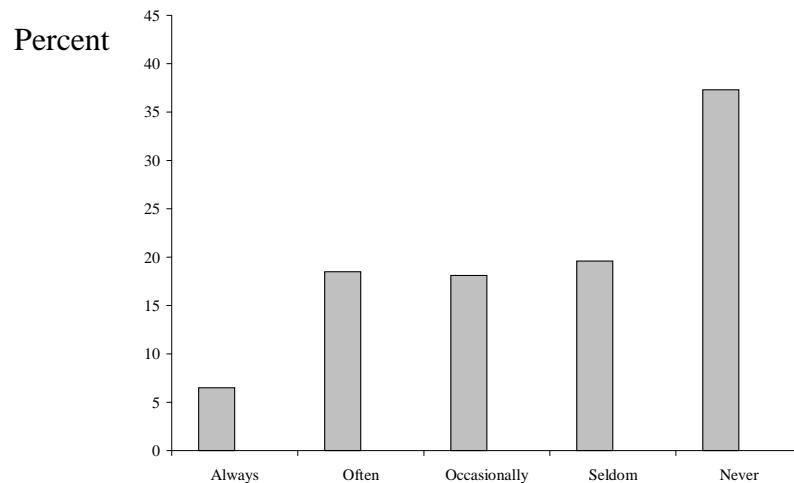


Figure 2. Share of households that do their large basket shopping in connection with work travel.



End Notes

¹ Nilssen (1992) defines two types of switching costs. The first is defined as a transaction cost and arises at every switch. The second is a learning cost that is incurred by the consumer who switches to a previously unknown store.

² See for example Nako, 1992; Proussaloglou and Koppelman, 1999; Storm, 1999; the Swedish Competition Authority, 2003; and Carlsson and Löfgren, 2004.

³ According to Statistics Sweden (SCB), figures from 2004 show that food and non-alcoholic beverages comprises 14.6 percent of Swedish households' total expenditures.

⁴ The Mägi and Julander (1996) study is based on 220 in-store distributed questionnaires from four stores in Sweden associated with the same retailer and the findings rest on Spearman's rank correlation coefficients and comparisons of means while the Smith et al study (2003) is a diary study based on 30 informants.

⁵ Nordic Competition Authorities (2005).

⁶ Note that the Herfindahl index for the Umeå region is based on market shares from 2002. Unfortunately we lack information of this type for later years but as the market has developed there are reasons to expect an even higher concentration ratio. The calculation of the Herfindahl index is based on figures from the Swedish Research Institute for Trade.

⁷ The Konsum/COOP MedMera card was preceded by a member club card with a bonus system where an annual bonus was paid given that the members returned their receipts.

⁸ The Swedish Consumer Agency is a state agency with responsibility for looking after the interest of the general public with respect to consumer affairs.

⁹ Questions about earnings are in general considered as a delicate question and one way to avoid missing values or lose response rate is to design the income question with multiple alternatives.