Sustainable Products and Consumers' Brand Choice.

Oliver Meixner[1] and Viktoria Knoll[2]
[1]Institute of Marketing and Innovation, Department of Economics and Social Sciences,
University of Natural Ressources and Applied Life Sciences, Vienna
Feistmantelstr. 4, A-1180 Vienna, Austria
[2]emotion banking, Theaterplatz 5, 2500 Baden, Austria
oliver.meixner@boku.ac.at ; viktoria.knoll@emotion-banking.at

Abstract

Within this study selected empirical results out of a 3 year project concerning the analysis of Austrian panel data are presented. Raw data coming from the most important Austrian consumer tracking panel was analyzed with respect to consumers' variety seeking and brand choice behavior. It is analyzed if consumers tend to switch to "sustainable" (here: organic) products and brands more frequently compared to brand switches between conventional products and brands (significant interrelation between sustainability and consumers' brand choice). After a brief introduction into a specific variety seeking model operationalizing consumers' brand switching tendency, a descriptive analysis of the analyzed data set, and analytical outcomes concerning "sustainability" and "brand switching" are presented.

Keywords: *Consumer behavior, brand choice, variety seeking, organic food*

1 Introduction

Consumers claim from food companies to proof their corporate social responsibility. Therefore, food markets in Europe may also be characterized by an increasing importance of the sustainability concept on an individual food product level. In this respect, organic foods are probably the most important tendency on food markets because from the customers point of view organic production is supposed to be much more "sustainable" compared to conventional production processes. Other relevant developments on food markets are e.g. carbon food print labeling or the fair trade concept. Within this study, it is analyzed if these signals affect consumers' brand choice significantly. We will present selected empirical results out of a 3 year project funded by the Austrian National Bank. Within this project raw data coming from the most important Austrian consumer tracking panel was analyzed with respect to consumers' variety seeking and brand choice behavior. The panel data is provided by the market research institute GfK Austria for 3 different product categories and contains shopping data of more than 2000 households for a time period of 2 years (however, only the analytical results for only one specific brand category, fruit yoghurt, will be presented within this paper).

We will try to find answers to the question if there is a significant interrelation between sustainability and consumers' brand choice. For this purpose, other relevant variables, like brand loyalty, will be included into the analysis. We will present a brief introduction into a specific variety seeking model operationalizing consumers' brand switching tendency, a descriptive analysis of the analyzed data set, and analytical outcomes in terms of hypothesis tests concerning "sustainability" and "brand switching". The study should be considered to

be explanatory of nature as the interrelation between the sustainability concept and consumers' brand choice is analyzed for the first time in the food market and based on consumer tracking panel data.

2 Consumers brand choice and variety seeking behavior

The phenomenon that consumers switch between brands because they derive a utility from the switch itself is called variety seeking behaviour (VSB) (Givon, 1984, pp. 2). Johnson et al. (1995, 236) assumes that VSB occurs between familiar brands, which are part of a certain portfolio a consumer has (Lattin and McAlister, 1985, 331). The importance of VSB for marketers is its influence on the ability to compete in a market based on its impact on demand elasticities (Chintagunta et al., 2001, 112). Moreover, VSB influences the response to price promotions (Trivedi, 1999, 47), and consumers' reaction to retention programs (Berné et al., 2001, 343).

To approximate VSB based on households panel data – a very trustful way of estimating consumer behaviour tendencies as real shopping behaviour is analysed – a number of approaches are available. Quite often, some simple indicators are used to approximate VSB, namely the number of purchased brands (more brands is a typical signal that the relevant consumers seeks variety) and the number of brand switches from brand *i* to brand *j*. A more sophisticated model including both central variables to approximate VSB is the so-called "Switch of Brands" model (*SB*) confirming Meixner and Knoll (2012). Through this model, real world data from shopping behaviour can be taken (on a household level) to analyze if a household has a more or less distinct tendency to switch between brands in order to achieve a certain level of "stimulation" through variety. Theoretically, the *SB*-model was developed by aggregating comparable VSB-models to improve the estimation of VSB on a household level. Formally, two important approaches the so-called Switch (*S*) and Successive Switch (*SS*) approach (Menon and Kahn, 1995) were aggregated. The following formula is therefore the multiplicative combination of *S* and *SS* (with further slight modifications which can be taken from Meixner and Knoll, 2012):

$$SB = \sqrt{\frac{(n-1)\cdot n_{ij}}{(Max(n_k)-1)\cdot(N-1)}}\;;\; k = 1 \ldots m$$

with n = the number of brands in the purchase set of the relevant household, n_{ij} = the number of brand switches from one occasion to the immediate next one, N = the total number of purchases, m = the number of households, and $Max(n_k)$ = the maximum number of purchased brands in the total panel set. The *SB*-model is still a very basic one to approximate VSB. However, confirming Meixner and Knoll (2012) it delivers a reliable and clearly interpretable index with $0 \leq SB \leq 1$ which can be taken to analyze the tendency of a household to seek variety (including purchased brands and brand switches). A coefficient near 1 is a clear signal that this relevant household seeks variety (many brands and brand switches); in contrast, a coefficient near 0 indicates that this household avoids variety and behaves rather brand loyal.

3 Analytical approach – relevant variables included into the analysis

In order to analyze if there is a interrelation between consumers' brand choice and the purchase of sustainable food products, *SB* is one of the variables which were taken for the further analysis. Further explanatory variables we included into the analysis are:

- The share of sustainable food product purchases (organic%). Sustainability was measured via the attribute "organic food". Of course, this again is a simplification because organic production is not the only attribute connected to sustainability. To analyze the interrelation between the purchase of sustainable food products and consumers' brand choice, organic% was correlated with all other variables of this analysis.
- A brand loyalty index (*L*) confirming Cunningham (1956; comp. Wagner and Boyer, 2000, pp. 279; Kumar et al., 1992, p. 410). *L* is defined as the share of the most favored brand. The number of the most preferred brand $Max(b_h)$ is divided by the total number of brand purchases *N* of the relevant household: L = $Max(b_h)$ / N. Of course, this is a very simple way of approximating brand loyalty. For our purpose – an explanatory analysis – the restrictions connected with this index are acceptable.
- The total value of all purchases of one household in €.
- The share of price promotions *PR%* as one important variable concerning brand switches which is not included into the *SB*-model. The assumption is that a specific brand switch can also be induced by a price promotion. The total share of purchases based on price promotions divided by all purchases of this relevant household is calculated.

4 The Austrian fruit yoghurt market

In comparison to other product categories in the organic market, fruit yoghurt is of sixth importance in terms of volume as well as value. The consumption of organic fruit yoghurt is increasing since 2008, in 2010 organic fruit yoghurts had a value based market share of 11.9%.

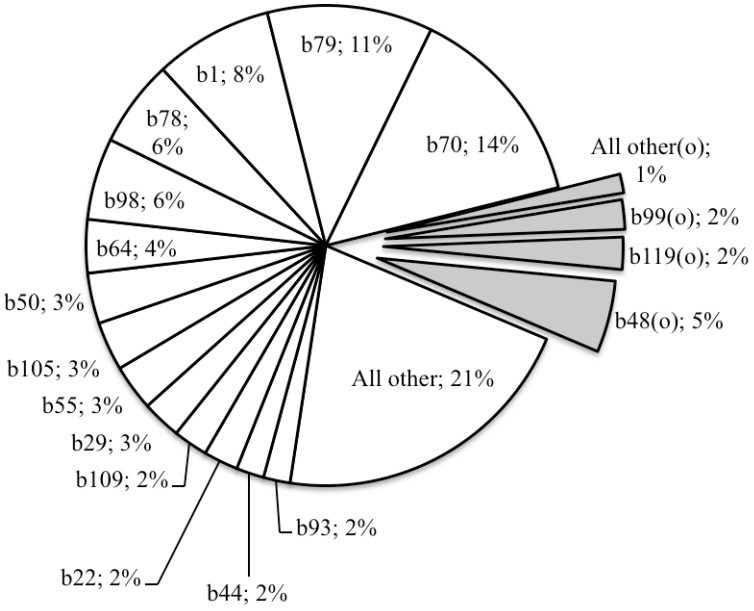

Figure 1. Austrian fuit yoghurt market: brands (market shares per unit) – orgnanic (o) and conventional

In our sample which refers to 2007-2008, the market share per unit amounts to about 10% organic fruit yoghurt. The organic segment is dominated by 3 brands (b48, b11 and b99), in total 16 organic brands and 103 conventional brands were registered within the consumer tracking panel data for fruit yoghurts. In the conventional segment, the distribution between the different brands is much wider compared to the organic segment; however, two brand (b79 and b70) are clearly dominating the Austrian fruit yoghurt market (together about ¼ of all units sold). In total, sales for our sample (n = 3922, 2007-2008) amounted to about €81000 per year. For the whole market (3.566 mio. households in 2008), the market size would amount to about €147 mio. However, this seems to be an over-estimation, as not all households in the panel are included into the projection for the total market. Confirming the Austrian RollAMA/AMA Marketing (2011, p. 12) the total market amounts to about €110 mio. The total market volume stayed stable in 2009 and 2010 (RollAMA/AMA Marketing, 2011, p. 12). As the share of organic products raised to about 12%, this segment amounts to about €13 mio. in total.

5 Analytical results for the Austrian fruit yoghurt market

Confirming Givon (1984) only those households were included into the further analysis, where a minimum number of purchases was available ($N \geq 20$) during the relevant time period of 2007-2008. Therefore, the original sample size was reduced from 3922 households within the sample to 1788 households. We grouped these households with respect to the share of organic food purchases in order to get a better overview over the distribution of the interesting variables. The segments were built confirming the overall distribution within the sample (they are not uniformly distributed, therefore we built classes coming close to a logarithmic distribution: 0%, 0% > 2.5%, 5% > 10% etc.; see "Organic%" in Table 1). Furthermore, the overall distribution of the original data showed that a linear correlation cannot be presumed for the majority of the included variables. This was the main reason

why we decided to built groups for our (explanatory) analysis as a simple correlation analysis with the original (metric) data would not work.

In average, a typical household buys about 70 products within the selected time period of 2 years (35 per year) and uses 9 brands (see "Total mean" in Table 1). The households are in general moderately seeking variety with *SB* = 0.33 (whereby this only refers to brands; if we would include variants – like flavors – into the analysis, the search for variety might differ) and can be considered to be relatively brand loyal (almost half of the purchases are coming from the most preferred brand). The total value of the purchases amounts to about €40 per year (€80 in total). Almost 23% of the purchases are done because of price promotions.

Table 1.
Distribution of explanatory variables with respect to variable "Organic%"

Organic%	*Segment*	*Seg.*	*Mean*						
	size	*size %*	*N*	*PR%*	*Value*	*SB*	*n*	n_{ij}	*L*
= 0%	683	38%	53.6	0.179	66.0	0.261	6.9	21.0	0.540
0% > 2.5%	154	9%	125.3	0.183	145.2	0.376	11.5	56.3	0.485
2.5% > 5%	229	13%	70.9	0.219	81.0	0.376	10.8	35.1	0.448
5% > 10%	217	12%	79.1	0.270	89.3	0.401	11.7	41.2	0.400
10% > 25%	284	16%	69.5	0.291	74.5	0.403	11.3	37.9	0.368
25% > 50%	143	8%	74.1	0.317	77.7	0.353	9.7	37.0	0.344
50% to 100%	78	4%	69.7	0.281	75.8	0.234	6.4	26.3	0.570
Total sum	1788	100%							
Total mean			69.9	0.229	80.3	0.331	9.3	32.5	0.465
Min	78	4%	53.6	0.179	66.0	0.403	6.4	21.0	0.344
Max	683	38%	125.3	0.317	145.2	0.234	11.7	56.3	0.570

N = total number of purchases, PR% = share of promotions, Value = total value of all purchases, SB = switch of brands (VSB) coefficient, n_{ij} = brand switches, n = brands, L = loyalty index

There is a large group of households that are *not buying organic fruit yoghurts at all* (683 [38%]). In contrast, only small groups of households can be classified to be "heavy" organic fruit yoghurt buyers (78 [4%] have a share of more than 50% of all purchases, 143 [8%] of more than 25%). As we can see from Table 1, there is obviously a relation between the share of organic brands bought (*Organic%*) and the explanatory variables (*N, PR%, Value, SB, n,* n_{ij}*, L*):

- Concerning the relevant *variables approximating VSB* (*SB* as an aggregated index and the variables "number of brands" *n* and "number of brand switches" n_{ij}) the following assumptions seems to be appropriate: Households, which tend to buy no organic food at all or which tend to buy organic food to a high extent are *not looking for variety*. This might be explained by the fact, that both groups of households are much more brand loyal compared to the other households (see *L* in Table 1). These households buy much less brands (6.9 and 6.4 in average, compared to 9.3 for the total sample), tend to switch less between brands from one occasion to the next (*SB* = 21.0 and 26.3 compared to 32.5 in the total sample).
- All deviations from the expected distributions are significant (see Table 2). Concerning the explanatory power of these variables, the most important ones with the highest empirical *F-value* in Table 2 are *SB* and *n* (also refer to *Eta* and Eta^2 in Table 3). About 42% of variance (*Eta* in Table 3) concerning the tendency to search variety (as measured via *SB*) can be explained by the grouping variable *Organic%.*
- This is a clear signal that within this set of variables, the relation between the choice of organic food and the tendency of households to switch between brands is the strongest. This could also be explained by the fact, that *within the organic fruit yoghurt market much fewer brands are available* compared to conventional ones (16 vs. 103; see above). Therefore, the correlation between VSB and the purchase of organic foods should not be over-estimated: Consumers are forced to select only between a small number of brands if they want to buy organic compared to conventional brands.
- However, this conclusion cannot explain why households, which are *not buying organic food at all* seem to use similar patterns in their shopping behavior. Compared to the average, these households are avoiding variety, their behavior is significantly more brand loyal, they are purchasing less brands (even though they would have a much wider range of brands in the conventional fruit yoghurt segment).
- Concerning price promotions, the share of promotions is usually lower in the segment of non-organic buyers. This is the only variable where a true linear relation seems to be likely. In the organic fruit yoghurt segments, the share of price promotions is raising. Therefore, organic fruit yoghurts seem to be promoted over the price more often compared to conventional products.

Table 2.
ANOVA explanatory variables and Organic%

		sum of squares	df	mean sum of squ.	F	sig.
*N * Organic%*	between groups	675088	6	112515	27.74	0.000
	within groups	7224000	1781	4056		
	total	7899000	1787			
*PR% * Organic%*	between groups	4.83	6	0.81	17.39	0.000
	within groups	82.52	1781	0.05		
	total	87.36	1787			
*Value * Organic%*	between groups	$8.19 \cdot 10^{9}$	6	1.37E+09	20.56	0.000
	within groups	$1.18 \cdot 10^{11}$	1781	6.64E+07		
	total	$1.27 \cdot 10^{11}$	1787			
*SB * Organic%*	between groups	7.47	6	1.24	64.60	0.000
	within groups	34.31	1781	0.02		
	total	41.77	1787			
*n * Organic%*	between groups	8369	6	1395	65.72	0.000
	within groups	37799	1781	21		
	total	46168	1787			
n_{ij} ** Organic%*	between groups	209435	6	34906	30.47	0.000
	within groups	2040000	1781	1146		
	total	2250000	1787			
*L * Organic%*	between groups	10.45	6	1.74	43.69	0.000
	within groups	70.97	1781	0.04		
	total	81.42	1787			

Table 3.
Interrelation between explanatory variables and Organic%

	Eta (η)	*Eta^2 (η^2)*
*N * Organic%*	0.292	0.085
*PR% * Organic%*	0.235	0.055
*Value * Organic%*	0.255	0.065
*SB * Organic%*	0.423	0.179
*n * Organic%*	0.426	0.181
*n_{ij} * Organic%*	0.305	0.093
*L * Organic%*	0.358	0.128

6 Conclusions

The analytical results of this study are explanatory of nature and should not be over-estimated. There seem to be a interrelation between consumers' brand choice (VSB) and the purchase of sustainable (organic) food products. It is advisable to further analyze this outcome by use of consumer tracking data. The inclusion of a switching model approximation variety seeking with special emphasis on variants (flavors) is advisable (we already developed that model but did not include it into the analysis presented above).

The approximation of VSB and brands is still a very crude one. Therefore, we further improved the *SB*-model by integrating price promotions into the model (for a first analytical approach concerning price promotions, VSB and the organic fruit yoghurt market refer to Knoll and Meixner, 2012). In fact, this analytical improvements will help to get deeper insights into the relation between an important tendency in consumer behavior, the search for variety, and the decision of consumers to buy sustainable products. Having this knowledge, marketing experts will be able (1) to better understand their consumers but also (2) to influence their shopping behavior. In particular point (2) will gain increasing importance in saturated food markets like the Austrian fruit yoghurt market.

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