Does Economic Crisis Force to Consumption Changes Regarding Fruits and Vegetables?

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ABSTRACT

This study focuses on consumers’ behaviour towards Fruits and Vegetables (FVs) under economic crisis. The implementation of both factor analysis and logistic regression reveals discrete consumer groups, affected and not affected by the ongoing economic crisis. Interviewees were selected randomly. In total, 250 questionnaires were completed and 238 of them were used for computations. There are two consumer groups, one affected by the crisis and one which did not. For the former, the price criterion prevails, while for the latter parameters like locality of production and health concerns lead them to purchasing decisions. The economic crisis has reduced the quantities of FVs being consumed, and the retail chain stores fail to meet the criteria of locality and secure traceability procedures about the origin of the products. Nevertheless, educated consumers with higher incomes prefer to visit supermarkets, while elderly people with low incomes prefer grocery stores and open markets.

KEYWORDS
Consumer Behaviour, Consumer Groups, Economic Crisis, Fruits and Vegetables

INTRODUCTION

It is widely accepted and scientifically proved that Fruit and Vegetables (FVs) consumption is positively correlated with aversion of serious health issues, like heart diseases, stroke and cancers, with other studies verifying that higher rates of cardiovascular disease are partially explained, in low socioeconomic groups, because of low intakes of FVs (Griep et al., 2012; Dauchet et al., 2005; Dauchet et al., 2006; He et al., 2006; He et al., 2007). These findings upgrade the FVs consumption from a dietary issue to a public health one, signifying the importance of assessing the parameters shaping the consumers’ profile. The ongoing economic crisis worsens the purchasing power of continuously greater social groups, because of wage reductions and high rates of unemployment (Frangos et al., 2012). Greece perhaps is the EU country having experienced up till now the most negative outcomes of this deficit crisis, with six continuous years of recession and extremely high rates of unemployment (KEPE, 2012). Therefore it is important to assess the impact of this economic crisis on FVs consuming norms.

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LITERATURE REVIEW

The FVs consumption issue is a research topic being approached by both psychological and economic means. The most consistent predictors for consumption are self-efficacy, social support, and knowledge, while there was no strong evidence for barriers, intentions, attitudes/beliefs, stages of change, and autonomous motivation (Arulselvan et al., 2008; Brug et al., 1995). There are though differences on consumer profiles among consumer groups. Regarding young adults, findings suggest that fruit consumption increase target should focus on developing messages concerning situational beliefs, rather than emphasising on health outcomes (DeBruijn, 2010). In Italy, referring to the same consumer group, in order to increase fruit consumption it is necessary to improve availability and develop abilities to overcome barriers. Especially for those who do not consume large quantities, it is proven that this happens due to attitude, supporting by this way the effectiveness of school campaigns (Menozzi & Mora, 2012). Various studies focus on the implementation of the TPB to examine possible differences among genders regarding FVs consumption. Emanuel et al. (2012) verified that TPB constructs to a large extent explain the gender difference, with females to report more favourable attitude and greater perceived behavioural control regarding FVs consumption than males, while males reported greater perceived norms. Locality of production and consumption is another important issue for FVs. Issues maintaining competitive advantage is less food miles and better quality for central England and southern France respectively (Brown et al., 2009). During economic crises special attention is given on consumer behaviour of low-income households. Five parameters revealed as their concerns regarding FVs consumption: store venue; internal store environment; product quality; product price; relationships with the stores (Webber et al., 2010). Considerable differences have been revealed among low and high socioeconomic status women on the FVs consumption subject, with the former to reveal as key influences the high cost of healthy eating and the lack of time due to work commitments. On the contrary, the latter reveal the health consciousness and the lack of time due to family commitments (Inglis et al., 2005). Perhaps the most sensitive members of the society, the children, are the most exposed, regarding dietary habits, during economic crises. A repeated taste exposure by low-income elementary school children increased liking scores for carrots, peas, and tomatoes; with the liking to remain stable for bell peppers, proving that this strategy is a promising one for the achievement of FVs consumption increase (Lakkakula et al., 2010). The use of promoting e-mails, in order to increase FVs consumption, proved to be effective for those primarily interested in increasing FVs consumption, with concerns though about the development of the TPB to explain any behavioural change in this particular context (Kothe et al., 2012). Similar attempts to increase FVs consumption of low-wage employees revealed that fresh fruit deliveries on scheduled basis increased the overall consumption (Backman et al., 2011).

METHODOLOGICAL APPROACH: FINDINGS

The present study focuses on consumers’ choices for buying FVs from retail chain stores and other selling places, like grocery stores and open markets, taking into consideration several socioeconomic factors affecting the final choice of each consumer. For this field research consumers were asked to fill a questionnaire in both urban and rural areas of Greece. Interviewees were selected randomly. In total, 250 questionnaires were completed and 238 of them were used for computations. The assessment of the impact of these parameters is achieved through regression analysis in which the depended variable will be the final choice of the consumer, (buying FVs from retail chain stores or other selling places), and the independent variables are the factors being derived from the completion of a questionnaire being described below. Since the phenomenon under study is a dichotomous outcome (buying from super market or grocery store) application of an Ordinary Least Squares model is not feasible as it violates the normality assumption of the dependent variable and the residuals. For this reason binomial logistic regression is preferred as it is applied with greater ease when the dependent
variable has two possible outcomes. Logistic regression is considered as the most appropriate when it is supposed that consumer’s behaviour reflects a utility maximizing decision process (Bishop, 2006; Papajorgji and Pardalos, 2009). The main assumption of logistic regression is that the relationship between a set of variables and the ratio of the probability of an event occurs, against the probability that it will not occur, is linear. By logistic regression (Tarling, 2008), can be estimated the impact of selected determinants on the probability consumers for selecting alternative supply modes. For easier adjustment of the model the log odds ratio is preferred as an independent variable, called logit. The model is solved by the method of maximum likelihood (Norusis, 2005).

Independent variables are split into two categories. The first category of variables demonstrates the socioeconomic status of consumers. The variables of this category are the following:

- **Gender (GE):** Variable GE is a dummy variable taking the value 1 if the consumer is male and 0 if consumer is female.
- **AGE:** Variable AGE is split into five dummy variables according to the different age categories of consumers, with the age category 18-24 to be the reference one for the construction of the other dummy variables. The five dummy variables of AGE are:
  1. DAGE1: 25-34.
  2. DAGE2: 35-44.
  3. DAGE3: 45-54.
  4. DAGE4: 55-64.
  5. DAGE5: 65+.
- **Income:** The consumers are classified into three categories according to their family income levels. Consumers of the first category have monthly family income up to 749€, consumers of the second category have monthly family income between 750-1249€ and consumers of the last category have family income above 1,250€ per month. Taking the first income category as a reference two dummy variables are constructed (DINC1, DINC2)
- **Education:** Education variable (ED) depicts the educational level of each consumer. It’s a dummy variable taking the value 1 if the person holds an academic degree and the value 0 if not.

The second category of variables is derived from a group of questions having as target to reveal attitude and subjective norms parameters shaping the final consuming choice for FVs. For this reason customers were asked if issues like locality of production, country of origin, pricing policies and the ongoing economic crisis affect on a positive or negative way the final choice of buying FVs. Respondents were asked to score each item using a 5-point scale, ranging from 1 = completely agree to 5 = completely disagree as suggested by Epstein (1997). In order to maintain balance between the number of variables describing the socioeconomic status of consumers and the attitude and subjective norms ones, factor analysis was applied for the variables of the second category. Factor analysis is used in order to reduce the number of variables which are classified into a limited number of unobserved factors, while maintaining a maximum of the information which is present in the original data. The methodology implemented, in order to extract these factors, is principal components analysis with Varimax rotation. Exploratory Factor Analysis (EFA) is especially pertinent when there is no a-priori knowledge about how many of the factors / constructs needed to explain the relationship between the set of indicators or items (Gorsuch, 1993; Tabachnick and Fidell, 2007) and it also allows verifying the pertinence of the suggested constructs.

Before the application of factor analysis the consistency of the answers was checked. The reliability test returned a Chronbach’s a value of 0.708. Taking into account that the critical value of the chronbachs coefficient is 0.7, data is considered as reliable and rendered as suitable for the application of factor analysis. The results of principal components analysis are presented in Table 1.

As can be seen from Table 1 PCA returned two latent variables. The first one refers to consumers deeply affected by the economic crisis. These consumers have proceeded to various changes, regarding
their nutrition habits, revealing as first priority criterion for buying FVs the price of them. The second one though refers to consumers not being affected so much by the economic crisis. These consumers reveal as major criterion for consuming FVs the locality of production.

The scores of the two latent variables are entered into the regression as two independent variables. The structure of the model is as follows:

\[
\ln \left( \frac{P(CC = 1)}{1 - P(CC = 1)} \right) = \beta_0 + \beta_1 \text{GE} + \beta_2 DAGE_1 + \beta_3 DAGE_2 + \beta_4 DAGE_3 + \beta_5 DAGE_4 + \beta_6 DAGE_5 + \beta_7 \text{DINC}_1 + \beta_8 \text{DINC}_2 + \beta_9 \text{ED} + \beta_{10} \text{FAC}_1 + \beta_{11} \text{FAC}_2 \quad (i = 1, 2, \ldots, N)
\]

(1)

where,

- \(CC\) Customers’ Choice
- \(GE\), \(DAGE_1\), \(DAGE_2\), \(DAGE_3\), \(DAGE_4\), \(DAGE_5\), \(DINC_1\), \(DINC_2\), \(ED\) The Independent Variables of the 1st Category
- \(FAC_1\), \(FAC_2\) The Independent Variables of the 2st Category
- \(\beta_0\) The Constant Term
- \(\beta_i\) The Regression Coefficients Under Estimation \(i = 1, \ldots, 11\)

The results of the logit regression are presented in Table 2. In the two last rows of Table 2 the results of model’s goodness of fit tests are presented. The value of the Likelihood Ratio Test (72.253) exceeds the critical value of the \(X^2\) distribution. Thus, the null hypothesis that models’ variables have no effect on the dependent variable is rejected at a significance level of (<.01). On the other hand, the value (6.995) of the Hosmer and Lemeshow test and the lack of statistical significance of the estimation render the rejection of the null hypothesis that there are not significant differences

<table>
<thead>
<tr>
<th>Questions</th>
<th>FACTORS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Price is an important factor for buying FVs</td>
<td>0.596</td>
</tr>
<tr>
<td>Economic crisis has affected significantly the way I choose to buy FVs</td>
<td>0.835</td>
</tr>
<tr>
<td>Economic crisis has a negative impact on FVs consumption quantities</td>
<td>0.804</td>
</tr>
<tr>
<td>Economic crisis does not allow further increase of consumption of FVs</td>
<td>0.801</td>
</tr>
<tr>
<td>Economic crisis will have a negative impact on my health, because of changes on my nutrition habits</td>
<td>0.638</td>
</tr>
<tr>
<td>I buy FVs being produced locally</td>
<td>0.793</td>
</tr>
<tr>
<td>I buy FVs according to the country of origin</td>
<td>0.729</td>
</tr>
<tr>
<td>FVs being produced locally are healthier</td>
<td>0.673</td>
</tr>
<tr>
<td>It is not socially acceptable to buy FVs not produced locally</td>
<td>0.483</td>
</tr>
<tr>
<td>Eigenvalues</td>
<td>2.925</td>
</tr>
<tr>
<td>% of Variance</td>
<td>32.505</td>
</tr>
</tbody>
</table>
between the estimated and observed values of the dependent variable impossible. The results of both tests confirm the relatively good fit of the model to the survey data.

The estimation of the regression coefficient of GE variable has a negative sign but is not statistically significant.

The estimation of the AGE regression coefficients present negative signs for all age categories. Nevertheless, the only statistically significant estimations are these concerning the DAGE3 and DAGE4 variables. The estimation of the DAGE3 coefficient is statistically significant at the (<.1) level and the estimation of DAGE4 at the (<.05) level. These results signify that elderly consumers prefer to buy FVs either from grocery stores and open markets, but not from retail chain stores.

The estimated signs for the coefficients of the two income dummies are both positive. However, statistical significance is only found at the estimation of the DUNC2 which is statistical significant at the (<.05) level. This means that consumers with higher incomes prefer to cover their needs for FVs by purchasing them from retail chain stores.

The estimation of ED variable’s coefficient is positive and statistically significant at (<.01) level. Consumers holding an academic degree prefer to buy FVs from super markets rather than satisfying their needs from grocery stores or open markets. It is obvious that this tendency is the same with consumers with higher family incomes.

The estimations of the coefficients of the two latent variables of the second category are both positive and significant at the (<.01) level. As it has already been mentioned the two factors – criteria summarising the consumers’ behaviour towards FVs consumption are the purchasing price and the locality and quality standards of them. Based on these subjective norms, consumers choose to purchase FVs not from super markets, but from other alternatives such as grocery stores or open markets.
CONCLUSION

This research provides a clear and concise consumer profile for the FVs market. It is evident that socioeconomic parameters shape distinct consumer behaviours, which finally choose to purchase them from different market places. The ongoing economic crisis though plays a significantly negative role for FVs consumption, because it is obvious that consumers with low incomes have already, or plan to, reduce the quantities of FVs the used to consume. The subjective norms of the specific market form two factors; one based on selling prices and another based on locality of production and a subjective approach regarding quality. Both of them cannot satisfy their criteria for purchasing FVs by visiting for this purpose retail chain store, but they prefer grocery stores or open markets. One possible explanation for this attitude could be the direct contact with the producer or the operator of the grocery store, which builds a confidence relationship between the seller and the buyer, in contrast with the anonymity characterising a purchasing transaction in a super market. Nevertheless, this issue has to be researched further, in order this hypothetical explanation to be justified. These findings can be quite useful for policy makers, because there is solid argumentation, that this continuous recession, decrease of purchasing power and increase of unemployment will have a significant negative impact on populations’ health in the near future, and affect negatively both the public health expenses as well as the turnover of the internal FVs market.
REFERENCES


George Vlontzos is a graduate of the Faculty of Agriculture, Aristotle University of Thessaloniki. His post-graduate studies were at the University of Wales on the subject of agribusiness management (Masters in Business Administration, Agribusiness). He earned his PhD from the Department of Planning and Regional Development, University of Thessaly under the title The Internationalization of Agricultural Policy and its Impact on Growth and Structure of the Greek Agriculture. So far, he has published several works and has participated in several international conferences. He specialized on the topics of competitiveness of agricultural enterprises and food businesses, international agricultural trade and food consumer behaviour.

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