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**ALTERNATIVE FOOD NETWORKS AND SHORT FOOD
CHAINS: ESTIMATING THE ECONOMIC VALUE OF THE
PARTICIPATION IN SOLIDARITY PURCHASING GROUPS**

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**Alternative Food Networks and short food chains:
estimating the economic value of the participation
in solidarity purchasing groups**

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Alternative Food Networks and short food chains: estimating the economic value of the participation in solidarity purchasing groups

Summary

Solidarity purchasing groups (SPGs) are common Alternative Food Networks in many towns in Italy. They are set up by groups of citizens who cooperate in order to buy food and other commonly used goods collectively and directly from producers, at a price that is fair to both parties. Within the group, the choice of the products and the farmers usually follow some guidelines related to the respect for the environment and the solidarity between the members of the group and the producers. Though still a small niche, SPGs are quite numerous and represent an interesting alternative to traditional setting of the food chain.

The main motivation of members for participating in SPGs is arguably not a monetary one, i.e., it is not lower prices. Ethical motivations and environmental concerns are typically proposed among the goals of the groups. Nevertheless, the budget constraint is always operating, and it is of interest to measure how much the ethical and environmental motivations are able to overcome the budget constraint. This is tantamount to measure the value members attach to their participation to the SPG.

Hence, the aim of this study was to estimate the value that group members attach to their participation. A stated preferences methodology was employed on a first sample of members of SPGs in Torino (Italy) and other neighbouring towns to estimate the value consumers buying in such groups attach to this particular channel, relative to the conventional supermarkets. Preliminary results show that SPG members do state a preference for buying with their organization rather than at a supermarket's even when the prospected prices are substantially higher when purchasing through the SPG.

1. Introduction

Especially in developed countries, new forms of the food chains are developing, collectively known as Alternative Food Networks (AFNs). They comprise those marketing chains that, unlike conventional ones, create a direct relationship between consumers and producers, and/or embed consumers in the territory and in the local productive fabric. They include several forms: farmers' direct sales, community-supported agriculture, pick-up your fruit, etc. Among them, in many towns in Italy it is common to find forms of AFN such as ethical purchasing groups. Called *Solidarity Purchasing Groups (SPGs)* – in Italian *Gruppi di Acquisto Solidale (GAS)* – they are set

up by groups of consumers who cooperate to buy food and other goods collectively and directly from producers, at a price that is fair to both parties. At present there are about one thousand recorded SPGs in Italy. However, since many groups are informal, their number is likely to be higher (about twice as many)¹. There is a general umbrella organisation (*Retegas*) acting as a general coordinator, but they are rather spontaneous organisations. The main stated motivations of the SPGs (Economia solidale, 2016; Saroldi, 2001) are to raise consciousness about food consumption, to establish trust relationships between consumers and producers (especially local ones), to foster short food chains through the solidarity between consumers and small producers, to foster environmentally friendly food consumption, to guarantee fair prices, both for consumers and producers, and to get fresh, seasonal and healthy food.

In general, SPGs are run as formal or informal non-profit organisations. For their operations, they rely on occasional or regular volunteers appointed on a rotation basis among their members. Regular volunteers (or co-ordinators), appointed for products or producers, make periodical calls for cycle of orders. Then, they collect and place the orders. Usually producers deliver the orders to a point of collection where the SPG members pick up their products. In formal groups, a board of directors is in charge of the management of the participatory process, administration and accounting.

Within the group, the choice of the products and the farmers usually follows some guidelines as to the respect for the environment and the solidarity between the members of the group and small producers. Since typically SPGs are aimed to foster short food chains, to promote quality and environmentally friendly food consumption, and to support farmers' right to fair prices, the main motivation of members for participating in SPGs is arguably not utilitarian, i.e., it is not lower prices or convenience, but it is rather related with ethical and solidarity issues (Schifani and Migliore, 2011; Brunori et al., 2012; Hankins and Grasseni, 2014).

Though according to the stated motivations the members' main motivation is not a monetary one, the members still have a budget constraint, and strictly economic

¹ The estimated number of SPGs in Italy is reported on the web site of the National Thematic Group on the communication for the solidarity economy (www.economiasolidale.net).

motivations are anyway possible. Therefore, it is of interest to measure how much the ethical and environmental motivations are able to overcome the budget constraint and the economic motivations and, hence, to measure the value members attach to their participation to the SPG. The aim of this study is to analyse the characteristics of consumers choosing to participate in those groups and to estimate the value they attach to their participation. This estimate can provide an indicator of how strong the motivation is and, hence, of the solidity of the organisation itself, which is of interest to evaluate the perspectives for these alternative food networks. A large value attached to the participation guarantees to a larger extent the long-term sustainability of the organisation. This is because the SPGs are based on the voluntary work of their members, since they rely on occasional or regular volunteers for their operations. Members' voluntary work allows distribution costs to be cut down, so higher prices can be paid to producers than in conventional distribution chains, and to achieve balanced budgets without any mark-up. Hence, the economic sustainability of SPGs is arguably based on labour costs that are not borne directly (implicit costs). One way of assessing the value of the participation is precisely analysing the value of the voluntary work provided by SPG members and its contribution to the economic sustainability of SPGs (Novelli and Corsi, 2016). However, in this paper we use a different approach, based on stated preferences. We assess the value for members of the participation in money terms, based on interviews to SPG members in some towns in Piedmont (Italy). Like in the literature on the valuation of environmental goods, the valuation is in money terms or, more precisely, in our case it is in terms of higher prices for the purchase of food. Though, we stress that this does not mean that the participation is on sale: the valuation in money terms is simply a measure of preferences, using money as a unit of measurement. We were particularly interested in assessing if, along with some monetary benefit from the participation (lower prices) the members were also motivated by non-monetary benefits, such as the pleasure of collaborating with others and the commitment to an activity considered as socially and ethically desirable. This can be revealed by the degree of involvement of the members in the activities needed to run the organisation.

2. Theoretical and methodological approach

The theoretical setting is the same used by Corsi and Novelli (2015) to estimate the value of the relational good in the direct purchase from farmers. More generally, our approach is intended to assess the value of a frame in which a purchase is performed, in terms of a relative change in prices. In our specific case, the participation into the SPG has a value for the consumer if the utility he/she obtains from the transaction is greater when performed within the SPG. Therefore, for a consumer optimally choosing his/her bundle of goods X for a price vector p_1 :

$$U(X, \alpha_0, Y) < U(X, \alpha_1, Y) \quad (1)$$

where X is a vector of desired quantities of n goods composing the bundle, Y is the consumer's income less the expenditure on X goods, α_1 and α_0 indicate the participation or not, respectively, to the SPG.

Assume the consumer has chosen his/her optimal bundle of goods X for a price vector p_1 when participating to the SPG. Call C the consumer's characteristics that can affect his/her utility. The problem is measuring the value of the change to α_0 . Under the assumption that the consumer does not change the optimal bundle when changing the purchasing channel, there will exist a price vector p_2 such that:

$$U_1(X, \alpha_1, C, Y|p_1) = U_1(X, \alpha_0, C, Y|p_2) \quad (2)$$

Put in another way, if the consumer is given the alternative of buying the same quantities at price p_1 but at a supermarket ($\alpha = \alpha_0$), or still at the SPG, but at a higher price p_{bid} , he/she will still buy at the SPG if:

$$U_1(X, \alpha_1, C, Y - (p_{bid} - p_1)X) > U_2(X, \alpha_0, C, Y) \quad (3)$$

In terms of the indirect utility function, the consumer will stay with the SPG if:

$$v_1(p_{bid}, \alpha_1, C, Y - (p_{bid} - p_1)X) > v_2(p_1, \alpha_0, C, Y) \quad (4)$$

To implement an empirical analysis, following the random utility theory (McFadden 1974 and 1976), it is assumed that the indirect utility functions are composed by systematic component functions of observable variables, and by random components,

known by the consumer but not by the researcher. The above equation can then be written as:

$$v_1(p_{bid}, \alpha_1, C, Y - (p_{bid} - p_1)X) + \varepsilon_1 > v_2(p_1, \alpha_0, C, Y) + \varepsilon_2 \quad (5)$$

where X is the purchased quantity of food. Hence, the probability that a consumer is willing to pay a higher price p_{bid} for staying with the SPG is:

$$\text{prob}(\text{stay}) = \text{prob} [v_1(p_{bid}, \alpha_1, C, Y - (p_{bid} - p_1)X) - v_2(p_1, \alpha_0, C, Y) > \varepsilon_2 - \varepsilon_1] \quad (6)$$

Assuming a functional form for the utility function and a distribution for $\mu = \varepsilon_2 - \varepsilon_1$, the probability of a positive difference can be estimated by maximum likelihood techniques. More specifically, we used a utility function additive in participation to the SPG, personal characteristics, and income. Income was introduced linearly (which implies a constant marginal utility) given the small change in total income implied by the prospected change. In summary:

$$v_1 = \alpha_1 + \beta Y + \gamma C + \varepsilon_1 \quad (7)$$

$$v_2 = \alpha_0 + \beta[Y + (p_{bid} - p_1)X] + \gamma C + \varepsilon_2 \quad (8)$$

Hence, the change in utility from the present situation to the prospected one is:

$$\Delta v = \alpha + \beta[(p_{bid} - p_1)X] + \mu \quad (9)$$

where Δv is the change in utility from the prospected change in prices, $\alpha = \alpha_0 - \alpha_1$ and $\mu = \varepsilon_2 - \varepsilon_1$. Assuming a distribution for μ , the probability that the member refuses the prospected change and remains with the SPG is:

$$\begin{aligned} \text{Prob}(\text{stay}) &= \text{Prob}[\alpha + \beta[(p_{bid} - p_1)X] + \mu < 0] = \\ &= F_\mu[\alpha + \beta[(p_{bid} - p_1)X]] \end{aligned} \quad (10)$$

where F is a cumulative density function. We chose the standard normal cumulative distribution.

Alternatively, using the valuation function approach (this is similar to the approach in environmental valuation proposed first by Cameron, 1988) the value of using the SPG channel can be estimated considering the expenditure function. Call again p_2 the price vector such that the relevant indirect utilities are equal:

$$v_1(p_1, \alpha_1, C, Y) = v_1(p_2, \alpha_0, C, Y) \quad (11)$$

Call v_2 the indirect utility that can be reached with prices p_1 and without the SPG, $v_2 = v_2(p_1, \alpha_0, C, Y)$. The value of the utility due to the participation to the SPG can then be assessed by comparing the indirect utility v_1 with the original price and the participation to the SPG (which, by (9), is equal to the utility with no SPG and a higher price) to the indirect utility with the original price and without the participation to the SPG (v_0):

$$v_1(p_1, \alpha_1, C, Y) - v_2(p_1, \alpha_0, C, Y) = v_1(p_2, \alpha_0, C, Y) - v_2(p_1, \alpha_0, C, Y) \quad (12)$$

The value of this difference in utility can be measured as the maximum amount of money the consumer is willing to pay (WTP) to remain with the SPG even with an increase in expenditure because of the higher price. It is equal to the difference between the values of the relevant expenditure functions:

$$\text{WTP} = e(p_2, \alpha_0, C, v_1) - e(p_1, \alpha_0, C, v_2) = \text{WTP}(p_1, p_2, \alpha_0, C, v) \quad (13)$$

This implies that when no value is attached to the participation, the difference is nil. Setting then WTP to zero, one can express the minimum price difference $d^* = p_2 - p_1$ for which the consumer has a positive WTP as a function of the observable characteristics. We assumed a linear functional form for the function, so that $d^* = X\beta + \mu$, where X are the variables of the observable characteristics. The probability that a consumer is willing to remain with the SPG even with a price increase $d = p_{\text{bid}} - p_1$ is then:

$$\begin{aligned} \text{Prob}(\text{stay}) &= \text{Prob}[d - d^* > 0] = \text{Prob}[d - X\beta - \mu > 0] = \text{Prob}[d - X\beta > \mu] = \\ &= 1 - F_\mu[d - X\beta] \end{aligned} \quad (14)$$

where F is a cumulative density function. With a maximum likelihood technique the β parameters can then be estimated, and from them the relevant d^* value for each participant can be calculated. In this way, the maximum price increase that a participant can bear before shifting to the conventional chain can be detected.

3. Data

The data for the analysis come from an in-person survey among group members of several SPGs in the city of Torino (Italy) and other neighbouring towns. Further data collection is currently underway with an on-line questionnaire, and in this paper we present the early results from four SPGs surveyed so far. The four groups – “Salvagas”, “Gas di Avigliana”, “La Cavagnetta” and “Roccafranca” - have different sizes, as they have 25, 156, 96 and 136 member families or persons respectively.

A questionnaire was submitted to 151 group members during the meetings for the distribution of the ordered food. The questionnaire included a first part in which respondents were asked about their participation in the SPG, about the tasks they are performing in the SPG, and on their motivations. From the answers to the questions concerning the tasks performed for the SPG we built an indicator of the commitment². Another question one asked whether the prices for fruits and vegetables they paid at the SPG were higher or lower than those of a conventional supermarket. This is an indicator of the monetary benefit of the participation to the SPG.

Then, a stated preferences methodology was employed to estimate the value consumers buying in such groups attach to this particular channel. To estimate their willingness-to-pay for the participation to the SPG, an elicitation question was asked with a dichotomous format. The respondents were asked whether they would still buy at the SPG if the prices for fruits and vegetables were to increase by a certain percentage higher than those currently paid, and the only alternative was to buy at a supermarket's. The percentages were randomly assigned to each questionnaire among 20, 30, 40 and 50%. Those who responded they would still buy with the SPG were further asked for the reasons.

This information allows, through maximum likelihood techniques, to estimate a willingness-to-pay function, giving the maximum price increase they would bear for

² If they took care of the purchase for their household we assigned up to 5 points, depending on the frequency (less than 6 times/year; every second month; every month; every 15 days; every week); up to 5 points if they took care of the purchase for other households too; up to 5 points if they took care of the collection of products from the farmers and of its distribution to the other members; 5 points if they handled the mailing list, the website, etc.; 5 points if they managed the relationship with the producers; 5 points if they kept the contacts with the participants and collected the orders; 5 points if they were members of the SPG board; 1 point if they participated to the SPG assembly and to the social initiatives. The points are obviously arbitrary, but they try to reflect the time devoted to the activities and, hence, the commitment to the SPG, since these activities are not paid.

staying with the SPG as a function of explanatory variables. This function can then be used to calculate the average WTP for the sample and the relevant variation.

The last part of the usual questionnaire included information on the socio-economic characteristics and on the characteristics of the households. Household income was asked as income brackets (up to 1200 Euro/month; 1200-2000; 2000-3000; over 3000) and the midpoints of the income bracket were used for estimation, except for the lower and the highest brackets set to 600 and 4500 Euro/month, respectively.

4. Results

Table 1 shows the descriptive statistics of the explanatory variables included in the model. They are calculated on the valid observations (106) after dropping incomplete questionnaires. It is worth noting that slightly more than half find the SPG prices lower than in the conventional chain. Most respondents are women, the average age is 48, and the level of education is quite high (the mean corresponds to some University). Clerical work is prevailing, with some self-employed and professional, while manual work is a minority. The average income is about 2,500 euro. The respondents take care of food purchase in most cases (88%). The average household composition is 3.2 people, with less than one child on the average.

Table 2 reports the answers to the elicitation question. As predicted, the share of those remaining with the SPG even with a price increase is decreasing with the amount of the price increase itself. Nevertheless, the shares remain very high even with substantial price increases: when a price increase by 50% is prospected, still four out of five respondents would remain with the SPG.

Table 3 (estimated model) reports the results of the estimates of the probit model of the probability to stay with the SPG. The table also reports the marginal effects, evaluated, as usual, at the mean values of the explanatory variables, or at the median value, in the case of dummy variables. The results are preliminary since they are estimated on the observations surveyed so far.

The model is statistically significant at a prob level of 6.4 percent. The price increase has the predicted negative effect, though the marginal effect is quite weak: at the

mean values of the variables, a 1 percent increase in prices decreases the probability of remaining with the SPG by only 0.7 percent. Also the dummy variable indicating whether the member states that the SPG prices are lower than elsewhere is (weakly) significant. These members are those who also have a monetary incentive in the participation to the SPG, so it is consistent that they are more willing to remain with it. The marginal effect suggests that they are 14 percent more likely to stay with the SPG than the other members are. The commitment variable shows a significant positive effect on the probability to stay with the SPG even with higher prices. Every additional point in the variable (the average point is 12.8, with a range from 2 to 33) adds 1.3 percent to the probability of staying. This strongly suggests that the participation provides utility to some participants regardless of the monetary incentive. Satisfaction in performing an ethical activity, pleasure on the socialisation through the initiatives and the activities and, more generally, psychic reward are obviously the reasons for this result³. Usual characteristics that typically make consumers more willing to use alternative food networks, higher income and upper level occupation, are not significant in our estimates. Professionals and self-employed do not differ from non-labour forces (the reference category), while clerks and manual workers are more likely to stay. Younger and more educated respondents are more willing to stay with the SPG even with higher prices, but the effects of these variables are not strong: every additional year of age changes the probability by -0.6 percent, and every additional year of education by 2.4 percent. Finally, the presence of young children decreases the probability of staying with the SPG, which could be interpreted in terms of the tighter income constraint implied by young children: every additional child decreases the probability of staying by 10 percent.

³ It is worth noting that the inclusion of the commitment variable is crucial for the model to be statistically significant. A previous version of the model (Corsi and Novelli, 2016) not including it was not overall statistically significant at the conventional levels, and no variable, except for the price discount and lower prices in the SPG, was significant. The omitted variable bias would be severe.

Overall, socio-economic personal characteristics do not seem to influence much the choice. One should nevertheless consider that the survey is among SPG members only, not on the overall population. Hence, it tries to ascertain which variables are influencing their preference for the SPG and it is not surprising that they are not so different among members.

With the estimated parameters, it is possible to recover a d^* function that yields the WTP based on explanatory variables. The parameters of the d^* function are calculated dividing the relevant parameters of the estimated model by the coefficient of the prospected price increase, and the standard errors are corrected as suggested by Cameron and James (1987) and Cameron (1988). The parameters of the d^* function and the relevant standard deviations are reported (section d^* function) in Table 3.

The individual d^* of the respondents was then calculated using the d^* equation, by multiplying the matrix of the individual variables by the relevant estimated parameter vector. The mean d^* and standard deviation for the sample can then be computed. The average d^* is 68.4%, with a standard deviation of 26.0% and the median is 66.3%. In other words, a typical SPG member would still buy at the SPG even with prices up to two-third higher than those currently paid in a supermarket.

This result is comparable to the one of the model of utility difference (eqn. 10). The estimates are presented in Table 4. In this case, the significance level is lower (12.3%). The mean price increase (that in this model also corresponds to the median) can be calculated as α/β , and is 77.6%, sensibly similar to the one estimated with the previous model.

The results definitely point to a strong commitment of participants to their SPG, thus implying that intrinsic motivations for the participation are undoubtedly very strong. Even allowing for some hypothetical bias, the size of the stated preferences measure is such that it suggests a predominance of ethical and personal motivations rather than to a strictly economic profitability. Nevertheless, the greater willingness to participate among those that pay lower prices with the SPGs than elsewhere, and the negative sign for young children, suggest that strictly economic motivations are not necessarily to be excluded. In this respect, it should be noted that lower prices for the consumers and

higher prices for the producer, or even the balance between revenues and costs in the SPGs, are strictly linked to voluntary work provided by their members (Novelli and Corsi, 2016). Hence, lower prices for the SPGs actually stem from not considering voluntary work as a cost. This leaves open two possibilities. One is that members trade their own work for lower prices, possibly because of a low opportunity cost of their work; in this case, monetary benefits are predominant. The second, non mutually exclusive possibility is that the voluntary work for the SPG provides utility because of the collective interactions and of the pleasure to contribute to a good cause; in this case, non-monetary motivations are more important. The latter motivation finds more support from the answers to the question about the main reasons for participating to the SPG (Table 5). The respondents were asked to tick up to 3 items they considered the most important, and “Price” has the lowest score (0.6%), while the largest one is “Support to local farmers” (23.1%) and “Consumption of local food” (14%). Nevertheless, also more self-interested motivations like “Quality guarantee” and “Quality/price ratio” receive some support (12.8 and 12.1%, respectively).

Our results also suggest that SPG members are rather homogeneous in the characteristics motivating their participation. No significant difference can be detected in terms of income, nor in terms of gender. This is quite consistent with the prevailing nature of SPGs, that were mainly born as an alternative to the conventional food chain models, on the basis of ethical and ideological statements, and often starting from informal groups of friends or neighbours (even though they sometimes grew to larger sizes). Hence, the homogeneity between participants is probably the main reason for the finding that many socio-economic characteristics do not significantly affect their willingness to pay.

5. Conclusions

The main goal of this paper was to assess the strength of the link of participants to the SPGs through a survey among their members to evaluate the motivations of their participation and for measuring the strength of their commitment. The survey is ongoing and we present here some preliminary results on the interviews available so far. Based on

these data, we estimated with a stated preference method the value for SPG members of the participation in the groups. The value is measured in terms of the price increase, relative to what they currently pay, that members would bear before shifting to a conventional chain. The results show that group members state their willingness to continue to purchase with the group even when facing very substantial increases in the prices. This suggests that the individual ethical and ideological motivations are extremely strong, and that participation to the SPGs has not a prevailing monetary reason. This conclusion is reinforced by the consideration that the willingness to remain with the SPG is positively correlated with the commitment and time devoted to the SPG activities. However, there is some evidence that SPG members also find some economic benefit from the participation, since a large share considers that the prices they are paying in the SPG are lower than what they would pay elsewhere. One should nevertheless consider that the lower prices of the SPGs stem from unpaid voluntary work of their members, which either can derive from a very low opportunity cost of their labour or from positive utility of labour provided to the SPGs. Hence, this consideration too strengthens the conclusion of the prevalence of non-monetary motivations of the participation. This is relevant for the future of the SPGs themselves, since they should take into account the issue of how to maintain the commitment of their members if they intend to render sustainable on the long term their activity.

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References

- Brunori G., Rossi A., Guidi F. (2012). On the New Social Relations around and beyond Food. Analysing Consumers’ Role and Action in Gruppi di Acquisto Solidale (Solidarity Purchasing Groups). *Sociologia Ruralis*, Vol 52, No 1: 1-30.
- Cameron, T.A. (1988). A New Paradigm for Valuing Non-Market Goods Using Referendum Data: maximum Likelihood Estimation by Censored Logistic Regression, *Journal of Environmental Economics and Management*, 15, 355-379.
- Cameron, T.A., James M.D. (1987). Efficient Estimation Methods for ‘Closed-Ended’ Contingent Valuation Surveys, *Review of Economics and Statistics*, 69(2), 269-276.
- Corsi A., Novelli S., 2015. *Relational Goods and Direct Purchase from Farmers: Estimating the Value of the Relationship between Consumers and Producers*. Dept. of Economics and Statistics Working Paper Series - ISSN:2039-4004 vol. 43/2015, pp.1-23, available at:
http://www.est.unito.it/do/home.pl/Download?doc=/allegati/wp2015dip/wp_43_2015.pdf
- Economia solidale (2016) What’s a Gas? Available at:
<http://www.economiasolidale.net/node/675>, last accessed 10/9/2016
- Hankins, J., Grasseni, C. (2014). Collective food purchasing networks in Italy as a case study of responsible innovation. *Glocalism: Journal of Culture, Politics and Innovation*, No 2/2014: 1-14.
- McFadden D. (1974). Conditional Logit Analysis of Qualitative Choice Behavior, in Zarembka P. (ed.) *Frontiers of Econometrics*, New York, Academic Press
- McFadden D. (1976). Quantal choice analysis: a survey, *Annals of economic and social measurement*, V, 363-390.
- Novelli S., Corsi A. (2016) *Economic sustainability of short food chains: the case of the Solidarity Purchasing Groups in Italy*, paper presented at the 7th International Conference on Localized Agri-food Systems. Challenges for the New Rurality in a Changing World”, Stockholm, May 8-10
- Saroldi, A. (2001). *Gruppi di acquisto solidali. Guida al consumo locale*. Bologna: Edizioni EMI, 2001.

Schifani, G., Migliore, G. (2011).Solidarity Purchase Groups and the new critical and ethical consumer trends: first results of a direct study in Sicily. *NewMedit*, No 3/2011: 26-33.

Table 1. Descriptive statistics of the variables (calculated on the 106 nonmissing observations used for estimation).

| Variables | Mean | Std.Dev. |
|---------------------------|--------|----------|
| Lower prices in SPG (0/1) | 0.547 | 0.500 |
| Commitment (points) | 12.811 | 7.504 |
| Gender (F=1) | 0.642 | 0.482 |
| Age (years) | 48.330 | 10.446 |
| Education (years) | 16.066 | 2.634 |
| Main buyer (0/1) | 0.887 | 0.318 |
| N. family members | 3.255 | 1.033 |
| Children < 14 year old | 0.802 | 0.920 |
| Professional (0/1) | 0.142 | 0.350 |
| Self-employed (0/1) | 0.094 | 0.294 |
| Clerk (0/1) | 0.689 | 0.465 |
| Manual work (0/1) | 0.038 | 0.191 |
| Income (€/month) | 2.564 | 1.289 |

Source: own elaboration

Table 2. Answers to the elicitation question.

| Price increase (%) | N. "I would stay" | N. of answers | % Stay |
|--------------------|-------------------|---------------|-------------|
| 20 | 25 | 28 | 89.3 |
| 30 | 22 | 26 | 84.6 |
| 40 | 18 | 27 | 66.7 |
| 50 | 20 | 25 | 80.0 |
| | 85 | 106 | 80.2 |

Source: own elaboration

Table 3. Results of the probit model of the willingness to remain with the SPG.

| | Estimated model | | | | | | <i>d</i> * function | |
|---------------------|-----------------|---------|---------|------------------|---------|---------|---------------------|----------|
| | Coeff. | t-ratio | P-value | Marginal effects | t-ratio | P-value | Coeff. | St. Err. |
| Bid | -0.033 | -1.874 | 0.061 | -0.007 | -1.943 | 0.052 | | |
| Lower prices in SPG | 0.612 | 1.850 | 0.064 | 0.138 | 1.849 | 0.064 | -18.728 | 14.489 |
| Commitment | 0.061 | 2.261 | 0.024 | 0.013 | 2.422 | 0.015 | -1.877 | 1.215 |
| Gender (F) | 0.099 | 0.241 | 0.810 | 0.022 | 0.237 | 0.813 | -3.038 | 12.649 |
| Age | -0.026 | -1.690 | 0.091 | -0.006 | -1.764 | 0.078 | 0.801 | 0.570 |
| Education (years) | 0.112 | 1.689 | 0.091 | 0.024 | 1.726 | 0.084 | -3.441 | 1.925 |
| N. family memb. | -0.043 | -0.242 | 0.809 | -0.009 | -0.241 | 0.810 | 1.319 | 5.597 |
| Children < 14 | -0.461 | -1.843 | 0.065 | -0.100 | -1.916 | 0.055 | 14.107 | 9.205 |
| Main buyer | -0.299 | -0.953 | 0.341 | -0.065 | -0.970 | 0.332 | 9.162 | 9.751 |
| Profess. | 1.405 | 1.532 | 0.126 | 0.173 | 2.737 | 0.006 | -42.983 | 30.047 |
| Self-empl. | 1.459 | 1.558 | 0.119 | 0.160 | 3.153 | 0.002 | -44.644 | 30.551 |
| Clerk | 1.385 | 1.744 | 0.081 | 0.379 | 1.586 | 0.113 | -42.383 | 27.633 |
| Manual work. | 1.986 | 1.768 | 0.077 | 0.151 | 3.589 | 0.000 | -60.766 | 40.041 |
| Income | 0.061 | 0.419 | 0.676 | 0.013 | 0.421 | 0.674 | -1.856 | 4.423 |
| N. Obs. | 106 | | | | | | | |
| Log-likelihood | -41.602 | | | | | | | |
| Chi-sq. (15 d.f.) | 22.32 | | | | | | | |

Table 4. Results of the difference-in-utility model

| | Coefficient | Standard Error | t-ratio | P-value |
|----------------------|-------------|----------------|---------|---------|
| α | 1.444 | 0.461 | 3.130 | 0.002 |
| β | -1.862 | 1.217 | -1.530 | 0.126 |
| N. Obs. | 110 | | | |
| Log-likelihood | -56.517 | | | |
| Chi-squared (1 d.f.) | 2.377 | | | |
| Prob | 0.123 | | | |

Table 5. Responses to the question about the main reasons for participating to the SPG (max 3 items)

| | N. | % |
|---|-----|-------|
| Respect for the environment | 23 | 7.2 |
| Support to local farmers | 74 | 23.1 |
| Consumption of seasonal products | 36 | 11.2 |
| Consumption of local food | 45 | 14.0 |
| Fighting multinationals and supermarket chains | 30 | 9.3 |
| Quality guarantee | 41 | 12.8 |
| Price | 2 | 0.6 |
| Quality/price ratio | 39 | 12.1 |
| Participation to a collective action of people with the same ideals | 14 | 4.4 |
| Familiarity with the producers | 17 | 5.3 |
| | 321 | 100.0 |