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Relational goods and direct purchase from farmers: estimating the value of the relationship between consumers and producers

RESEARCH ARTICLE

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Abstract

Personal relationships can affect economic life, more importantly in alternative food networks. Estimating the value of enjoyment of the relational good produced by consumers' personal relationship in direct sales from farmers is important to assess how much personal interactions can affect food purchases. We employ different stated preferences models to estimate from a consumer survey in open-air markets in four towns in Italy the value consumers buying directly from farmers attach to their particular choice of a specific vendor. Contingent on the chosen model, the average value of the personal relationship is 13.5-24.4% of their expenditure for fruits and vegetables.

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1. Introduction

New forms of organisation of the food chains have emerged in the last decades, characterised by a direct relationship between consumers and producers, and/or embedding consumers in the territory and in the local productive fabric. They go under the general title of alternative food networks (AFNs) and include direct sales, farmers' markets, pick-up-your-product, community-supported agriculture, solidarity purchase groups, and the like. They have been the object of extensive research especially in the sociological and anthropological field (e.g. Goodman *et al.*, 2011; Marsden *et al.*, 2002) but also of economic and interdisciplinary approaches (Corsi *et al.*, 2018a; Kneafsey *et al.*, 2013). Various criteria have been indicated as characteristic of AFNs, namely the number of intermediaries (the argument of the 'short chain'), the physical length of the chain (the argument of 'zero miles' (Paxton, 1994)), the local origin of the food, or the 'embeddedness' (the product's connection with information on how it is produced (Marsden *et al.*, 2000)). Though many AFNs are motivated by environmental concerns, one common feature of the different AFNs is nevertheless the relevance of the personal relationships between producers and consumers (Corsi *et al.*, 2018a). The term 'alternative' itself suggests a nature of the transactions different from the one in conventional chains like supermarkets. Assessing the nature and the strength of these relationships is therefore crucial for understanding their functioning. This paper addresses the issue of how much interpersonal relationships can influence an economic transaction like food purchase in such chains.

It is a widespread concept among the general public, and for a long time also maintained in traditional economics, that personal relationships are out of the scope of economic transactions. Of course, economic transactions are usually between human beings, but the interpersonal relationships involved in economic transactions are inherently something different from personal relationships like friendship, sympathy, love, solidarity, and the like. These are idiosyncratic, reciprocal, and free, as opposed to fungible, anonymous, and self-interested relationships in economic life. Though personal relationships of the former kind are pervasive in everyday life, and shape most of people's and behaviour life in many respects, their effect on economic life was neglected for a long time or only taken into account in terms of externalities (Bruni, 2010; Gui and Sugden, 2005). The role of interpersonal relationships was theorised in terms of relational goods by Uhlaner (1989). Her concept of relational goods ('goods (that) arise as a function of a relationship with others […and that] can only be 'possessed' by mutual agreement') aimed at explaining political participation. Gui (2000) enlarged the concept to include interpersonal transactions in more general terms, also including those connected with economic transactions. In particular, Gui (2005) views 'interpersonal events as 'encounters': peculiar productive processes that employ various types of resources contributed by interacting parties (human resources, above all), and that deliver not only conventional outputs (…) but also relational outputs' (Gui and Stanca, 2010). The concept of 'encounter' entails that relational goods cannot be produced, consumed or obtained by single individuals, but they depend on the interaction among individuals (Bruni, 2010). Hence, relational goods are the result of an action that may create reciprocal ties between people even in the case of economic transactions. Relational goods are therefore local public goods that are co-produced and co-consumed by the operators during their economic transactions (Gui, 2002; Uhlaner, 1989).

Some literature attempted to measure the value of relational goods in terms of monetary units. Stanca (2016) presents a literature review of the two main approaches that have been recently used in economic research to attempt to estimate the monetary value of relational good, i.e. the Hedonic Pricing Method (HPM) and the Life Satisfaction Approach (LSA). With HPM the monetary value of different type of amenities, including the relational goods, can be derived from the individuals' marginal willingness to pay for different levels of the amenity affecting the market prices for homes or wages. Following this approach, for instance, Colombo and Stanca (2014) estimated the monetary value of relational amenities (time spent with friends, active participation in associations and frequency of going out for leisure activities). LSA considers reported subjective well-being as a satisfactory empirical approximation to individual utility. Accordingly, self-reported life satisfaction can be modelled as a function of relational amenities. A monetary valuation can therefore be derived from the marginal rate of substitution between income and individual amenities (Frey and Stutzer, 2002; Moro *et al.*, 2008; Stanca, 2016). Actually, although a stream of research investigated quantitatively

the effects of relational goods on individual life satisfaction and in particular on self-reported happiness (Becchetti *et al.*, 2008, 2011; Bruni and Stanca 2008; Bünger, 2010; Capecchi *et al.*, 2018; Rasciute *et al.*, 2017), these empirical studies do not usually get to a monetary estimation of the relational goods (Stanca, 2016). Among the few examples that do, e.g. Powdthavee (2008) used the shadow pricing method to estimate the monetary value of the satisfaction with life gained by an increase in the frequency of interaction with friends, relatives, and neighbours. However, the relational goods commonly included in these studies are typically measured by the time spent in family, friends, cultural, arts, sports, religious and volunteering related activities. To the best of our knowledge, the relational goods jointly produced in economic transaction (i.e. between vendors and potential buyers) were not considered. In addition, our research does not use an HPM or LSA approach, but a stated preference method.

Measuring the value of relational goods in economic transactions is relevant for understanding if, and how much, basic economic activities can be influenced by personal relationships. In particular, we assess how consumers' actual behaviour can deviate from 'narrowly rational' considerations (meaning by that the considerations that only take into account the utility from the purchased good in itself, and not from the framework in which it is purchased), when food purchase is performed in a particular AFN environment, i.e. direct sales by farmers in urban open-air markets.

To this purpose, we present a theoretical model of consumer behaviour when repeated purchase interactions between consumer and vendor have created a relational good,[1] i.e. 'affective components of interpersonal relations that are usually perceived as having value through their sincerity or genuineness' (Gui and Sugden, 2005), so that the consumer derives utility from a further purchase interaction, i.e. from the enjoyment of the relational good. In this sense, we consider the relational good in itself a stock, and we measure the flow of benefit that stems from enjoying it in a single further purchase occasion. Incidentally, this model can also be valid when the modality itself of the economic transaction produces utility (e.g. consumers preferring farmers' markets by themselves, even when no relational good is produced). From the theoretical model, we derive the empirical strategy for measuring the value consumers attach to the personal relationship with the vendor, i.e. the value of the enjoyment of the relational good. It is measured in monetary terms (more precisely as a change in prices), but we stress that measuring it in monetary terms does not mean that it can be purchased. By their very nature, relational goods cannot be purchased. They are based on mutual cooperation and respect that would be destroyed if the relationship were suspected to be based on self-interest (nobody can buy a true friendship, for instance). The money value of the relational good we estimate is therefore simply a measure of consumers' preferences, where money is the unit of measurement. We also note that the value of the enjoyment of the relational good we measure is only the one on the consumer's side, while the value for the vendor is not detected. Hence, our estimates only concern a part of the benefit of the relational good produced by the interaction between vendor and consumer.

The structure of the paper is as follows. First, we review the literature on the preferences for food purchased in direct sales. Then the theoretical framework and the econometric strategy are presented, followed by the description of the data employed in the empirical exercise. The following section presents the results, and a discussion of the results and a presentation of their policy implications conclude.

2. The value of goods in direct sales and alternative food networks

The role of relational goods in direct sales can be analysed both from farmers' and consumers' perspectives. Indeed, in the economic literature, the concept of AFN is linked to the issue of the farmers' choice of the marketing channel (e.g. Brown *et al.*, 2006; Corsi *et al.*, 2009, 2018b; Rocchi *et al.*, 2020; Verhaegen and Van Huylenbroeck, 2001) and, on the other side, on the value for consumers of food products purchased in these chains, and on their choice of where and from whom to purchase. We intend to investigate the latter issue.

[1] We are grateful to a referee for drawing our attention to the fact that enjoyment of the relational good is conditional on repeated preceding interactions building the affective and trusting relationship in which the relational good consists.

The economic literature dealing with consumers' preferences generally focuses on the factors influencing the choice of purchasing in farmers' markets (FMs). Many studies provide insights into characteristics of those consumers who purchase local foods at FMs and into their motivations. Motivations include, e.g. quality of products, interest for local food, convenience, environmental sustainability, support for rural development processes and, which is relevant here, direct contact with farmers (Feagan and Morris, 2009; Grebitus *et al.*, 2013; Gumirakiza *et al.*, 2014; Jefferson-Moore *et al.*, 2013; Neill *et al.*, 2014; Rocchi *et al.*, 2010). Other studies specifically focused on the interpersonal relationships between consumers and vendors in FMs. Some authors investigated the role of interpersonal trust, analysing the building and the implication of trusting relations, e.g. on purchase intentions or actual purchase behaviour (Moore, 2006; Tsai *et al.*, 2019). Others analysed the sharing of information during direct consumer/farmer interaction able to lead to transformative learning and willingness to change behaviour both on the consumption side (Carson *et al.*, 2016; Pascucci *et al.*, 2011) and on the production side (Hunt, 2007). In some cases, the analysis is performed for different types of direct marketing facility (e.g. pick-your-own farms, roadside stands, FMs, and direct farm markets) to characterise farmer-to-consumer market segments having different needs, wants or demand characteristics (Govindasamy and Nayga, 1997; Onianwa *et al.*, 2005). Other studies analyse the key factors affecting the frequency of consumer visits to FMs (i.e. consumer factors, market factors, and socio-demographic characteristics) or the associations between local food purchasing from FMs and diet-related outcomes (Abelló *et al.*, 2014; Minaker *et al.*, 2014; Thapaliya *et al.*, 2015).

Another stream of research is devoted to estimating the willingness-to-pay (WTP) for product characteristics (e.g. organic, local, labelled, etc.). Some scholars simply investigate the issue with consumers attending FMs (Chang *et al.*, 2013; Curtis *et al.*, 2014). Other include being sold at FMs as a characteristic of the good (Carroll *et al.*, 2013; Onken *et al.*, 2011). However, they do not distinguish among different motivations for purchasing at FMs, that may include the price, the actual or presumed quality of the produce, the symbolic value from purchasing from farmers or of local product, the trust in the vendor, along with the motivation of our interest, the personal relationship with the farmer, i.e. the relational good. The role of relational goods in agricultural production has been analysed by Rocchi (2013), but only in qualitative terms. Our contribution is quantifying the relevance of this determinant for purchasing choices.

3. Theoretical approach and econometric strategy

We are interested in measuring the value of the enjoyment of a relational good stemming from a commercial transaction between farmers and consumers. We assume that repeated interactions between vendor and buyer can create a relational good. If such a good is created, then each interaction in a new purchase occasion allows the enjoyment (and possibly, the increase) of the relational good. For consumers, we therefore posit that a relational good connected with the transaction has been produced if the utility the consumer obtains from the transaction is greater when performed with a specific farmer. Therefore, for a consumer optimally choosing his/her bundle of goods X for a price vector p_1:

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

where X is a vector of desired quantities of n goods composing the bundle; E is the consumer's expenditure on X goods, thus representing the utility for all other goods foregone when purchasing X, so that $U'_X>0$ and $U'_E<0$; C are consumer's characteristics that can affect his/her utility; α_1 is the level of enjoyment of the relational good connected with the purchase from a seller with whom he/she has a personal relationship and α_0 indicates the absence of the relational good.

Assume the consumer has chosen his/her optimal bundle of goods X for a price vector p_1 when enjoying the relational good. The problem is measuring the value of the loss of enjoyment of the relational good, i.e. a change from α_1 to α_0. We assume that consumers do not change their optimal bundle for limited price

changes, so that they have a fixed amount $\bar{X}$ of food items to buy.[2] In absence of a relational good, there will exist a price vector p_2 such that:

$$U_1(\bar{X}, \alpha_1, C, E) = U_2(\bar{X}, \alpha_0, C, E - (p_1 - p_2)\,\bar{X}) \quad (2)$$

This implies that when no value is attached to the enjoyment of the relational good (or when no relational good exists), $p_2 = p_1$. Assume the consumer is given the alternative of buying the same quantities $\bar{X}$ at lower prices p_{bid}, but not enjoying the relational good ($\alpha = \alpha_0$). He/she will accept this alternative if:

$$U_1(\bar{X}, \alpha_1, C, E) < U_2(\bar{X}, \alpha_0, C, E - (p_1 - p_{bid})\,\bar{X}) \quad (3)$$

In other words, the consumer will give up his/her preferred vendor if the utility stemming from the enjoyment of the relational good is smaller than the utility from the saved expenditure. In this way, his/her choice reveals that his/her minimum willingness-to-accept (WTA) for giving up the enjoyment of the relational good is lower than the saved expenditure.

To implement an empirical analysis, following the random utility theory (McFadden, 1974, 1976), it is assumed that the utility functions are composed by systematic component functions of observable variables, and by random components, known by the consumer but not by the researcher.

Different functional forms of the utility function have been used in the related literature of environmental goods evaluation. We assume an additive utility function linear in enjoyment of the relational good, food quantities, and logarithmic in food expenditure (thus implying non-negative and decreasing marginal utility of income):

$$U_1 = \alpha_1 + \delta\bar{X} - \beta\ln(p_1\bar{X}) + \gamma C + \varepsilon_1 \quad (4)$$

$$U_2 = \delta\bar{X} - \beta\ln(p_{bid}\bar{X}) + \gamma C + \varepsilon_2 \quad (5)$$

where δ and γ are parameter vectors, and β a scalar. Hence, the change in utility from the present situation to the prospected one is:

$$U_1 - U_2 = \Delta U = \alpha_1 + \beta\ln(p_{bid}/p_1) + \mu \quad (6)$$

where $\mu = \varepsilon_1 - \varepsilon_2$. Assuming a distribution for μ, the probability that a consumer accepts the prospected discount and moves from his/her favourite vendor is:

$$\text{Prob(move)} = \text{Prob}[\alpha_1 + \beta\ln(p_{bid)}/p_1) + \mu<0] = F_\mu[\alpha_1 + \beta\ln(p_{bid)}/p_1)] \quad (7)$$

and:

$$\text{Prob(stay)} = 1 - F_\mu[\alpha_1 + \beta\ln(p_{bid)}/p_1)] \quad (8)$$

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

[2] This is not a strong hypothesis in the case of purchase of everyday food, the expenditure for which represents a small share of households' budgets (for the Region of our empirical investigation on fruits and vegetables purchases, their share on total monthly household expenditure was 3.2% (I.Stat, 2013)). The income effect of price changes is therefore arguably negligible. Since we hypothesize a relative price change equal for all food items, the substitution effect across food items is not relevant, and we assume that it is nil with reference to items other than food. In theoretical terms, instead of invoking a division of the expenditure shares like in the separability assumption of demand systems, we assume that for a necessity like food the quantities are given, so that its expenditure share depends on the food prices.

A bid price p_2 that makes the respondent indifferent to the choice ($\Delta U=0$) indicates the minimum relative decrease in prices for which he/she is willing to move. Hence, his/her minimum willingness-to-accept the change is:

$$WTA = (p_2/p_1) = \exp[(-\alpha_1 - \mu)/\beta] \quad (9)$$

and the median WTA is $\exp(-\alpha_1/\beta)$, and the mean WTA is $\exp(-\alpha_1/\beta)*\exp(1/2\beta^2)$ (Carson and Hanemann, 2005). This approach is similar to the utility difference model used in contingent valuation of environmental goods and emphasised by Hanemann (1984).[3]

Alternatively, using the so-called valuation function approach (the approach to environmental valuation proposed by Cameron and James (1987) and Cameron (1988)),[4] the value of the relational good can be estimated considering the expenditure function. Call again p_2 the price vector such that it exactly compensates the loss of the enjoyment of the relational good, keeping consumption constant. The indirect utilities are then:

$$v_1(p_1, \alpha_1, \bar{X}, C) = v_1(p_2, \alpha_0, \bar{X}, C) \quad (10)$$

and the relevant expenditure functions are also equivalent:

$$e(p_1, \alpha_1, \bar{X}, C, v_1) = e(p_2, \alpha_0, \bar{X}, C, v_1) \quad (11)$$

The value of the utility due to the existence of the relational good can then be assessed by comparing the expenditure with the original price and the relational good to the expenditure needed to reach the same utility with the relational good but price p_2. The willingness-to-accept (WTA) the prospected change measures the difference between the values of the relevant expenditure functions:

$$WTA = e(p_1, \alpha_1, \bar{X}, C, v_1) - e(p_2, \alpha_1, \bar{X}, C, v_1) = e(p_2, \alpha_0, \bar{X}, C, v_1) - e(p_2, \alpha_1, \bar{X}, C, v_1,) = WTA(p_1, p_2, \alpha, \bar{X}, C, v) \quad (12)$$

Following again the random utility theory (McFadden 1974, 1976) and attaching a random component to the WTA functions, it follows that the change will be accepted if the individual WTA is lower than the value of the proposed discount D (bid):

$$WTA(p_1, p_2, \alpha, C, v, \bar{X}, \varepsilon)<D \quad (13)$$

Keeping in mind that the bid is expressed in terms of price variation and keeping food quantities constant, the probability that a consumer is willing to accept a lower price p_{bid} for giving up the relational good is:

$$Prob(move) = Prob(WTA\ (C, \varepsilon) - D<0) \quad (14)$$

Assuming a linear additive functional form for the WTA and a distribution for ε, the probability of acceptance of the change can be estimated by maximum likelihood techniques, as:

$$Prob(move) = Prob[C\varphi + \varepsilon - D<0] = Prob[D - C\varphi>\varepsilon] = F[D - C\varphi] \quad (15)$$

and

[3] We note that there is a subtle but important difference with Hanemann's model. In the classical contingent valuation method, the prospected trade-off is between the change in the quantity or quality of the environmental good (or whatever is estimated) and a lump sum. Here the prospected trade-off is between the change in the relational good and a change in prices, which requires the assumption of constant quantities of the purchased goods, see footnote 2 (also see Corsi (2007) for a discussion of this issue).

[4] The two approaches are theoretically consistent, as to each utility difference function corresponds a valuation function, and vice versa (Hanemann and Kanninen, 2001), and when the marginal utility is constant the WTA will have the same family of distributions as the difference in utilities (Haab and McConnell, 2002).

$$\text{Prob(remain)} = F(C\varphi - D)$$

where φ is a vector of parameters to be estimated and F is a cumulative density function for ε.

4. Data

The empirical analysis is based on a survey among consumers in Torino, Cuneo, Asti and Alessandria, all towns in the Italian Region of Piedmont, NW of Italy. The sample in Torino (a large city) was drawn with a two-stage random sampling methodology. The primary sampling units were the urban open-air markets in town where, along with ordinary vendors, farmers have the right to sell directly their products. In Torino, according to city statistics, there are farmers selling directly in 28 open-air markets, in a number ranging from 1 to 13, except for a particular market (Porta Palazzo, the largest in town) where they are 88. Individual markets were divided into 3 strata according to the number of farmers selling at the markets (1-4, 5-8, 9-13 farmers), plus the market with 88 farmers. In the strata, 5, 4 and 3 specific markets, respectively, were randomly drawn. In each market, consumers to be interviewed were randomly chosen. In the smaller towns of Cuneo, Alessandria and Asti, the survey was conducted in the main, or only, market-place in town where both farmers and conventional vendors sell their products. The interviews were distributed on different days of the week and different hours during Spring to Fall 2014.

Since the objective was to estimate the value of the direct relationship between consumers and producers, the questionnaire started with filter questions allowing to select the consumers that usually bought most or part of fruits and vegetables from farmers' stalls, only to which the elicitation question was asked. Using a closed-ended format, they were asked whether, given the possibility of finding exactly the same products as those they bought most frequently from a farmer from another farmer at a lower price, they would still buy from their favourite farmer or from the other one. The specification 'exactly the same products from another farmer' was intended for getting rid of reasons other than the relational good and the price. In particular, we wanted to avoid a preference based on information provision, on trust, on reputation based on the past average quality provided by the producer (McCluskey and Loureiro, 2005; Quagrainie *et al.*, 2003; Winfree and McCluskey, 2005), and on the symbolic value or the convenience of buying from farmers rather than in other points of sale. The proposed price discounts were randomly assigned between 10, 20 and 30%. The possible answers were 'I would stay with my favourite farmer', 'I would move to the other farmer' and 'I am indifferent'. Both the percentage discount and an example of absolute change in expenditure were provided. To increase the efficiency of the estimation, we used a double-bounded format of the elicitation question (Hanemann *et al.*, 1991). When the respondent refused to move for the first discount, a higher discount was proposed. When on the contrary the respondent answered the first question that he/she would move, the question was asked again with a lower discount. To avoid a question order bias, six different versions of the questionnaire were randomly submitted to the respondents, each different in the ordering of the provided answers.

Since we wanted to be sure that what the respondents stated was their WTA for the relational good, those who stated they would rather stay with the previous vendor were asked the reason. Some of them reported the pleasure of spending their time chatting with the vendor, a person they know well, indicating the existence of an interpersonal relationship. In other cases, they mentioned trust in the vendor rather than the relational good as the main reason for staying. Arguably, the reputation of the seller as trustworthy is a prerequisite for the development of a relational good. Nevertheless, one can trust a seller regardless of a personal connection with him/her. For treating these answers, we opted for a conservative approach, considering the value of the relational good as null for those who mentioned trust in the seller as determinant of their choice. We experimented two different treatments for these cases: either they were simply dropped, or the responses were reclassified as an acceptance of the alternative. Finally, the questionnaire asked for some socio-demographic information on the respondent.

The interviewers made personal contacts with 473 urban market customers. The respondents who were occasional customers (60) didn't enter the survey. Those who were not aware of the farmers' stalls and/or who bought the larger part of fruits and vegetables from conventional market vendor (110) were not asked the elicitation question. After dropping these observations and the questionnaires with missing information (19), a final sub-sample of 284 questionnaires was employed to estimate the value of the relational good with the difference-in-utility model, 238 if the trust responses (46) were dropped. For the valuation function model, some further missing data on personal characteristics led to a final sample of 241 observations (207 if the trust responses were dropped).

Table 1 shows the descriptive statistics of the explanatory variables for the sample of 241 observations used in the valuation function model (with trust responses reclassified). They include respondents' socio-demographic characteristics: gender, age, education (in schooling years), household size, number of children until fourteen,[5] occupation and job skill level (three categories), household income (four income brackets) and a dummy variable indicating whether the respondent was the family member usually in charge of buying fruits and vegetables. Two further dummy variables were added to highlight the possible role of markets and areas with distinctive characteristics. One was Porta Palazzo, the largest and more traditional open-air market in Torino, possibly particularly attracting consumers interested in purchasing from farmers, the second the market location in a provincial town.

As expected, the socio-demographic characteristics of the sub-sample are rather different from those of the town residents as recorded by the Census data (I.Stat, 2011). For instance, the share of males is much lower than the average of Torino (39 vs 48%), because females more frequently take care of buying food. The average age of the market customers (51) is higher than that of the population (45), possibly because elder people have more time for midweek shopping and market shopping during the day and because young people living with their family do not usually shop. Market customers are also more educated than the general population (14.8 years of education on the average as compared to 9.2 years of the city residents).

[5] 15 is the minimum working age in Italy.

Table 1. Descriptive statistics of the variables.[1]

Variables	Mean	Std. Dev.[2]
Gender (male = 1)	0.386	0.488
Age (years)	50.739	18.300
Education (years)	14.793	4.046
Household member in charge of buying fruits/vegetables (yes = 1)	0.963	0.190
Household size (number of other family members)	1.369	1.080
Children under fourteen (number)	0.141	0.424
High-skill job (yes = 1)	0.100	0.300
Middle-skill job (yes = 1)	0.299	0.459
Low-skill job (yes = 1)	0.037	0.190
High-middle-pensioner (yes = 1)	0.154	0.361
Low-pensioner (yes = 1)	0.116	0.321
1 Net household income <1,200 euro/month (yes = 1)	0.320	0.467
2 Net household income 1,200-2,000 euro/month (yes = 1)	0.386	0.488
3 Net household income 2,000-3,000 euro/month (yes = 1)	0.199	0.400
4 Net household income >3,000 euro/month (yes = 1)	0.095	0.294
Provincial town (yes = 1)	0.183	0.387
Porta Palazzo (yes = 1)	0.249	0.433

[1] The descriptive statistics are calculated on 241 observations (missing income responses dropped).

[2] Std. Dev. = standard deviation.

Since personal characteristics may affect the choice of buying in an open-air market, the estimated values attached to the relational good strictly refer to the sub-sample of consumers buying in open-air markets and purchasing from farmers.

5. Results

Table 2 presents the distribution of responses to the double bounded elicitation questions for the full sample, for the sample in which the 'trust responses' were dropped, and for the one in which they were reclassified. The responses are consistent with rational behaviour, as the number of 'stay' responses decreases the higher the proposed discount.

From these data, a first group of results was estimated with the utility difference models, that is, only based on the bid variable, using the double-bounded format. The bid variable, which was presented to respondents as a price discount, was previously transformed into the desired p_{bid}/p variable simply as (1-discount). Responses 'I am indifferent' were treated as acceptance of the change. A first estimation was based on a parametric model, assuming a truncated normal distribution of the random error. The truncation was introduced to respect the limits of the price discount, that can only vary between 0 and 100%.[6] Table 3

[6] In the likelihood function, $[\alpha_1 + \beta \ln(p_{bid}/p_1)]$ can take the values from minus infinity (when $p_{bid}/p_1=0$) to α_1 (when $p_{bid}/p_1=1$). Hence, Prob(move) has been modelled as $\Phi[\alpha_1 + \beta \ln(p_{bid}/p_1)]/\Phi(\alpha_1)$, where Φ is a standard normal.

Table 2. Responses to the offered discount (bid).

Full sample									
First bid	**Lower second bid**	**Higher second bid**	**Responses to the first and second bid[1]**						
			S-M	**S-S**	**M-S**	**M-M**	**Total**		
0.1	0.05	0.2	29	21	10	34	94		
0.2	0.1	0.3	13	17	9	54	93		
0.3	0.2	0.4	8	13	7	69	97		
Total			50	51	26	157	284		
Dropped trust answers									
First bid	**Lower second bid**	**Higher second bid**	**Responses to the first and second bid[1]**						
			S-M	**S-S**	**M-S**	**M-M**	**Total**		
0.1	0.05	0.2	24	10	6	34	74		
0.2	0.1	0.3	7	10	5	54	76		
0.3	0.2	0.4	6	7	6	69	88		
Total			37	27	17	157	238		
Reclassified trust answers									
First bid	**Lower second bid**	**Higher second bid**	**Responses to the first and second bid[1]**						
			S-M	**S-S**	**M-S**	**M-M**	**M (1st bid)[2]**	**M (2nd bid)[2]**	**Total**
0.1	0.05	0.2	24	10	6	34	16	4	94
0.2	0.1	0.3	7	10	5	54	13	4	93
0.3	0.2	0.4	6	7	6	69	8	1	97
Total			37	27	17	157	37	9	284

[1] S = stay, M = move.

[2] These columns report the number of 'stay' answers to the first and to the second bid, respectively, that were stated for trust reason and that were therefore reclassified as 'move'.

presents the results of this model for the full original sample and for the double version for the treatment of the 'trust responses'. They may be dropped (Dropped trust responses), or be reclassified as acceptance to move to the new vendor (Reclassified trust responses).[7] In all cases, the parameters are highly significant and exhibit the predicted signs.

From the estimated equations, the median and average WTA can be recovered as $\exp(-\alpha_1/\beta)$, and $\exp(-\alpha_1/\beta)*\exp(1/2\beta^2)]$, respectively (Carson and Hanemann, 2005). Since these values are the results of ratios of random variables, and therefore the distribution of these ratios is not defined, we performed a Monte Carlo simulation to create an empirical distribution of the WTAs. We randomly drew (10,000 draws) from a multivariate normal distribution having as mean the vector of the parameter estimates and as variance-covariance matrix the estimated one; the vector of the coefficients produced by each new draw was used to compute the relevant WTAs. In this way, we obtained empirical distributions of the mean and median WTAs, from which their relevant means and standard deviations were calculated. The Monte Carlo simulations produced mean and median WTAs very similar to the ones of the simple ratios of the model parameters.

The resulting values of the WTA are presented in Table 4. They indicate that on average the respondents were willing to forego a 20.4% discount on their expenditure to remain with their favourite vendor. The median value is very similar, 20.9%, thus suggesting that the WTA distribution is almost symmetric. When dismissing the responses in favour of remaining with the present farmer for trust reasons, the mean WTA is higher, 24.4% when those responses are reclassified as move choices, 22.4% if they are simply dropped. The median values are 25.2 and 23.0%, respectively. This suggests that the respondents mainly motivated by trust have a lower WTA than the overall sample. Although getting rid of trust increases the average WTA, the difference between the full sample and the dropped sample is not statistically significant, since the 5% confidence intervals overlap between the estimates of the different samples. By contrast, the 5% confidence intervals do not overlap between the full and the reclassified sample, though they do between the reclassified and the dropped sample estimates.

As a robustness check, along with the parametric estimations, we implemented a nonparametric, maximum likelihood, estimation for interval data. This methodology does not need any assumption on the distribution and is also particularly recommended for small sample sizes (Borzykowski *et al.*, 2018). The stated choice is used to build an interval within which the latent WTA belongs to, i.e. a specific bid amount will represent a lower or an upper bound of individual WTA. The use of the follow-up question allows us to more finely identify these intervals. To perform the maximum likelihood estimation, we employed the Spearman-Karber (SK) estimator and the modified Kaplan-Meier-Turnbull (KMT) estimator (Kaplan and Meier, 1958; Kristrom, 1990; Turnbull, 1974, 1976) that provide the share of population that would accept to move at each value

Table 3. Utility difference model.[1]

	All responses		**Reclassified trust responses**		**Dropped trust responses**	
	Coeff.[2]	**Std. err.[2]**	**Coeff.**	**Std. err.**	**Coeff.**	**Std. err.**
α	2.077***	0.273	2.070***	0.282	2.088***	0.316
β	8.864***	1.184	7.165***	1.170	8.031***	1.417
Log-likelihood	-197.14		-171.82		-153.81	
N. obs.[2]	284		284		238	

[1] *** = significant at the 0.01 level.

[2] Coeff. = coefficients; N. obs. = number of observations; Std. err. = standard error.

[7] In the estimation of the reclassified sample, the likelihood function used only one bid from the reclassified observations, since the other was pleonastic. E.g. a respondent was willing to stay with the farmer at a 10% discount, and was asked a second bid of 20%; if its first response is reclassified as a 'move' with a 10%, he/she would obviously also be willing to move with a 20% discount. Similarly, if the response to the first bid of 30% was 'move' and to the second bid of 20% was 'stay', and the latter was reclassified as 'move', the first response becomes pleonastic. The likelihood function was modelled accordingly.

Table 4. Mean and median willingness-to-accept from the utility difference model.[1]

	All responses	Reclassified trust responses	Dropped trust responses
Model parameters			
Mean	0.796 (20.4%)	0.756 (24.4%)	0.777 (22.3%)
Median	0.791 (20.9%)	0.749 (25.1%)	0.771 (22.9%)
Monte Carlo simulations			
Mean	0.796 (20.4%)	0.756 (24.4%)	0.776 (22.4%)
Std. Dev.	0.008	0.011	0.010
Median	0.791 (20.9%)	0.748 (25.2%)	0.770 (23.0%)
Std. Dev.	0.008	0.013	0.011

[1] In brackets = in terms of price discount. Std. Dev. = standard deviation.

of the bid vector. The standard procedure is to fix the lower support of the WTA distribution by assuming $\hat{P}(0)=1$ and the upper support assuming that the probability of moving is one with a discount equal to Bid_{max}. Then the Spearman-Karber mean estimator is simply computed by:

$$\widehat{WTA} = \sum_{i=1}^{I}\left(\hat{P}_i - \widehat{P_{i-1}}\right)(Bid_i - Bid_{i-1}) \quad (16)$$

With $\hat{P}_i$ the empirical probability of positive responses for each bid value Bid_i. An alternative estimator is the KMT, that is obtained assuming that $\hat{P}(Bid) = \hat{P}_1$ for $0 < Bid < Bid_1$ and the probability of moving is one for all discounts greater to Bid_{max}. The KMT estimator is, then, computed by:

$$\widehat{WTA} = \sum_{i=1}^{I}\left(\hat{P}_i - \widehat{P_{i-1}}\right)(Bid_i) \quad (17)$$

There is no unified approach to determine the ending point of bids at which the probability approaches one; in our case, we assume that a 40% discount, the Bid_{max}, is large enough to ensure the probability of moving to be one. This implies that the estimates of the mean WTA are somewhat conservative since some could (and actually stated to) be willing to forego higher discounts. According to the conservative assumptions on which the non-parametric estimators are built, they can be interpreted as conservative lower bounds of the WTA distribution.

Table 5 presents the results of the nonparametric estimation for the full sample and for both 'reclassified' and 'dropped' samples. The relevant mean estimated WTAs are in the range of 13.5 to 24.2% in terms of discount. They are therefore of the same order of magnitude and, especially in the case of the KTM, very similar to the ones obtained with the difference-in-utility model (Table 4).

The alternative econometric strategy is using the valuation function approach. Table 6 reports the relevant results of the estimates of Equation 15 for the full sample and both treatments of the trust responses. The only highly significant parameter is the proposed discount. The second income bracket is weakly significant and negative. Overall, this implies that individual characteristics do not systematically affect consumers' WTA, so that the covariates do not add to the estimate of the WTA.

Nevertheless, as a further check, we experimented the use of the WTA function. The parameters other than the prospected discount represent the WTA function (see Equations 14 and 15). One can calculate the WTA of all consumers in the sample by multiplying the matrix of the individual variables by the vector of relevant estimated parameter vector and calculate the resulting mean and standard deviation. Since the parameters of the WTA function are random parameters, the resulting average WTA and variability measures can be found by simulation methods (Krinsky and Robb, 1986). We randomly drew (10,000 draws) from a multivariate normal distribution with mean φ (the vector of the estimates of the WTA function) and variance-covariance matrix V (the estimated variance-covariance matrix), thus obtaining 10,000 random vectors; by multiplying

Table 5. Nonparametric Turnbull estimation.

Survival probabilities						
Upper bid	**All responses**		**Reclassified trust responses**		**Dropped trust responses**	
0	1		1		1	
0.6	0.887		0.944		0.933	
0.7	0.818		0.894		0.876	
0.8	0.729		0.833		0.807	
0.9	0.520		0.647		0.616	
0.95	0.402		0.559		0.524	
1	0		0		0	
Bootstrap confidence intervals[1]						
	All responses		**Reclassified trust responses**		**Dropped trust responses**	
Bid	**LB**[2]	**UB**[2]	**LB**	**UB**	**LB**	**UB**
0	0.987	1	0.987	1	0.985	1
0.6	0.837	0.932	0.902	0.980	0.881	0.974
0.7	0.763	0.876	0.855	0.929	0.824	0.925
0.8	0.665	0.775	0.784	0.875	0.752	0.862
0.9	0.455	0.589	0.577	0.721	0.543	0.658
0.95	0.326	0.496	0.472	0.651	0.444	0.613
1	0	0.129	0	0.013	0	0.015
WTA[2] **estimates**						
	All responses		**Reclassified trust responses**		**Dropped trust responses**	
Kaplan-Meier mean WTA	0.758		0.832		0.816	
Spearman-Karber mean WTA	0.813		0.865		0.854	

[1] Confidence level = 0.95.

[2] LB = lower bound; UB = upper bound; WTA = willingness-to-accept.

the matrix of the individual variables by each of them the individual WTAs for the sample were computed. From these, the mean and the median were calculated. The final result was an empirical distribution of the mean and median WTAs of which the means and the standard deviations were calculated.

Table 7 presents the mean and median WTA values, both directly calculated from the function parameters and from the Monte Carlo simulation. With this approach, the mean WTA is around 20% for the full sample, a result similar to the ones of the utility difference models. The mean WTA is around 19% for the 'dropped trust responses', but only 8.3-8.4% for the 'reclassified trust responses'. Note nevertheless that WTA mean and median values are not statistically significant at the conventional values. This obviously depends on the valuation function parameters not being significant, so that the resulting mean and median WTAs are equally not significant. In summary, the valuation function approach in our case does not provide reliable results.

Table 6. Valuation function models.[1]

	All responses		Reclassified trust responses		Dropped trust responses	
	Coeff.[2]	**Std. err.[2]**	**Coeff.**	**Std. err.**	**Coeff.**	**Std. err.**
Prospected discount	-4.957***	0.590	-4.809***	0.567	-4.957***	0.590
Constant	-0.294	1.034	0.083	0.989	-0.294	1.034
Gender (1 = male)	-0.251	0.214	-0.220	0.201	-0.251	0.214
Age (years)	0.005	0.007	0.004	0.007	0.005	0.007
Education (years)	0.024	0.031	0.011	0.030	0.024	0.031
Main purchaser	0.338	0.726	0.189	0.693	0.338	0.726
# household members	0.007	0.123	-0.054	0.116	0.007	0.123
# children	-0.369	0.280	-0.245	0.274	-0.369	0.280
High-level occupation	0.106	0.360	0.130	0.356	0.106	0.360
Mid-level occupation	-0.089	0.273	-0.191	0.261	-0.089	0.273
Low-level occupation	-0.666	0.517	-0.550	0.520	-0.666	0.517
High-middle-pensioner	-0.185	0.365	-0.141	0.359	-0.185	0.365
Low-pensioner	0.467	0.347	0.267	0.326	0.467	0.347
Net HH[2] income 2	-0.408*	0.223	-0.355*	0.213	-0.408*	0.223
Net HH income 3	-0.158	0.321	-0.139	0.320	-0.158	0.321
Net HH income 4	-0.355	0.389	-0.199	0.393	-0.355	0.389
Province	-0.096	0.289	-0.149	0.270	-0.096	0.289
Porta Palazzo	-0.260	0.281	-0.274	0.275	-0.260	0.281
Log-likelihood	-197.285		-206.762		-197.285	
AIC[2]	430.6		449.5		430.6	
AIC/N = 1.865	1.787		1.865		2.080	

[1] ***, * = significant at the 0.01 and 0.1 level, respectively.

[2] AIC = Akaike information criterion; Coeff. = coefficients; HH = household; Std. err. = standard error.

Table 7. Mean and median willingness-to-accept from the valuation function model.

	All responses	Reclassified trust responses	Dropped trust responses
Model parameters			
Mean	0.203	0.084	0.189
Std. Dev.[1]	0.375	0.333	0.371
Median	0.183	0.104	0.173
Monte Carlo simulations			
Mean	0.202	0.083	0.188
Std. Dev.	0.134	0.127	0.132
Median	0.226	0.11	0.216
Std. Dev.	0.141	0.134	0.139

[1] Std. Dev. = standard deviation.

6. Conclusions

In this paper, the value urban consumers attach to the enjoyment of a relational good represented by the personal relationship with a farmer selling directly his/her products has been estimated with different econometric methods. As always in stated preference models, the results are contingent on the chosen model. Among the models, the utility difference approach, based on the comparison between the bid and the loss in utility when giving up the personal relationship, yields more reliable results, both for parametric and non-parametric models. In these models, the mean WTA ranges from 13.5 to 24.4%. Individual characteristics do not seem, by contrast, to significantly affect the WTA, so that the estimates based on them turn out not to be significant. Regardless of the differences in the results, we can conclude that personal relationships do have a non-negligible impact on these consumers' economic behaviour. This might not sound like a novelty to marketing practitioners, since all marketing textbooks recommend putting the consumer at ease with the vendor, but to the best of our knowledge, its measurement is new. Incidentally, we also note that our approach, both theoretical and empirical, also allows measuring the value of any characteristic of the purchase situation that is of interest to the consumer, for instance, when buying at a farmers' market is preferred to buying at a supermarket.

Some considerations and qualifications are nevertheless needed. First, a word of caution is needed about the very nature of the relational good and about what consumers value in the relationship with a particular vendor. We tried to isolate the effect of the relational good in itself, getting rid of trust and symbolic values. Though, the difference in WTA keeping or not trust responses is generally not statistically significant. And, in any case, some ambiguity may remain. For instance, some answered to the check question 'Why did you state you would stay with your favourite vendor?' with 'because of habit' which is somewhat ambiguous. It may imply familiarity and, hence, be a sign of the relational good; but it can also stem from risk averse attitudes. Likewise, trust does not correspond to a relational good, but may be strictly linked. When one is familiar or on friendly terms with someone else, he/she usually trusts the other, but one can also trust someone else who is indifferent to him/her.

Second, we only estimate the value of the enjoyment of the relational good for the consumers. Relational goods provide utility for both parties of the relationship. In our case, there is a value created by the relationship also for the farmers. This is not estimated by our exercise, so our estimates do not comprise the whole benefit created by the personal relationship.

Third, we estimate the willingness-to-accept. It is well known that in the Contingent Valuation literature measures based on WTA are looked at with suspicion, since they are prone to overvaluation (e.g. the NOAA panel advice (Arrow *et al.*, 1993)), especially because there is no upper bound. In the case of relational good, though, only WTA can be assessed since, by definition, a relational good cannot be purchased, and an individual cannot even evaluate it until it is created, so that the willingness to pay for a relational good cannot even exist. In addition, the WTA was bounded by the 100% realistic limit to the discount. Our setting was anyway framed in terms of asking the willingness to obtain an economic advantage implying a loss of the enjoyment of the relational good. Nevertheless, one should be aware that the valuation might be influenced by people's reluctance to leave something already acquired (Kahneman and Tversky, 1979). And, like in all stated preferences exercises, hypothetical bias is a possibility.

Notwithstanding these caveats, we think our results are enough evidence of a substantial benefit of interpersonal relationships in a sales environment alternative to supermarkets. In terms of policy implications, the result that personal relationships between consumers and farmers directly selling their products yield non-negligible intangible benefits supports the policy goal of strengthening short or local food chains. This is a goal already included in the European Common Agricultural Policy, particularly for rural development. The rationale of the EU interest towards short food chains can generally be linked to an enhancement of farmers' income, clearly an equity criterion, corresponding to a long-time complaint by farmers' organisations about the small part of total value added of the food chain accruing to farmers. If the small share is actually the result

of market power of the distribution sector, then favouring direct sales in addition to the equity benefit also provides an efficiency gain. In the USA too, short and local food chains have been favoured, both at the federal, state and local levels (Martinez *et al.*, 2010). The motivations are diverse. Some programs are linked to food security issues in an effort to provide healthier products to beneficiaries of food support programs, while others are more addressed to favour farmers' capacity to sell their products locally.

The results of our research nevertheless show that the overall benefit for establishing short or alternative food chains does not only stem from an improvement of farm income, which increases farmers' welfare, but also generates a welfare increase among consumers who purchase their products. In addition, intangible benefits similar to the ones we measured for consumers are predictably gained also by farmers in these kinds of food chains. Also note that, while an increase of farm income at the expense of the distribution sector has predominantly welfare distributional effects and not necessarily welfare-enhancing ones, the creation of relational goods unambiguously adds to welfare creation.

From the above, it should be clear that the public measures already taken to favour alternative or short food chains are fully justified and their scope could also be enlarged. Subsidies and legal arrangements to allow farmers to sell directly their products should be introduced where they do not yet exist; local services relating to short supply chains and material infrastructures to allow direct sales in urban markets should be implemented; programs to promote more direct knowledge between consumers and producers should be promoted. All these measures can enhance the possibility to create personal relationships, which are a core benefit of AFNs.

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