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RESEARCH ARTICLE

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Assessing consumer preferences and willingness to pay for organic tomatoes in Albania: A conjoint choice experiment study

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Abstract

Albania has potential for developing the organic agriculture sector; however, it is a new industry and constraints abound including lack of consumer preferences information for organic food. Knowledge on consumer preferences and behaviour toward organic (bio) products is crucial for market development benefiting potential entrepreneurs and government policies. They need to know the preference for preferred product attributes and willingness to pay. Tomato, which is the most important vegetable in terms of consumption and production in Albania, is the subject of this study. A conjoint choice experiment with the most important product attributes: production type (bio *vs.* conventional), production system (open field *vs.* greenhouse), origin and price were used to design the choice surveys. Four distinct classes have been identified as significant using latent class analysis. The classes are summarized as: Bio-ready consumers, price sensitive consumers, variety seeking consumers and quality seeking consumers. Origin played a small influence on preference. Education and income did show some influence on preference for organic tomatoes. Although the organic food market in Albania is in its infancy stage, organic tomatoes are clearly preferred and many consumers are willing to pay a premium price.

Additional keywords: consumer behaviour; stated preferences; conjoint choice experiment; latent class analysis; organic food.

Abbreviations used: ALL (Albanian Lek); BIC (Bayesian Information Criterion); CA (Conjoint Analysis); CCE (Conjoint Choice Experiment); DCE (Discrete Choice Experiment); LCA (Latent Class Analysis); MARDWA (Ministry of Agriculture, Rural Development and Water Administration, Albania); WTP (Willingness to Pay).

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Introduction

Albania has favourable climatic conditions for producing a wide range of agricultural products (Bernet & Kazazi, 2012). While in the past producers and government have been mainly focused on increasing the supply, the focus now has been shifting towards meeting the consumer demand and preferences. World market trend shave shown a growing demand for organic food (Willer & Lernoud, 2014) which represents a new opportunity for Albanian farmers to expand their markets (Bernet & Kazazi, 2012). Considering potentials for development, the Albanian government introduced a subsidy scheme for organic agriculture in 2008, as such providing incentives for farmers to venture into growing organic food.

The organic food industry faces many challenges such as weak regulation, insufficient financial resources, and market information on organic. The information on consumer preference on organic food is important to farmers so they produce what consumer want and are willing to pay. In Albania, there is a dearth of information on Albanian consumer preference for organic foods such as the value consumers attach to the label "organic". Hence, organic farming in Albania is not well developed compared to its potentials.

Vegetables are important in the Albanian food diet and among them tomato is the most important item

(INSTAT, 2008). According to the FAO (2014), Food Balance data on annual consumption per capita in 2011 ranked Albania the World 4th on vegetables consumption (251 kg per capita) and World 10th on tomato consumption (56 kg per capita). The steady increase in consumption of vegetables in Albania is mainly associated to income growth and health concerns.

Between 2006 and 2013 production of tomatoes in Albania increased significantly by 58% and imports reduced by more than two-fold (Table 1). Foreign trade is negligible when compared with the total production, however there was a steady increase of exports from 2005 to 2013 (Table 1). Given the potential for growth and demand, tomato production has been considered a priority subsector by the Albanian government to target for support for the period 2014-2020 (MARDWA, 2014).

In Albania, tomatoes are generally produced in the open field and greenhouses. More than half of the total greenhouse area is cultivated with tomatoes (GTZ, 2010). The production of field tomatoes is common in all regions of Albania; however, production of tomatoes in greenhouse is concentrated in the district of Lushnja, one of the most productive areas in Central Albania. Production of organic tomatoes is (quasi) inexistent in Albania.

A key concern for the Albanian producers is how to market to consumers. Therefore providing information to consumers and influencing their purchase decisions through advertising is an unexplored perspective from the Albanian producers. In the past, economists such as Nelson (1970) and Darby & Karni (1973) explored the influence of advertising by distinguishing the impact of three types of product attributes, namely "search", "experience" and "credence" attributes. Nelson (1970) created the term "search qualities" to describe those qualities of a brand that "the consumer can determine by inspection prior to purchase" and "experience qualities" which refer to those that "are not determined prior to purchase". Darby & Karni (1973) contributed the idea that certain qualities can never be verified even after purchase and consumption; they named them as "credence" attribute, since an average consumer may not possess sufficient technical expertise to assess the product's "credence" attributes. The existence of credence attributes is one of the main sources of information asymmetry and opportunistic behaviour, and it may cause market failure.

Past consumer preference studies have attempted to explore a diversity of search and experience attributes. Recently, there is an expanded interest in evaluating consumer preferences for credence attributes such as quality assurance/certification schemes and labelling in an attempt to obtain more product marketing information. Several studies explored credence attributes such as organic or pesticide-free food labelling (Boccaletti & Nardella, 2000; Moser *et al.*, 2011; Caputo *et al.*, 2013; Grunert *et al.*, 2014). Other studies explored consumer preference for methods of production (Ekelund *et al.*, 2007; Novotorova & Mazzocco, 2008) and origin of production (Maumbe & Brown, 2013). These credence attributes complement search and experience attributes such as price, brand, visual, smell and taste attributes in buyer's decision (see Kuhar & Juvančič, 2010; Dimech *et al.*, 2011; Moser *et al.*, 2011; Carroll *et al.*, 2013; Fernqvist, 2014; Oltman *et al.*, 2014).

One of the most important credence attributes frequently used for market analysis of vegetables has been the 'organic' label, which is perceived to provide benefits such as food safety, human health and more sustainable agricultural practices (Haghiri *et al.*, 2009; Thøgersen, 2009). Many studies have shown the willingness to pay (WTP) a premium for organic labelled vegetables including fresh or processed tomatoes (Haghiri *et al.*, 2009; Yue & Tong, 2009; Causse *et al.*, 2010; Gao *et al.*, 2011; Carroll *et al.*, 2013).

Most of the available research exploring the preferences for organic products is based on cases in the USA or Western Europe. More recently, there are more studies on consumer behaviour in developing countries but they might not be relevant to the Balkans due to very

Table 1. Production and trade statistics of tomatoes in Albania in selected years from 2000-2013

Item	2000	2005	2010	2011	2012	2013
Production (Mt)	162,000	152,000	192,283	200,000	205,000	240,153
Import (Mt)	2,263	6,514	3,429	3,061	3,080	2,615
Export (Mt)	0	123	6,573	11,349	17,315	25,245
Apparent consumption (Mt)	164,263	158,391	189,139	191,712	190,765	217,523
Export/import (%)	0.0	1.8	191.6	371	562	965
Export/production (%)	0.0	0.0	3.4	5.6	8.4	10.5
Import/supply (%)	1.4	4.1	1.8	1.6	1.6	1.2

Source: FAOSTAT (production), INSTAT (Trade)

different cultural and economic contexts (*e.g.* Roitner-Schobesberger *et al.*, 2008; Chen & Lobo, 2012; Bruschi *et al.*, 2015). Few are focused on products from the Balkans, which is becoming a major production region due to its potential competitiveness and demand (Radić & Canavari, 2014). Vukasovič (2013) investigated the consumption of organic meat in the Western Balkans. The study found that consumers had a positive attitude toward organic meat as healthy, safe, natural, tasty, environmental friendly, of good quality but also expensive. A study by Kuhar & Juvančič (2010) on organic and integrated fruit and vegetables production in Slovenia found perceptions of positive impact on health and environment while the lack of availability in retail outlets and visual unattractiveness of organic products were considered as challenges. A study on Croatian consumers (Radman, 2005) concluded that organic products are regarded as good quality, healthy and tasty products while more expensive and with unsatisfactory appearance. Moreover, consumers are not very informed about the provision of ecologically-grown products in the market. The study did not include consumer segmentation. Authors suggested further studies that include market segmentation and targeting would provide useful information for farmers and suppliers. More recently, a study exploring consumer preferences for organic food was carried out in Albania (Imami *et al.*, 2016), but it was not product-specific.

Given the literature review described above and the relevance of information on consumer preference for organic food in a particular economic and cultural contexts, this paper aims at analysing consumer preferences and willingness of Albanian consumers to pay for organic tomatoes. Specifically, the research objectives were: (i) to group consumers according to their preferences for the main tomato attributes including the organic attribute; (ii) to estimate the WTP for organic tomatoes; (iii) to provide marketing and policy recommendations for the sector's stakeholders, with particular focus on farmers and policy-makers.

To achieve these objectives, we rely upon the application of a well-established stated preference approach, which is Conjoint Choice Experiment for collecting data on consumer choice, and a latent class approach to analyse the collected data.

Material and methods

Research design

Conjoint choice experiments (CCE) combined with Latent Class Analysis (LCA) were used in this study. CCE was developed by Louviere &Woodworth (1983). The method originated theoretically from Lancaster (1966) which stated that the utility derived from a product is based on the bundle of attributes it represents. As an empirical method it has been used widely in market research. LCA is an improvement on the traditional (*i.e.* one class) aggregated model analysis in terms of the ability to accommodate heterogeneity of preferences. Latent classes take into consideration different segments with different utility preferences within a study population (Vermunt & Magidson, 2000). In LCA, respondents are distinguished by the probability of belonging to a particular class, according to their choice responses in the CCE. The choices that respondents make are considered mainly based on their attribute preferences and possibly on their socio-demographics.

CCE combined with LCA is deemed superior to traditional Conjoint Analysis (CA) because Discrete Choice Experiments (DCE) are based on the Random Utility Theory (RUT), which is a well-tested economic theory, strongly associated with error components whose properties play a key role in parameter estimates derived from data. In contrast, traditional CA is largely a curve fitting/scaling exercise where error components are largely ad hoc and lack clear interpretations. Moreover, by using DCEs to gain a better understanding of how people make choices, practitioners are likely to learn how to construct better empirical studies in marketing and other applied economic fields where choices play important roles (Louviere *et al.*, 2010).

Table 2 gives a brief description of the research design stages (Green & Wind, 1975; Chan-Halbrendt *et al.*, 2010).

Selecting product attributes and their levels (stages 1 and 2)

Attributes and their levels were chosen based on the purpose of the study, literature review and focus group discussions, while considering constraints related to the experiment implementation. For practical reasons, the number of attributes included in the experiment design was limited to (the most important) four, namely product type, production system, origin and price. Conducting a face-to-face survey using more attributes would be difficult to implement in the field. The level of the product attributes are described in Table 3.

— *Product type attributes and levels*: organic *vs.* conventional way of producing tomato. Organic is the main attribute of interest in this study. In the case of Albanian consumers, the word "bio" is the familiar term to distinguish an organically produced product from a conventional one. We hypothesize that there is a positive perception and preference of Albanian consumers

Table 2. Design stages for a Conjoint Choice Experiment (CCE)

Stage	Description
1. Selection of attributes	Selection of tomato attributes has been done based on the literature review, expert interview, market observations and focus groups discussions.
2. Assignments of attributes level	The range of attribute levels is also determined by literature review, expert interview and market observations. The attribute levels chosen ensure that the resulting profiles are reasonable and realistic.
3. Choice of experimental design	Fractional factorial (orthogonal) design was used to reduce the possible combinations of attribute levels, thus reducing fatigue, while also providing efficiency in model estimation.
4. Construction of choice sets	The profiles (concepts) identified by the experimental design procedure are then paired and grouped into choice sets to be presented to respondents.
5. Data analysis	Data is analysed with latent class approach using Latent Gold 4.0 software

Source: Green &Wind (1975) and Chan-Halbrendt *et al.* (2010)

Table 3. Tomato attributes and their levels

Attributes	Levels			
Production type	Not bio (conventional)	Bio (organic)		
Production system	Greenhouse tomatoes	Field tomatoes		
Origin	Lushnja	Korça		
Price (ALL[1]/kg)	40	80	120	160

[1]ALL: Albanian Lek

for organic tomato similar to other studies around the world. Awareness, perceptions and preferences about organic products are critical in the consumer purchase decision. During the interviews, because of the probable lack of consumer knowledge of the exact organic definitions we provided the meaning of organic.

— *Production system attribute and levels*: open field *vs.* greenhouse production system. Production systems (and origin) are the most frequently used attributes in similar consumer studies according to the research by Moser *et al.,* (2011), as well as in other studies (Boccaletti & Nardella, 2000; Loureiro & Hine, 2002; Gilg *et al.*, 2005). Two types of tomato growing systems are commonly used in Albania, greenhouse production and field production. Production system is important and field production is hypothesized to be preferred to greenhouse production because it is grown in a more natural environment (similar to Sirieix *et al.*, 2008).

— *Origin attribute and levels*: Korça *vs.* Lushnja origin. Origin of product within the country was found to be one of the main factors influencing consumer purchases for food including tomatoes (Brumfield *et al.*, 1993). Most Albanian consumers consider the area of origin within Albania as a very important quality cue when choosing to buy domestic food products (Imami *et al.*, 2015). Lushnja and Korça are well-known production areas for vegetables including tomatoes. Therefore, these two regions have been chosen as relevant levels for the "origin" attribute.

— *Price attribute and levels: ALL*[1] *40 to ALL 160 per kilogram*. Price is usually included in Conjoint Choice Studies because it is a major purchasing factor in consumer choice and also because it is essential if one wants to compute WTP for selected attributes. In previous studies, price is seen as one of the main factors (most cases higher price is a deterrent) influencing consumer preference for organic *vs.* conventional tomato (Gilsenan *et al.*, 2007; Mesías Díaz *et al.*, 2012). The price levels have been decided through reviewing historical prices, observing the green markets prices and discussions in focus groups. The price interval embraces the whole range of realistic market prices, starting from a highly discounted price up to a price level that only occurs in rare cases. Similar to Huang & Lin (2007), Yue & Tong (2009), and Bhatta *et al.* (2010), in this paper we used price levels that are balanced (*i.e.*, equally distant).

[1]ALL is the Albanian currency (Albanian Lek). Approximately 120 ALL = 1 USD. The value for PPP (purchasing power parity) conversion factor (GDP) to market exchange rate ratio in Albania was 0.4586 as of 2011. This factor tells how many dollars are needed to buy a dollar's worth of goods in the country as compared to the United States.

Choice of experimental design

Sawtooth Software SSI Web v 6.6 was used to design the survey and to prepare the data for analysis. The attributes and levels were combined into choice tasks composed of triplets of profiles (concepts) or alternatives, as in the example shown in Table 4. Since a significant issue with many experimental designs is inertia (risk of choosing overwhelmingly one alternative in the choice task) which may also be found in many experiments that involve status quo or no choice alternatives (Hess & Rose, 2009), the latter was not included in the choice tasks. The propensity to opt for no choice alternative increases as the number of attributes and levels increases (Patterson & Chrzan, 2003).

Complete enumeration option of Sawtooth Software SSI Web v 6.6 was used for generating the choice tasks. In complete enumeration, profiles are nearly as orthogonal as possible within respondents, and each two-way frequency of level combinations between attributes is equally balanced. Within choice tasks, attribute levels are duplicated as little as possible - a property called "minimal overlap" (Chrzan & Orme, 2000).

A choice set with twelve choice tasks, each made of three concepts, was included in each questionnaire and respondent were asked to choose 12 concepts, one from each triplet concepts in a task. Seven questionnaires versions were generated using Sawtooth Software SSI Web v 6.6. Eighty-four different choice tasks were created for the seven versions, a design which is optimal or efficient (p<0.05).

Data analysis method: Latent class analysis

The Choice-Based Conjoint data collected was analysed using LCA. This method uses choice data for the simultaneous development of segments and estimation of part-worth utilities for the attributes and levels included in the design. For each respondent in the sample, a probability of belonging to each segment (class) is estimated; therefore they are not classified into a specific segment univocally, as it is normally in cluster analysis.

LCA was used to evaluate respondent choice behaviour by capturing both observable attributes of choice and unobservable factors found in the heterogeneity of individuals' behaviour (Greene & Hensher, 2003; Milon & Scrogin, 2006). In other words, respondents were placed into distinct classes based on their choices when answering the conjoint choice experiment (CCE) questions. In LCA studies, the probability of making a specific choice in a choice task is based on the perceived value of product attributes, and socio-demographic characteristics of respondents (McFadden, 1974). Based on McFadden (1974), the probability, P_{ni}, that individual n chooses profile i can be represented by the following (conditional logit model) equation:

$$P_{ni} = \frac{\exp(\mu X_{ni})}{\sum_{j=1}^{n} \exp(\mu X_{nh})} \quad [1]$$

where μ denotes a scale parameter, usually normalized as 1.0. X_{ni} stands for explanatory variables.

Equation [1] can be represented as equation [2] for LCA:

$$P_{ni} = \frac{\exp(\mu \beta Z_{ni})}{\sum_{j=1}^{n} \exp(\mu \beta Z_{nh})} \quad [2]$$

where Z_{ni} are explanatory variables including both product attribute level of profile i, and socio-demographic factors of respondent n. β is a vector of estimated parameter coefficients.

In a latent class analysis, respondents are sorted into M classes in terms of individuals' choice of observable product attributes, and the unobservable heterogeneity among the respondents. The value of estimated parameter coefficient β is different from class to class because this parameter coefficient is

Table 4. Choice task for surveying tomato preferences

If these were your only options, which would you choose? Choose by putting an X under preferred alternative.		
Greenhouse tomato	Field tomato	Greenhouse tomato
Not bio (Conventional)	Bio (Organic)	Bio (Organic)
Lushnja	Korça	Lushnja
ALL40	ALL80	ALL160
	I would choose	
↓ ☒	↓ ☐	↓ ☐

expected to capture the unobservable heterogeneity among individuals (Greene & Hensher, 2003). Then the choice probability of individual *n* belongs to class *m* (m = 1, …, M) can be expressed as equation [3]:

$$P_{ni|m} = \frac{\exp(\mu\beta z_{ni})}{\sum_{j=1}^{n}\exp(\mu\beta z_{nh})} \quad [3]$$

As mentioned above, the probability for individual *n* in class *m* choosing product profile *i, P(i),* is measured using two types of characteristics: product attributes, including product type *(T)*, origin *(O)*, Production system *(S)*, and Price *(P)*; and individual socio-demographic factors, including gender *(G)*, age *(A)*, education (*E*), income (*I*), and household size (*H*). The preference model is specified in equation [4].

$$P(i) = f(T, O, S, P, G, A, E, I, H) \quad [4]$$

While effects-coding was used to measure product attributes and dummy coding was used for gender, the rest of quantitative variables were treated as continuous variables.

Latent Gold 4.0 software that was used for data analysis automatically drops one attribute level (the one with which the other levels compare to) when estimating, but part worth utility coefficients are reported for each attribute level. The dropped attribute coefficient is not estimated directly, but it is calculated as the difference between zero and the rest of the coefficients for the levels of the same attribute. Therefore, coefficients must be interpreted as referred to the grand average and not to a baseline variable like in dummy coding. The software thus reports the econometric model results for all attribute levels and the sum of coefficients for all levels within each attribute equals zero. Due to the use of effect coding approach and the absence of a no-choice alternative in the choice tasks, a constant is not included in the model.

The resulting utility function for a given profile, for a given individual, in a given class, and a given choice task, is as follows:

$$U = \beta_{price} \cdot price + \beta_{bio} \cdot bio + \beta_{conv} \cdot conv + \\ + \beta_{grhouse} \cdot grhouse + \beta_{field} \cdot field + \beta_{Kor} \cdot Kor + \beta_{Lus} \cdot Lus + \varepsilon \quad [5]$$

where *price* represents the hypothetical product price, *bio* represents tomato produced organically and *conv* tomato produced conventionally, *grhouse* stands for tomato produced in green house and *field* for tomato produced in open field, and finally, *Kor* represents Korca origin *vs. Lu* that stands for Lushnja origin.

Data collection

The questionnaire was structured in three main parts, namely demographics, concept choices (consumer was asked to choose 12 concepts in a list of 12 choice tasks as explained above) and questions to evaluate respondent understanding of bio-product such as when they consider a product to be bio, difference between bio and natural and between bio and organic, whether or not the respondent has bought bio-products, and source of assurance of bio product, such as labelling and brand, origin, knowing the seller, buying directly from producer or special shops.

The questionnaire was tested with a small group of respondents and validated before performing the actual data collection. The questionnaire was properly coded in order to better manage data entry and processing.

Data were collected by well-trained interviewers (graduate students) and the process was closely followed by the principal authors. The survey was administered in Tirana, which is the capital city and the largest urban area and market in Albania. Various sites within Tirana were chosen, as suggested by the outcomes of the focus groups discussions. We chose the urban area of Tirana for three reasons: (i) purchasing power is concentrated mainly in Tirana; (ii) Tirana is a reasonably good representative of an urban area of the country (due to internal migration during the last 25 years, Tirana has grown from 200,000 to around 700,000 inhabitants, and they come from all over Albania representing variety of subcultures); and (iii) interviews in Tirana reduce travelling and subsistence costs substantially.

Interviews took place in the summer of 2013. People were randomly picked in around green markets and supermarkets and after completing one interview, the interviewer approached the next closest person who walked by. Each interview lasted on average of 25 minutes. Altogether, 230 face-to-face interviews were carried out and 220 questionnaires were valid.

The sample

Table 5 shows the gender and age structure of survey respondents compared to Tirana population; they are similar especially in terms of gender distribution. A certain deviation from population statistics of the age structure can be observed. Middle age respondents are over-represented as compared to elderly and younger respondent. Having less young respondents is expected because it is common in Albanian households that young people are not in charge of purchasing food.

Table 5. Socio-demographic comparison of survey respondents with Tirana's population[1]

		Survey respondents (%)	Tirana population (%)
Gender	Male	47	49
	Female	53	51
Age	18-34	20	42
	35-54	51	32
	55-64	20	13
	Over 64	9	13

Census of households and dwellings 2011 data, INSTAT. *Source*: Survey results and Albanian Institution of Statistics (http://www.instat.gov.al/)

Results

Consumer classes

From models with 1, 2, 3, 4 and 5 classes, the Bayesian Information Criterion (BIC) indicates that the 4-class model has the best fit as it has the lowest BIC. In the 4-class choice model, Class 1 represented 32.5% of the respondents; Class 2, 29.3%; Class 3, 22.4% and Class 4 15.8% of the respondents (Table 6).

Table 6 shows also the estimated parameters and their statistical significance.

The characteristics of the different classes can be of guidance if a label is assigned to each of them, although it is important to point out again that the Latent Class model does not allow univocal classification of consumers, estimating membership probabilities instead.

— *Bio-ready consumers* (Class 1): this class size is about 1/3 of surveyed consumers, with product type (organic *vs.* conventional tomato) by far the most important attribute. Consumers in this class strongly prefer bio to non-bio tomatoes. Additionally, consumers in Class 1 prefer field tomato to greenhouse tomato. They were indifferent to the two areas of origin within the country (Lushnja *vs.* Korça) since the estimated parameter was not significant. The price coefficient was negative and significant, showing that members in this class of consumers were price sensitive.

— *Price sensitive consumers* (Class 2): this class size was 29.3%. Price was the most important attribute for Class 2: each increase of 40 ALL in the unit price of tomatoes had a strong negative effect on the total utility and therefore on the probability of choosing a more expensive option. Consumers in this class, however, also prefer bio to conventional tomato and open field to green-house tomato as those in Class 1.

— *Variety-seeking consumers* (Class 3) with a class size of 22.4%. Though production system (bio *vs.* conventional) was the most important attribute, consumers in this class tend to make trade-offs between different attributes much more than those in the other classes. In addition to their preference for bio tomato, they prefer Korça *vs.* Lushnja tomato and greenhouse to open field tomato. Consumers in this class showed a positive sign of the price coefficient, which presumably means that for these consumers price can be interpreted as a signal of quality.

— *Quality-seeking consumers* (Class 4): this was the smallest class size (15.8%). Production system was the most important attribute and open field tomatoes were strongly preferred to greenhouse tomatoes. Product type was the second most important attribute with "bio" clearly preferred to conventionally grown tomato. In this case, Korça was preferred to Lushnja tomato.

All in all, the estimated parameters for part-worth utilities associated with the "bio" product were all positive and significant highlighting the main results of this study that organic tomatoes were preferred to conventional grown ones. There is potential for growth of the organic sector, since a large share of consumers were strongly oriented towards choosing organic tomatoes, although it is important to point out that this is something stated in a hypothetical purchase situation.

Socio-demographic variables were included in the analysis and they contributed to defining the probability of each consumer belonging to one of the four classes identified above. Results indicate that income was the main variable significantly affecting clusters membership. Class 1 (Bio-ready consumers) was more likely made of higher income households, since income represents an influential (β=2.87) and significant (p<0.01) characteristics of consumers classified in Class 1 (Table 7). Class 2 (Price sensitive consumers), instead, was more likely made of lower income households. The characteristics of this class were very similar with characteristics of consumers described in a survey conducted by Chan-Halbrendt *et al.* (2010). Class 3 was also made up of higher income and more educated consumers, while other socio-demographic variables did not significantly affect Class 4 (Table 7).

Willingness to pay

The model parameters obtained above allow estimation of the value of the attributes/levels. By calculating the marginal rate of substitution between the attribute levels and measured in monetary units, the maximum WTP can be estimated. The WTP for specific product characteristics was derived by the price difference necessary to make an individual equally happy

Table 6. Class sizes, importance of attributes and model parameter estimates

	Class 1	Class 2	Class 3	Class 4
Class size	32.54%	29.30%	22.39%	15.77%
Attribute importance				
Price	21.34%	**69.41%**	34.36%	15.55%
Production system	18.03%	8.49%	10.95%	**43.29%**
Product type	**58.25%**	18.59%	**45.76%**	28.14%
Origin	2.37%	3.52%	8.93%	13.02%
Parameter estimates				
Price	-0.017**	-0.036**	0.018**	-0.005**
Production system				
Field tomato	0.849**	0.261**	-0.336**	0.870**
Greenhouse	-0.849**	-0.261**	0.336**	-0.870**
Product type				
Non-organic	-2.743**	-0.570**	-1.404	-0.566**
Organic	2.743**	0.570**	1.404**	0.566**
Origin				
Korça	-0.112	-0.108	0.274**	0.262**
Lushnja	0.112	0.108	-0.274**	-0.262**

**Significant 0.01% level. Numbers in bold show the most important attribute for each class.

or indifferent when choosing between two alternatives. The maximum WTP for a discrete quality attribute *vs.* an equivalent option without that attribute was simply calculated as the negative ratio of the difference in attribute coefficients (part-worth utility) divided by the price coefficient (utility of the monetary unit), all the other characteristics of the product being equal (Hensher *et al.*, 2005):

$$WTP_{bio-conv} = -(\beta_{bio} - \beta_{conv}) / \beta_{price} \qquad [6]$$

The maximum WTP for one kg of tomato for the attributes/levels considered in our design, calculated using equation [6] and the model parameters estimated in Table 6, are illustrated in Table 8. The WTP estimation is omitted when a coefficient is not significantly different from 0 and for the class that has a positive price parameter, since it shows WTP would be not consistent.

Discussion

This study sheds light on consumer preferences for organic tomatoes in Albania, including product attributes such as product type, production system, origin, and price. Results of the study provide market information of consumer groups with different purchasing preferences. This market intelligence information identifies potential market segments that can be targeted by producers/traders. In the context of the Albanian market, to the best of authors' knowledge, this is the first in-depth study on consumer preferences and WTP for tomatoes in general and organic tomatoes specifically.

Table 7. Socio-demographic estimates by class.

	Class 1		Class 2		Class 3		Class 4	
Covariates	**B**	**z-value**	**B**	**z-value**	**B**	**z-value**	**B**	**z-value**
Gender	0.36	1.33	0.51	1.65	-0.57	-1.64	-0.29	-0.80
Age	0.01	0.93	0.00	0.09	-0.03	-2.25	0.02	1.59
Education	0.03	0.13	-0.71	-2.67	0.78	2.33	-0.11	-0.36
Household size	-0.17	-1.41	0.01	0.11	-0.03	-0.19	0.19	1.40
Income	2.87**	3.16	-4.72**	-3.63	4.42**	4.02	-2.57	-1.87

**Significant 0.01% level

Table 8. Willingness to pay estimates (in ALL = Albanian Lek)

Tomato attributes	Bio-ready consumers	Price sensitive consumers	Quality seeking consumers
Field *vs*. greenhouse	102	15	335
Bio *vs*. conventional	328	32	218
Korça *vs*. Lushnja			101

While cluster membership probabilities of various product profiles are important, it is also useful to discuss the WTP for different attributes under consideration, since they are crucial to producers as they consider the type of tomatoes to supply.

It appears that all consumer classes were willing to pay significant premium for organic tomatoes *vs.* conventionally grown ones. Particularly, the "Bio-ready consumer" class is willing to pay 328 ALL (~€2.3) more per kilogram of organic tomatoes. Also "Quality seeking consumers" class WTP for organic tomatoes was quite high, namely 218 ALL (~€1.6) per kg. As expected, the "Price sensitive consumers" class is willing to pay only 32 ALL (~€0.2) per kg of organic tomatoes compared to conventional tomato.

All classes (for which WTP have been calculated) showed WTP a premium for field tomatoes over greenhouse tomatoes; namely 102 ALL (€0.7), 15 ALL (€0.1) and 335 ALL (€2.4) per kg respectively for the "Bio-ready consumers", "Price sensitive consumers" and "Quality seeking consumers" class. Field production was perceived as more natural and probably also more tastier when compared to greenhouse production. This is probably the reason why the "Quality seeking consumers" class prefers open field to organic greenhouse tomatoes, all the other characteristics being equal.

In terms of origin, it is an important attribute only for "Quality seeking consumers" class whose WTP a premium for tomatoes produced in Korça *vs.* tomatoes from Lushnja is 101 ALL (€0.7) per kg.

An important caution to these estimated values seems warranted. The WTP values for the price sensitive classes were reasonable and comparable to the market prices for the product at hand; however, the values for the "Bio-ready consumers" were rather high. In the case of the "Bio-ready consumer" class, excessive WTP was likely to be attributed to (i) the use of a stated preference approach, which tends to overestimate the results, and (ii) to the possible presence of lexicographic responses. Lexicographic behaviour occurs when respondents to a stated preference survey choose alternatives based upon only one or few attributes and it can lead to an over estimation of that attribute parameter and to lack of responsiveness to price (Meenakshi *et al.*, 2012). In any case, these WTP estimations can only provide a general indication of the greater interest these consumers show for the proposed attributes.

Another important warning is that the WTP calculated in this way must not be interpreted as a suggested premium price for a quality attribute, since at that price difference, a consumer would be equally interested in buying the product of the less preferred alternative. Therefore, in a marketing context a premium price should be set at a lower level compared to WTP and the lower the premium, the higher the probability that consumers would actually buy the most preferred alternative, all the other conditions being equal. The market for bio product in Albania is still small, but consumers' preference and WTP a premium for bio food represents a potential for market development. Overall, there is a strong preference for organic tomatoes – that is in line with other studies on consumer preferences for organic food in Albania (Imami *et al.*, 2016).

Organic production was the most important attribute for the largest group of consumers (Bio-ready consumers). Similarly to Ekelund & Tjarnemo (2004), price was by far the most important attribute for the "Price sensitive consumers" class that also shows a preference for organic tomato. The third class (Variety-seeking consumers) seems to be more prone to trade off among the attributes and their levels, and the fourth group (Quality-seeking consumers) values the open field production and the organic production more than the other attributes considered.

Therefore, it can be concluded that organic products are in general preferred to conventional ones for all the four classes identified. This is line with the findings of Zanoli & Naspetti (2002), Yiridoe *et al.* (2005), and Guido *et al.* (2010), and contradictory with the findings of Zhao *et al.* (2007), Hemmerling *et al.* (2013) and Fernqvist & Ekelund (2014), who found weak preferences for organically grown when compared to conventionally grown tomato. The widespread and generally positive preference of Albanian consumers for bio products may be explained by the fact that they are mainly grounded on health-related concerns. According to Imami *et al.* (2016), most Albanian consumers consider factors surrounding health to be the most important determinants for preferring the organic products (as in the case of Wilkins & Hillers, 1994; Grunert & Juhl, 1995; Anastasiadis & van Dam,

2014). Since there are strong concerns about food safety and its enforcement in Albania (Imami *et al.*, 2011; Zhllima *et al.*, 2015; Verçuni *et al.*, 2016), the purchase of organic products can be interpreted as a risk reduction strategy by many consumers.

WTPs estimations highlight and confirm the two main findings of the study. There is a clear preference for organic product and positive WTP for organic tomato. This finding is similar to other studies which confirm WTP for organic tomatoes, especially when the credence attribute is associated to labels and information (Huang & Lin, 2007; Thøgersen, 2009; Bhatta *et al.*, 2010; Bashir, 2012; Biguzzi *et al.*, 2014). The premium price that 3 out of 4 identified classes are willing to pay for organic tomatoes is quite high and indicates a clear market potential.

Two important limitations of this study must be highlighted: 1) the sample is only targeting urban consumers, and for that reason it might not be considered representative of the whole country population; and 2) the CCE method is based on stated preference, which tends to overestimate consumer WTP, since consumers do not have incentives to behave realistically (they do not really pay the price of their choices, as in case of revealed preference methods). Hence, the results should be interpreted with care. However, a rather very high WTP shows that the potential for developing an organic product sector is very promising.

The findings presented in the study deliver useful information to agribusiness operators. The survey results give indications on consumer preferences in Tirana, the largest urban area and the most important market in Albania, with a higher income population compared to other regions (see INSTAT, 2013; 2014). This higher income population market should be the most obvious target market for the introduction of premium food products, such as organic tomatoes. Further research is needed however for exploring the sensory preferences of Albanian consumer on tomatoes following similar approach with the studies of Causse *et al.* (2010) and Moser *et al.* (2011).

In order to develop market potentials for organic food production in Albania, several issues must still be considered by both private businesses and government agencies. The former may consider opening special "bio" product shops, negotiate dedicated areas in supermarkets, and develop on-farm direct selling strategies combined with agro-tourism. Government agencies may consider the possibility of subsidizing bio production in order to help farmers to overcome the barriers to entry into this new sector and support the development of the sector by implementing extension, training and certifications programmes.

Another issue to be considered by both private sector actors and policy-makers is addressing the limited understanding of average Albanian consumers about organic food. The term of "bio" or "organic" food product is not obvious for most urban consumers in Albania (Imami *et al.*, 2016). Even in more advanced economies with rather developed organic food (production and trade) sector, there is limited understanding around the definition of organic food (Hughner *et al.*, 2007). Also Yiridoe *et al.* (2005) confirmed that consumers were not consistent in their perception of what was organic food product. Thus, it is not a surprise that in the case of Albania, with poorly developed organic food production and marketing, the awareness among consumers around organic food is low. Despite the lack of understanding, most Albanian consumers link organic food to food safety and health benefits, while there is lack of awareness about environmental impact (Imami *et al.*, 2016). Therefore, any promotion campaign for organic tomatoes (food) should also include educating average consumers regarding organic food concepts and standards, and related health and environmental benefits.

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