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REGULAR PAPER
Willingness to pay for organic and fairtrade certified yellow chili peppers

Evidence from middle and high income districts in Lima, Peru

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Abstract

Purpose – The purpose of this paper is to evaluate the consumers' preferences in middle- and high-income districts in Lima for three organic and Fairtrade certification attributes: environmental protection, production without pesticides, and improvement in the quality of life of farmers. Yellow chili pepper was used as case study.

Design/methodology/approach – A survey of 183 households was conducted among the population located in middle and high income districts in Lima, because of their higher ability to pay. Choice experiment data were analysed using random parameter logit models (RPM) with and without interaction effects.

Findings – The results suggest that there is a statistically significant willingness to pay for organic and Fairtrade certification attributes (ranging from S/.4.4 to 9.3). The results also indicate that the higher the income the higher the willingness to pay for yellow chili peppers grown without pesticides.

Originality/value – The results provide support that willingness to pay values for particular food certification attributes are statistically significantly associated with the ability to pay even among the middle and high income population in Lima. This positive association between willingness to pay and income is not always present among the general population in developed countries. As such, the demand for certified products would be especially associated with the overall economic growth of the emerging and developing country under consideration.

Keywords Developing countries, Income, Consumer choice, Chili peppers, Fair trade, Organic certification

Paper type Research paper

Introduction

The worldwide retail sales of organic certified food and drink were estimated at 62.9 billion US dollars in 2011 (FIBL and IFOAM, 2013). The demand for organic certified products has increased and is expected to grow at over 20 per cent per year in developed countries (Raynolds, 2004). In those countries, the domestic production is unable to keep pace with such demand, and much of the organic commodities are imported (Barrett *et al.*, 2002). Accordingly, over the last decade, the production of certified organic goods has grown rapidly throughout emerging and developing

countries. At present, 90 countries in the global South produce organic goods in commercial quantities, almost all for export to Europe and the USA (Raynolds, 2004). Latin America constitutes the hub of certified organic production, with 6.9 million hectares under organic production, which constitutes about 1.1 per cent of its total agricultural land. In Asia and Africa, there are 3.7 and 1.1 million hectares under organic production. Therefore, in those regions, the shares of organic agricultural land with respect to the total agricultural land are only about 0.1 and 0.3 per cent, respectively (FIBL and IFOAM, 2013).

Similarly, over a million producers and hundreds of millions of consumers currently participate in certification marketing channels, with annual Fairtrade sales nearing US$5 billion (FLO, 2013). Sales of Fairtrade certified products are also rising: the overall growth in the value of Fairtrade sales was €673 million in 2011, which corresponds to a 22 per cent increase from 2010 (FLO, 2012a). Fairtrade mostly applies to products imported from the global South to developed countries (North-South trade) (Howard and Allen, 2008). However, as stated by FLO (2011), "The term Fair Trade defines a trading partnership, based on dialogue, transparency and respect, that seeks greater equity in international trade. It contributes to sustainable development by offering better trading conditions to, and securing the rights of, marginalized producers and workers – especially in developing countries." In this sense, "The North-South relationship is not included in this definition. While producers and workers are mainly located in the South of the planet, consumers, on the other hand, do not appear to have to belong to a particular hemisphere" (BTC, 2010, p. 6). Nicholls and Opal (2006, p. 243) consider the promotion of South-South Fairtrade a "huge market opportunity" due to the increasing purchasing power of the significant middle class emerging in many developing countries.

There are successful initiatives currently focused on South-South Fairtrade. Those initiatives include the promotion of sales in domestic markets inside the same producing country. For example, Fairtrade Label South Africa (FLSA) was created in 2009 to develop the internal market for Fairtrade products (FLSA, 2013). In 2012, the total sales of Fairtrade products domestically were estimated at R234 million (23.8 million US dollars), corresponding to an increase of 220 per cent from 2011 (FLSA, 2013). However, South-South Fairtrade faces specific challenges. Fairtrade as it is commonly practiced today (South-North) has an expensive certification system. Similarly, the work and expense of organic certification creates a major barrier to entry for small-scale farmers (Raynolds, 2004). Raynolds (2004) also points out that the trajectory of the traditional certification sector is fundamentally driven by consumers' preferences and institutional relations in the North. Accordingly, BTC (2010, p. 17) indicates that "South-South fair trade would re-appropriate the term fair and would give it a local dimension, no doubt with less stringent criteria, but closer to local reality." Local initiatives such as "Promoting Fair Trade in India" (PROFIT) have already developed rules and criteria for fair trade adapted to the local context, as well as a certification and follow-up system (IRFT, 2013). One of the advantages of creating local Fairtrade labels is the potential for developing standards that add value to products that are only in demand in the internal market (BTC, 2010). In this context, it is of minor relevance to identify local consumers' WTP for traditional organic and Fairtrade logos; rather it is more important to understand which attributes consumers value the most in order to be able to include those in potential locally developed organic and Fairtrade labels.

The objective of this research is to evaluate domestic ("South-South") household demand for organic and Fairtrade intrinsic characteristics, as indicated by local

consumers' willingness to pay (WTP) in Peru for three of the main attributes of organic
and Fairtrade certifications: environmental protection, production without synthetic
pesticides, and improvement in the farmers' quality of life. Yellow chili peppers were
used as the subject of this case study because it is commonly used in home-made
preparations. Medium and high income households were targeted due to their higher
ability to pay. This is also related to practical reasons (for obvious reasons, low income
households do not buy price premium products in developing countries). For example,
FLSA focuses its efforts exclusively on the top 20-25 per cent consumers in terms of
purchasing power in major cities of South Africa (Cooper, 2012). As such, this paper
does not intend to draw conclusions for the whole population, but only for the medium
and high income segments under study.

Background information
Organic and Fairtrade certification attributes
At present, organic and the Fairtrade certifications are two of the most well-known
certifications (although others exist) worldwide (Beuchelt and Zeller, 2011). The exact
standards for organic products depend on the importing country and the specific
certification label. The International Federation of Organic Agriculture Movement
(IFOAM), founded in 1972, is the only umbrella organization of the organic movement,
and currently has 750 member organization worldwide (IFOAM, 2013a). IFOAM has
established a common set of organic standards. Those common standards focus on
(IFOAM, 2007): enhancing the health of soil, plants, animals, and humans; helping
to sustain ecological systems; ensuring fairness among people and their relationship to
other living beings; and preventing significant risks by adopting appropriate
technologies and rejecting unpredictable ones. Among the main characteristics of this
certification are that it prohibits the use of synthetic agrochemical inputs and also aims
at preventing environmental pollution and degradation.

Different labels also exist in the fair trade movement. The most common standard is
the "Fairtrade" label (Wills, 2006). The Fairtrade Labelling Organization (FLO) is the
umbrella organization of 19 Fairtrade labelling initiative members worldwide. FLO sets
the Fairtrade standards, which follow several key objectives such as (FLO, 2012b):
ensure that producers receive (fair) prices that cover their average costs of sustainable
production; provide an additional Fairtrade premium to be invested in enhancing
sustainability; enable pre-financing; and facilitate long-term trading partnerships, and
enable greater producer control over the trading process. The main differentiated
attribute of Fairtrade is the provision of "fair prices", which is a unique characteristic of
this certification.

Organic and Fairtrade certified production in Peru
There are no reliable data on the quantities or value of certified organic goods being
produced in developing countries. Most of the data on organic products are very scarce.
This situation is complicated by the fact that no clear distinction is made between
organic and other types of goods in official statistical accounts (Barrett *et al.*, 2002).
In Peru, the total organic export market in 2006 was estimated at 100 million US Dollars
(Zschocke, 2008). The majority of the organic production (97 per cent) is exported to
US and European Union (EU) markets, 94 per cent of which are coffee and cocoa.
The internal market for certified goods is still small, although different NGOs have
promoted weekly organic "bio-fairs", notably in Lima since 1999. Organic products are

also found in some specialized shops in Lima. Sales through those channels were minor, and estimated at 0.5 million US dollars in 2006 (Zschocke, 2008).

Peru is the Latin American country with the largest number of Fairtrade-certified producers' organizations, totalling 91 in 2011 (FLO, 2012a). As in the case of organic certified products, Fairtrade certified goods are mainly aimed at international markets. Peru exported an equivalent of 81 million Euros (or about 97 million US Dollars) worth of Fairtrade products in 2010 (Beltran, 2012). The main Fairtrade certified export is coffee, making Peru the leading Fairtrade certified coffee exporter in the world (25,730 metric tons, 26 per cent of the total Fair-trade coffee production), followed by Mexico and Colombia with market shares of 9 per cent each (FLO, 2009). Some Fairtrade products are also offered at "bio-fairs", although estimates of their sales are currently unavailable. Regarding chili peppers, only organic certified chili peppers are exported to US, but those exports were relatively unimportant, and valued at 6.6 thousand US dollars in 2007 (Olsen, 2008). Currently, there is no Fairtrade certified chili pepper production in Peru.

Price premiums for organic and Fairtrade certifications

Numerous studies have evaluated consumers' WTP for organic and Fair-trade attributes in developed countries using choice experiments. Van Loo *et al.* (2011) found price premiums from 35 to 104 per cent for organic chicken breast in Arkansas, USA; Olesen *et al.* (2010) indicated a price premium of 15 per cent for organic salmon in Norway; Howard and Allen (2008) suggested a price premium of 68 per cent for Fairtrade strawberries in the USA; Pouta *et al.* (2010) found price premiums ranging from 5 to 28 per cent for organic broiler meat in Finland; and Scarpa *et al.* (2007) calculated price premiums of 10 to 150 per cent for environmental-friendly carrot production in Italy. From those studies, Van Loo *et al.* (2011) evaluated the effect of income in WTP and found that in some cases the relationship was negative. For example, higher income households (US$70,000-89,999) were willing to pay less for organic certification than lower income households (less than US$15,000 per year). The number of studies assessing the WTP for organic attributes in developing countries is still scant. Exceptions include Hearne and Volcan (2005), who calculated a price premium of 19 per cent for a "Green Seal" in Costa Rica; and Birol *et al.* (2009), who evaluated consumer preference for organic grapes in India, although price was not a statistically significant attribute in their study. To the best of my knowledge, there are no choice experiment studies about consumer preferences for Fairtrade attributes, which were implemented within emerging and developing countries.

Survey design and econometric model specification
Survey design and implementation

A face to face survey was conducted in 2011 with 205 households in Lima, Peru's capital city. The sampling procedure was stratified by districts. The sample considered 12 (Barranco, Jesús María, La Molina, Lince, Magdalena del Mar, Miraflores, Pueblo Libre, San Borja, San Isidro, San Miguel, Santiago de Surco and Surquillo) of the 43 districts of this city, because they include most of Lima's medium and high income population (Apoyo, 2011). The number of inhabitants in those districts is estimated at 1,168,926, which corresponds to about 14 per cent of the total population of Lima (INEI, 2007). To obtain a random sample within each district, a numbered grid was overlaid over each district map. Then, a computer generated random number was used for selecting one square per district map for sampling. Enumerators were sent to the house located in the

centre of the selected squares for interviewing. If nobody was available, the enumerator chose the nearest house until a respondent was found.

The choice experiment was part of a very large questionnaire assessing local consumption of different types of native chili peppers under the scope of a project funded by the German Development Cooperation (GIZ). In the choice experiment, the choice set included three options: A, B and the option currently available in the market (status quo). The respondent had to select only one of those three options. Option A and B had different levels of the following attributes: environmental protection, production without synthetic pesticides, improvement in farmers' quality of life, and price. Only three attributes were considered in the evaluation to reduce choice complexity. When respondents face too complex choice sets, such as those with many attributes, they are thought to continue assessing available attributes, although they do so with increasing levels of error (Hensher *et al.*, 2007). To avoid confusion among respondents about the meaning of those attributes, additional information was provided in the choice sets. The "environmental protection" attribute focused on soil, water, air, and biodiversity conservation; "production without synthetic pesticides" on potential harmful effects on health; and "improvements of farmers' quality of life" on fair price payments to small-holder farmers. The organic and Fair-trade attributes were indicated as present or absent, and the price levels were S/0.6, 7, 8, 9, and 10 (one US dollar ≈ S / 2.6). The status quo option indicated yellow chili pepper without any certification with the current price of S/0.5.

In this sense, the selected attributes are not exhaustive of all the implications of organic and Fairtrade certifications, which have a large number of criteria. For example, the Fairtrade Standard for Small Producer Organizations is 45 pages long, and includes requirements for traceability, sourcing, contracts, freedom from discrimination, among others (see FLO, 2011). However, Jaffee and Howard (2009, p. 397) argue that for consumers there is a "simplification of the operational meaning of both initiatives toward a single variable: allowable versus prohibited inputs in organics, and payment of a minimum price in fair trade". Therefore, only the most representative attributes of those certifications were selected: production with environmental protection and production without synthetic pesticides in the case of organic certification, and improvement of farmers' quality of life through fair price payments in the case of Fairtrade certification. Also, the descriptions of the organic and Fairtrade attributes were kept concise. Zander *et al.* (2013) evaluated organic certification and Fairtrade attributes using a combination of methods. They discussed with consumers on different ways to successfully communicate these attributes and found that consumers preferred and better understood short statements referring to very specific aspects of production (e.g. "from the respective region", "highest animal welfare standards").

In the choice experiment, the status quo was included as the "opt-out" alternative. In demand choice experiment applications, the opt-out alternative competes with the other alternatives in the choice set and it is usually framed either as "status quo" or "no purchase" option (Kontoleon and Yabe, 2009). Overall, the reason for including an opt-out alternative is to resemble the freedom of choice that consumers have in real market situations, where they can decide to buy their habitual brand, a new brand, or not to purchase any product at all. The use of a status quo as an opt-out option is sensible when the product is consumed by most households; otherwise, the no purchase option should be used (Dhar and Simonson, 2003). Yellow chili pepper is known as the particular ingredient that gives traditional Peruvian food its unique flavour (Valderrama, 2010), and previous

analyses have indicated that almost all the households located in medium and high income neighbourhoods buy and consume this product (Garcia, 2011). Therefore, a status quo instead of the no purchase option was used in the choice sets.

There were a low number of attributes and levels ($2^3 \times 5$); therefore, a blocked full factorial design was constructed to allow each respondent to answer two independent choice scenarios. Full factorial designs have the advantage of allowing the calculation of main and interaction effects. In this study the RPMs with interaction effects among certification attributes were not significant, and are not included in this paper, but are available upon request to the author. An example of a choice scenario is shown in Table I. The choice experiment was preceded by a "cheap talk" in order to reduce potential "hypothetical bias".

Econometric model specifications
In this study, the model specification without interaction effects is based on the following utility function:

$$U_{ijt} = \beta_0 + \beta_1\text{Price}_{ijt} + \beta_2\text{Env}_{ijt} + \beta_3\text{Pest}_{ijt} + \beta_4\text{Farmer}_{ijt} + \varepsilon_{ij} \tag{1}$$

The model with an interaction term between non-synthetic pesticides attribute and income becomes:

$$U_{ijt} = \beta_0 + \beta_1\text{Price}_{ijt} + \beta_2\text{Env}_{ijt} + (\beta_3 + \beta_4\text{Inc})\text{Pest}_{ijt} + \beta_5\text{Farmer}_{ijt} + \varepsilon_{ij} \tag{2}$$

where $i = 1, \dots, n$ is the number of the respondents; t is the number of choice occasions; j is the option A, B, or status quo; β_0 is a variable indicating the selection of alternative A or B with respect to the status quo; Price is the price per kilogram of yellow chili peppers; Env, Pest and Farmer are dummy variables indicating the presence or absence of environmental protection, production without synthetic pesticides, and an improvement in farmers' quality of life, respectively; and Inc is the monthly income level in Peruvian Soles.

RPM
An individual faces a choice among the alternatives in the choice set J in each of T time periods or choice situations. The utility that the individual i obtains from alternative j in choice situation t is (Revelt and Train, 1998):

$$U_{ijt} = \beta_i X_{ijt} + \varepsilon_{ijt} \tag{3}$$

	Option A	Option B	Option currently available in the market
Production with environmental protection (soil, water, air, and biodiversity conservation)	Yes	No	No
Production without synthetic pesticides (with potential harmful effects to health)	No	Yes	No
Improvement of quality of life of farmers (through fair price payments)	Yes	Yes	No
Price per kilogram (Peruvian soles, S/)	S/9	S/8	S/5

Note: One Euro ≈ S/3.5

Table I.
Example of choice scenario

where X_{ijt} are observed variables; β_i are the coefficients that vary in the population with density $f(\beta_i/\theta)$, where θ are the parameters of the distribution (mean and variance), and ε_{ijt} is the extreme value error term $(0, \sigma^2)$, i.i.d. (independently distributed) over alternatives and independent of β and X.

Then in the RPL model, the (unconditional) probability that individual i chooses alternative j in a choice set, C_i, is:

$$\text{Probi}(j\text{chosen}) = \int \frac{e^{vijt}}{\sum_{k-1}^{j} e^{vikt}} f\left(\frac{\beta i}{\theta}\right) d\beta i, \text{ with } k \tag{4}$$

For maximum likelihood estimation, the probability of each sampled individual's sequence of observed choices (S_i) is needed. Therefore conditional on β_i, the probability of the individual i observed sequence of choices is the product of the logit equations:

$$S_i(\beta_i) = \prod_{t-1}^{T} \frac{e^{\beta_i\ X_{ijt}}}{\sum_{k-1}^{j} e^{\beta_i\ X_{ikt}}} \tag{5}$$

The unconditional probability of this sequence of choices is the integral of this product over all values of β:

$$Pi = \int Si(\beta i) f\left(\frac{\beta i}{\theta}\right) d\beta i \tag{6}$$

There is no closed form solution; therefore the probabilities are approximated through simulation techniques (Train, 2009). R draws of values of β are drawn from $f(\beta_i/\theta)$ and labelled β^r with $r = 1, …, R$. Halton draws are used because they have been shown to provide a more efficient distribution of draws compared to random draws.

The individual-specific WTP estimates are calculated using simulated values from the chosen distributions. If ηra is the rth random draw from the distribution of the coefficients of attribute a (e.g. non-synthetic pesticides) with mean βa and standard deviation σa, and the price coefficient is βp, then the WTP is calculated as (Hensher et al., 2005):

$$\text{WTP individual} = (\beta a + \beta i\ \text{Inc} + \eta ra\sigma a)/\beta p \tag{7}$$

In the case of attributes without interaction terms (environmental protection, and farmers' quality of life), $\beta i\ \text{Inc} = 0$. The (conditional) mean WTP by attribute simply becomes the sum of WTP individual divided by the number of individuals.

Results
The main descriptive statistics of the sample are presented in Table II. The average age of the respondents was 43. Most of the respondents were females (81 per cent). In the majority of the households (55 per cent), the monthly income without excluding taxes is between S/3,001 and S/7,000. The average income per month of the respondents is S/4,579. This income is above the calculated average income in Peru, which is about S/1,000 (IMF, 2011). There are no official national statistics for income per district in Lima. However, Apoyo (2011) indicates that the income level of the high and middle income population strata in Lima is about S/3,975. This means that we oversampled higher income households in those districts. In addition, 51 per cent of the respondents have university education. This value is slightly above the estimated 49 per cent of

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Variable	Sample mean or percentage	Population in high and middle income districts[a]
Age (in years)	43.344 (14.260)	36.100
Female (%)	80.874	54.320
Average income per month in Peruvian Soles (S/)	4,579.260	3,975.363
Monthly income less than S/1,000 (%)	3.279	na
Monthly income between S/1,001 to S/3,000 (%)	25.137	na
Monthly income between S/3,001 to S/5,000 (%)	33.880	na
Monthly income between S/5,001 to S/7,000 (%)	20.765	na
Monthly income between S/7,001 to S/9,000 (%)	8.197	na
Monthly income more than S/9,000 (%)	8.743	na
Primary school (%)	2.732	6.579
Secondary school (%)	18.579	24.365
Technician (%)	27.322	20.125
University education (%)	51.367	48.931
Consumption yellow chili pepper (kg per week)	0.375 (0.378)	na
Consumption of chili varieties (number of varieties)	4.421 (1.741)	na
Attitude about environmental protection (from 1 = not important at all to 5 = very important)	4.640 (0.521)	na
Attitude related to avoiding synthetic pesticides in food (from 1 = not important at all to 5 = very important)	4.798 (0.416)	na
Attitude about improving the quality of life of farmers (from 1 = not important at all to 5 = very important)	4.247 (0.729)	na
Attitude about price (from 1 = not important at all to 5 = very important)	3.6923 1.200	na

Note: Standard deviation in parentheses. na, no available. [a]Level of education for population 20 years and older
Source: INEI (2007)

Table II.
Descriptive statistics

inhabitants of those districts with university education in national statistics (INEI, 2007). Only the person in charge of buying decisions was surveyed; therefore relatively older, wealthy female respondents were expected in the sample. The average consumption of yellow chili pepper was 0.4 kg per week, and the number of chili varieties consumed was about four, including yellow chili pepper. Consumers attitudes about environmental protection, avoiding synthetic pesticides in food, importance of improving the quality of life of farmers, and prices were measured using a Likert scale from 1 = not important at all, to 5 = very important. Most of the respondents considered that avoiding synthetic pesticides was "very important" (4.8), while environmental protection and improving the quality of life of farmers were "important" (4.6 and 4.3, respectively). Price was marginally important (3.7).

The econometric results were evaluated under homogeneous assumptions using a MNL, and under heterogeneous assumptions using a RPM[1]. The MNL was included for comparison purposes. The variables selected as random parameters were the organic and Fairtrade attributes, which were assigned a normal distribution. The software used in the analysis was Nlogit 5 and the RPM estimation was conducted with 1000 Halton draws. The results of the models are presented in Table III.

The parameter estimates of the MNL are included in the second column of Table III. RPM without and with interactions were estimated. In order to avoid over-fitting the

Variable	Conditional MNL	RPM		
		Without interactions	With interactions	With interactions
Constant	1.5717 (0.5272)***	3.7144 (1.0544)***	3.7164 (1.0577)***	3.6618 (1.0532)***
Environmental protection	1.0787 (0.1877)***	2.7494 (0.7344)***	1.8843 (1.0215)*	2.7808 (0.7339)***
Environmental protection (SD)	–	3.1826 (1.1400)***	3.1971 (1.1128)***	3.2015 (1.1322)***
Non-synthetic pesticides	1.9423 (0.2098)***	5.1717 (1.2786)***	2.6903 (1.3596)**	2.6339 (1.3508)*
Non-synthetic pesticides (SD)	–	4.6551 (1.4425)***	4.7675 (1.5126)***	4.7016 (1.4804)***
Quality of life of farmers	0.8826 (0.1861)***	2.6791 (0.6919)***	1.7762 (0.9898)*	2.6363 (0.6727)***
Quality of life of farmers (SD)	–	2.9844 (0.9725)***	3.0183 (0.9623)***	2.8576 (0.9374)***
Price (in Soles)	–0.2572 (0.0645)***	–0.6047 (0.1388)***	–0.6040 (0.1385)***	–0.5994 (0.1383)***
Environment × Income	–	–	0.0002 (0.0002)	–
Non pesticides × Income	–	–	0.0006 (0.0003)*	0.0006 (0.0003)*
Quality of life × Income	–	–	0.0002 (0.0002)	–
McFadden R^2	0.1975	0.3534	0.3629	0.3600
AIC	1.5772	1.4623	1.4600	1.4550

Note: SD, standard deviation; Number of respondents = 183; number of observations = 366. Standard error in parentheses. ***, **, *, Significant at 0.01, 0.05, or 0.1 levels respectively

Table III.
Estimates for
multinomial logit
and random
parameters logit
models

models, the interaction terms of the certification attributes with each socio-economic characteristic (e.g. age, female, education) were included in different RPMs (those results are available upon request to the author). However, only the interaction of non-synthetic pesticides and income[2] was found to be statistically significant. Therefore Table III only considers the RPMs including the interaction terms among each certification attribute and income, and non-synthetic pesticides and income. The latter model is preferred to the other models based on the lower AIC. This model also fits the data relatively well with a pseudo R^2 of 0.36. Louviere *et al.* (2000) report that R^2 values in the range from 0.2 to 0.4 represent acceptable fits for choice models. All the organic and Fairtrade attributes were positive and significant, indicating that respondents are better off when more of those attributes are provided to them. In addition, the standard deviations of organic and Fairtrade attributes (environmental protection, production without synthetic pesticide, and farmers' quality of life) were all statistically significant. This result suggests that different households possess individual-specific parameters that are different from the sample population mean parameter estimates for those attributes. On the other hand, the alternative specific constant is also positive and significant, implying that respondents are more likely to choose one of the alternatives (A or B) presented to them than the status quo. On the other hand, the statistically significant and positive interaction term between non-synthetic pesticides and income suggests that as income increases, sampled individuals tend to have higher individual-specific preference for the non-synthetic pesticide attribute.

Table IV shows the mean WTP or average individual-level WTP values for organic and Fair-trade attributes, calculated following Equation (7) by using the estimates of the model presented in the last column of Table III. Those mean values suggest that on average, households are willing to pay the largest price premiums for yellow chili pepper produced without synthetic pesticides (186.4 per cent), following by environmental protection (92.8 per cent) and finally for improvements in farmers' quality of life (87.8 per cent).

Discussions

The available literature about consumers' preferences for organic and Fairtrade certification attributes in emerging and developing countries is still scarce. This paper provides a contribution to consumers' valuation for organic and Fairtrade attributes in a South-South commercialization context. Overall, the results suggest that consumers are willing to pay for organic and Fairtrade certification attributes in emerging and developing countries, such as Peru. Therefore, efforts could be implemented to link farmers willing to follow organic and Fairtrade certifications' basic standards with conscientious consumers. However, the Fairtrade attribute is less valuable for the consumers than organic certification attributes, especially production without synthetic

Table IV.
Mean WTP and average price premiums for organic and fairtrade attributes per kilogram of yellow chili pepper in Peruvian soles

Attribute	Conditional mean or average individual-level WTP	Average price premiums per attribute (%)
Environmental protection	4.64 (0.1981)***	92.8
Non-synthetic pesticides	9.32 (0.2699)***	186.4
Quality of life of farmers	4.39 (0.1790)***	87.8
Notes: Standard errors in parentheses. ***Significant at 0.01 level		

pesticides. Nevertheless, the Fairtrade attribute is still positive and significant. As such, farmers should consider first to obtain organic certification before Fairtrade certification. On the other hand, further research is needed to evaluate the acceptability of new potential local organic and Fairtrade labels, which would depend on other aspects not included in this research such as trust on the certification body and monitoring systems.

The results also suggest that consumers prefer production without synthetic pesticides, compared with environmental protection and improvement in the farmers' quality of life. Grolleau *et al.* (2009) argue that the reduction of the pesticide residues in food products clearly has a private dimension because consumers perceive these lower levels of pesticide residues as preventing health problems. On the other hand, less soil and water pollution and farmers' quality of life have subjective social welfare significance, given that those preferences are not mainly motivated by personal well-being. These results are consistent with survey findings related to consumers' preferences in developed countries. According to Nielsen (2007), 48 per cent of European and 57 per cent of North American consumers indicate that the main reason for them choosing organic products is because "it's healthier for me". Only 16 per cent of Europeans indicate that the main reason they buy organic products is because "it is better for the environment".

The interaction term between the non-synthetic pesticides attribute and income was found to be statistically significant. As such, the results suggest that the higher the income the higher the WTP for the non-synthetic pesticide attributes. This result is particular relevant, because it provides support that WTP values for specific food certification attributes may be primarily associated with the ability to pay among the population in emerging and developing countries, as suggested by Birol *et al.* (2010). Similarly, as suggested by Freidberg and Goldstein (2011), lower income may make domestic markets in general a much weaker tool for positive agro-food change associated with the (potential) introduction and commercialization of certified products in developing countries. As such, the demand for certified products would be still associated with the overall economic growth of the emerging and developing country under consideration.

Conclusions
The results of this research suggest that certified agricultural products are demanded in particular domestic markets inside developing and emerging countries such as Peru. Most households in middle and high income neighbourhoods in Lima derive positive and significant values from both organic and Fairtrade attributes, with a larger preference for yellow chili pepper produced without synthetic pesticides (average WTP of S/9.3), lower preference for environmental protection (S/4.6), and improvements in farmers' quality of life (S/4.4). Households show heterogeneous preferences for chili pepper produced without synthetic pesticides according to their income level. The heterogeneity is straightforward: the higher the income the higher the WTP. The results provide support that WTP values for particular food certification attributes are statistically significantly associated with the ability to pay. This positive association between willingness to pay and income is not always present among the general population in developed countries (e.g. Van Loo *et al.*, 2011). As such, the results outline the importance of focused marketing strategies which should mainly target the wealthiest consumers in Peru. This could help to potentially increase the demand for organic and Fairtrade certified products with possible positive benefits for both the environment and farmers' socio-economic well-being.

Notes

1. An alternative for including heterogeneity in the evaluation is to run a latent class model. In this study, the latent class model failed to converge when two or more groups were estimated.

2. Income was included as one continuous variable in the regression to avoid over fitting the model.

References

Apoyo (2011), *Perfiles zonales de la Gran Lima 2011*, Apoyo, Lima.

Barrett, H., Browne, A., Harris, P. and Cadoret, K. (2002), "Organic certification and the UK market: organic imports from developing countries", *Food Policy*, Vol. 27, pp. 301-318.

Beltran, Y. (2012), "Comercio Justo es una herramiento eficaz para impulsar negocios inclusivos y exportaciones no tradicionales, afirma la Cámara de Comercio de Lima", *Aeronoticias*, available at: http://aeronoticias.com.pe/noticiero/index.php?option=com_content&view =article&id=26556:comercio-justo-es-una-herramienta-eficaz-para-impulsar-negocios-inclusivos-y-exportaciones-no-tradicionales-afirma-ccl&catid = 15:economia-comercio-exterior&Itemid=580 (accessed 27 July 2012).

Beuchelt, T. and Zeller, M. (2011), "Profits and poverty: certifications's troubled link for Nicaragua's organic and fair-trade coffee producers", *Ecological Economics*, Vol. 70, pp. 1316-1324.

Birol, E., Roy, D. and Torero, M. (2010), "How safe is my food? Assessing the effect of information and credible certification on consumer demand for food safety in developing countries", International Food Policy Research Institute. IFPRI Discussion Paper 01029, Markets, Trade and Institution Division, US, Washington, DC.

Birol, E., Roy, D., Deffner, K. and Karandikar, B. (2009), "Developing country consumers' demand for food safety and quality: is Mumbai ready for certified and organic fruits?", *Contributed Paper at the International Association of Agricultural Economists Conference, Beijing, 16-22 August*.

BTC (2010), *South-South Fair Trade*, Belgium Development Agency, Brussels.

Cooper, B. (2012), "BRICS and beyond: South-South the new direction for Fairtrade", available at: www.just-food.com/analysis/south-south-the-new-direction-for-fairtrade_id119899.aspx (accessed 10 July 2013).

Dhar, R. and Simonson, I. (2003), "The effect of forced choice in choice", *Journal of Marketing Research* XL, pp. 146-160.

FIBL and IFOAM (2013), *The World of Organic Agriculture. Statistics & Emerging Trends*, FIBL and IFOAM, Bonn.

FLO (2009), *Internal Statistics*, FLO, Bonn.

FLO (2011), *Fairtrade Standard for Small Producer Organizations*, FLO, Bonn.

FLO (2012a), *Monitoring the Scope and Benefits of Fairtrade*, 4th ed., FLO, Bonn.

FLO (2012b), "Aims of Fairtrade standards", Key objectives, available at: www.fairtrade.net/ aims_of_fairtrade_standards.html?&L=0 (accessed 20 July 2012).

FLO (2013), "For producers, with producers," Annual report 2011-12, FLO, Bonn.

FLSA (2013), "What is Fairtrade?", available at: www.fairtradelabel.org.za/whatis/about-us-flsa.3. html (accessed 10 July 2013).

Freidberg, S. and Goldstein, L. (2011), "Alternative food in the global south: reflections on a direct marketing initiative in Kenya", *Journal of Rural Studies*, Vol. 27, pp. 24-34.

Garcia, A. (2011), Estudio de Mercado de variedades sub-utilizadas de ajíes nativos (Capsicum spp.) en el Perú dentrol del marco del proyecto internacional financiado por la cooperación alemana "Descubriendo el potencial de la diversidad de los cultivos olvidades para la diferenciación de productos de alto valor y la generación de ingresos para los pobres: El caso del Capsicum en su cento de origen", Department of Marketing, Master's thesis, Universidad Peruana de Ciencias Aplicadas, Lima.

Grolleau, G., Ibanez, L. and Mzoughi, N. (2009), "Too much of a good thing? Why altruism can harm the environment?", *Ecological Economics*, Vol. 68, pp. 2145-2149.

Hearne, R. and Volcan, M. (2005), "The use of choice experiments to analyze consumer preferences for ecolabeled and organic produce in Costa Rica", *Quarterly Journal of International Agriculture*, Vol. 44 No. 4, pp. 381-397.

Hensher, D., Rose, J. and Bertoia, T. (2007), "The implications on willingness to pay of a stochastic treatment of attribute processing in stated choice studies", *Transportation Research Part E*, Vol. 43, pp. 73-89.

Hensher, D., Rose, J. and Greene, W. (2005), *Applied Choice Analysis. A Primer*, Cambridge University Press, New York, NY.

Howard, P. and Allen, P. (2008), "Consumer willingness to pay for domestic 'fair trade': evidence from the United States", *Renewable Agriculture and Food Systems*, Vol. 23 No. 3, pp. 235-242.

IFOAM (2007), *The IFOAM Basic Standards for Organic Production and Processing. Corrected Version, August 2007*, IFOAM, Bonn.

IFOAM (2013a), "About us", available at: www.ifoam.org/en/about-us-1 (accessed 10 July 2013).

IMF (2011), *World Economic Outlook*, IMF, Washington, DC.

INEI (2007), *Censos nacionales 2007: XI de población y VI de vivienda*, INEI, Lima.

IRFT (2013), "Fair Trade India", available at: www.irft.org/history-fair-trade.html (accessed 10 July 2013).

Jaffee, D. and Howard, P. (2009), "Corporate cooptation of organic and fair trade standards", *Agricultural and Human Values*, Vol. 27 No. 4, pp. 387-399.

Kontoleon, A. and Yabe, M. (2009), "Assessing the impacts of alternative 'Opt-out' formats in choice experiment studies: consumer preferences for genetically modified content and production information in food", *Journal of Agricultural Policy Resources*, Vol. 5, pp. 1-13.

Louviere, J., Hensher, D. and Swait, J. (2000), *Stated Choice Methods. Analysis and Applications*, Cambridge University Press, New York, NY.

Nicholls, A. and Opal, C. (2006), *Fair Trade. Market-driven Ethical Consumption*, SAGE Publications, Wiltshire.

Nielsen (2007), "Organic and functional foods. A global Nielsen consumer report", ANUGA, available at: http://pt.nielsen.com/documents/tr_0710_OrganicsFood.pdf (accessed July 2012).

Olesen, I., Alfnes, F., Roda, M. and Kolstad, K. (2010), "Eliciting consumers' willingness to pay for organic and welfare-labelled salmon in a non-hypothetical choice experiment", *Livestock Science*, Vol. 127 Nos 2-3, pp. 218-226.

Olsen, P. (2008), "Peru organic products update 2008", USDA Foreign Agricultural Service, Report No. PE8014, Global Agriculture Information Network, available at: http://apps.fas.usda.gov/gainfiles/200805/146294603.pdf (accessed July 2012).

Pouta, E., Heikkilä, J., Forsman-Hugg, S., Isoniemi, M. and Mäkelä, J. (2010), "Consumer choice of broiler meat: the effects of country of origin and production methods", *Food Quality and Preference*, Vol. 21 No. 5, pp. 539-546.

Raynolds, L. (2004), "The globalization of organic agro-food networks", *World Development*, Vol. 32 No. 5, pp. 725-743.

Revelt, D. and Train, K. (1998), "Mixed logit with repeated choices: households' choices of appliance efficiency level", *The Review of Economics and Statistic*, Vol. 80 No. 4, pp. 647-657.

Scarpa, R., Thiene, M. and Marangon, F. (2007), "The value of collective reputation for environmentally-friendly production methods: the case of Val di Gresta", *Journal of Agricultural & Food Industrial Organization*, Vol. 5 No. 1, pp. 1-28.

Train, K. (2009), *Discrete Choice Methods with Simulation*, 2nd ed., Cambridge University Press, New York, NY.

Valderrama, M. (2010), *Gastronomía, desarrollo e identidad cultural, El caso peruano*, APEGA, Lima.

Van Loo, E., Caputo, V., Nayga, R., Meullenet, J. and Ricke, S. (2011), "Consumer' willingness to pay for organic chicken breast: evidence from choice experiment", *Food Quality and Preference*, Vol. 22 No. 7, pp. 603-613.

Zander, K., Stolz, H. and Hamm, U. (2013), "Promising ethical arguments for product differentiation in the organic food sector. A mixed methods research approach", *Appetite*, Vol. 62, pp. 133-142.

Zschocke, A. (2008), "Bolivia's local organic market and how it might be affected by the new national organic legislation 3525/06", Master's thesis, Faculty of Organic Agricultural Sciences, University of Kassel, Kassel.

Further reading

IFOAM (2013b), "IFOAM standard", available at: www.ifoam.org/en/ifoam-standard (accessed 10 July 2013).

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