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Does Fair Trade Compete with Carbon Footprint and Organic Attributes in the Eyes of Consumers? Results from a Pilot Study in Scotland, the Netherlands and France.

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Abstract:

Several studies on ethical and social food attributes have shown that consumers especially in developed countries are willing to pay a price premium for fair trade foods products. However, there is a scant literature on how consumers' preferences and WTP for fair trade products are affected by the presence of other ethical food attributes such as environmental attributes (i.e. organic and carbon footprint). To fill this gap, a choice experiment was conducted in Scotland, the Netherlands and France to assess consumers' preferences and willingness to pay (WTP) for ethical attributes (i.e. fairtrade, organic, lower carbon footprint) of bananas and to find out whether this ethical food attributes are competing in real markets. The results showed that in the three countries consumers are willing to pay a price premium for the three ethical food attributes. The results showed that in the current market situation these ethical foods are not generally competing against each other. Nonetheless, they are likely to become competing for consumer's money at least when: (1) the price of organic foods is decreased significantly, (2) the price for fairtrade food products is set higher than consumers' WTP, and (3) bananas labeled as having lower carbon footprint are made available in retail stores and sold at a price lower than consumers' WTP.

Key words: Fair trade, organic, carbon footprint, willingness to pay, tradeoffs, choice experiment.

1. Background

Expanding exports of food products is a key strategy used by developing countries to boost the growth of their economy. Nonetheless, exporting food products to developed countries is becoming more challenging because consumers are increasingly demanding food products with high level of safety and ethical values, e.g., fair trade, organic production, low carbon footprint. While satisfying these consumers might be challenging and costly, some producers and traders of products such as coffee, tea and bananas have taken advantage of the increasing interest in fair trade and managed to expand their sales in developed countries after introducing the required changes to be eligible for the fair trade certificate. According to Fair trade Foundation, i.e., the owner of the commercial brand, fair trade certification guarantees principles of ethical purchasing such as banning child and slave labour, guaranteeing a safe workplace and a fair price that covers the cost of production, facilitating social development, and protecting the environment (Nicholls and Opal 2005).

According to Fair trade International (2013a), the total fair trade sales revenues and fair trade premium receipts from small producer organizations have grown significantly in the last two decades. Moreover, in comparison with 2010–11, the data for 2011–12 show a 41% increase, from 61.1€ million to 86.1€ million, in premium returns to producer organizations, and a 36% increase, from 673€ million to 913€ million, in overall sales revenues.

The expansion of fair trade market has been accompanied by a growing interest of researchers in assessing consumers' preferences and willingness to pay for fair trade products. More than fifty research papers, e.g., Rousu and Corrigan 2008; Cranfield et al. 2010; Hejkrlik et al. 2013; Annunziata and Scarpato 2014, have been published on this topic so far. We refer the reader to four papers, i.e., Tallontire et al. 2001; Connolly and Shaw 2006; Newholm and Shaw 2007; and Andorfer and Liebe 2012, that critically

reviewed the methodologies and results reported in the literature. They state that, in general, values such as “socially responsible attitudes”, “support of human right”, “need for self uniqueness”, “ethical obligation”, and “sense of universalism with mankind and nature” are the main factors that have been found to positively influence the consumption of food products labeled as fair trade. “High prices”, “lack of availability”, and “lack of information” were reported to be the major barriers to the purchase of fair trade food products.

Furthermore, several paper, e.g., Arnot et al. 2006; Carlsson et al. 2010; Cranfield et al. 2010; Basu and Hicks 2008; De Pelsmacker et al. 2005; Galarraga and Markandya 2004; Loureiro and Lotade 2005; Trudel and Cotte 2009; Didier and Lucie 2008; and Rousu and Corrigan 2008, have found that consumers are willing to pay a price premium for food products labeled as fair trade. For instance, interviewed consumers in those studies were found to be willing to pay an average premium for fair trade coffee that ranges between 0.90€/kg and 3.50€/kg.

As mentioned above, there is an extensive literature on consumers’ preferences and willingness to pay for fair trade food products. However, little effort, e.g., Loureiro and Lotade 2005; Onozaka and McFadden 2011, has been devoted to assess the tradeoffs that consumers are likely to make when they have to choose among food products with different ethical food attributes, e.g., fair trade banana vs. environmentally-friendly banana. In fact, in retail stores, it is becoming common to see fair trade food products, say banana, displayed and sold along with non-fair trade bananas but labeled as environmentally-friendly, e.g., organic, lower food miles or GHG emissions[1]. Therefore, the price premium consumers might be willing to pay for fair trade bananas could be adversely affected by the fact that other available bananas are more sustainable, even though in reality they are not fair trade. Thus, it is possible that consumers might be indifferent between fair trade

[1] This could happen due to the increasing interest of consumers in developed countries to contribute to the global effort to reduce global warming by, among others, purchasing sustainable food products (Wiser 2007; Whitehead and Cherry 2007; Jeanty et al. 2007, Bollino 2009; and Onozaka and McFadden 2011).

bananas that are not environmentally friendly and environmentally-friendly bananas that are not fair trade.

The purpose of this paper is to contribute to the literature by providing additional information about possible tradeoffs that consumers may make when they have to choose between food products with different ethical attributes. To investigate these possible tradeoffs, we conducted choice experiments in Scotland, France and Netherlands. Four attributes were considered in the study, i.e., fair trade, organic, carbon footprint, and the price. To the best of our knowledge, none of the published studies on consumers' preferences and willingness to pay (WTP) for fair trade food products considered the all aforementioned attributes and conducted the same choice experiment in different European countries. Onozaka and McFadden (2011) is the only published paper that assessed the tradeoffs between fair trade, organic and carbon footprint, however, the study was conducted in the United States.

The reminder of this paper is organized as follows. The next section describes the experimental design. This is followed by an explanation of how the data were analyzed. The main findings are reported in section 4 and discussed in section 5. The conclusions of the study and the recommendations for future research are presented in section 6.

2. Experimental Design

The choice experiment was conducted in three locations: Edinburgh (Scotland), Clermont-Ferrand (France) and Amsterdam (the Netherlands). In total, 247 consumers participated in the study (100, 95 and 52 respondents from Scotland, France and the Netherlands, respectively)[2]. Participants were randomly recruited in public places and in front of food retail stores. Banana was the product considered in this study. Only subjects

[2] We must mention that the size of our sample is not representative of the whole population of the three countries. However, the main objective of this study is to gain insight on consumers' preferences and willingness to pay for different ethical food attributes in the three countries and not to produce country-wide estimates.

who were at least occasional buyers of bananas were allowed to take part in the study. Table 1 summarizes the socio-demographic characteristics of participants.

Table 1 goes here

Respondents were first asked to participate in a choice task. Then, they were required to complete a questionnaire about their attitudes toward ethical food attributes and their socio-demographic characteristics. In the choice task, respondent were successively provided with 16 different choice sets and were repeatedly asked to choose between two different alternatives of bananas and a "no choice" option. Each alternative was a combination of different levels of four attributes: fair trade, i.e., fair trade/not fair trade, organic , i.e., organic/not organic, emitted carbon dioxide during the transport per kg of bananas, i.e., 697 g of CO_2, 1.143 kg of CO_2, 1.880 kg of CO_2, 2.619 kg of CO_2[3], and the price, i.e., £0.13, £0.18, £0.23, and £0.28 per banana in Scotland and 0.13€, 0.18€, 0.23€, and 0.28€ per banana in France and the Netherlands. The origin of the products was not revealed to participants. The price levels were chosen so they cover the range of the retail prices of bananas in the three countries. At the time of the experiment, the retail prices of conventional and fair trade bananas were found to be quite similar in the three countries. Nonetheless, organic bananas were found to be cheaper in Scotland and more expensive in France.

Participants were told that apart from these attributes the bananas would be identical in appearance. A cheap talk script, similar to the one implemented by Cummings and Taylor (1999), was used to incentivize participants to reveal their real preferences.

[3] These values were calculated assuming that the origin of bananas is Canary Islands – Spain (697 g of CO_2), from Ghana (1.143 kg of CO_2), Ecuador (1.880 kg of CO_2), and Indonesia (2.619 kg of CO_2). Please notice that the origin of the products was not revealed to participants. This is important to obtain a clean estimation of participants' WTP for carbon footprint, otherwise, their WTP for carbon footprint will be confounded with their WTP for the origin of bananas.

Given all the attributes' levels, a full factorial design of 64 (2*2*4*4) profiles was created. Since presenting participants with 64 combinations would be time and cognitive costly, an orthogonal factorial design of 16 combinations was generated. To generate the second option from the 16 profiles obtained in the orthogonal design, we followed the optimal design approach proposed by Street and Burgess (2007). We used the generator (1,1,1) to obtain the second option. This resulted in a main-effect design of 95.84% efficiency which was found to be sufficient to estimate uncorrelated main effects, i.e., the estimates corresponding to the four attributes assuming that the interactions between these attributes are equal to zero. Since it is not realistic to force participants to choose one of the provided options of bananas, we included a "no choice" option, i.e., third option, in each choice set. An illustration of a choice set is presented in Figure 1.

Figure 1 goes here

3. Choice model: random parameter logit (RPL)

The conditional logit model (McFadden 1974) is the Work horse model for analyzing discrete choice data. While widely used this model has several well-known limitations: (1) it does not account for preference heterogeneity among respondents and (2) it assumes that the alternatives included in any choice sets are independent, which can lead to unrealistic predictions. The RPL model solves these limitations by allowing one or more of the parameters in the model to be randomly distributed and the unobserved factors to be correlated over time (McFadden and Train 2000).

Utility-maximizing individual i who is confronted with a set of j alternatives at a given choice occasion *t*, should choose the alternative that yields the highest utility. The utility function takes the form:

$$U_{ijt} = V_{ijt} + \varepsilon_{ijt} \quad (1)$$

where V_{ijt} is the deterministic component and ε_{ijt} is the random component. ε_{ijt} is assumed to have an *iid* extreme value distribution. Assuming that the deterministic component of utility is linear-in-parameter, equation (1) can be written as:

$$U_{ijt} = \beta_i' X_{ijt} + \varepsilon_{ijt} \quad (2)$$

where X_{ijt} is a vector of explanatory variables that are observed by the analyst and include the food attributes, i.e., fair trade, organic, carbon footprint, and price, as well as the socio-economic characteristics of the respondents (e.g. gender, education, income and age). β_i denotes the *K*×1 vector of utility parameters that correspond to *K* choice characteristics. The subscript *i* on β_i indicates that β_i are individual-specific parameters. In the RPL, β_i are considered as draws from the population distribution $f(\beta|\Omega)$ where Ω are the fixed parameters of the distribution such as the mean and the variance. For a given value of β_i, the conditional probability that individual i makes a choice j is:

$$P(j|X_{it}, \beta) = \prod_{t=1}^{T} \left[\frac{\exp(\beta_i' X_{ijt})}{\sum_{k=1}^{J} \exp(\beta_i' X_{ikt})} \right] \quad (3)$$

The unconditional choice probability is the expected value of the logit probability over all possible values of β, that is, integrated over these values and weighted by the density of β. So the unconditional probability is:

$$P(j|X_{it},\Omega) = \int_{\beta} P(j|X_{it},\beta)\, f(\beta|\Omega) d\beta \qquad (4)$$

This expression does not have a closed form solution and is therefore approximated through simulation methods. In particular, draws of β_{ir} are taken from the distribution $f(\beta|\Omega)$ for $\mathrm{r} = 1, \ldots, \mathrm{R}$, and the resulting probabilities are then averaged. The simulated log-likelihood (SLL) for all respondents, which is estimated via maximum likelihood procedures, is calculated as:

$$SLL = \sum_{i=1}^{I} \sum_{t=1}^{T} ln\left(\frac{1}{R} \sum_{r=1}^{R} \frac{\exp(\beta_{ir} X_{ijt})}{\sum_{k=1}^{J} \exp(\beta_{ir} X_{ikt})}\right) \qquad (5)$$

For this estimation, the parameters for fair trade, organic and carbon footprint are assumed to be distributed normally. The price should enter the utility negatively, which can be imposed by specifying the parameter on negative price as log-normally distributed. In this way, the price coefficient can therefore be interpreted as the marginal utility of money.

In choice experiment, the standard approach to calculate respondents' WTP consists in computing the ratio of the attribute coefficient to the price coefficient, with a negative sign. Therefore, the WTP from an RPL is given by the ratio of two randomly distributed terms.

$$WTP_{non-price\ attribute} = -\frac{\beta_{non-price\ attribute}}{\beta_{price}} \qquad (6)$$

Depending on the choice of the coefficients' distributions, this can lead to heavily-skewed WTP distributions, e.g., very large WTP values, that may not even have defined moments. A common approach to dealing with this potential problem is to specify the price coefficient to be fixed. Nonetheless, it is often unreasonable to assume that all individuals have the same preferences for price (Meijer and Rouwendal 2006). Train and Weeks (2005) suggest another way to get around this problem that consists in estimating the RPL in WTP space rather than in preference space. This involves estimating the distribution of willingness to pay directly by re-formulating the model in such a way that the coefficients represent the WTP measures. In the reformulated models, the a priori assumptions about the distributions of the parameters are made on the WTP rather than the attribute coefficients.

The model in preference space is:

$$U = \beta_{price} Price + \beta_{Fairtrade} Fairtrade + \beta_{Organic} Organic + \beta_{CO2} CO2 + \varepsilon \quad (7)$$

The model in WTP space consists in rewriting equation (7) as:

$$U = \beta_{price} \left[Price + \frac{\beta_{Fairtrade}}{\beta_{price}} Fairtrade + \frac{\beta_{Organic}}{\beta_{price}} Organic + \frac{\beta_{CO2}}{\beta_{price}} CO2 \right] + \varepsilon \quad (8)$$

Equation (8) can be rewritten as:

$$U = \beta_{price} [Price + \theta_1 Fairtrade + \theta_2 Organic + \theta_3 CO2] + \varepsilon \quad (9)$$

$\theta_1, \theta_2, \theta_3$ are the WTP estimates. All the explicative variables considered in the estimation are described in table 2.

Table 2 goes here

4. Results

This section, starts presenting results from the analysis of respondents' consumption habits and attitudes. Next, the results from the estimation of the RPL model are described. Finally, respondents' WTP for the ethical attributes, i.e., fair trade, organic, and carbon footprint, as well as the tradeoffs they made when they were presented with these attributes are described.

The analysis of participants' responses, reported in the questionnaire, showed that Scottish and French respondents consume more frequently fair trade bananas than Dutch respondents. In fact, 45%, 41% and 25% of Scottish, French and Dutch participants, respectively, revealed to regularly consume fair trade bananas. Compared with the consumption of fair trade bananas, the frequency of consumption of organic bananas were lower in the three countries. For instance, 16% (28%), 15% (37%) and 15% (50%) of, Scottish, French and Dutch participants, respectively, revealed to always (never) consume organic bananas.

The majority of respondents in the three countries revealed to be reasonably or well informed about fair trade and organic labels, although Scots were found to be less informed than French and Dutch respondents. In fact, 36% (30%) of Scottish participants stated to be not well informed about fair trade (organic) labels compared with 13% (15%) and 24% (7%) of French and Dutch participants, respectively. The results also showed that 85% (83%), 88% (71%) and 72% (81%) of Scottish, French and Dutch respondents revealed to trust fair trade (organic) labels.

The results of the estimation of the RPL models are displayed in Table 3. All the estimations were conducted using NLOGIT 5.0, with 1000 Halton draws to simulate random parameters. The RPL models show significant improvement in fit when tested against the conditional logit models: *Chi square* = 1827.28, *p-value* <.01 for Scotland

model; *Chi square* = 1021.18, *p-value* <.01 for the Netherlands model and *Chi square* = 1324.26 and *p-value* <.01 for France model.

Table 3 goes here

The parameters corresponding to the four attributes (i.e. fair trade, organic, carbon footprint and price) were modeled as random parameters. The no-choice option parameter (NONE) was modeled as a fixed parameter. In the three models, the means of the coefficients are statistically significant and with the expected sign. The positive and significant sign for fair trade and organic attributes shows that average respondent in the three countries prefer fair trade bananas than non-fair trade bananas and organic bananas than non-organic bananas. In other words, average respondent is more likely to choose bananas labeled as fair trade or organic than conventional bananas.

The negative and significant sign of carbon footprint attribute indicates that average respondent in the three countries prefer bananas with lower carbon dioxide emissions. Furthermore, the results show that Scottish, French and Dutch respondents prefer the attribute price to take lower levels, i.e., cheaper bananas are preferred. Finally the negative and significant sign of the "NONE" coefficient shows that respondents preferred to buy bananas than to opt out and choose the no-choice option.

All the standard deviations of the random parameters were significant, indicating that preferences' heterogeneity was detected in all the random parameter. We used some socio-demographic variables, i.e., age, income and education, to explain the detected heterogeneity. The results are displayed under the section "*heterogeneity in mean*" in Table 3. The results show that Scottish respondents with higher education are more willing to choose bananas with higher prices than respondents with lower education level. Furthermore, Dutch and French respondents with high income were found to prefer fair

trade bananas to non-fair trade bananas. Note that in many cases the parameter was fixed because the heterogeneity around the mean was found to be insignificant and not fixing the corresponding parameter was found to decrease the general model fit.

The heterogeneity around the mean that was found to be significant for all the random parameters can be partially due to the correlation between the different attributes and not only the interactions between attributes and socio-demographic variables. Assuming that the attributes considered in a choice experiment are uncorrelated was found to bias the results for the heterogeneity in mean (Hensher et al. (2005). To get around this problem, we allowed the error components in different choice situations from a given individual to be correlated. The results under the sections "*Diagonal values in Cholesky matrix,* L" and "*Below diagonal values in L matrix V = L*Lt*" show that the attributes are indeed correlated. This implies that part of the heterogeneity around the mean of the random parameters is explained by correlations between attributes such as the negative correlations between fair trade and carbon footprint.

Since the attributes have different units of measurement, comparing respondents' preferences for these attribute is inappropriate. The appropriate way to compare consumers' preferences for the different attributes is to calculate the marginal rate of substitution (MRS). When the price is included as the denominator in the ratio calculation, the MRS is interpreted as marginal WTP. As mentioned previously, we estimated individual WTP space for each attribute and each country. The results are displayed in Table 4, 5 and 6[4,5]. Results in Table 4 show that Scottish, Dutch and French respondents are willing to pay a premium of 0.14€, 0.13€ and 0.09€, respectively, for each banana labeled as fair trade and a premium of 0.08€, 0.09€ and 0.13€, respectively, for each

[4] The estimated individual WTPs in the Scottish data were obtained in pound sterling. For a clean comparison across countries, the individual WTP were multiplied by 1.28 to convert them from pound sterling to Euro.

[5] We tested the normality of the distribution of respondents' WTP for each ethical attribute in each country. All the distributions were found to be non-normal. As a result a non-parametric test (Wilcoxon rank-sum test) was used to test whether respondents' WTP for the different ethical attributes are statistically different from each other.

banana labeled as organic. Scottish, Dutch and French respondents were also found to be willing to pay a premium of 0.09€, 0.12€ and 0.12€, respectively, for a reduction of 1kg of carbon dioxide emissions.

Table 4 goes here

The results of comparing respondents' WTPs for the three ethical attributes are presented in Table 5. For the ease of interpretation and discussion, let's assume a hypothetical market where fair trade bananas, organic bananas and bananas with lower carbon dioxide emissions are being sold[6]. The results show that Scottish respondents are willing to pay a significantly higher price premium for fair trade bananas than for organic bananas and bananas with lower carbon dioxide emissions. Furthermore, the results show that Dutch respondents' WTPs for the three types of ethical bananas are not statistically different. In the case of French data, the results show that respondents' WTPs for fair trade bananas and for bananas with lower carbon dioxide emissions were not statistically different. Nonetheless, the results show that French respondents are willing to pay a significantly higher price premium for organic bananas than for fair trade bananas. The results also show that average Scottish, Dutch and French consumer may opt to buy non-fair trade bananas if the retail price premium for fair trade banana is higher than 0.14€, 0.13€ and 0.09€ per banana, respectively.

Table 5 goes here

Results displayed in Table 6 show that Scottish, Dutch and French respondents' WTPs for fair trade bananas are not statistically different (at 5% level of significance). French respondents revealed to be willing to pay a significantly higher price premium for

[6] We are making this assumption because bananas certified as having lower carbon footprint are not currently sold in any of the three countries' grocery stores.

organic bananas than Scottish and Dutch respondents. Nonetheless, Scottish and Dutch respondents' WTP for organic bananas were found to be statistically similar. Finally, the results also show that for carbon footprint, Scottish respondents are willing to pay a lower price premium than Dutch and French respondents. However, French and Dutch respondents' WTPs for bananas with lower carbon footprint were found to be statistically similar. As mentioned in the experimental design section, the difference of sample size between countries urges the readers to use the results displayed in Table 6 with caution.

Table 6 goes here

5. Discussion

The descriptive analysis of respondents' habits and attitudes showed that the majority of participants in the three countries know about the fair trade concept, consume fair trade and organic bananas and trust its labels. Furthermore, the majority of Scottish, French and Dutch respondents revealed to be concerned about how workers, in developing countries, are treated and paid for their works in farms. These results concur with the findings by Globescan (2011) who carried a survey in April 2011 covering 17,000 respondents in 24 nations to study, among other things, consumers' attitudes toward fair trade. Globescan found that 58% (61%), 86% (85%) and 96% (90%) of the surveyed consumers in France, the Netherland and the United Kingdom, respectively, recognized (trust) the fair trade label.

As regards respondents' preferences, the results showed that fair trade bananas, organic bananas and bananas with lower carbon footprint are more preferred than non-fair trade bananas, non-organic bananas and bananas with higher carbon footprint, respectively. Furthermore, we found that the price could be a barrier for purchasing ethical bananas since respondent revealed to prefer cheaper fair trade and organic bananas. These preferences results concur with the findings from previous studies. For instance,

Onozaka and McFadden (2011) found that US consumers have positive preference for apples certified as fair trade, organic or having lower carbon footprint. In Europe, and according to the opinion survey carried out in 1997 in the entire 15 EU (European Comission 1997), 74 % of the interviewees stated that they would choose the fair trade bananas if they were available, cost the same and were of the same quality as the non-fair trade labeled bananas. Mahe (2010) found that, in Switzerland, 66% of participants in his study chose to buy fair trade bananas over organic and conventional bananas.

As found in earlier studies, i.e, Carlsson et al. (2010), Cranfield et al. (2010), Globescan (2011), and Onozaka and McFadden (2011), respondents in the three countries revealed to be willing to pay a price premium for fair trade bananas, organic bananas as well as for bananas with lower carbon footprint. This implies that producers and retailers of ethical bananas can benefit from selling this type of bananas as long as he retail price is set equal to or lower than consumers' willingness to pay. Particularly, a positive sign could be sent back to the producers of bananas with lower carbon footprint about consumers' willingness to purchase their bananas if they are labeled as environmentally friendly and made available in most of grocery stores. Furthermore, It is expected that satisfying the demand for environmentally-friendly bananas will in turn contribute to the reduction of the global emissions of greenhouse gases from agriculture.

Comparing respondents' WTP for the three ethical bananas showed that if these different types of bananas are sold at the same price (being equal or lower than consumers' WTP), average Scottish consumer is likely to buy fair trade bananas. Similar results were found by Onozaka and McFadden (2011) in US for apples. Currently in Scotland, the actual retail price of organic bananas is significantly higher than both the price of fair trade bananas and consumers' WTP for organic bananas. Therefore, average Scottish consumer is expected to buy fair trade bananas in first instance. This implies that fair trade and organic bananas are not competing as long as its current retail prices are

maintained. Furthermore, if the *retail*-price premiums for fair trade and organic bananas with respect to conventional bananas are set higher than 0.14€ and 0.08€, respectively, average Scottish consumer is more likely to purchase conventional bananas instead of ethical bananas. Therefore, to incentivize average Scottish consumer to buy fair trade bananas, the retail price premium of fair trade bananas with respect to conventional bananas should be kept lower than 0.14€ per banana.

In the Netherlands, the results showed that the three types of ethical bananas are competing and average Dutch respondent is likely to buy the cheapest ethical bananas as long as its price is lower than her/his WTP. Similar to Scotland, the current retail price of organic bananas in the Netherlands is significantly higher than the price of fair trade bananas. Therefore, fair trade bananas are more likely to be chosen in first place by average Dutch consumers. Nonetheless, the retail price premium for fair trade bananas with respect to conventional bananas should not exceed 0.13€ per bananas, otherwise average Dutch consumer is likely to opt for conventional bananas as a first choice.

In France, fair trade bananas and bananas with lower carbon footprint were found to be competing and, hence, average French consumer is likely to buy the cheapest of these two types of bananas as long as its retail price is lower than her/his WTP. This is important at least for two reasons: (1) European producers of bananas (i.e. Spain) can benefit from the price premium consumers are willing to pay for environmentally-friendly bananas if they label their bananas as having lower carbon footprint due to the shorter distance of transport to French markets, and (2) stakeholders engaged with the production and commercialization of fair trade bananas need to be prepared to adjust their marketing strategies to be able to compete with bananas labeled as having lower carbon footprint once they become available in retail stores.

Furthermore, the higher price premium that French respondents revealed to be willing to pay for organic bananas with respect to fair trade bananas implies that if these ethical bananas are sold at similar price, average French consumer is likely to buy organic bananas as long as its retail price is lower than his or her WTP. Similar results were found by Onozaka and McFadden (2011) in US for tomatoes. Nonetheless, if the *retail* price premium for organic bananas with respect to fair trade bananas is higher than 0.04€ per banana, i.e., 0.04 = 0.13 - 0.09, average French consumer may opt to purchase fair trade bananas. Therefore, maintaining the retail price of fair trade bananas lower than the retail price of organic bananas by more than 0.04€ per banana could be an effective strategy to incentivize average French consumer to purchase fair trade bananas.

6. Conclusion

Several studies on ethical and social food attributes have shown that consumers especially in developed countries are willing to pay a price premium for fair trade foods products. However, there is a scant literature on how consumers' preferences and WTP for fair trade products are affected by the presence of other ethical food attributes such as environmental attributes (i.e. organic and carbon footprint). To fill this gap, we conducted a pilot study in Scotland, France and the Netherlands) using the same choice experiment design to assess, among others, the tradeoffs that consumers might make when they have to choose between bananas with different ethical attributes, i.e., fair trade, organic, and carbon footprint.

Our results showed that: (1) respondents in the three countries have positive preferences for ethical bananas, (2) Scottish, French and Dutch consumers are willing to pay a price premium for the three types of ethical bananas, (3) average consumer in the three countries is more likely to buy fair trade bananas partially because of the high retail price of organic bananas, (4) to set the right retail price of fair trade bananas, it is necessary to take into account consumers' WTP and the retail price of the other ethical

food products, e.g., organic and carbon footprint, and (5) the price premium that consumers were found to be willing to pay for bananas with lower carbon footprint is an evidence that producers and retailers of bananas transported for a shorter distance can increase their sales of bananas labeling them as having lower carbon footprint.

It should be noted that there are a number of ways in which the robustness of the results from this paper can be improved. For instance, the size of the sample used in this study is relatively small. Therefore, a complete picture of the topic addressed in this paper could be obtained if a larger and more representative sample of shoppers is used. Furthermore, purchasing food products for the first time does not guarantee repetitive future purchases of the same product. In fact, after tasting the product, consumer may decide to stop buying this product because of its unwanted taste. In our study, we did not control for the taste and, hence, we encourage future studies on the same topic to assess the effect of taste. Finally, in our study we used a cheap talk script to reduce the effect of hypothetical bias. Results from previous studies on the effectiveness of cheap talk in reducing hypothetical bias are, however, mixed. Due to the prohibitive cost of conducting non-hypothetical choice experiments in the three countries, we opted for conducting the choice experiments in hypothetical setting using a cheap talk script. Therefore, we warmly encourage future research studies on the same topic to use non-hypothetical choice experiment whenever possible.

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Table 1: Socio-demographic characteristics of respondents

Variable	Categories	Scotland (%)	Netherlands (%)	France (%)
Gender	Female	73	75	65
	Male	27	25	35
Age	18-29	28	25	46
	30-64	54	58	53
	65 and older	18	17	1
Education	Primary studies	9	6	13
	Secondary studies	8	19	4
	University studies	42	31	58
	Postgraduate studies	41	44	25
Annual Household income (£/€)	Less than 10.000	23	23	22
	10.000 - 19.999	16	15	16
	20.000 – 34.999	13	23	24
	35.000 - 54.999	20	9	24
	55.000 – 99.999	12	23	12
	More than 100.000	5	6	2

Table 2: Description of the variables used in the estimations

Variables	Name	Description
FT	Fair trade	Dummy variable that take the value of 1 if the banana is labelled as fairtrade and 0 otherwise.
ORG	Organic	Dummy variable that take the value of 1 if the banana is labelled as organic and 0 otherwise.
CO2	Carbon footprint	Quantitative variable that takes one of these four carbon footprint levels: 697 g of CO2 (from Canary Islands - Spain), 1143 g of CO2 (from Ghana), 1880 g of CO2 (from Ecuador), 2619 g of CO2 (from Indonesia)
PRICE	Price	Quantitative variable that takes one of these four price levels: £0.13, £0.18, £0.23, and £0.28 per banana in Scotland and 0.13€, 0.18€, 0.23€, and 0.28€ in the Netherlands and France
NONE	No-choice option	Dummy variable that take the value of 1 if no-choice option is chosen and 0 otherwise.
INC	Household income	Dummy variable that take the value of 1 if the household income is greater or equal to (£) 55,000€ and 0 otherwise.
AGE	Age of respondent	Continuous variable expressed in number of years
EDU	Education level	Dummy variable that take the value of 1 if respondent has at least some university studies and 0 otherwise.

Table 3: Results from the estimation of the random parameter models

Variables	Scotland	Netherlands	France
Random parameters			
FT	1.787***	1.559***	.881***
ORG	.874***	1.489***	1.599***
CO2	-1.087***	-2.034***	-1.355***
PRICE	-21.942***	-18.200***	-13.465***
Non-random parameters			
NONE	-8.190***	-9.787***	-4.878***
Standard deviations of parameter distributions			
sdFT	1.955***	2.265***	.891***
sdORG	1.252***	1.344***	1.531***
sdCO2	1.270***	1.822***	1.291***
sdPRICE	13.624***	13.671***	11.942***
Heterogeneity in mean			
FT:INC	FP	1.907***	1.103**
FT:AGE	FP	FP	FP
ORG:EDU	FP	FP	FP
CO2:EDU	FP	FP	FP
PRICE:EDU	6.223**	FP	FP
Diagonal values in Cholesky matrix, L.			
NsFT	1.955***	2.265***	.891***
NsORG	1.238***	1.338***	1.514***
NsCO2	1.156***	1.683***	1.129***
NsPRICE	10.341***	10.537***	11.459***
Below diagonal values in L matrix. V = L*Lt			
ORG:FT	-.185	.132	-.224
CO2:FT	-.350*	-.550**	-.023
CO2:ORG	-.390***	-.429	-.626***
PRICE:FT	4.401**	-2.507	-.697
PRICE:ORG	6.193***	5.937**	-.554
PRICE:CO2	-4.576***	-5.858***	-3.243*
Observations	1600	832	1520
LogL	-844.13	-403.45	-1007.75
CHI2	1827.28	1021.18	1324.26
P-Value	.00	.00	.00

*** (**) (*) Statistically significant at 1% (5%) (10%) level

FP: fixed parameter

The number of observations is equal to the number of participants multiplied by the number of choice sets (i.e. 16) completed by each participant.

Table 4: Estimated willingness to pay space in €

Variables	Scotland	Netherland	France
Fair trade	.14***	.13***	.09***
(St. Error)	*(.016)*	*(.033)*	*(.016)*
Organic	.08***	.09***	.13***
(St. Error)	*(.011)*	*(.025)*	*(.018)*
Carbon footprint	.09***	.12***	.12***
(St. Error)	*(.009)*	(.020)	*(.0171)*
Standard deviations of WTP distributions			
Fair trade	.112***	.124***	.083***
Organic	.072***	.085***	.127***
Carbon footprint	.059***	.086***	.104***

*** (**) (*) Statistically significant at 1% (5%) (10%) level

Table 5: Differences of respondents' WTPs between attributes

		Wilcoxon rank-sum test
Variables	**Countries**	p-value
Scotland	Fair trade * Organic	.00
	Fair trade * Carbon footprint	.04
	Organic * Carbon footprint	.02
Netherland	Fair trade * Organic	.39
	Fair trade * Carbon footprint	.71
	Organic * Carbon footprint	.06
France	Fair trade * Organic	.02
	Fair trade * Carbon footprint	.12
	Organic * Carbon footprint	.37

Table 6: Differences of respondents' WTPs between countries

		Wilcoxon rank-sum test
Variables	**Countries**	p-value
Fair trade	Scotland * Netherland	.43
	Scotland * France	.07
	Netherland * France	.48
Organic	Scotland * Netherland	.09
	Scotland * France	.00
	Netherland * France	.03
Carbon footprint	Scotland * Netherland	.04
	Scotland * France	.07
	Netherland * France	.78

Figure 1: Example of a choice set included in the choice task carried out in Scotland.

Attributes	Option 1	Option 2	No-choice option
Fair Trade	Not Fair trade	Fair trade	None
Organic	Organic	Not Organic	of the
Carbon Footprint (from transport)	1880 g CO_2 (equivalent to 4.4 miles in a medium-sized car)	2619 g CO_2 (equivalent to 6.1 miles in a medium-sized car)	two
Price	£ 0.23	£ 0.28	options
	☐	☐	☐
Please indicate your most preferred option (mark your choice)			