Segmenting the Italian coffee market: marketing opportunities for economic agents working along the international coffee chain

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Abstract — **Globalization, either directly or indirectly (e.g. through structural adjustment reforms), has called for profound changes in the previously existing institutional order. Some changes adversely impacted the production and market environment of many coffee producers in developing countries resulting in more risky and less remunerative coffee transactions. This paper focuses on customization of a tropical commodity, fair-trade coffee, as an approach to mitigating the effects of worsened market conditions for small-scale coffee producers in less developed countries. fair-trade labeling is viewed as a form of "de-commodification" of coffee through product differentiation on ethical grounds. This is significant not only as a solution to the market failure caused by pervasive information asymmetries along the supply chain, but also as a means of revitalizing the agricultural-commodity-based trade of less developed countries (LDCs) that has been languishing under globalization. More specifically, fair-trade is an example of how the same strategy adopted by developed countries' producers/ processors (i.e. the sequence product differentiation - institutional certification - advertisement) can be used by LDC producers to increase the reputation content of their outputs by transforming them from mere commodities into "decommodified" (i.e. customized and more reputed) goods. The resulting segmentation of the world coffee market makes possible to meet the demand by consumers with preference for this "(ethically) customized" coffee and to transfer a share of the accruing economic rents backward to the Fair-trade coffee producers in LDCs. It should however be stressed that this outcome cannot be taken for granted since investments are needed to promote the required institutional innovations.**

In Italy FTC is a niche market with very few private brands selling this product. However, an increase of FTC market share could be a big commercial opportunity for farmers in LDCs and other economic agents involved along the international coffee chain. Hence, this research explores consumers' knowledge of labels promoting quality products, consumption coffee habits, brand loyalty, willingness to pay and market segmentation according to the heterogeneity of preferences for coffee products. The latter was assessed developing a D-efficient design where stimuli refinement was tested during two focus groups.

Keywords — **fair-trade coffee, product de-commodification, choice experiments.**

I. INTRODUCTION

Coffee is one of the most important commodities in the world. Significantly, until the crisis of the '90s, it was the second most important commodity in international trade second only to oil, while today it still ranks as fifth. The coffee production-processing chain employs roughly 25 million people around the world mainly from less developed countries (LDCs).

The early '90s marked a dramatic change in the international trade of coffee. More competitive conditions due to the entry of new producers such as Vietnam onto the global market, together with factors such as technological innovation, the suppression of the International Coffee Agreement and more liberalization-oriented policies (e.g. structural adjustment reforms) generated an excess in the supply of green coffee onto the world market which in turn caused a dramatic drop of more than 40% of the production price and an increase in price volatility. These changes led to more risky and less remunerative coffee transactions along the coffee chain, especially at production level.

Fair-trade coffee (FTC) has been indicated by its advocates as an option which can mitigate the effects of worsened market conditions for small-scale coffee producers in less developed countries [1]. More specifically, fair-trade is an example of how the same strategy adopted by developed countries' producers/ processors (i.e. the sequence product differentiation - institutional certification - advertisement) can be used by LDC producers to increase the reputation content

of their outputs by transforming them from mere commodities into "decommodified" (i.e. customized and more reputed) goods [2]. In principle, the resulting segmentation of the world coffee market should make possible to meet the demand by consumers with preference for this "(ethically) customized" coffee and to transfer a share of the accruing economic rents backward to the fair-trade coffee producers in LDCs [3].

Therefore, the purpose of this paper is to assess whether the above hypotheses are fulfilled in the case of the Italian market. In Italy FTC is a niche market with very few private brands selling this product. Consumers can buy FTC in specialised small shops or in big retailers who generally place the product on shelves where it is difficult to attract the shopper's attention. However, an increase of FTC market share could be a big commercial opportunity for farmers in LDCs and other economic agents involved along the international coffee chain. Hence, this research aims at exploring consumers' knowledge of labels promoting quality products, consumption coffee habits, brand loyalty, willingness to pay and market segmentation according to the heterogeneity of preferences for coffee products.

This paper is organized as follows. Section 2 provides an overview of the problems faced by coffee production under globalization. Section 3 introduces the concept of fair-trade and reports on its developments in last years with specific reference to fair-trade coffee. Section 4 analyzes the institutional changes required for the marketing of fair-trade coffee and assesses the pros and cons of the process of coffee decommodification through fair-trade labelling. Section 5 summarizes the main findings of the study.

II. THE COFFEE CHAIN UNDER GLOBALIZATION

Coffee production is in crisis since the early 1990s. Decreasing prices and reduced market opportunities have severely affected producers' livelihoods. The final outcome was that coffee production became less profitable (Fig. 1). which in turn increased the vulnerability of coffee producers, especially those who are small-scale and are not organized.
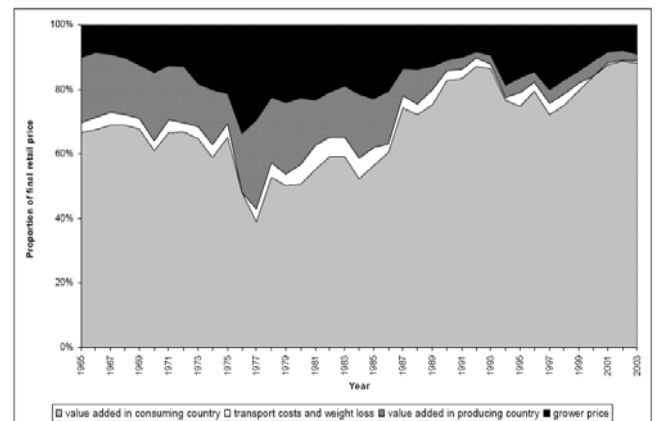

Fig. 1. Value added along the coffee supply chain
(source: [4])

This was mainly due to the changes induced by globalization, such as the dismantling of pre-existing market institutions (e.g. the International Coffee Agreement) and the entry of new suppliers in the world market, that compounded the already existing weaknesses of the coffee supply chain [5].

The coffee supply chain is structured in an articulated and complex cobweb of relationships that links production and consumption, where information asymmetries and market power are pervasive problems (Fig. 1). In the pre-globalization years, many operators (including marketing boards, domestic traders, exporters, international traders, brokers, retailers and restaurateurs) used to transact along the supply chain. Under globalization, the market liberalization induced a reorganization of the worldwide coffee supply chain, which implied the disappearance of the marketing channel that used to pass through coffee marketing boards (cf. the dotted-arrow links in Fig. 2) and nowadays the supply chain is dominated by five multinationals that control almost 70 percent of the product transformation and marketing.

Overall, the international coffee trade is characterized by the increase in market power at the marketing and processing stages that, along with excess supply, contributed to a dramatic decrease of the green coffee price. Although since 1989 the world consumption of coffee has been growing at an average rate of about 1.5 percent per annum, the price at farm gate has been decreasing [6]: in real terms, this price

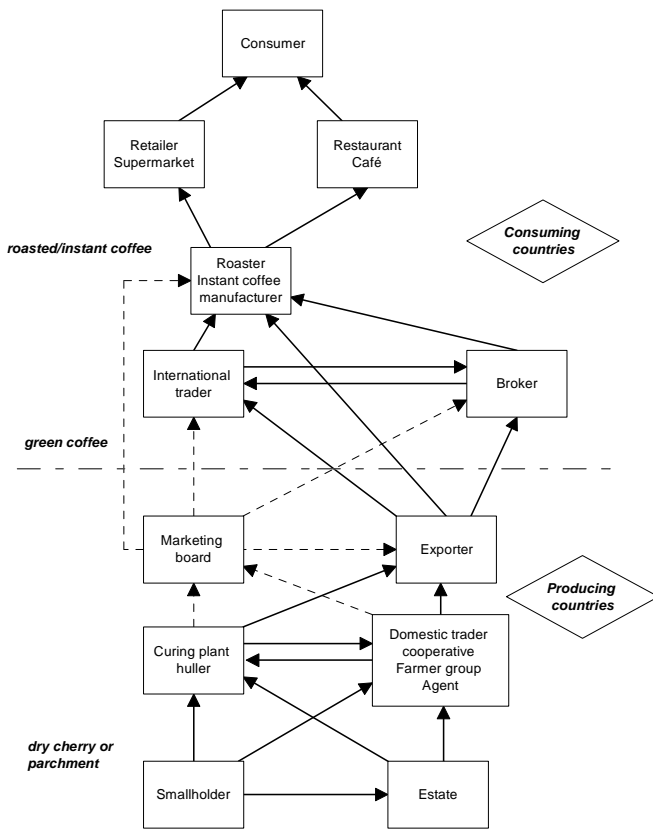in 2003 barely reached a quarter of what it had been in 1960.

Fig. 2. The coffee supply chain (source: [3])

Decreasing prices at the farm gate were not the only problem for smallholder coffee producers. The broad implementation of structural adjustment reforms in the 1990s implied that many countries liberalized, fully or partially, the coffee market. Under the pre-existing International Coffee Agreements (ICA) framework, producer countries agreed to control supply through export quotas and buffer stocks that helped to keep prices high, especially between 1962 and 1989 [7]. In 1989 the ICA were abolished leaving the farmers to deal directly with the strong commercial intermediaries and with the vagaries and uncertainties of the global market [4].

At the same time, the prices at consumption level have been increasing or not-decreasing in real terms (Fig. 3).
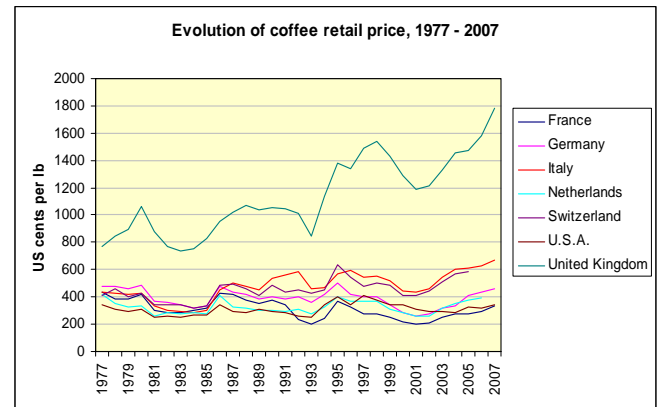

Fig. 3. Coffee retail price (source: [8])

More recently the situation has become even more critical for producers because of the structural oversupply of coffee at world level. In fact, world coffee production increased from 6.0 million Mt in year 1989-91 to 7.6 million Mt ton in year 2004-2006 (Fig. 4).[1]
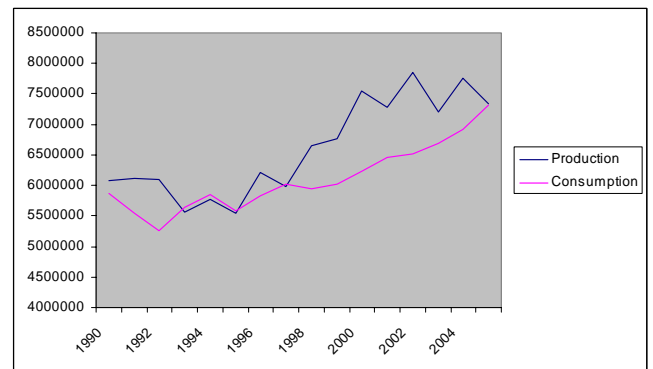

Fig. 4. Production and consumption of green coffee, Mt (source: [8])

In response to the problems of smallholder farmers, a new international coffee agreement was signed in 2001 [7]. However, the lack of economic coordination and the opportunism of producers and intermediaries in the marketing chain undermined its effectiveness. In conclusion, the old institutional order disappeared with globalization and has not been adequately replaced.

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[1] This was largely due to (i) the improvement in coffee production techniques in Brazil, (ii) the entry of Vietnam in the world coffee market, and (iii) the increasing production and use of robusta variety coffee.

III. FAIR-TRADE AND FAIR-TRADE COFFEE

Fair-trade labelling is a form of "de-commodification" of coffee through product differentiation on ethical grounds [4]. Labelling may be seen as a viable solution to the market failure caused by poor information along the supply chain, but also as a means of revitalizing the agricultural-commodity-based trade of LDCs that are threatened by globalization. Fair-trade labelling can be viewed as an alternative institutional arrangement that provides the farmers with an opportunity to organize production as well as to strengthen their bargaining power vis-à-vis the intermediaries [9].

The fair-trade label signals the commitment of fair-trade organizations that the premium paid by consumers represents a fair value of additional attributes of coffee and also contributes to a more remunerative price for the farmer [10, 11]. This process of product differentiation required some institutional innovations in order to succeed. The most important institutional development was the establishment in 1997 of the Fair-trade Labelling Organizations International (FLO), an umbrella organization for national initiatives, that has built up partnerships with hundreds of coffee producer partners in LDCs (Table 1).

Table 1. Number of fair-trade initiatives, 2007

Country	Trader	Producer
Australia	4	
Belgium	4	
Bolivia	1	20
Brazil	8	10
Cameroon		1
China	2	
Colombia	9	31
Congo Dem. Rep.		1
Costa Rica	4	7
Denmark	8	
Dominican Republic		3
East Timor		1
Ecuador		1
El Salvador	2	5
Ethiopia		4
Finland	9	
France	45	
Germany	29	
Guatemala	2	21
Haiti		7
Honduras	7	20
Iceland	1	
India	2	2
Indonesia	3	3
Italy	3	
Ivory Coast		2
Japan	1	
Kenya	6	1
Laos		1
Mexico	6	40
Netherlands	8	
New Zealand	1	
Nicaragua	2	18
Norway	2	
Papua New Guinea	1	4
Peru	5	35
Poland	1	
Rwanda		5
Singapore	1	
South Korea	2	
Spain	25	
Sweden	10	
Switzerland	13	
Taiwan	1	
Tanzania	2	7
Thailand		1
Uganda	1	11
UK	6	
USA	1	
Venezuela		0
Zambia		1
Total	238	263

Source: [12]

The FLO and national initiatives certify the compliance to the ethical standards throughout the supply chain (Fig. 4).
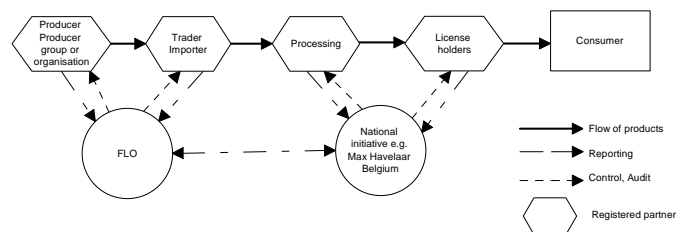

Fig. 4. Controls in the fair-trade coffee supply chain

(source: [3])

Although the consumption of fair-trade coffee is increasing, it remains a niche-market segment that reaches only 0.66 percent of the overall world coffee trade amounting to slightly more than 52 thousand Mt in 2006 [12]. Yet its sales are steadily increasing (Table 2) at an average annual growth of 15 percent over the past twelve years. This is remarkable because the increase of fair-trade coffee took place in an environment where traditional and larger brands are struggling to keep their market shares.

Table 2. Sales of fair-trade coffee, 1995-2006

Year	Sales Volume	Annual growth rate
1995	9,971	
1996	10,883	9.1
1997	11,370	4.3
1998	11,663	2.5
1999	11,819	1.3
2000	12,818	7.8
2001	14,387	10.9
2002	15,780	8.8
2003	19,872	20.6
2004	24,223	18.0
2005	33,994	28.7
2006	52,077	34.7
Average growth rate		14,8%

Source: [4] for data prior to 2004; otherwise, [12]

The same steady increasing trend is developing in Europe (Table 3), where fair-trade coffee accounts for 15% of all fair-trade product market. The same applies to Italy [13].

Table 3. Fair-trade development in Europe, 2000-2005

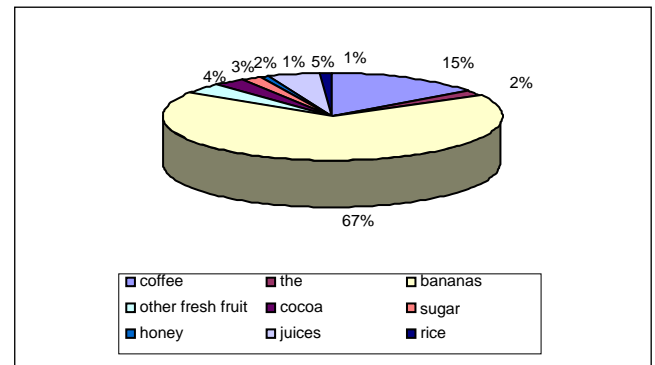|	2000	2005	% change
Turnover (000 €)			
Import organizations	118,000	243,300	+105
World shops	41,600	103,100	+148
Certification organizations	208,900	597,000	+186
Training/marketing (000 €)			
Import organizations	5,600	11,400	+104
World shops	1,000	1,700	+70
Certification organizations	3,500	5,100	+46

Source: [13]

Fig. 5. Market shares of food fair-trade products in Europe (source: [12])

IV. MATERIALS AND METHODS

A. Survey design

The two main purposes of the research are (i) eliciting the willingness to pay for coffee characteristics including area of origin and certifications (fair trade as well as organic) and (ii) exploring market segmentation according to the heterogeneity of preferences for coffee products. These objectives were pursued developing a D-efficient design[2] where stimuli refinement was tested during two focus groups. The attributes and their relative levels chosen to develop the choice experimental design are presented in Table 4.

The 128 selected alternatives obtained using SAS's JMP procedure have been distributed in 8 blocks of 4 choice sets each. Every choice set contained four unlabelled products plus a no choice option, which has been phrased to respondents as follows: "none of these four products; I will continue to buy my preferred coffee".

Therefore, each respondent has been asked to perform four different choice experiments, i.e. answering four different choice tasks.

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[2] The D-efficient design is based on the maximization of the determinants of the Fisher's information matrix. In the case of the estimation of a logit model, this is equivalent to minimizing the confidence intervals of estimators, leading to efficient estimates.

Table 4. Attributes, attribute levels and design codes used to develop the experiment design.

Attributes	Attribute levels	Design codes
Origin	1. Blend from several regions	0
	2. Africa	1
	3. Asia	2
	4. Latin America	3
Price	1. €6,00	0
	2. €8,00	1
	3. €10,00	2
	4. €12,00	3
FT certification	1. No	0
	2. Yes	1
Organic certification	1. No	0
	2. Yes	1

The scenario was characterize explicitly asking the respondent to imagine to be in his/her usual shopping environment and that his/her preferred brand was going to introduce certified fair trade coffee, organic coffee or a product with both characteristics. Furthermore, the product characteristics explicitly include the geographic area of origin of imported green coffee used for roasting. Respondents were also told that the taste characteristic of the products proposed in the four choice tasks would have been the same as those of their preferred coffee.

B. Questionnaire

In order to pursue the two objectives above, a questionnaire was designed through focus groups. The questionnaire was designed following a 'zooming' approach which starting with more general questions (e.g. exploring consumers' knowledge of logos promoting quality products, consumption coffee habits, brand loyalty, etc.) leads the respondents to the more specific ones (e.g. WTP elicitation) (Table 5).

Table 5. Questionnaire contents

Sections	Contents
A – General knowledge on quality products	- Knowledge of certification logos and contents - Purchase of FT goods - Attitude towards FT goods
B – Coffee explicit and sensor characteristics	- Coffee brand - Coffee characteristics
C – Coffee purchasing behavior	- Purchasing frequency and amounts - Purchasing place
	- Coffee expenditure - FT coffee expenditure - Brand loyalty - WTP for FT coffee (open ended)
D – Elicitation questions for certified coffee	- WTP for certified coffee: area of origin FT certification Organic certification
E – Socio-demographics	- Gender - Age - Civil status - Education - Employment - Household composition - Income

The questionnaire was administered via web[3] countrywide in February 2008: 50,000 respondents were invited via email by an Italian gateway to fill in the online questionnaire and 471 respondents successfully completed the questionnaire. This is the sample size used in the analysis.

C. Estimation methodology

The theoretical framework for the analysis of choice experiments (CE) is the so-called random utility theory [14]. According to this approach the consumer utility can be represented as the combination of a deterministic component, *V*, and an error component, *e*:

$$U = U\left(X_1,...,X_m;Z_1,...,Z_n\right) = V(X) + e(X,Z) \quad (1)$$

where the arguments are $X = 1...m$ market goods and $Z = 1...n$ non-market goods. The probability the individual *i* would prefer option *g* in the choice set to any other *h* option can be expressed probabilistically as

$$P\left[\left(V_{ig}+e_{ig}\right)>\left(V_{ih}+e_{ih}\right)\right] = P\left[\left(V_{ig}-V_{ih}\right)>\left(e_{ih}-e_{ig}\right)\right] (2)$$

that is the individual would chose that option whose utility is greater than the utility of alternative options. The random error is identically independent distributed according to an extreme value Gumbel distribution:

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[3] A second round of web survey is about to be launched to correct for sample the selection bias typical of this kind of surveys. Moreover, for the same reason it is planned to launch a face to face administered survey over the next months.

$$P(e_{ij} \leq t) = F(t) = \exp[-\exp(-t)] \qquad (3)$$

That be represented as a logistic distribution: this is the so-called McFadden's [14] 'conditional logit' model:

$$P(U_{ig} > U_{ij}) = \frac{\exp(\mu V_{ig})}{\sum_j \exp(\mu V_{ij})} \qquad (4)$$

where μ is a scale parameter can cannot be separately identified. When, as in our choice experiment, the dependent variable can assume more than one value, the model is the so-called 'multinominal logit'.

The choice must also fulfill the independence of irrelevant alternatives (IIA) condition, that is the probability of choosing one out of two alternatives should not change including or dropping any other alternative in the choice set. Operationally, this is obtained including as a feasible option in the choice set the 'status quo' alternative.

The estimation is made using the maximum likelihood estimator, where y_{ij} assumes value 1 if the individual i chooses the alternative j, 0 otherwise:

$$\log L = \sum_{i=1}^{N} \sum_{j=1}^{J} y_{ij} \log\left[\frac{\exp(V_{ij})}{\sum_{j=1}^{J} \exp(V_{ij})} \right]. \qquad (5)$$

If the utility is defined over a vector of independent variables X and β are the parameters to be estimates, then

$$P(\text{choice } g) = \frac{\exp(\beta' X_{ig})}{\sum_j \exp(\beta' X_{ij})}. \qquad (6)$$

With the multinomial logit model can be estimated some 'alternative specific constants' which reflect the utility difference between a given alternative with reference to the base alternative when the attributes of all other alternative are set equal.

Comparing the attributes with the implicit price it is possible to estimate the willingness to pay (WTP) for each characteristic. If V^0 is the initial utility, V^1 is the alternative utility, and b_y is the coefficient that represents the marginal utility of price and the cost of the attribute, the WTP is:

$$WTP = b_y^{-1} \ln\left\{ \frac{\sum_i \exp(V_i^1)}{\sum_i \exp(V_i^0)} \right\}. \qquad (7)$$

This can be simplified as the ratio between the attribute coefficient, b_c, and, b_y:

$$WTP = \frac{-b_C}{b_y}. \qquad (8)$$

The sample can be partitioned in latent classes to study how the different individual characteristics impact the estimates. The hypothesis is that different individual characteristics determine a different structure of preferences. If any individual belong to a different segment of population s ($s = 1, \ldots, S$), Let S be independent variables, the utility function (1) can be expressed as a utility function conditional to the individual characteristics $U_{ig|s} = \mu_s V_{ig} + e_{ig|s}$, where the scale parameter μ varies across segments.

The probability of choosing the g alternative depends on the segment s to which the individual belongs to:

$$P_{ig|s} = \frac{\exp(\mu_s V_{ig})}{\sum_j \exp(\mu_s V_{ij})} \qquad (9)$$

where ms is the utility parameters specific for the s segment [15].

V. RESULTS

A. Attributes estimates

All parameter estimates are statistically significant but Africa and all show the expected signs (Table 6). In particular, the price coefficient show a negative sign

as expected. Very interesting are the estimates of fair trade and organic certifications, both positive and quite large. Broadly speaking, the respondents seem sensible to both ethical and environmental characteristics, while less important seems to be the area of origin[4].

Table 6. Attributes estimates

Variable	Coeff.	SE	b/SE	P[|Z|>z]	WTP
Africa	0.128	0.11067	1.156	0.2477	0.588
America	0.564	0.09919	5.683	0.0000	2.592
Asia	-0.404	0.11266	-3.589	0.0003	-1.860
Price	-0.217	0.01246	-17.451	0.0000	
Fair trade	1.373	0.08360	16.423	0.0000	6.314
Organic	1.074	0.07972	13.471	0.0000	4.939

The last column reports the WTP estimates as coefficients ratio. Again, fair trade certification seems to play an important role showing that the average consumer is willing to pay a price premium of about 6.3 €/kg.

B. Latent classes

According to the sample results, the Italian coffee market is characterized by strong consumer loyalty towards a preferred brand. In fact, 34% of respondents had never chosen one of the 16 products profiles proposed and thus they were excluded from the econometric analysis because they were clearly considered to be a separate consumer segment.

The estimated latent class multinomial logit model yields five classes[5], computing the Bayesian probability of belonging to a given class has been computed per each respondent. Linking the probability of belonging to a certain class with socio-economic characteristics of respondents, the following consumers profiles were identified[6]:

- 'non interested' consumers (class A): generally men living in northern Italy, aged from 45 to 59 years, generally high school educated and with a yearly average income of €25,000;
- 'ethics concerned' consumers (class B): generally men living in the northern and central part of the country, aged around 40, highly educated and with an average yearly income of €30,000;
- 'premium' men (classes C): generally men living in the North-east and central Italy, most of them aged between 45-59, high school education level and income classes ranging from €15,000 to €55,000;
- 'traditional' consumers (class D): living all over the country and with a household size of four components;
- 'premium' women (classes E): generally women living all over the country, aged between 30 and 34 and between 50-54, highly educated and with income classes ranging from €15,000 to €55,000.

Table 7 shows the parameter estimates for respondents who chose at least one of the proposed product profiles.

Table 7. Latent class estimates

Attributes	Classes				
	$\hat{\beta}_A$	$\hat{\beta}_B$	$\hat{\beta}_C$	$\hat{\beta}_D$	$\hat{\beta}_E$
Africa	-0.374	1.012	0.350	-0.055	0.584
	(1.121)	(3.221)	(1.895)	(0.099)	(2.818)
America	-0.289	-0.219	1.293	3.630	0.571
	(0.932)	(0.787)	(7.519)	(7.944)	(3.154)
Asia	-0.404	-0.523	-0.458	-28.033	-0.386
	(1.514)	(1.996)	(2.299)	(0.000)	(1.827)
Price	-0.033	-0.159	-0.505	0.013	-0.259
	(0.954)	(3.324)	(18.94)	(0.307)	(8.867)
Fair trade	-0.012	3.963	2.275	-1.174	2.575
	(0.049)	(9.270)	(13.854)	(3.256)	(14.58)
Organic	0.256	-0.375	1.580	-0.271	3.126
	(1.047)	(1.785)	(11.27)	(0.662)	(16.446)

Z values in brackets

Class A appears to be a very divergent segment because none of the attributes considered is significant, while in the others four classes:

- price shows the expected sign, being always negative and statistically significant but in class D;

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[4] Although the positive sign of the American origin, probably linked to the Arabica variety of such coffee, hints to the possibility to use this information in a marketing strategy (cf. below).

[5] Four information criteria (AIC, AIC3, BIC and crAIC) were used to decide the number of segments to retain in the models.

[6] According to the order of extraction, the five classes have been named as A (first), B (second), C (third), D (fourth) and E (fifth). Class C is the largest representing 26% of the whole sample, class E 19%, class A 11%, class B 6% and class D 4%.

- green coffee imported from Asia is perceived as lower quality coffee as compared to coffee from America and Africa. In particular respondents belonging to class B prefer African coffee, those in classes C and D, American coffee, while respondents in class E does not show a marked preference. Thus considering the share of each segment, coffee imported from America seems to have a greater market potential;
- fair-trade coffee certification is positively appreciated by respondents belonging to classes B, C, and E, while individuals belonging to class D dislike this attribute;
- organic certification is statistically significant and positive only in the two biggest classes (C and E) thus indicating a potential market for this attribute too.

VI. CONCLUSIONS

Findings illustrated so far have to be further explored and to be confirmed in subsequent analysis conducted on a larger sample in which web responses will be contrasted with those from face to face interviews. Preliminary estimates indicate that private companies can invest in these aspects because there are consumers who are ready to pay a premium price for these attributes. Segmentation suggests that the market shares of fair trade and organic coffees could be increased providing appropriate communication to different group of consumers. Finally, with regard to LDCs, Latin American countries and to a lesser extent African countries appear to have a competitive advantage over Asian countries for Italian consumers.

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