

The Hedonic Price of Fair-trade Coffee for the Italian Consumer

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1. Introduction

A recent feature of consumer demand in developed countries is the increasing interest in the consumption of products incorporating ethical aspects (Thøgersen 1999, Vitell *et al.* 2001, Carrigan and Attala 2001, Maietta 2003). Among the latter, fair-trade products are probably of paramount importance; for this reason, they are recently object of theoretical (Becchetti and Adriani 2002, Immordino 2002) and empirical investigation (Gallenti and Prestamburgo 2001; Mariani *et al.* 2001).

Fair-trade products are usually distributed by Alternative Trade Organisations (ATOs), non profit firms whose aim is to promote the economic and social development of particularly underprivileged populations through the international trade of food and home-made products. European consumers have become familiar with these products, sold, with certified labels, in a network of *World Shops* and more recently also introduced in supermarkets and shopping centres.

Coffee, which is the second most widely traded commodity in the world after oil, is the fair-trade product with the highest share on the total: it has reached a significant share on the total domestic market in countries like Luxemburg, Switzerland and the Netherlands. In Italy, fair-trade organisations have been less active than in other European countries but market shares are rapidly increasing.

Market studies suggest that Italian consumers are interested in fair-trade products for quality, solidarity and equity reasons. These considerations provide the background for the analysis performed in the present study. More particularly, this study aims to ascertain the preferences of Italian consumers for coffee attributes, including the ethical content. The sample utilised is based on the purchase data of a representative sample of supermarket and shopping centre consumers observed from 1998 to 2002. Since scanner data are used, the analysis can allow for the numerous coffee attributes described by the labels: branded, organic, decaffeinated, fair-trade, espresso coffee, arabica variety, and so on. The empirical approach followed is the estimation of the hedonic price for the fair-trade content and for other attributes of coffee.

2. Fair Trade coffee

Fair Trade is a trading partnership that seeks greater equity in international trade. It contributes to sustainable development by offering better trading conditions to, and securing the rights of marginalised producers and workers, especially in less developed countries (Bowen 2003).

Fair Trade instruments are:

- fair price: a bonus beyond the world market price and a guaranteed minimum price;

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- direct purchase: the product always comes directly from small farmers' organisations;
- pre-financing: credit up to maximum 60% of the selling price granted as the harvest starts;
- security: annual contracts stipulating the purchase of the product and long-term collaboration.

Coffee has formed the core of Fair Trade initiatives in Europe and North America and remains the most widely available labeled commodity. Fair Trade coffee sales have leveled off in much of Europe where long running campaigns have successfully acquired a sizable market presence. It is sold in supermarkets and is served in many corporate headquarters and universities as well as municipal, national, and European Union government offices, like the *bouvette* of the European and of the Italian Parliament. Fair Trade coffee holds an average of 1.2% of European national markets in 2000 and has captured roughly 3% of the market in Luxemburg, Switzerland, and the Netherlands (EFTA 2001). Markets continue to grow rapidly in countries like Norway, Italy and France where it has only recently been introduced.

More recently, the crisis in coffee market makes this commodity a symbol of the inequalities between North and South: coffee prices have fallen by over 50% over the last three years, to the lowest price in real terms for at least 100 years, and seem likely to maintain their recent increased volatility. The price decreases has been dramatic for over 25 million coffee growers in over 50 developing countries where coffee is a crucial source of rural employment and foreign exchange earnings.

The crisis is mainly due to the collapse in 1989 of the quota system established by the International Coffee Agreement (ICA) that ensured the stability of the market through fixed export quotas. Consuming and producing countries could not agree on the conditions of a new agreement and on the distribution of the export quota. That meant deregulation of the market. The coffee-producing countries almost immediately dumped the stocks they had accumulated on the market. The result was a dramatic fall in the coffee prices, with a record bottom price in the autumn 1992 when arabica coffee reached a level similar to that of the thirties in the stock market in New York (Renkema 2003). Echo of the consequences of this crisis has reached the consumer of the developed countries through mass-media¹.

3. The hedonic price model and its empirical specification

In this paper, the hedonic price of the ethical content in coffee consumption is estimated for the Italian market. The hedonic price (Rosen 1974) is used to explain the price of a differentiated product (or factor of production) and to estimate the implicit, shadow prices of its quality characteristics. Coffee can be described as a heterogeneous good, as in Goddard and Akiyama (1989) and Sellen and Goddard (1997). Infact, consumers (and roasters-buyers) are concerned about what variety² of coffee they acquire. Sellers also distinguish their products by highlighting their

¹ See for example, *Caffè scorretto dal Vietnam*, La Repubblica, 15/2/2003.

² Varieties are typically divided into robustas, which are more acid and higher in caffeine, and arabicas, which are milder and fragrant. Arabicas are further subdivided into Colombian milds (from Colombia, Kenya and Tanzania), unwashed arabicas (mainly Brazilian) and other milds (mainly from Central and South America).

country of origin, by emphasising their particular characteristics or by showing a commitment to organic, shade-grown or Fair Trade practices. Then, niche or speciality coffees, new types of coffee drink sold at a premium, have been successfully introduced in the market.

The product will be sold by a number of manufactures usually supplying more than one model, each model having different characteristics. The hedonic price function is:

$$(1) \quad P = f(z)$$

where z is the vector of characteristics for the product examined.

This hedonic price equation represents the equilibrium price schedule determined by the interaction of consumers and sellers in perfectly competitive markets or where arbitrage exists.

In fact, if the utility function for a representative consumer is:

$$(2) \quad U = U(x, z)$$

$$(3) \quad s.t. \ y = w x + f(z)$$

where x is a composite good which represents all goods except the product examined and w is its price.

The first order conditions for utility maximization are:

$$(4) \quad f_j = U_j(x, z) / \mathbf{I}(x, z) = g(y - P, z)$$

where: $f_j = \partial f / \partial z_j$; $U_j = \partial U / \partial z_j$ and λ is the Lagrange multiplier.

The representative consumer will use z_j up to the level where its implicit marginal price will be equal to the willingness to pay for z_j .

Then a set of $j = 1, \dots, m$ characteristics can be identified, if data over $k = 1, \dots, n$ models are collected for a regression of the price of model k (P_k) on the levels of its characteristics (z_{kj}).

The empirical specification is usually a semi-logarithmic form. Arguea *et al.* (1994) and Feensta (1995) have recently argued for a linear form, which will be adopted in this work:

$$(5) \quad P_k = \beta_0 + \sum_{j=1}^m \beta_j z_{kj} + \varepsilon_k$$

the β_j are estimates of the marginal value of the characteristics.

4. The data

In this work, scanned data are used; they are referred to the total observed purchases of all brands supplying roasted coffee in Italian supermarkets over the period 1998-2002 from IRI InfoScan source. Brands usually supply more than one model, here called reference, with different characteristics, most of them described in the label. Price and sale volume for each reference is known; finally, these information are given for big territorial aggregates. The number of references increases over time (see table 1).

From this analysis, Italian market appears highly segmented since products of the same brands can differ for a big variety of packaging choice (and then price), blends recipes are responsive to changes in consumers' tastes (and relative prices), new characteristics are offered, like ethical or organic coffee. The sector is composed by few leaders and by a large number of small firms; competition is strong in each segment. During the period examined marketing strategies for big firms have been the development of new packaging (like the easy open system), the launch of new products (for example Espresso, which is a solid espresso) or the implementation of a network of bars with its own brand. Marketing strategies for medium firms have been: fulfilment of high quality standard and product differentiation through speciality coffee, like Fair Trade coffee, organic coffee or coffee with specification of area of plant origin (Fabro 2002). Finally, small firms strategies have been essentially low prices and local penetration, particularly in the South of Italy.

Data related to shares for moka, espresso, decaffeinated and fair trade coffee sold in Italian supermarkets are reported in TABLE 1. Moka is an Italian special brewer used to prepare coffee³. Espresso coffee is prepared by a high pressure machine like those used in the bar.

TABLE1: Descriptive statistics

Variables		1998	1999	2000	2001	2002
sale volumes (kg)	kg	83223232	85376416	88079376	91658512	96947592
moka	%	89.9	91.1	91.2	91.5	91.8
espresso	"	10.1	8.9	8.8	8.5	8.2
branded	"	79.1	79.9	80.4	81.0	81.6
private label		7.9	7.7	6.7	5.9	5.7
decaffeinated	"	3.5	3.7	4.1	4.6	5.3
fair trade coffee	kg	223732	238800	278366	326487	396734
	%	0.27	0.28	0.32	0.36	0.41
references	No.	660	697	749	795	878
price	€/kg					
<i>North-West</i>		8.7	8.1	8.0	8.0	7.8
<i>North-East</i>		8.3	7.9	7.9	7.9	7.8
<i>Centre-Sardinia</i>		8.1	7.6	7.6	7.6	7.5
<i>South</i>		7.5	7.0	6.9	6.7	6.6
<i>Italy</i>		8.2	7.7	7.6	7.6	7.4
minimum		2.3	2.1	2.1	2.1	2.0
maximum		86.0	112.8	123.8	93.3	85.2
st. deviation		6.4	7.7	8.5	8.8	9.0

For each reference, the information contained in the label were processed and several characteristics derived. The related variables are reported in TABLE 2.

³ Italian coffee is very different from the instant or filter coffee that is a long beverage. This latter is not very widespread and is mainly consumed by young people.

TABLE 2: Variable list

Variables	description
P	price
Q	sale volume
DEC	decaffeinated
BR	branded
ETHIC	fair trade
ORG	organic
MOKA	moka
ESPR	espresso
CIAL	espresso filters
	<i>packaging choice</i>
PACK	pack
CAN	canned
ACONF	other packaging
CONFR	gift packaging
GM	weight
NCONF	No. packs
NFIL	No. espresso filters
	<i>variety</i>
ARAB	arabica
ROB	robusta
ORI	origin
CERT	certified
TASTE	taste

5. The results

Regression of price on all characteristics has been performed with respect to the sample of references referred to the same quantity: 250 gm and one pack. The number of observations is 3669. The results have been corrected for heteroskedasticity with the Breusch - Pagan procedure (Chi-sq. = 9586.24 with 20 degrees of freedom). OLS estimates are reported in TABLE 3.

The regression fit is quite high: the adjusted R-squared is 0.70; the time dummies are not significant. The area dummies are significant except for the North-West.

All variables related to characteristics are significant except the variable referred to the origin. The sign are positive except for the taste variable which is negative; probably it is a spurious effect since the dummy includes all references with indication of taste (strong, delicate, rich). Finally, the marginal value of the ethical content in coffee consumption is 1.14 €/kg, which is 9% more than the average price, while the marginal value for organic coffee is 3.84 €/kg, which is 25% more than the average price. Notice that organic coffee was entirely supplied by fair-trade labels except for the last year. Also, the coefficient for fair-trade coffee is lower compared with those referred to other characteristics. This is not surprising since it is a niche product, only recently introduced in Italian supermarkets, but with increasing markets shares (see TABLE 1). Finally, notice that the consumption of fair-trade coffee sold in supermarkets is lower in the South of Italy but its marginal value is not

different after controlling for area income differences. More precisely, area intercepts control for the price differential due to the different area income; after introducing the area dummies as intercepts, no significant area differences in the coefficient for fair-trade content is noticed.

TABLE 3: Dependent variable P (mean = 11.27)

Variable	Coefficient	Standard Error	t-Student	Mean of X
Constant	5.29	0.25	21.20	
North-West	0.41	0.28	1.50	0.22
North-East	0.75	0.25	2.97	0.27
Centre-Sardinia	0.53	0.28	1.88	0.24
D99	0.14	0.27	0.53	0.19
D00	0.24	0.27	0.92	0.20
D01	0.46	0.29	1.58	0.22
D02	0.51	0.29	1.72	0.22
DEC	1.82	0.16	11.11	0.08
ESPR	2.79	0.28	9.96	0.24
CAN	2.51	0.25	9.95	0.13
ACONF	1.32	0.20	6.57	0.09
CONF	29.17	0.92	31.70	0.09
BR	1.49	0.20	7.44	0.44
ARAB	3.05	0.27	11.44	0.13
ROB	9.22	3.85	2.40	0.00
CERT	1.64	0.27	6.07	0.17
ORG	3.84	0.52	7.33	0.02
ETHIC	1.14	0.42	2.71	0.05
TASTE	-0.75	0.13	-5.62	0.19
ORI	-0.37	0.37	-1.00	0.08
Adjusted R-squared	0.70			

6. Conclusions

Objective of this study is to ascertain the marginal value for the ethical content in coffee consumption after controlling for other coffee attributes, according to the Italian consumer preferences.

The data used refer to the purchase data of a representative sample of supermarket and shopping centre consumers observed from 1998 to 2002. The coffee attributes analyzed are those described by the label: fair-trade coffee, branded, organic, decaffeinated, fair-trade, espresso coffee, arabica variety, and so on. The empirical approach followed is the estimation of the hedonic price for the fair-trade content and for other attributes of coffee.

The results show that the coefficient for fair-trade coffee is significant and lower than those referred to other coffee attributes. The marginal value of the ethical content in coffee consumption is 1.14 €/kg which is 9% more than the average price. Also, the marginal value for organic coffee, which was entirely supplied by fair-trade labels (except for the last year), is 3.84 €/kg which is 25% more than the average price. Finally, after controlling for area income, no area differences in the coefficient for fair-trade coffee was noticed.

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