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The hedonic price of fair trade coffee for the Italian consumer

Il prezzo edonico del caffè equo – solidale per i consumatori italiani

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Abstract

Consumers in developed countries are increasingly interested in the consumption of products incorporating ethical aspects, particularly fair trade products. They are usually distributed in a network of World Shops and more recently also introduced in supermarkets and shopping centres. The fair trade product with the highest share on the total is coffee. This study aims to ascertain the implicit price paid by Italian consumers for the fair trade content of coffee. 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, soluble, and so on. The empirical approach followed is the calculation of hedonic prices for the fair trade content and other attributes of coffee.

Riassunto

I consumatori dei paesi avanzati sono sempre più interessati al consumo di prodotti che incorporano aspetti etici, ad esempio i prodotti del commercio equo e solidale. Questi prodotti sono abitualmente venduti in una rete di Botteghe del Mondo e più di recente sono stati introdotti nei supermercati. Il prodotto del commercio equo e solidale con la più alta quota di mercato è il caffè. Questo studio intende stimare il prezzo implicito pagato dai consumatori italiani di caffè per l'attributo etico. Il date set usato è basato sugli acquisti presso la grande distribuzione, nel periodo 1998-2002, di un campione rappresentativo di consumatori. Poiché i dati sono scannerizzati, l'analisi si basa sugli attributi desumibili dall'etichetta: qualità (Arabica o Robusta), marca, formato, se decaffeinato, se di agricoltura biologica, confezione, origine, ecc. L'approccio usato è la stima del prezzo edonico per l'aspetto di commercio equo e solidale e per gli altri attributi del caffè.

***key-words**:* hedonic price, coffee, fair trade, scaner data.

parole-chiave: prezzo edenico, caffè, commercio equo e solidale, dati scannerizzati.

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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, Mannheimer, 2003). Among the latter, fair trade products are probably of paramount importance. For this reason, they have recently become object of theoretical (Adriani and Becchetti, 2002; Immordino, 2002) and empirical investigation (Loureiro and Lotade, 2002; Sali, 2004).

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 (Gallenti and Prestamburgo, 2001), 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 (Maietta, 2004). These considerations provide the background for the analysis performed in the present study. More particularly, this study aims to ascertain the implicit prices paid by Italian consumers for coffee attributes, including the ethical content. The sample utilised is based on the purchases of a representative sample of supermarket and shopping centre consumers observed from 1998 to 2002. Since scanner data are used, the analysis can take account of the numerous coffee attributes described by the labels: branded, organic, decaffeinated, fair trade content, 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;
- direct purchase: the product always comes directly from small farmers' organisations;
- pre-financing: credit up to a maximum 60% of the selling price granted as the harvest starts;
- security: annual contracts stipulating the purchase of the product and long-term collaboration.

Fair trade products have become familiar to European consumers, reaching not insignificant share on the total domestic market (table 1).

Table 1 – *Market shares of some fair trade*

Country	Coffee	Tea	Banana
Luxembourg	3.3	-	4
Switzerland	3	4	15
Netherlands	2.7	0.7	4.2
Denmark	1.8	1.8	2
United Kingdom	1.5	-	-
Belgium	1	-	0.6
Germany	1	2.5	-
Sweden	0.8	0.8	1.8
Austria	0.7	0.7	-
Ireland	0.5	-	-
Italy	0.4	0.7	1.2
Finland	0.3	-	-
Norway	0.3	-	-

Source: Fair Trade in Europe, 2001

They are sold in a network of *World Shops* and more recently also introduced in supermarkets; products, like coffee, are also served in many corporate headquarters and universities as well as municipal, national and European Union government offices, like the cafeterias of the European and of the Italian Parliament, the *institutional markets* presented in table 2[2].

Table 2 – *Percentage of sales by market and by EFTA (European Fair Trade Association) organisation in 2001*

EFTA organisation	Super-markets	Institutional markets	World Shops
Claro	–	–	51
CTM	30	15	55
EZA	10	8	82
Fair Trade Organisatie	1	19	65
Gepa	16	14	66
Ideas	21	3	76
Intermón-Oxfam	10	–	90
Mdm-Oxfam	–	–	100
Oxfam WW	9	1	90
Solidar'M	0	24	76
Traidcraft	27	0	73

Source: EFTA

Finally, the trend of retail sales seems to be increasing (fig. 1).

Coffee has formed the core of fair trade initiatives in Europe (table 3) and North America and remains the most widely available labelled commodity. Fair trade coffee sales have levelled off in much of Europe where long running campaigns have successfully acquired a sizeable market presence.

Fair trade coffee held 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 (table 1). 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 the North and South: coffee prices have fallen by over 50% over

[2] EFTA data presented in tables 2 and 3 and in figure 1 are unpublished and have been kindly supplied by Danilo Tucconi, CTM Altromercato.

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.

Figure 1 – *Retail value (ml Euro) in Europe by fair trade organisations*

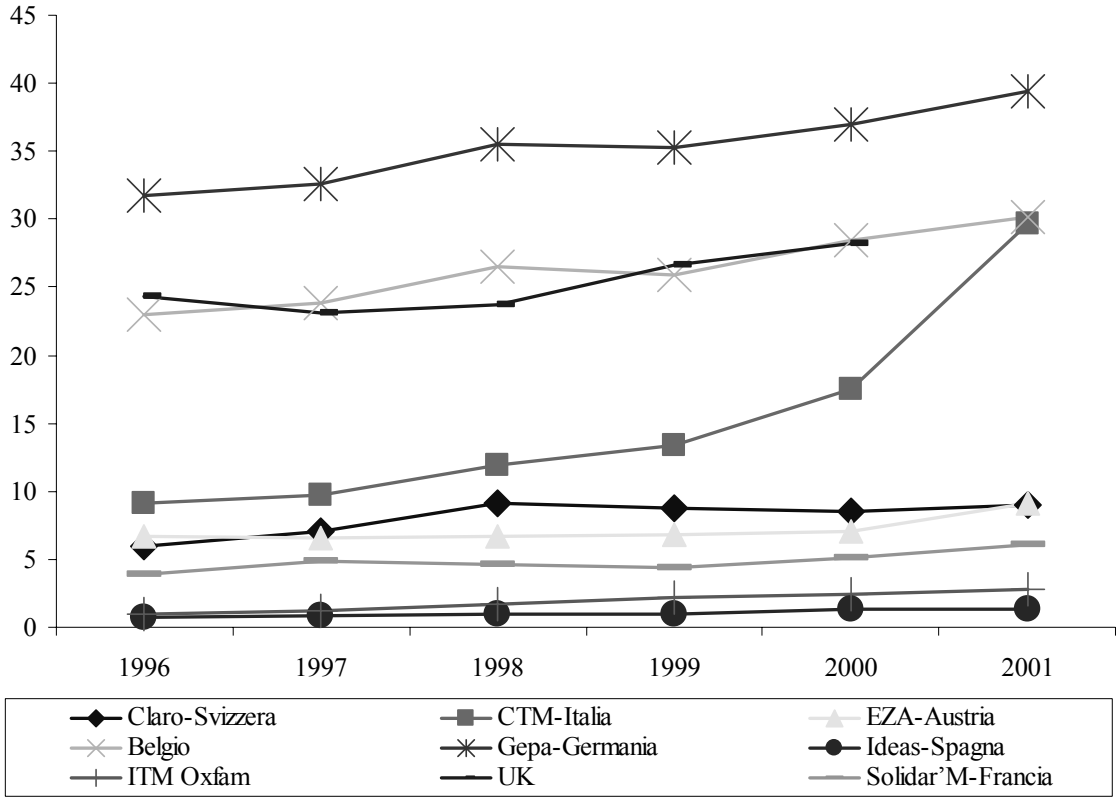


Table 3 – *Percentages of total sales by product for some fair trade organisations in Europe in 2001*

Organisation	Coffee	Food	Handicraft	Literature	Other
CTM	18	62	18	2	–
EZA	36	40	24	–	–
Fair Trade Organisatie	38	27	32	4	–
Gepa	43	44	13	–	–
Ideas	70	–	24	6	–
ITM-Oxfam	9	19	60	4	8
Mdm-Oxfam	45	–	49	6	–
Oxfam WW	22	78	–	–	1
Solidar'M	66	–	32	–	2
Traidcraft	14	52	17	1	17

Source: EFTA

The price decreases have 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 (Lawson, 2004; Renkema, 2003).

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 of 1992 when arabica coffee reached a level similar to that of the thirties in the stock market in New York (Zehner, 2002; Renkema, 2003). Echo of the consequences of this crisis has reached the consumer of the developed countries through the mass media[3].

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 (Nestor and Hsiao, 1993; Freeman, 1995; Combris *et al*., 1997; Perali and Zago, 1998; Schamel and Anderson, 2001).

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:

$$P = f(z) \tag{1}$$

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, the utility function for a representative consumer is:

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

(2)
$$U = U(x, z)$$
$$s.t.\ y = wx + f(z)$$

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

Maximisation of utility subject to the budget constraints gives rise to a vector of demand functions, g, for characteristics:

(3)
$$fj = \frac{U_j(x, z)}{U_x(x, z)} = g(y - P, z)$$

where: $f_j = \frac{\partial f}{\partial z_j}$, $U_j = \frac{\partial U}{\partial zj}$ and $U_x = \frac{\partial U}{\partial x}$.

The representative consumer will use z_j up to the level where its implicit marginal price, f_j, will be equal to the willingness to pay for z_j. Equation (3) also shows that f_j is proportional to the marginal rate of substituion, i.e. the ratio of the marginal utility from the characteristic j and the marginal utility from the consumption of all the other goods.

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

If the empirical specification is linear, as suggested by Arguea *et al.* (1994) and Feensta (1995):

(4)
$$P_k = \beta_0 + \sum_{j=1}^{m} \beta_j z_{kj} + \varepsilon_k$$

the β_j are estimates of the marginal value of the characteristics. As has been mentioned before, in this work the linear specification is rejected by the data in favour of a semi-logarithmic form.

Coffee can be described as a heterogeneous good, as in Goddard and Akiyiama (1989) and Sellen and Goddard (1997). In fact, consumers (and roasters-buyers) are concerned about what variety[4] of coffee they acquire. Sellers also distinguish their

[4] 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

products by highlighting their 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.

4. *The data*

In this work, scanned data are used; they refer to the total observed purchases of all brands supplying roasted coffee in Italian supermarkets over the period 1998-2002 from IRI InfoScan[5] source. Brands usually supply more than one model (in this study it is called reference) with different characteristics, most of them described in the label. Price and sale volume for each reference is known; finally, this information is given for big territorial aggregates. The number of references increases over time (see table 4).

Table 4 – *Descriptive statistics*

Variables		1998	1999	2000	2001	2002
sale volumes	t	83223	85376	88079	91659	96948
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	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	t	224	239	279	327	397
	%	0.27	0.28	0.32	0.36	0.41
references	No.	660	697	749	795	878
price	Euro/kg					
North-West		8.7	8.1	8	8	7.8
North-East		8.3	7.9	7.9	7.9	7.8
Centre-Sardinia		8.1	7.6	7.6	7.6	7.5
South		7.5	7	6.9	6.7	6.6
Italy		8.2	7.7	7.6	7.6	7.4
minimum		2.3	2.1	2.1	2.1	2
maximum		86	112.8	123.8	93.3	85.2
st. deviation		6.4	7.7	8.5	8.8	9

Colombia, Kenya and Tanzania), unwashed arabicas (mainly Brazilian) and other milds (mainly from Central and South America).

[5] www.infores.it

The related variables are reported in table 5.

Table 5. Variable list

Variables	description
P	price
Income	households disposable income
Dec	decaffeinated
Br	branded
Ethic	fair trade
Org	organic
Espr	espresso
Cert	certified
Taste	taste indication
	variety
Arab	arabica
Rob	robusta
	packaging choice
Can	canned
Aconf	other packaging
Gift	gift packaging

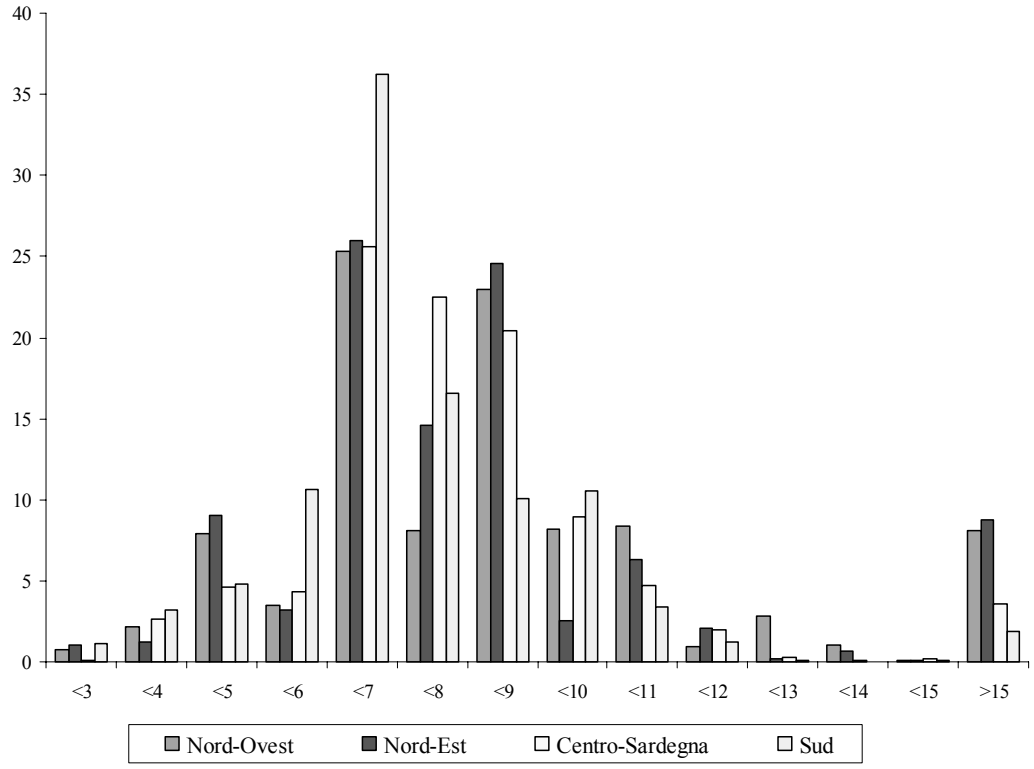
From this analysis, the Italian market appears highly segmented since products of the same brand can differ for a large variety of packaging choice (and then price); also, blend recipes are responsive to changes in consumers' tastes (and relative prices) and new characteristics are offered, like ethical 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 Espesso, 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 firm 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 4. Moka is an Italian special brewer used to

prepare coffee[6]. Espresso coffee is prepared by a high-pressure machine like those used in the bar.

For each reference, the information contained in the label was processed and several characteristics were derived.

Figure 2 – *Distribution of coffee price (Euro/Kg) in 2002 in the sample used for the hedonic regression*



5. *The results*

Regression of price on all characteristics has been performed with respect to the sample of references referring to the same quantity: 250 gm and one pack. The number of observations is 3678. 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 6. On the basis of the Reset test, the linear specification is rejected and the semi-logarithmic form is accepted.

[6] Italian coffee is very different from the istant or filter coffe that is a long beverage. This latter is not very widespread in Italy and is mainly consumed by young people.

The regression fit is good: the adjusted R-squared is 0.594. All variables related to characteristics are significant. The sign is positive except for the taste indication variable which is negative; it is probably a spurious effect since the dummy includes all references with indication of taste (strong, delicate, rich).

Table 6 – *OLS estimates. Dependent variable ln (p)*

Variable	Coefficient	T-student
Constant	1,686	75,49
Income	0,010	4,85
Espr	0,218	13,63
Can	0,205	8,07
Gift	1,404	39,85
Aconf	0,184	8,36
Dec	0,243	14,23
Arab	0,283	12,61
Rob	0,210	2,34
Cert	0,096	4,80
Org	0,270	7,20
BR	0,203	16,23
Ethic	0,277	9,30
Taste	-0,030	-3,19
Adj R2	0,594	–

The coefficient on the ethical content is not only significant but also larger in size than those on the other attributes except for the gift packaging variable, GIFT. This variable probably reflects the higher availability to buy coffee during holidays (Koerner, 2002) and to pay for its packaging.

Table 7 – *The implicit price for the ethical attribute in coffee consumption (Euro/Kg)*

Territory	1998	1999	2000	2001	2002	1998-2002
North-West	2.57	2.47	2.50	2.49	2.57	2.52
North-East	2.42	2.37	2.40	2.39	2.39	2.40
Centre-Sardinia	2.32	2.37	2.30	2.41	2.41	2.36
South	2.23	2.13	2.11	2.18	2.08	2.14
Italy	2.39	2.33	2.33	2.37	2.36	2.36

Finally, since the linear specification is rejected by data, the implicit price for the ethical attribute in coffee consumption is not constant but varies with price. The

marginal value of the ethical content in coffee consumption is reported in table 7: on average, it is 2.36 Euro/kg but the value is lower for the South of Italy. Notice that after introducing the income variable, no significant area differences in the coefficient for fair trade content is noticed; then, no territorial differences remain in the implicit price paid after controlling for income.

6. *Conclusions and policy implications*

The 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 analysed are those described by the label: 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 high. The marginal value of the ethical content in coffee consumption is not constant; it is 2.36 Euro/kg on average but the value is lower for the South of Italy. Finally, after controlling for area income, no area differences in the coefficient for fair trade coffee was noticed. This suggests that fair trade brands should adopt a strategy of price differentiation, similar to that adopted by conventional brands, in order to increase their market share.

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