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**Is Fair Trade Fair for Consumers? A Hedonic Analysis of U.S. Retail Fair Trade Coffee
Prices**

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Abstract

This study aims to investigate the impact of the fair trade label on the market for coffee in the United States, a country with high public awareness regarding environmental and social matters. A revealed preference approach is adopted, using monthly Nielsen scanner sales panel data. The pricing of labeled ground and whole bean coffee is studied over the 2011-2013 period. Hedonic estimates are obtained for what consumers pay for different product characteristics. Results would provide information on the existing price differences between labeled and conventional coffee, and add to the ongoing analysis and debate over fair trade coffee.

JEL classification: C13, D44, O31, Q13

Keywords: fair trade; coffee; hedonic price; social premium; Nielsen scanner data

Introduction

Coffee is big business and remains the world's second most valuable traded commodity, behind only petroleum. However, many of the world's 25 million coffee growers (Food and Agriculture Organization, 2013) are small-scale family farmers who live in remote locations and lack access to credit. They are vulnerable to middlemen who offer cash for their coffee at a fraction of its value, and to the volatile international market and its wildly fluctuating prices. Moreover, coffee prices have shown a declining long-term real price trend. Fair Trade has made a breakthrough as a global social movement and a major certification system, with coffee as its primary illustrative

case of the model¹. product. It guarantees farmers a minimum price, and links farmers directly with importers, creating long-term sustainability. The fair trade minimum price is set at \$1.40 per pound for Fair Trade certified (conventional, washed Arabica, price varies by coffee type and origin) coffee, plus a 20 cents Fair Trade Premium (also known as the Community Development Premium) which are paid directly to the farmer groups and a 30 cents differential for organic production² (Fairtrade International, 2011). The numbers coffee farmers in the Fairtrade system reached to 737,100 in 2013, representing a 12 percentage increase over 2012, producing more than 314 million lbs. of Fairtrade certifiable coffee valued at \$651.4 million in 2012-2013. Total coffee premiums of \$56 million were received by producers in 2013 (Fairtrade International, 2014). Fairtrade certification purports to guarantee not only fair prices, but also the principles of ethical purchasing. These principles include adherence to International Labor Organization standards for their paid employees—such as paying any local minimum wage, banning child and slave labor, and protection and conservation of the environment.

There is a growing desire for socially-conscious consumers to align their purchasing habits with their values on sustainable and responsible coffee products. Data from a report by National Coffee Association (NCA, 2014) show the majority of the coffee drinkers believe that Fair Trade Certification means fair prices and better working conditions for farmers compared with other labels. According to data from the Natural Marketing Institute (NMI, 2014), consumer awareness of the Fair Trade label increased to 55% of the U.S. population, 37% of the U.S. adult coffee drinkers state that they are more likely to buy coffee if it has the Fair Trade USA seal,

¹ Though coffee was the first—and remains the primary—commodity channeled through the Fair Trade network, today the network certifies and distributes a vast array of commodities, including bananas, cocoa, cotton, flowers, sugar, tea, fruit, gold, honey, rice, and even sports balls (Claar and Haight, 2015).

² In 2011 Fairtrade International revised its pricing standards to include a 50 per cent increase in the organic premium (from \$0.20 to \$0.30 per pound) paid for Fairtrade coffee, aiming to account for the higher costs of organic production and provide an incentive to farmers to convert to or maintain organic production (Fair Trade USA, 2011).

same percentage for the USDA Certified Organic seal. Moreover, Fair trade certified is the one ethical attribute that resonates most across all generations (Agriculture and Agri-Food Canada, 2013). In 2012, imports of fair trade certified coffee in North America hit a record high at more than 160 million pounds and over \$30 million in premium funds were paid to coffee farmers. Fair Trade made up about 5 percent of the U.S. coffee market in 2012, but is growing steadfastly (Fair Trade USA, 2013).

Coffee is the largest food import of the United States, which is also the largest coffee importing country. Several studies have been performed on the US demand for fair trade coffee. Most of them rely on the stated preferences approach (conjoint/choice analysis), examining consumers' willingness to pay for coffee with fair trade labels. The majority of these studies finds that consumers are willing to pay higher premiums for coffee with eco-labels. Loureiro and Lotade (2005) conducted surveys in four grocery stores located in Colorado and Wyoming in 2002, asking 276 participants valuation questions regarding the fair trade, shade grown, and organic coffee labels. They found that consumers were willing to pay the highest premium of about 22 cents/lb for fair trade coffee, followed by premiums of 20 and 16 cents/lb, respectively, for the shade grown and organic coffee. Basu and Hicks (2008) investigated label performance and consumer willingness to pay for fair trade coffee in the United States and Germany. They found that US respondents would like to pay 50 cents up to \$1.40 for Fair Trade coffee, depending on the level of grower revenue increases. Hertel, Scruggs, and Heidkamp (2009) found that over 75% of the 508 nationally surveyed coffee buyers in the United States in 2006 said they would be willing to pay at least 50 cents more per pound for Fair Trade coffee versus noncertified coffee (a premium of roughly 16% over the average price of coffee at the time), and more than half said they would pay a premium of a dollar or more. Different from previous

studies, Hainmueller, Hiscox, and Sequeira (2014) conducted field experiments in a U.S. grocery store chain and found that consumers buying the more expensive and more popular French Roasted Regular coffee were willing to pay a sizable premium (8%) for Fair Trade labeled coffee and had less price elastic demand, while consumers buying the lower-priced coffee blend were price sensitive and were not willing to pay a premium for Fair Trade.

While consumers have shown a willingness to pay more for fair trade coffee, the premiums are not necessarily reflected in retail prices. Compared with specialty coffees of a higher grade, Fair Trade coffee can come in any quality grade, but the coffee is considered part of the specialty coffee market because of its special production requirements and pricing structure. Some argue that these requirements and pricing structure that create a quality problem for Fair Trade coffee (Elliott, 2012). It is virtually impossible to know whether the higher price for the Fair Trade coffee is due to higher quality, higher costs, or price-gouging. Besides, some believe that retailers/roasters offer Fair Trade coffee as a “loss-leader”. Presumably, the companies are absorbing the additional costs themselves rather than passing it on directly to consumers or relying on cross-subsidization. Given the difficulties in controlling for quality differences, it is simply impossible to know whether consumers are paying more than they should.

Reinstein and Song (2012) developed a model to explain that even consumers who are fully informed and rational may prefer to purchase the fair trade product. Their model predicted that the consumer premium for fair trade should not exceed the premium paid to farmers. We try to test their model empirically by comparing the coefficient on a fair trade dummy in a hedonic regression at the consumer level by using recent supermarket scanner data to a similar coefficient in a regression at the farmer level. Hedonic analysis for fair trade coffee has been done for some

European countries: such as the UK (Galarraga and Markandya, 2004), Italy (Maietta, 2003), France (Cailleba and Casteran, 2010) and Sweden (Schollenberg, 2012). Hoehn and Session (2015) is the only study to our knowledge, which explicitly analyzed the demand for labeled coffee in the U.S. They used a hedonic pricing approach and estimate the marginal retail value of coffee attributes for the U.S. market from 1997 through 2014. They used nominal retail price and quality data derived from 1,350 cupping evaluations posted online by Coffee Review. They found that Estate and Fair Trade designations detract (-6%), rather than add, value to coffees sold in U.S. retail markets, while organic/nature labels add values by 12%.

The rest of this paper is organized as follows: section 2 is concerned with the employed model and methodology. Section 3 discusses the data and variable construction. Empirical results from the estimations are presented in section 4, while section 5 summarizes findings and concludes the paper.

The Hedonic Framework

Research on hedonic theory originates from Waugh (1928), but it is Court (1939) who developed the method using multiple regression techniques. Hedonic pricing was revived and further evolved by Grilliches (1961), Lancaster (1966), Rosen (1974) and Ladd and Zober (1977) etc. Hedonic pricing model (HPM) rests on the assumption that goods are valued for their utility-bearing attributes or characteristics. Hedonic prices are defined as the implicit prices of attributes and are revealed from observed prices of differentiated products and the specific amounts of characteristics associated with them. One of the most attractive components of HPM is that it is able to monetize those differences between levels of one attribute and across attributes. We are interested in identifying price premia/discounts associated with the characteristics of fair trade

coffee. A first-stage hedonic price function is an appropriate approach to our problem. It allows us to estimate the implicit prices of the attributes of a good, including its ethical characteristics.

Our model specification follows Rosen (1974) and specifies the price of a product as a function of the product attributes. In its most general form the model can be written as:

$$P_{it} = f(z_1, z_2, \dots, z_n) \quad (1)$$

where P_{it} is the price of product i at time t , and z_1, \dots, z_n is a vector of attributes that determine the price of the product. The partial derivative of this function with respect to any attribute is the implicit marginal attribute price, *ceteris paribus*, which can be easily acquired from the regression coefficient.

Linear and log-linear functional forms are frequently found in the literature for hedonic price models (some studies use Box-Cox functional forms). For our model, we use a simple linear form as it is easier to interpret than a log-linear form. In this analysis, the attributes are all expressed as dummy variables (see table 1).

Data

We estimate a hedonic price function and calculate the implicit prices of product attributes for labeled coffee. We extract ground and whole bean coffee product³ data from the 2011-2013 Nielsen Homescan panel dataset, which covers nearly 0.7 million monthly transactions made by 55,470 households located in 264 counties from the 48 continental states plus the District of Columbia. Compared with Nielsen Retail Scanner data, the Homescan data have more retail channel types. If the purchase is made in Nielsen cooperating retailers, the price prompt is bypassed and filled by Nielsen with the average weighted price for the item that week in that

³ Instant coffee, coffee beverage, and coffee substitutes (coffee partners and alternatives) are excluded since ground and whole bean coffee products have the largest degree of product variety, with number of UPCs accounting for almost 80% of the total.

particular store. Otherwise, households are instructed to enter the price and quantity for that particular purchase. In our dataset, consumers purchase coffee products via 62 different retail channels, with the majority of purchases made in grocery stores, followed by discount stores⁴ and warehouse clubs.

One major advantage of the data is that it is at the UPC level and has detailed product attributes information. Numerous coffee attributes, such as sustainability certification (such as organic, Fairtrade, FLO, Organic, shade grown/bird-friendly), brand, roast type, decaffeinated, and flavor were accessible from the data. Therefore, it is possible to identify several relevant attributes and to elicit that the premium consumers are actually paying for the fair trade label and other coffee attributes.

Roast types include light, medium, dark roasted and others. Container types include bag, can, brick, canister and all others (i.e., plastic canister, packet, plastic jug, filter packs, box, pouch, individual bag, or wrap). Types describe the caffeine content, according which we categorize the product into three types: decaffeinated, low caffeine, and regular coffee. Country of origin information was also extracted, including Hawaii (Kona), Mexico, Guatemala, Colombia, Indonesia (Java and Sumatra), Nicaragua, Brazil, Peru, Ethiopia, Kenya, Costa Rica and products with no origin information specified. We reclassified the retail channels into six categories: grocery, hypermarket/warehouse club, coffee store/gourmet coffee shop, discount/dollar store, online shopping, and all other stores.

Table 1 presents summary statistics of the model's variables. In our final dataset, there were 540 different brands and 6,714 ground and whole bean coffee products at the UPC level.

⁴ Nielsen codes all mass merchandisers, including Kmart, Target, and Wal-Mart in the "Discount Store" channel.

Empirical Results

Table 2 reports the results for the linear hedonic price regression using the Nielsen monthly scanner data over the sample period of January 2011 to December 2013. Each column of the table contains estimates from a separate regression that adds fixed effects sequentially across columns in order to understand how each set of controls impacts our estimates. Column (4) has the largest $R^2(=0.631)$ among all the columns, indicating that 63.1% of the variation in coffee prices is explained by the product attributes and control variables. Thus, we focus on interpreting the results from column (4). Channel type variables are dropped once retailer dummies are included, due to the multicollinearity issue.

The results indicate that there are statistically significant attributes in all categories, indicating that all the attribute groups influence the price of coffee. As far as our main variable of interest, Fair Trade labeling, is concerned, the estimated coefficient (0.056) is highly statistically significant and of the expected positive sign. The positive price premium was anticipated given the fact that the Fair Trade label guarantees a good minimum price to the producers disregarding world market price developments (Galarraga Gallastegui, 2001). Organic labeling yielded a slightly larger coefficient (0.067), indicating organic coffee receive a relatively higher premium. Country of origin has a strong influence on market price, as also found in earlier studies. Products with the country of origin information have higher prices compared with those without such information. The individual parameters indicate that on average Nicaragua and Kenya coffee obtains the highest price on the US market. Moreover, consumers are willing to pay a 6 cents per oz. premium for Hawaii coffee relative to coffee with no origin information.

Conclusions

We used a hedonic pricing model to analyze the sale prices of ground and whole beans coffee products sold during the period of 2011-2013 by using the Nielsen consumer panel datasets. The most notable contributions are the revealed price premiums for credence attributes that have received little or no attention in the hedonic literature, i.e. substantial price premiums for production method (organic VS conventional operation); a premium for a fair trade coffee. These results signal that some consumers prefer and are willing to pay more for sustainable coffee. In this way, the market may help promote a more environmentally friendly production and ethical trade method at the expense of other methods perceived to be less so.

Nielsen data are limited to discrete product attributes, they don't have all the information regarding sustainability or eco-friendly labels, such as bird-friendly, UTZ Certified, and Rainforest Alliance. In addition, private labels have substantial market shares and provide consumers with important decision cues. There are usually price differences between different private retailer labels or brands and national brands, i.e. brands owned by manufacturers. Due to data limitations associated with scanner data, notably a lack of detail on individual retailers' brands and how these are priced, our study has not been able to explore the value of private labels. This calls for further research by using more detailed product attributes data.

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Table 1. Descriptive Statistics

Variables	Mean	Std. Dev	Min	Max
Prices				
Price \$/oz(N= 709,550)	0.363	0.181	0	3.755
Price \$/oz(organic, n= 9723)	0.505	0.222	0	1.757
Price \$/oz(conventional, n= 699,827)	0.361	0.180	0	3.755
Price \$/oz(Fair trade, n=118)	0.725	0.216	0.249	1.483
Price \$/oz(Non-Fair trade, n= 709,432)	0.363	0.181	0	3.755
Roast levels				
Light	0.015	0.120	0	1
Medium	0.359	0.480	0	1
Dark	0.162	0.368	0	1
All other roasted levels	0.532	0.499	0	1
Flavor				
Regular	0.888	0.315	0	1
Others	0.112	0.315	0	1
Type				
Decaf	0.101	0.301	0	1
Low caffeine	0.036	0.186	0	1
Regular	0.863	0.343	0	1
Container				
Bag	0.356	0.479	0	1
Can	0.224	0.417	0	1
Brick	0.044	0.205	0	1
Canister	0.103	0.304	0	1
Others	0.274	0.446	0	1
Country of Origin				
Hawaii	0.006	0.078	0	1
Mexico	0.001	0.025	0	1
Guatemala	0.002	0.039	0	1
Colombia	0.076	0.266	0	1
Indonesia	0.006	0.077	0	1
Nicaragua	0.0002	0.014	0	1
Brazil	0.001	0.035	0	1
Peru	0.001	0.024	0	1
Ethiopia	0.0001	0.011	0	1
Kenya	0.0005	0.022	0	1
Costa Rica	0.001	0.035	0	1
Not specified				
Sustainability labels				
Organic	0.014	0.116	0	1
Fair Trade	0.0002	0.013	0	1
Shade Grown	0.001	0.023	0	1
Channel type				
Grocery store	0.568	0.495	0	1
Hypermarket/Warehouse Club	0.092	0.288	0	1
Coffee Store/Gourmet Coffee Shop	0.007	0.084	0	1
Discount/dollar store	0.245	0.430	0	1
Online shopping	0.011	0.102	0	1

All Other Stores	0.078	0.268	0	1
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Table 2. Coefficient Estimates for Hedonic Regressions of Monthly Retail Coffee Price (\$/oz)

Independent Variables	(1)	(2)	(3)	(4)
Roast levels (base: all others)				
Light	0.007*** (0.001)	0.038*** (0.001)	0.030*** (0.001)	0.031*** (0.001)
Medium	-0.003*** (0.000)	-0.003*** (0.000)	-0.001 (0.000)	-0.000 (0.000)
Dark	0.022*** (0.000)	0.024*** (0.000)	0.023*** (0.000)	0.023*** (0.000)
Flavor (base: regular)				
Others	0.094*** (0.001)	0.061*** (0.001)	0.055*** (0.001)	0.055*** (0.001)
Type (base: decaf)				
Low caffeine	-0.065*** (0.001)	-0.050*** (0.001)	-0.054*** (0.001)	-0.054*** (0.001)
Regular	-0.067*** (0.001)	-0.061*** (0.000)	-0.061*** (0.000)	-0.062*** (0.000)
Container (base: bag)				
Can	-0.214*** (0.000)	-0.144*** (0.001)	-0.147*** (0.001)	-0.148*** (0.001)
Brick	-0.097*** (0.001)	-0.048*** (0.001)	-0.046*** (0.001)	-0.046*** (0.001)
Canister	-0.212*** (0.001)	-0.142*** (0.001)	-0.153*** (0.001)	-0.149*** (0.001)
Others	-0.152*** (0.000)	-0.082*** (0.001)	-0.097*** (0.001)	-0.098*** (0.001)
Country of Origin (base: not specified)				
Hawaii	0.114*** (0.002)	0.067*** (0.002)	0.057*** (0.002)	0.057*** (0.002)
Mexico	-0.000 (0.008)	0.087*** (0.008)	0.084*** (0.007)	0.082*** (0.007)
Guatemala	0.026*** (0.004)	0.065*** (0.004)	0.065*** (0.004)	0.062*** (0.004)
Colombia	0.026*** (0.001)	0.039*** (0.001)	0.037*** (0.001)	0.037*** (0.001)
Indonesia	0.126*** (0.002)	0.060*** (0.002)	0.055*** (0.002)	0.055*** (0.002)
Nicaragua	0.126*** (0.011)	0.163*** (0.010)	0.154*** (0.009)	0.150*** (0.009)
Brazil	0.017*** (0.005)	0.021*** (0.004)	0.013*** (0.004)	0.012*** (0.004)
Peru	-0.051*** (0.007)	0.021*** (0.008)	0.042*** (0.008)	0.045*** (0.008)
Ethiopia	0.078*** (0.015)	0.057*** (0.013)	0.051*** (0.012)	0.059*** (0.012)
Kenya	0.159*** (0.008)	0.092*** (0.007)	0.091*** (0.006)	0.092*** (0.006)
Costa Rica	0.030***	0.037***	0.031***	0.032***

	(0.005)	(0.004)	(0.004)	(0.004)
Sustainability labels				
Organic	0.067*** (0.002)	0.075*** (0.001)	0.067*** (0.001)	0.067*** (0.001)
Fair Trade	0.126*** (0.013)	0.153*** (0.018)	0.053*** (0.018)	0.056*** (0.018)
Shade Grown	0.059*** (0.008)	-0.006 (0.013)	-0.003 (0.013)	-0.000 (0.013)
Channel type (base: grocery store)				
Hypermarket/Warehouse Club	-0.083*** (0.001)	-0.068*** (0.001)		
Coffee Store/Gourmet Coffee Shop	0.276*** (0.002)	0.157*** (0.002)		
Discount/dollar store	-0.015*** (0.000)	-0.001*** (0.000)		
Online shopping	0.029*** (0.002)	0.022*** (0.001)		
All Other Stores	-0.017*** (0.001)	-0.033*** (0.001)		
Constant	0.531*** (0.001)	0.481*** (0.001)	0.627*** (0.012)	0.587*** (0.012)
Brand fixed effects	No	Yes	Yes	Yes
Retailer fixed effects	No	No	Yes	Yes
Time fixed effects	No	No	No	Yes
Observations	709,430	709,430	709,430	709,430
R-squared	0.411	0.598	0.623	0.631

Note: Standard errors in parentheses. *** represents statistical significance at 1% level of significance.