

Fair Trade and Free Entry: Generating Benefits in a Disequilibrium Market

Alain de Janvry
University of California at Berkeley

Craig McIntosh
University of California at San Diego

Elisabeth Sadoulet¹
University of California at Berkeley

February 2010

Abstract

Fair Trade (FT) markets have been introduced as a mechanism to improve the economic livelihoods of smallholder farmers by translating consumers' "ethical demand" into higher prices for producers. Unlike other certification mechanisms such as organic, dolphin-friendly, and shade grown that intend on affecting the production process, FT explicitly seeks to deliver rents to producers via the price mechanism. We provide a simple theoretical setting in which to understand FT coffee markets and show that producer entry will naturally tend to dissipate the rents that the system seeks to create. Even when the system successfully holds floor prices above the market price, over-certification will tend to continue until producer profits are the same as they would be under the traditional system. The tremendous quality heterogeneity in coffee prices, combined with FT prices that do not explicitly recognize quality, generates an inverse relationship between market prices and FT quality and provides an additional mechanism through which market behavior tends to drive down producer rents. We use data from a unique second-tier producer cooperative in Central America to measure FT premiums empirically, and find that the non-organic FT premium has been minimal. As predicted by our theory, the quality of non-FT coffee has improved in recent years while the quality of coffee sold on the FT market has stagnated. We suggest how the certification mechanism could be restructured to create greater producer benefits from FT markets.

Keywords: Coffee, Fair Trade, producer rent, quality, cooperatives

JEL Codes: D45, O19, P46,

¹ The authors are grateful to the USAID-BASIS project for financial support and to Michael Carter for his leadership in stimulating this research. We are also grateful to Tomas Rosada for his comments, and Hideyuki Nakagawa for assistance with data analysis.

1. INTRODUCTION

The Fair Trade (FT) initiative has been hailed by its advocates as the “success story of the decade” (Mathews, 2009) in benefiting poor producers of commodities consumed by the non-poor. It currently consists in a product certification and labeling mechanism that is intended to help certified producers obtain a higher price for their products sold under the FT label. In the case of coffee, by far the most important FT product, certified producers are organized in smallholder cooperatives that must meet a set of governance and transparency standards. Products sold under the FT label receive a guaranteed floor price and a social premium above the price paid that is intended to be invested in social development of the community of origin. While ethical consumers are now presented with a wide array of different labels (organic production, dolphin-friendly, shade grown, etc.), Fair Trade is unique in the sense that it is not based on altering the *process* through which a product is produced, but rather on improving the *price* that producers receive. While FT certification requires that a producer cooperative satisfies a variety of standards, in general inspectors from the certification agency are identifying candidate cooperatives that already satisfied these criteria rather than changing behavior directly. Criteria include democratic management, producer participation to decision-making regarding use of the FT premium, capacity building of members, and economic strengthening of the organization. More importantly, these behaviors do not entail direct costs in production in the same way as would producing without chemical fertilizers or using different nets in fishing. Hence FT represents the only labeling effort whose explicit purpose is to generate economic rents for producers via higher price paid for labeled products from certified producers.

For FT consumers, willingness to pay a higher price for the same product is mainly motivated by altruism in the expectation that it will result in a higher profit on sales for poor/ethical producers (see Elfenbein and McManus, 2010, for evidence of higher willingness to pay for charity-linked goods). Consistent with this, FT consumers have been shown to be less sensitive to price than non-FT consumers (Arnot, Boxall, and Cash, 2006) and demand for FT coffee may even be backward-bending (Basu and Hicks, 2008). But, can sustainable rents be generated via prices in competitive markets? While economists have long been familiar with the ways in which competitive pressures dissipate rents, how this process may occur in FT markets has not been established in the literature. Specifically, there exists a very large number of producers worldwide who satisfy the criteria for FT certification and who will want to enter any system that is successful in generating rents. The analogy is a common property resource where rents dissipate if there are no barriers to entry, leading to the

“tragedy of the commons” (Hardin, 1968). As shown by Ostrom (1990), this is however far from hopeless. A common property resource can be managed for durable benefits if it coordinates entry into the system, and the production capacity of community members, with effective demand for its products and services. This is what we explore in this paper.

Under the current certification mechanism, the FT certification agency (FLO-CERT) oversees a global network of more than 120 inspectors in 50 countries who respond to local demands by qualifying cooperatives willing to pay the cost of certification (Wikipedia, 2009). This demand-driven certification process provides strong incentives for over-certification, exacerbating the open access threats to FT rents. Indeed, the global supply of coffee currently certified to be sold as FT is estimated to be as much as two to four times as large as the actual size of the FT market. At the limit, this willingness to pay for FT coffee may be entirely absorbed by the certification process and by transaction costs in the FT market. For certified producers, rent dissipation occurs through a declining share of their total certified production capacity that is sold under the FT label. The only reason for a Fair Trade market to remain, then, is the intrinsic benefit consumers derive from the perceived attributes of FT coffee.

Given high price volatility in the coffee market, the FT floor price also serves as an insurance mechanism. In this case, given pervasive insurance market failures for smallholder coffee producers, competitive pressures will imply acceptance of a negative FT rent corresponding to risk-averse smallholders’ willingness to pay for the insurance service provided by FT. Hence, even extending producers’ utility to include risk aversion, the only reason for a FT market to remain is again existence of an intrinsic benefit for consumers.

The FT pricing mechanism is also particular in not providing quality recognition, in a market where quality is increasingly a key attribute of demand, and where there are potentially large quality premiums to be captured, including for the organic feature. We show that this implies segmentation of the coffee market into three components: a quality market, a FT market, and a commodity market. In the FT segment of the market, we show that there is an inverse relation between the price of traditional coffee and the quality of coffee sold in the FT segment. As a consequence, when the FT rent is expectedly at its highest with a depressed international price, the FT market absorbs producers’ highest quality coffee without a corresponding price premium, contributing to diminishing the effective FT rent.

This paper lays out these propositions theoretically in Section 2. It then uses, in Section 3, data from a large second-degree cooperative in Central America, referred to as Coffeecoop, to validate

empirically the predicted regularities. Results show that, net of observable and unobservable quality differences, the FT premium—that helped double the price received relative to the international market price (a 62 cts/lb premium over a market price of 63 cts/lb) when prices were low in 2001-03—fell to only 5% of the price received (a 6 cts/lb premium over a market price of \$1.26/lb) when prices were high in 2006-08. However, results also show that, when prices were low and the premium high, the share of certified production that could be sold under FT declined from 25% to 15%, implying that the effective premium on aggregate sales was less than 10% of the market price. Results support the proposition that there exists an inverse relation between market price and the quality of coffee sold as FT. When international market prices were low, the quality of FT coffee was above that of non-FT coffee while it was the same when prices are high. Finally, in Section 4, the paper discusses how sustaining price rents for certified FT producers would require managed entry.

2. THEORETICAL MOTIVATION

2.1. Fair Trade rents as a common property resource

We provide a simple theoretical setting to understand equilibrium in a FT market. Begin from the non-FT market, which we refer to as the “traditional” (t) market, when there is no FT demand. The simplest possible specification for this market is that demand D_t^0 equals $Q_t^D = 1 - p_t$. We think of the aggregate coffee supply as being an exogenous and stochastic \bar{Q} , driven primarily by weather shocks to major producers such as Brazil. Thus the equilibrium price of traditional coffee is given by $p_t = 1 - \bar{Q}$.

The emergence of ethical demand brings into existence a FT market in which consumers demand the special attributes embedded in FT coffee. We parameterize FT demand as being a function of θ , which represents an intrinsic benefit to the consumer from the inherent attributes of FT coffee, and $\alpha\pi$, where π is the profit to certified producers from selling the coffee and α is the altruistic preference weight that consumers place on producers’ welfare. Hence we can write FT demand D_f as $Q_f^D = \theta + \alpha\pi - p_f$. Of total supply \bar{Q} , an amount Q_f goes on the fair trade market and the remainder $Q_t = \bar{Q} - Q_f$ goes to the traditional market. We make the simplest possible assumption that the price of traditional coffee is invariant to the amount of coffee sold on

the FT market, since a bag of coffee sold as FT represents both one unit less of supply and one unit less of demand on the traditional market.

A producer (which may most naturally be thought of as a cooperative, since it is the cooperative that makes the certification decision) generates a fixed quantity of output q , incurring the variable cost κ in production. The certification process imposes a fixed cost c on the producer.

Output can be sold on the traditional market, in which case profits are $(p_t - \kappa)q$, or on the FT market, in which case profits are $(p_f - \kappa)q - c$. At the competitive equilibrium, producer profits are zero in the traditional market, and we can write π , the per-unit FT premium, as $p_f - p_t - c/q$.

This quantity is the excess of FT prices over traditional prices, net of the per-unit cost of certification. Given that FT demand is a direct function of this profit, we can then write the FT

inverse demand explicitly as $p_f = \theta + \alpha\pi - Q_f = \frac{1}{1-\alpha}[\theta - \alpha(p_t + c/q) - Q_f]$.

We can model the emergence of a FT market by considering an exogenous certified quantity of output \bar{Q}_f . Starting from a non-existent FT market, we will observe traditional price $\bar{p}_t = 1 - \bar{Q}$,

FT price $p_f = \theta + \alpha\pi - \bar{Q}_f$, and the per-unit FT premium will be given by

$\pi = \frac{\theta + \bar{Q} - 1 - \bar{Q}_f - c/q}{1 - \alpha}$. This expression says that the FT premium in a nascent market will be

increasing in ethical consumers' intrinsic and altruistic valuations, decreasing in the certification costs, and decreasing in the overall size of the FT market (because the demand curve for FT slopes downwards).

If we now permit free entry into the FT mechanism, then the open access FT output is nailed down by the arbitrage condition that $\pi^* = 0$, meaning that $p_f^* - p_t = c/q$. At this point,

$Q_f^* = \theta + \bar{Q} - 1 - c/q$ and $Q_t^* = 1 - \theta + c/q$, meaning that the size of the FT (traditional) market

increases as the consumers' intrinsic valuation increases (decreases) and the certification cost decreases (increases).

Illustrating the model graphically in Figure 1, we start from a pre-FT traditional demand D_t^0 , where an aggregate supply \bar{Q} induces equilibrium price \bar{p}_t . Then, a FT demand D_f comes into existence; initially we get a small quantity of FT supply \bar{Q}_f , a fair trade price \bar{p}_f , and a FT profit to

producers equal to $\bar{p}_f - c/q$. Eventually, FT supply expands until the arbitrage condition is reached so that $p_f^* - p_t = c/q$ at quantity Q_f^* . This quantity of output is taken off of aggregate supply to yield a new traditional output Q_t^* , but because the demand curve D_t^1 shifts in by exactly the same amount as supply has been reduced, the equilibrium traditional price remains at \bar{p}_t . At this new equilibrium, profits are zero for both traditional and FT producers, and supply equals demand on both markets.

The negative externalities on other producers caused by entry into the FT market is a familiar feature of common property resources, in which rents are generated by the ability of insiders to prevent entry. If they are unable to do so, the open access equilibrium will obtain and all rents are dissipated. As one moves towards the open access equilibrium, each new entry imposes a negative price externality on the producers already inside the mechanism, ultimately driving the benefit from the market to zero for all producers.

At the free-entry equilibrium, $\pi^* = 0$, and so the altruistic component of FT demand is cancelled. Therefore, another way of characterizing this equilibrium is the point at which an ethical demand curve driven only by intrinsic value θ would intersect one driven by both θ and $\alpha\pi$. The intercept of the altruistic inverse demand curve, $\frac{1}{1-\alpha}[\theta - \alpha(\bar{p}_t + c/q)]$, is higher than the intercept of the non-altruistic curve, θ , while the slope of the altruistic demand curve is steeper because increasing production not only drives down prices but decreases demand because the profits to producers fall. The two curves intersect at the point at which $\pi = 0$, namely the open-access FT equilibrium quantity Q_f^* . Thus the somewhat surprising result that, at the competitive equilibrium quantity, these two demand structures are indistinguishable except through their slopes.

As long as the size of the FT market is sufficiently small ($Q_f < Q_f^*$), some rent exists for producers and there is no meaningful distinction between the intrinsic demand shifter θ and the altruistic term $\alpha\pi$. When producer rents exist, these two motives for FT demand are observationally equivalent. If a market reaches the open access equilibrium, however, the existence of intrinsic demand now becomes necessary for the future survival of the market place.² If all of the demand for FT arises through the term $\alpha\pi$, then once the open access equilibrium is reached demand dries

² Note that adding an intrinsic benefit to producers from participation in FT would imply that they are losing money in the open-access equilibrium, forgoing profits in order to enjoy non-pecuniary benefits.

up and the FT and non-FT products become equivalent in consumers' minds. If, on the other hand, there is some intrinsic benefit θ enjoyed by consumers, as we believe there is where the FT label has been promoted as signaling an ethical product, then the market continues to demand the FT label even though there are no longer benefits being transferred to producers. The θ premium paid by ethical consumers is then fully absorbed by transactions costs in the FT system.

2.2. The Fair Trade market in practice: Share sold through FT and insurance premium

2.2.1. Market equilibrium through FT share

The previous stylized model demonstrates the effects of the presence of ethical consumers on aggregate demand for traditional and FT coffee, and the way in which equilibrium supply will adjust to drive the FT price premium down to zero. We now consider more explicitly the actual rules of the FT market as they exist in practice.

The economic benefits delivered to farmers under FT are composed of two parts. The first is the floor price, which we denote by \underline{p}_f . The floor price was set at \$1.26 per pound for non-organic coffee and \$1.31 for organic coffee up until 2007, when it was raised to \$1.36 and \$1.41, respectively. The second is the 'social premium', framed as a surplus above the counterfactual market price, which was originally 5cts and 11cts per pound for non-organic and organic coffee until 2007 when it was raised to 10cts and 20cts, respectively. This premium we write as $\underline{\gamma}$. The price-setting rule for FT coffee is therefore $\max(\underline{p}_f + \underline{\gamma}, \bar{p}_i + \underline{\gamma})$, where \bar{p}_i is the NY 'C' price. In other words, producers are supposed to receive the social premium on all contracts, added on to the FT floor or the market price, whichever is higher.

The NY 'C' market price has remained below the FT floor price for most of the past 20 years since FT was established, excepting periods around 1994 (frost damage in Brazil), 1997-99 (droughts in Brazil), and 2007-08 (world food crisis). Particularly during the coffee crisis of 1999-2003, Fair Trade was successful in delivering large premiums to producers, in some cases exceeding 50cts per pound. Thanks to effectiveness of the audits conducted by the 19 world labeling initiatives (such as TransFair for the USA), there appears to be virtually no documented cases of corrupt sales in which FT contracts were transacted below the floor price, meaning that the mechanisms in place to monitor prices seem to be effective.

Does the fact that, for a number of years, the FT system was effective in maintaining a floor price $\underline{p}_f > \bar{p}_t + c/q$ mean that the system was effective in generating profits for producers? The difficulty with this interpretation can be seen in the massive over-certification of supply that occurred during this period. It was estimated that in 2003 certified cooperatives could overall only sell about half of their coffee under FT (Levi and Linton, 2003). Berndt (2007) reports that, in 2006, Fedecocagua in Guatemala could only sell 23% of its certified coffee to FT buyers. In Costa Rica, average FT sale for certified coffee was 20%, rising to 40% in cooperatives with the highest quality coffee. Therefore, when a credible price floor is in place, the free entry equilibrium is manifested not through a decrease in the FT price, but rather through a decrease in the share of total output that each producer is actually able to sell at the FT price.

To state this concept more formally, we write the share of output certified FT that is actually sold through the FT mechanism as s and assume that this share is uniform across certified producers. Producers therefore receive an average price $s\underline{p}_f + (1-s)\bar{p}_t$, with associated per-unit profits $s(\underline{p}_f - \bar{p}_t) - c/q$. Under the open access equilibrium with a binding floor price, entry now pushes this term to zero through a decrease in s , rather than pushing $(\underline{p}_f - \bar{p}_t) - c/q$ to zero through a fall in \underline{p}_f . Recognizing that s can also be written as Q_f^D/Q_f^S , this says that entry will push up the supply of FT-certified coffee until $Q_f^S = Q_f^D \frac{(\underline{p}_f - \bar{p}_t)}{c/q} > Q_f^D$. Producer profits are zero in this equilibrium despite the presence of per-unit rents at the margin. The total FT market is smaller here than in the previous equilibrium so consumer surplus is smaller, producer surplus is the same, and only the certifiers benefit.

2.2.2. FT as a price insurance mechanism

A natural argument in favor of the FT floor price from the producers' perspective is that it insulates farmers from the highly volatile world price of coffee and thereby provides them with an important source of price insurance. Given the smallholder nature of most FT producers, and the persistent problems of access to credit and insurance for them, it is reasonable to think of producers as risk-averse agents maximizing expected utility rather than expected profits. The initial intuition for this problem would suggest that a fixed floor price would be strictly preferable to a volatile premium, but we will show that this is not the case under the open access equilibrium.

In order to keep the notation as simple as possible, we posit a utility function $U(y) - \rho \text{Var}(y)$, where y is producer income and ρ is a coefficient of risk aversion. We continue to assume that an individual producer's output q is constant, and so the source of risk for producers comes from \bar{Q} which has variance σ^2 .³ In this case producer welfare on the traditional market is $(p_t - \kappa)q - \rho q \sigma^2$, decreasing in risk aversion and in the variance of prices. Imagine that the FT contract is stipulated explicitly as a premium γ over the traditional price (equal to either \underline{p}_f or to $\underline{p}_f + \gamma - p_t$). In this case producer welfare on the FT market will be:

$$(sp_f + (1-s)p_t - \kappa)q - c - \rho q \text{Var}(p_f) = (p_t + s\gamma - \kappa)q - c - \rho q \sigma^2.$$

Because the variance of the FT price is identical to the variance of the traditional price, the risk aversion term is the same in the two expressions and hence the differential per-unit utility from FT and non-FT production is $s\gamma - c/q$, just as in the risk-neutral case, and in the open access equilibrium $s^*(p_f - p_t) = c/q$. Hence if FT pays a premium over market prices, risk aversion is irrelevant to the decision to enter FT.

A risk-averse producer facing a constant FT price, however, will enjoy an additional insurance premium from entry into the FT market. While this appears to work to the benefit of producers, the open access equilibrium is now given by equating the *utility* of producers across the two markets, or $s^*(p_f - p_t) = c/q - \rho \sigma^2$. The right-hand side of this expression is smaller than c/q , the price margin in the risk-neutral case. The implication is that producers' expected per-unit profit is now *negative*, and so the producers are paying for the insurance premium provided by the constant FT price. The amount they lose will be increasing in their risk aversion and in the variance of the non-FT price. Therefore, while it is true that producers gain insurance from a FT price floor, in equilibrium they pay full value for the utility gain in foregone profit, and so they end up at the same utility and with a lower expected profit than they would have had if they faced a FT premium instead of a FT floor.

³ The primary source of volatility in global coffee prices is the weather in Brazil, which drives the quantity exported by this dominant producer. Hence for individual producers in other countries their traditional price risk can be thought of as a function of the aggregate output of Brazil.

2.3. Quality heterogeneity and its impact on the effective FT premium

A first dominant feature of coffee markets is the steep price gradient over quality. Typically price contracts are quoted as a differential from the NY ‘C’ price, meaning that there is an aggregate international price with a benchmark quality set by aggregate supply and demand. Negotiation is over the quality premium to be paid for a specific lot with reference to this benchmark. To capture this feature of the market as simply as possible, we modify the inverse demand curve for traditional coffee as follows: $p_{it} = 1 + \beta_i - \bar{Q}$, where β_i is the quality premium paid to producer i with mean 0 and associated density $\phi(\beta)$. This says that the overall demand curve for coffee is set by aggregate supply, but that each producer i has a specific quality intercept which is stochastic and with mean zero. We consider the NY ‘C’ price to refer to a quality draw of zero, meaning the average quality, which receives a price of p^0 .

A second stylized feature of coffee markets is the lack of quality recognition in FT contracts: the FT floor price is a constant, and the social premium is quoted relative to the NY ‘C’ price, namely $p_f = p_0 + \underline{\gamma}$. Since a given producer’s quality premium from selling on the traditional market is β_i , the fact that the FT price is quality invariant implies that the FT premium for a given producer is quality-dependent, because $p_f - p_{it} = p_0 + \underline{\gamma} - (p_0 + \beta_i) = \underline{\gamma} - \beta_i \equiv \gamma_i$. We call γ_i the ‘effective’ FT premium, which is producer-specific and decreasing in β_i . Critically, while $\underline{\gamma}$ is strictly positive, γ_i may be negative for those producers with the highest-quality coffee. These features, combined with the desire of FT buyers to purchase the highest possible quality coffee, essentially segment the market into three portions: the quality market, the FT market, and the commodity market. We can visualize this relationship in Figure 2.

The FT price p_f is higher than the generic NY ‘C’ price, but is lower than the price commanded for higher quality coffee. For coffee with a quality draw $\beta_i > \underline{\gamma} - c/q$, the producer will be unwilling to sell the coffee on the FT market, because the quality premium is larger than the FT premium. Thus the average coffee quality on the ‘gourmet’ market is $\int_{\underline{\gamma} - c/q}^{\infty} \phi(\beta) d\beta$. The producer for whom the quality premium and the FT premium are equal, or for whom $\beta_i = p_f - p^0 - c/q$, is indifferent between using the FT and the traditional market. FT buyers,

then, can purchase any coffee whose quality is below this threshold level. Since they want to buy the highest-quality coffee possible, they will begin from this quality level and move down through the distribution of quality until they have purchased an amount equal to demand at the FT price. That is to say the minimum quality of coffee sold through the FT market will be determined by the solution

β_f^{\min} to the problem $\int_{\beta_f^{\min}}^{\underline{\gamma}-c/q} q\phi(\beta) d\beta = Q_f^D$. Finally, all coffee with quality $\beta < \beta_f^{\min}$ will be sold on

the commodity market.

There will be an inverse relationship between the price of coffee on the traditional market and the quality of coffee sold on the FT market. This can be seen by visualizing a shock to \bar{Q} (let us say from an increase in production due to good weather in Brazil). This shock translates into a fall in p_0 , and if we are in the regime of a floor price, the effect of this is to move the entire quality distribution to the left while holding the FT price constant, thereby delivering a higher net FT premium $\underline{\gamma} - c/q$. As the market price falls and the FT premium rises, producers of higher-quality coffee become willing to sell through the FT mechanism, and thus the upper limit of integration that defines quality on the FT market rises.

A more interesting question relates to the effective premium delivered to producers who use the FT system. It is clear from a setup with quality heterogeneity that the effective premium γ_i is not in general equal to the nominal FT premium $\underline{\gamma}$. Indeed the producer with a quality exactly $\beta_i = \underline{\gamma} - c/q$ derives no benefit from the system at all. Producers with quality lower than this, but with quality high enough to be able to sell to FT buyers, do indeed derive some benefit from the market because the FT price net of costs is higher than their own quality-specific price. The average

effective FT premium enjoyed by producers is given by $\int_{\beta_f^{\min}}^{\underline{\gamma}-c/q} (\underline{\gamma} - c/q - \beta)\phi(\beta) d\beta \bigg/ \int_{\beta_f^{\min}}^{\underline{\gamma}-c/q} \phi(\beta) d\beta$.

This premium is increasing in total demand on the FT market (Q_f^D) because the average quality sold on a larger market is further below the quality that would otherwise be commanded by the FT price.

Critically, the average effective FT premium is also increasing in the FT premium for any distribution whose PDF is monotonically decreasing above the NY 'C' price p_0 . While this relationship appears obvious and mechanical, in fact it only arises in a market with heterogeneous

quality because the density of quality beneath the FT premium gets smaller as the FT premium rises. To see this, observe that holding demand constant, and defining β_γ as the quality that would get exactly the FT price on the traditional market, $\beta_\gamma - \beta^{\min}$ gets larger as $\underline{\gamma}$ gets larger because we are integrating the same area over a density whose PDF is lower. Thus while the same *number* of producers sell on the FT market no matter what the FT price, the average difference between their quality-specific non-FT price and the price they receive on the FT market increases as the density of producers just below the FT price gets smaller. As the FT premium and therefore the effective premium increases, the variance of quality of coffee sold through the FT network also increases.

In Figure 3, for two different market prices (and therefore for two different FT premiums holding the floor price constant, where $\gamma^0 < \gamma^1$), we integrate downward from each FT premium the area Q_f^D , and thereby define the minimum FT quality under each regime, β_0^{\min} and β_1^{\min} . The average effective premium under each regime is the mean deviation from the FT price within each of these integrals, and because the higher FT premium γ^1 lies at a lower value of the PDF of quality than the lower FT premium γ^0 , the average effective FT premium is higher when the nominal FT premium is higher.

If there is a demand for FT coffee that is quality-specific, then FT contracts can be traded above the floor price. If the FT certification is unconstrained inside each quality bin, then none of these contracts can trade at an effective premium. In this case, contracts trading at the floor price will carry a higher effective premium than those trading above the floor price. If there is an above-floor price quality at which the quantity of FT is directly constrained (meaning that only a share of the producers of that quality satisfy the criteria for certification), then you can have FT contracts trading above the floor and trading at a real effective premium. A related question is the differential premium for organic FT coffee. Because the overall supply of organic coffee is much smaller than the supply of non-organic coffee and demand for organic FT is relatively large, we may expect that FT supply is more constrained in the organic market. Thus the question of the effective FT premium must be addressed carefully, market by market, using a data source that permits us to compare FT and non-FT coffee of exactly the same quality.

3. EMPIRICAL ANALYSIS

Establishing the effective FT premium empirically is not a straightforward task. The complexity is that while contracts are supposed to be (and indeed are) quoted as a premium over the NY ‘C’ market price, the tremendous quality heterogeneity of coffee means that the correct counterfactual traditional market price for a specific lot of coffee sold on the FT market is not easily established. There is a close analogy here to the problem of causal inference in impact analysis; if we think of FT as a ‘treatment’ whose impact on prices we wish to establish, we do not in general observe the same lot of coffee in both markets at the same time. The treated state (FT) gives a quality-invariant price, while the untreated (traditional) state reveals quality. Measuring the correct effective FT premium requires that we know what price each lot of FT coffee *would have received* had it been sold on the traditional market. Because quality (in the absence of a quality-dependent price) contains some unobservable component, and given that we have shown that the decision to certify as FT is driven precisely by a quality known to producers but not to the econometrician, any simple measure of the effective premium will suffer from omitted variables bias.

Our solution to this problem is to use data from Coffeecoop, a second-tier cooperative responsible for exporting over a quarter of a Central American country’s Fair Trade coffee. The feature that makes this organization ideal for the estimation of actual FT premiums is that its entire production is certified to be sold as Fair Trade. In a typical year, Coffeecoop sells somewhere between a fifth and a quarter of its total output as FT despite the potential to sell it all, and this intensive-margin decision over FT sales over the course of many years gives us a unique window on the relative merits of FT versus traditional markets for producers. Furthermore, the complexity of the internal supply chain in Coffeecoop means that within a single year (and even within a single delivery) a given cooperative’s production is split into different lots and these lots are then sold to different buyers. Thus we can focus on the cases in which exactly the same batch of coffee is split and sold on both the FT and the traditional markets. The differential in price for these two sales gives us a clean measure of the counterfactual quality-specific price, and hence of the effective premium earned on the FT market.

3.1. Data

Our data consist in the records of all acquisition and sale transactions from Coffeecoop for the coffee produced in 1997 to 2008. Each year Coffeecoop procures coffee from about 100 cooperatives or independent producers, of which 90 are regular suppliers and 10 are one-time

suppliers. Over the 12-year period, Coffeecoop has purchased coffee from 300 suppliers, cooperatives, or independent producers. Suppliers deliver coffee cherries in small batches from September to the following May. The median supplier sells 940 quintals of coffee per year, the average is 2800 quintals, in 10 to 12 separate deliveries. Coffeecoop then processes and stocks the coffee, and sells green coffee to international exporters in bags of 69kg. Annual sales have increased from less than 100,000 bags to 250,000 bags over this 12-year period. Shipment size has not increased; it is the number of sales that has increased from less than 200 per year to more than 400. Over the whole period, we thus observe 15,340 deliveries of coffee from growers or cooperatives to Coffeecoop and 3,556 sales from Coffeecoop to exporters.

All of the coffee processed by Coffeecoop is Fair Trade certified, but as demand for Fair Trade is not sufficient, only a fraction averaging 22% over the 1997-2009 period for non-organic coffee is sold with the Fair Trade label. Less than 5% of its coffee is organic, and it is all sold with the Fair Trade label. We will therefore not use the organic coffee transactions, as they cannot inform on price comparisons between the Fair Trade and regular markets.

Coffee quality. Although some observable characteristics of the delivery could inform on the coffee quality (such as its color, moisture, presence of debris, etc.) most of it is revealed after processing and tasting. Characteristics at the delivery level are in addition very irregularly informed, and even tasting results are not systematically recorded. The only systematic records on quality we have are those reported on the sale contract. These quality labels are: XPM, Prime Washed, Extra Prime, Other, Hard Bean, Small Beans, Strictly Hard Bean, Strictly Hard Bean EP, Strictly Hard Bean EP Varietal, Strictly Hard Bean EP HH, Fancy Strictly Hard Bean, and a particularly high quality designated as GAP. There is no doubt however that quality factors unobservable to us are known to Coffeecoop. We will take them into account through a cooperative/supplier specific fixed effect.

Prices. On the supplier side, all coffee is paid to the different cooperatives the same average price per year, regardless of its quality. This is therefore not informative. On the sale side however, each price is negotiated between Coffeecoop and the international exporter. Quality coffee is a highly differentiated product, and buyers have specific preferences. Sale contracts are negotiated throughout the year, but mostly from September to March, for deliveries to take place several weeks and months later. Price negotiations revolve around a differential to be paid over the future NY 'C' price for the position just prior to the planned delivery. The coffee future market has 5 positions per year, in March, May, July, September, and December. For example, a sale contract negotiated on

September 8 for a delivery of coffee the following June, will use as reference price the September 8 quotation for the May position. Contracts report both the future NY ‘C’ price and the differential, with a mention that the differential accounts for quality and, when applicable, the Fair Trade social and organic premiums. This information on the NY ‘C’ future price is however not reported in the database. We thus use the time series provided by the International Coffee Organization, labeled “Indicator price for other Arabica”, which we refer in the rest of the paper as the NYC price.⁴ It is built as a monthly average of the future price for the following 2nd and 3rd positions, which approximates the future price that serves in most contracts.

Figure 4 shows the inter-temporal trajectories of a variety of prices. The average non-FT price of coffee received by Coffeecoop is very close to the NYC price in all years. The average FT price calculated from the Coffeecoop data tracks the FT floor perfectly during periods in which the NYC price falls beneath the floor, and once the NYC price rises above the floor the FT price appears to track the NYC price quite closely, with some small surplus visible in average prices. FT organic, on the other hand, while only sold by Coffeecoop from 2004 onwards, appears to trade at a large premium compared to all other kinds of coffee. However, because Coffeecoop never sells organic coffee on the non-FT market, it is impossible to distinguish what part of this premium relates to the higher costs of producing organic coffee and what part may potentially correspond to a true FT premium.

3.2. Estimating FT premiums using quality controls

Our first approach to controlling for quality in estimating the actual FT premium is to include fixed effects for the thirteen different quality categories recorded in the Coffeecoop data. The regression specification is:

$$p_{smt} = Z_{smt}\beta + \gamma_t FT_{smt} + \mu_{mt} + \varepsilon_{smt}, \quad (\text{E1})$$

where p_{smt} is the price of sale s in month m from year or quarter t , Z the vector of indicator variables for each quality category as well as UTZ certification, μ_{mt} are month of shipment fixed effects, and FT is an indicator variable indicating coffee sold as Fair Trade. The γ_t parameters are

⁴ http://www.ico.org/coffee_prices.asp

thus the average annual or quarterly FT premiums, holding quality premiums constant across time and within quality categories.

As sales prices are explicitly established in reference to the NY ‘C’ price, this suggests an alternative specification as follows:

$$(p_{smt} - NYC_{mt}) = Z_{smt}\beta + \gamma_t FT_{smt} + \varepsilon_{smt}, \quad (E2)$$

for the price differential calculated over the NYC price in the corresponding month.

Estimated annual premiums from these two models without and with individual quality indicators, are reported in Table 1, columns (1) to (3). They show similar results, except for year 2009 where the price differential model estimates a lower premium.

The condition for obtaining an unbiased estimation of the fair trade premium is that no unobserved coffee quality be correlated with the FT variable. However, since all sales are done based on individual negotiation between Coffeecoop and the buyer, this is a difficult assumption to defend. We therefore proceed to a more stringent measure of the Fair Trade premium.

3.3. Estimating FT premiums using cooperative fixed effects.

Each sale made by Coffeecoop to foreign exporters combines coffees from different batches delivered by the member cooperatives. By matching each delivery to the corresponding sale, we can thus attribute a sale price to each delivery. The matching is complicated by the fact that deliveries of coffee from cooperatives are processed into batches of green coffee, and there are cases of batches of green coffee feeding into different sales as well as sales taking coffee from different batches. We therefore estimate a price equation for each matched pair of delivery and sale. The quality of this particular coffee consists in the observed quality categories noted on the sale contract described above and an unobserved cooperative fixed effect. The contract price equation that can be estimated is:

$$p_{csmt} = Z_{smt}\beta + \gamma_t FT_{smt} + \mu_{mt} + \nu_c + \varepsilon_{csmt}, \quad (E3)$$

where the unit of analysis is the delivery from cooperative c included in sale s in month m from year or quarter t . The advantage of this approach is the possibility of adding a cooperative fixed effect ν_c

that absorbs all the cooperative-specific coffee quality known to Coffeecoop and hence potentially used in the selection of which coffee is selected for the Fair Trade contracts and in the price negotiation. A similar equation for the price differential with the NYC price is also estimated. Results are reported in columns (4) and (7) of Table 1.

In column (5), we restrict the sample to the deliveries that were only sold as either Fair Trade or without the Fair Trade label. In column (6), instead of using individual quality categories, we use a quality index defined by the sale price in non Fair Trade contracts (see below for an explanation of its construction). The idea is to ensure that the quality measure is not affected by some potential different appreciation of quality in Fair Trade contracts.

We find a remarkable stability of the Fair trade premium estimations across the different specifications and samples, except for 2009, where the price differential model leads to a smaller estimated premium, like in the estimations based on reported quality in sales contract.

The different estimations with models that include or not the cooperatives fixed effects are compared in Figure 5. Estimations are very similar until around 2004-05. However in the later period 2005-2009, estimated premiums without accounting for cooperative fixed effects are larger than those estimated with fixed effects. This suggests that Fair Trade coffee was sold relatively more often from cooperatives with higher quality coffee during these years. A more systematic analysis of the coffee quality sold under the Fair Trade label done further in the paper will confirm this intuition.

3.4. Estimating FT premiums using split deliveries

An even more rigorous control of the potential selection bias in the choice of which coffee is sold under Fair Trade can be obtained from the coffee deliveries that end up being partially sold under Fair Trade and partially sold without the Fair Trade label. We observe between 80 and 300 such deliveries each year. As we noted above, the splitting and recombination of deliveries to compose sales batches is very common, and these split deliveries are not different from any other cooperative deliveries in terms of coffee quality, cooperative size, and average sale price fetched. For each of these deliveries we have a price for the part sold under a Fair Trade contract and a price for that sold without the Fair Trade label, while in all aspects the product is completely homogeneous. This is a rare case of a perfect counterfactual for a Fair Trade price, because we effectively observe the same unit in the ‘treated’ and ‘untreated’ states. The only potential

substantial difference between these sales is their timing. We therefore control for the sale time by estimating the following equation:

$$p_{dsmt} = \gamma_t FT_{dsmt} + \mu_{mt} + v_d + \varepsilon_{dsmt}$$

where p_{dsmt} is the price observed for the part of the delivery d that was sold in sale s in month m of year or quarter t . With a delivery fixed effect, v_d , the coefficient γ_t measures the average premium on these split deliveries. Results are reported in column (8) of Table 1 and Figure 5. There are no substantial differences with the other estimations that account for cooperative unobserved quality, except for a lower estimated premium in 2002, at the peak of the coffee crisis.

3.5. The Fair Trade premium, net of quality difference

The results of these alternative estimations of the Fair Trade premium thus show that it was quite significant in the years 2001 to 2004 with low NY ‘C’ price, accounting for an average of 62 cts/lb premium over a market price of 63 cts/lb, but falling to 6 cts/lb premium over a market price of \$1.26/lb, in 2006-2008 with high NY ‘C’ price (Figure 5). These estimated Fair Trade are around 10cts/lb below the value expected values from the FLO formula, due to the fact that the quality of the coffee sold as Fair Trade is higher than the coffee that sells for the NYC price (Table 2 and Figure 5).

In Figure 5b, we report the average quarterly premium, estimated with model (E3), i.e., controlling for observed quality characteristics, cooperative fixed effects and shipment month. These estimated premiums exhibit a fair amount of volatility due to the small number of sales in each quarter compared to the annual premium also reported in the Figure.

3.6. Share of coffee sold under the FT label and the effective premium

Coffeecoop is certified to sell all of its coffee on the FT market. Clearly, were it not facing constraint, we would see no coffee being sold by the organization on the traditional market. Indeed, in the case of organic coffee, this is precisely what we see: there are no records in the data of any sales of organic coffee else than as FT. This gives *prima facie* evidence that a meaningful FT premium exists on the organic market.

On the non-organic market, the share of coffee sold as FT averages around 20% and never exceeds 30%. As seen in the theory section, free entry in production would, at the aggregate level, induce over supply until the rent is fully dissipated. While we cannot take Coffeecoop to be representative of the global market, the relationship between the measured FT premium and the share of coffee sold as FT would not appear to be explicable via any supply-side story, and seems consistent only with the process of entry into the FT market by other producers.

As seen in Table 2 and in Figure 6, the share of coffee that was sold as Fair Trade was particularly low (down to 13%) in the years where the premium was high, and then as the premium fell over the past five years the share of coffee sold as FT began to rise again, reaching 27% in 2008-09. This negative correlation between premiums and sales shares is consistent with a relatively static demand combined with a global FT supply whose size is increasing in the premium. Thus Coffeecoop, uniquely certified to sell whatever it can as FT, sees its ability to move coffee through the FT channel restricted as other producers enter the certification mechanism and improved as they exit. As can be seen in Figure 6, the result is that the effective premium on Fair Trade production by member cooperatives remained very low, never exceeding 12 cts/lb while the coffee sold under the Fair Trade label carried a 60-70 cts/lb premium.

3.7. The empirical relationship between prices and FT quality

We begin the empirical discussion of quality by demonstrating that, as predicted by our theoretical model, FT coffee sales are concentrated around the middle of the quality distribution. Figure 7 is consistent with the idea that producers put high quality coffee on the traditional market because it commands a quality premium larger than the FT premium, and low quality coffee also goes on the traditional commodity market because FT buyers purchase the highest quality that the quality-invariant FT price is able to command.

We use an estimation equation similar to (E3) to extract an observed quality index for the coffee. Specifically, we regress the differential between the sale price and the NYC price on the observed quality characteristics, including a cooperative fixed effect:

$$\left(p_{cst} - NYC_t \right) = Z_{st} \beta + v_c + \varepsilon_{cst} \text{ for all non Fair Trade sales} \quad (\text{E5})$$

and define the quality index of any delivery from cooperative c in sale s as $Q_{cst} = Z_{st}\hat{\beta} + \hat{v}_c$. The model is estimated on coffee sold on the regular market to ensure that the quality measure is not affected by some potentially different appreciation of quality in Fair Trade contracts. Because there is no organic coffee sold as non Fair Trade, this does not provide a quality scale for organic coffee.

Quality is measured in US cts/lb, and can be interpreted as the differential that, on average, this coffee quality (identified by the type recognized on the sale contract and the cooperative of origin) would fetch above or below the NYC price. Estimating equation (E5) on observed quality types alone, cooperative fixed effects alone, or both, indicates the relative importance of these quality factors in explaining price differentials. Results show that the quality types recorded on sale contracts can explain 24% of the variance in prices, the cooperative fixed effects alone can explain 28%, and together 37%. This suggests existence of some, but not perfect, correlation between the cooperative quality and the quality types, as confirmed by a correlation of 0.46 between the quality indices based solely on quality types and solely on cooperative fixed effects. The densities of quality reported in Figure 7 show pounds of coffee sold under Fair Trade to be more homogenous than coffee sold without the Fair Trade label. Fair Trade contracts include neither the highest quality coffee, nor the lowest quality that would otherwise garner a price below the NYC. This is as expected since Fair Trade contracts are required to pay a price at least equal to the NYC. Overall, the range of quality differentials is relatively small, with a width of about 10cts/lbs across the different coffees sold as Fair Trade. Among coffee qualities not sold as Fair Trade, around 5% of the volume is of very high quality, 20% of quality below the NYC standard, and the rest exhibits very homogeneous qualities within a 10cts/lb range.

What the theory predicts is that the relative quality of coffee sold under Fair Trade varies with the reference international price. With a low international price for coffee, like that prevailing in the early 2000s, the fair trade premium allows FT importers to select higher quality coffees, while with a high international price, in particular when it surpasses the minimum floor price, Fair Trade importers cannot attract coffee of quality higher than what the non-FT market would get with the same price. This suggests existence of an inverse relationship between average FT coffee quality and the international price of coffee. The theory also suggests that when the international market price is close to the FT floor price, FT buyers can fulfill their demand within a narrow range of coffee quality, suggesting a negative relationship between the variance in FT coffee quality and the international price.

These relationships are estimated by regressing the quality index of each sale on the NYC price in the following specification:

$$\begin{aligned} Q_{st} &= \alpha^q FT_{st} + \beta^q NYC_t + \gamma^q FT_{st} * NYC + \mu_T^q + \varepsilon_{st} \\ \hat{\varepsilon}_{st}^2 &= \alpha^{sd} FT_{st} + \beta^{sd} NYC_t + \gamma^{sd} FT_{st} * NYC + \mu_T^{sd} + \zeta_{st} \end{aligned} \quad (E6)$$

These equations are estimated only on the observations for which the FT minimum price was binding, meaning the NYC price was at least 10cts below the FT floor price. Results reported in Table 3, columns (1) to (4), show as expected that the γ parameters, which account for the sensitivity of the FT coffee quality mean and variance to the NYC price, are negative. In columns (2) and (4) we control for the crop year, to possibly account for a variation in quality or change in the demand for Fair Trade coffee across years not accounted in the analysis. The direct effect of the NYC price changes sign depending on whether one controls or not for the crop year. This is simply the result of the year effect taking up much of the variation in the price. The critical results, however, are that both the direct effect of the Fair Trade variable and of its interaction with the NYC price are robust to these additional control for time effects. Results show that for an average NYC price of 110cts/lb for example, which is just below the Fair Trade floor, Fair Trade coffee quality is essentially the same as that of non Fair Trade coffee, while at a NYC price of 50cts/lbs, the Fair Trade coffee quality is 1.5cts/lb above the non Fair Trade coffee. This seems like a small number, but it is not so small when compared to the range of quality observed in Figure 7. The variance in Fair Trade quality also decreases by 5 points between these two extreme cases, which again seems large given the small base value.

Variation of the average FT quality with the NY ‘C’ price is the outcome of a selection process. An alternative way to see this is thus to estimate the probability that a delivery of a given quality be sold with a Fair Trade label in the following specification:

$$FT_{cst} = \beta_0 + \beta_1 Q_{cst} + \beta_2 NYC_t + \beta_3 NYC_t * Q_{cst} + \varepsilon_{cst}, \quad (E7)$$

where Q_{cst} is the quality of the delivery. Expectations are that $\beta_3 < 0$, meaning that, when the NYC price is low, a high quality coffee has a relatively higher probability of being sold to Fair Trade importers. This is verified in columns (5) and (6) of Table 3. A decline of the NYC price of

80cts/lb (which represents the situation in the 2001-2004 crisis years relative to 1998 before the crisis or 2008 after the crisis) increases the probability that a high quality coffee with an index of 10 be sold as Fair Trade by 8% relative to a coffee of quality index 0.

4. INCREASING PRODUCER BENEFITS FROM FAIR TRADE: A DISCUSSION

A Fair Trade market, being inherently based on disequilibrium between supply and demand, can be understood by analogy with the common property resource problem. Despite the fact that the FT system appears to control prices effectively, because the quantity of certified FT production is a free variable, rents are dissipated in equilibrium. Consistent with Ostrom's (1990) optimism, the situation is, however, not a hopeless open access problem because the long-established solution to a CPR management problem is met as there exists a FT gatekeeper able to regulate entry. In this case, the strict certification control possessed by FLO-CERT as the only certifying agency, and the proven effective maintenance of the FT trademark by TransFair and other labeling initiatives in the consumer countries, indicates that such gatekeepers exist. Therefore, the critical policy question in the ongoing effort to generate real benefits for producers is how the system can be used to control supply in relation to effective demand.

While many free-trading economists appear to be hostile to the intent of FT (see Hiscox, 2007), the existence of widespread ethical demand among coffee consumers does present an unambiguous opportunity for benefits to be created for smallholder farmers if the mechanism can be engineered correctly. Indeed, there is no market failure being addressed by FT because the poverty of producers of concern to FT is not arising as a consequence of any ignored externality. The analogy is instead to the voluntary provision of foreign aid, where the donor reveals through his actions that the welfare lost through foregone consumption is smaller than the benefits derived from giving. The question then becomes whether this channel for delivering aid to poor producers is preferable to the many other alternatives. The clearest answer to this question is that, because a supply chain already connects the consumers and the producers, additional money can be transferred to producers at extremely low marginal cost through this channel. Therefore, the FT mechanism can be justified on the ground that the pass-through of aid is relatively efficient because it piggy-backs on an existing mechanism. A major distinction, however, with a standard aid grant is that the willingness to transfer welfare through the FT mechanism is driven directly by the amount of benefit, and since the price is the mechanism through which benefit is transferred, it cannot be spread indefinitely across producers without driving the benefit to zero.

This idea in turn begs the question of what the ‘optimal’ level of FT certification would be. We can solve in typical fashion for the profit-maximizing quantity of FT output. If we shut off the component of FT demand that is directly driven by producer profits, then we get a solution that takes the familiar form $Q_f^* = (\theta - \kappa) / 2$. The solution to the problem when we include the additional demand arising from altruistic preferences over producer profits contains an extra term, $Q_f^* = (\theta - \kappa - \alpha(p_i + c/q)) / 2$. As shown in Section 2, the demand curve is steeper when we include preferences over producer profits (because demand falls as FT output falls) and therefore we get the familiar result from monopoly pricing that the steeper demand is, the stronger are the incentives for producers to restrain production in order to drive up prices.

An additional contracting problem in FT markets pertains to the incentives for certifiers. The optimal FT output derived above will be undermined and the open-access equilibrium will obtain simply as a result of the incentives for producers to become certified. To the extent that the certifiers themselves are private entities who derive their incomes from performing the certifications (and not from a share of the rents accruing to the certified), we can think of them as being paid piece-rate by producers for the act of performing certifications. Therefore, far from acting to attempt to control entry on the extensive margin, their incentives actually work to exacerbate the over-certification problem, further undermining the FT premium.

In summary, then, the FT market must be explicitly structured to take advantage of the existing single entry point into certification in order to coordinate the expansion of production capacity with the expansion of demand for producer benefits to persist in equilibrium. If this pool of producers is made large, then the benefit to each producer will be small. If the pool is kept small, then it restricts benefits to a more narrow range of producers but delivers more benefit to each of them and on the aggregate. This problem only differs from the standard aid targeting conundrum to the extent that $\alpha\pi \neq 0$, meaning that consumers directly value producer profits. To the extent that this is the case, the aggregate willingness to pay among ethical consumers may grow if the FT market is restricted and both per-producer and aggregate rents increase.

5. CONCLUSION

We perform empirical tests on unique data from a Central American second-tier coffee cooperative to measure the FT premium. We find that during the period when a substantial price premium existed, the share of certified coffee actually sold under the FT mechanism declined. As

the FT premium has fallen to almost zero in recent years (because the traditional market price exceeded the FT floor), the share sold on the FT market has risen. The effective FT premium, meaning the total FT surplus payment divided by all coffee produced by the member cooperatives, has remained constant and never exceeded eight cents per pound, not including the costs of certification. Empirical observations on FT sales by Coffeecoop thus confirm the core theoretical predictions of our model.

The existence of large group ethical consumers, willing to pay a premium on coffee to transfer rents to producers, opens up a tremendous opportunity to increase welfare in the poor global South. This is the unique promise of Fair Trade. Supply chains already exist to transfer payments from consumers to producers, and so a mechanism that can realize ethical willingness to pay can get these funds into producers' hands with high efficiency. The problematic feature of realizing this promise comes from the fact that a large number of qualifying producers wish to receive these surplus payments, and unless a credible coordinating scheme exists to determine access, producers will be willing to eventually lose money in order to gain access to this source of profits. Hence, while these markets can deliver benefits when they are nascent, once the supply side has responded to the presence of rents, the arbitrage condition states that the money lost on gaining access will tend toward equalizing the benefits from participation. The maintenance of long-term benefits therefore hinges on ability of the mechanism to coordinate entry.

BIBLIOGRAPHY

- Arnot, C., P. Boxall, and S. Cash. 2006. "Do Ethical Consumers Care about Price? A Revealed Preference Analysis of Fair Trade Coffee Purchases." *Canadian Journal of Agricultural Economics* 54: 555-565.
- Basu, A., and R. Hicks. 2008. "Label Performance and the Willingness to Pay for Fair Trade Coffee: A Cross-National Perspective." *International Journal of Consumer Studies* 32(5): 470-78.
- Bechetti, L., and F. Adriani. 2008. "Fair Trade: A 'Third Generation Welfare' Mechanism to Make Globalization Sustainable". CEIS Working Paper # 170.
- Berndt, Colleen. 2007. "Does Fair Trade Coffee Help the Poor? Evidence from Guatemala and Costa Rica." Mercatus Center, George Mason University.
- Elfenbein, D., and B. McManus. 2010. "A Greater Price for a Greater Good? Evidence that Consumers Pay More for Charity-Linked Products." *American Economic Journal Economic Policy*, forthcoming.
- Hardin, Garrett. 1968. "Tragedy of the Commons." *Science* 162: 1243-48.
- Hiscox, Michael. 2007. "Fair Trade and Globalization." Working Paper 2008-0057, Weatherhead Center for International Affairs, Harvard University.
- Levi, Margaret, and April Linton. 2003. "Fair Trade: A Cup at a Time?" *Politics and Society* 31(3): 407-32.
- Mathews, Tony. 2009. "Enhancing the Global Linkages of Cooperatives: The Fair Trade Option." UN Expert Group Meeting on "Cooperatives in World in Crisis". New York.
- Ostrom, Elinor. 1990. *Governing the Commons: The Evolution of Institutions for Collective Action*. Cambridge University Press.
- Poret, S., and C. Chambolle. 2007. "Fair Trade Labeling: Inside or Outside Supermarkets?" *Journal of Agricultural and Food Industrial Organization* 5(9). Berkeley Electronic Press.
- Wikipedia. 2009. "History of Fair Trade".

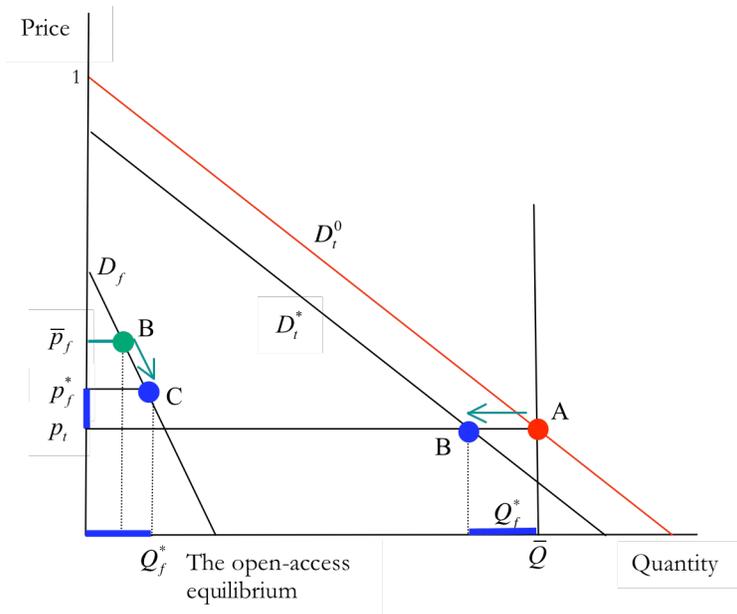


Figure 1. Equilibrium on the coffee market with FT demand

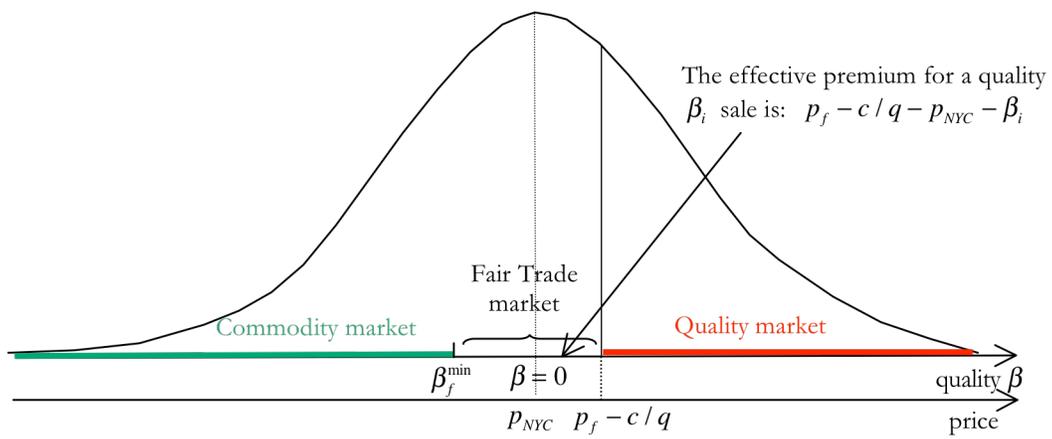


Figure 2. How FT prices segregate the quality distribution

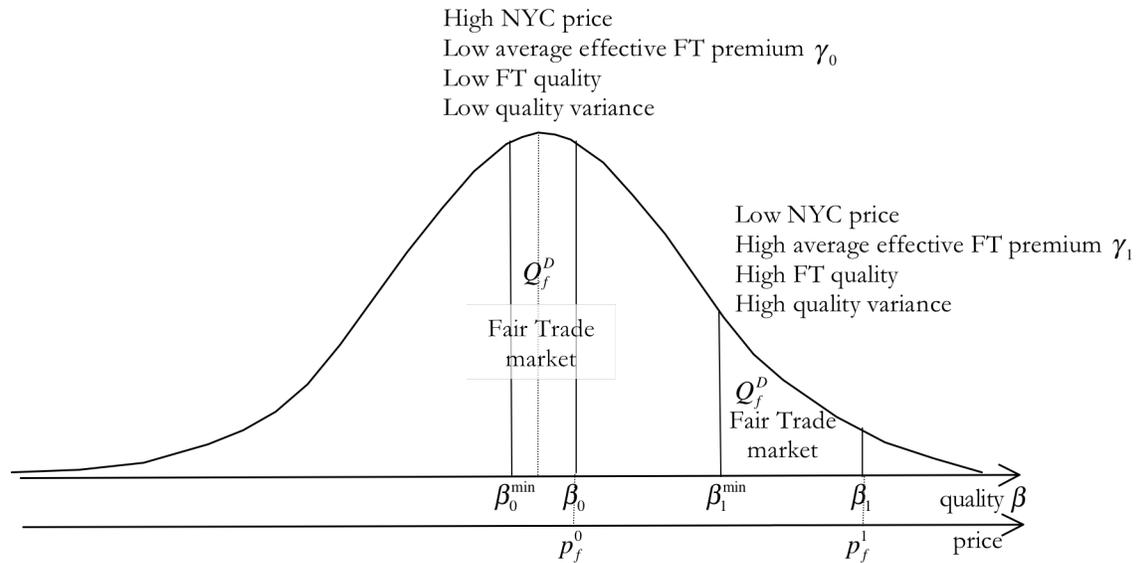


Figure 3. The Relationship between nominal FT premiums and average effective FT premiums

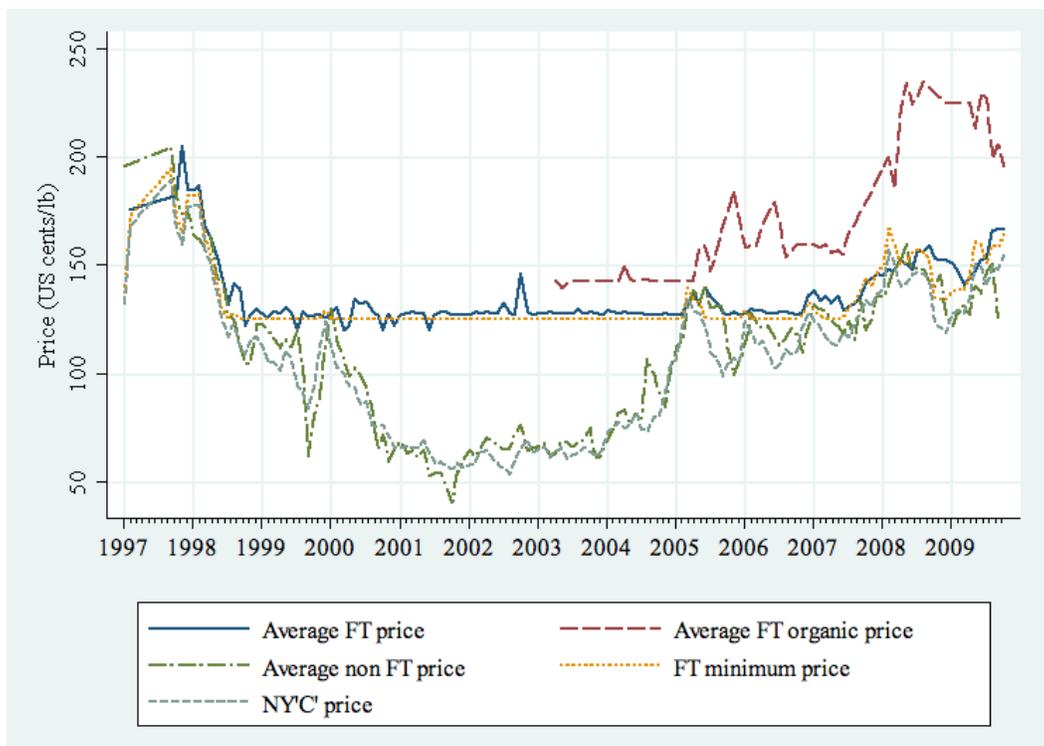


Figure 4. Evolution of coffee prices over time (US cents/lb)

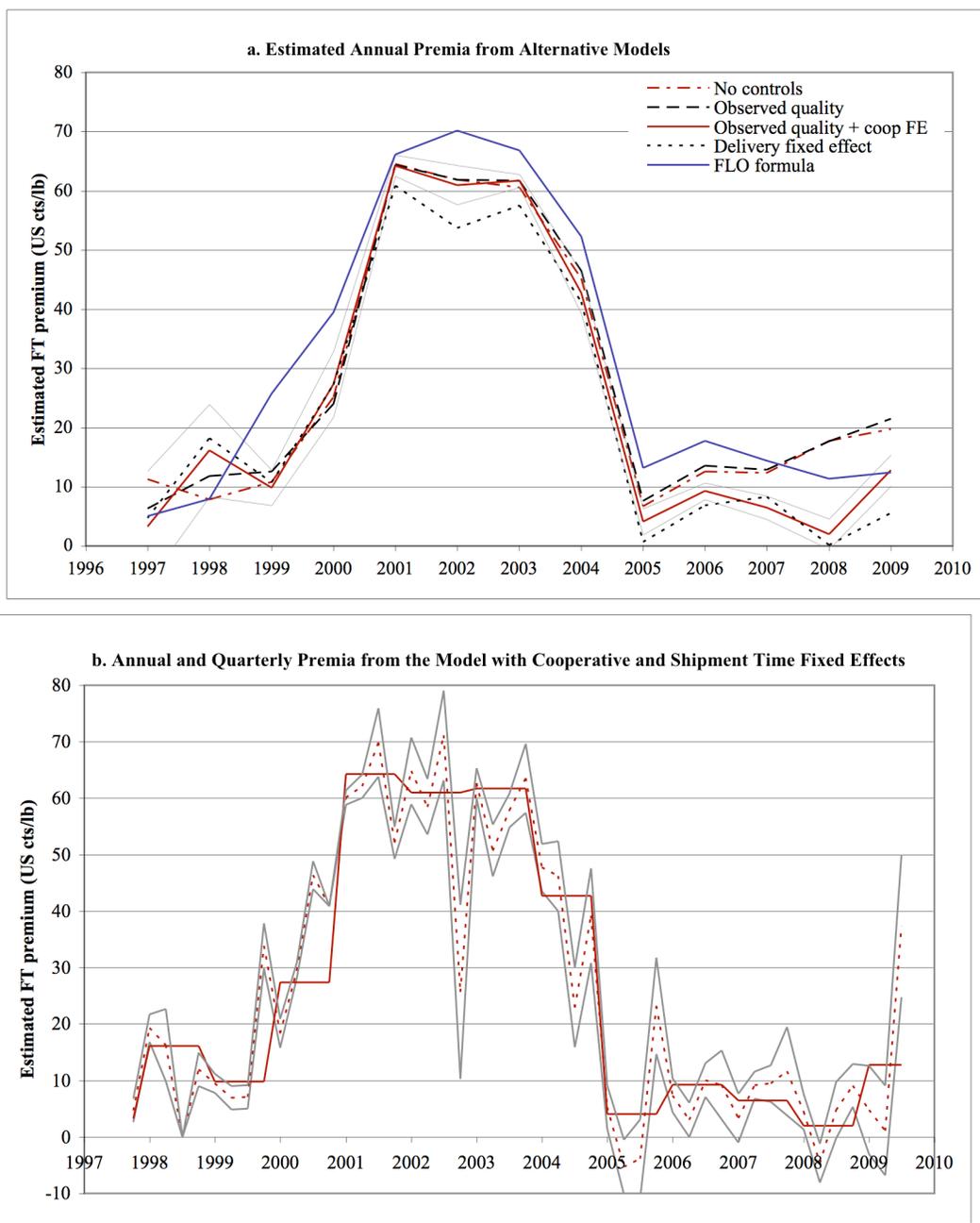


Figure 5. The estimated Fair Trade premium (US cents/lb)

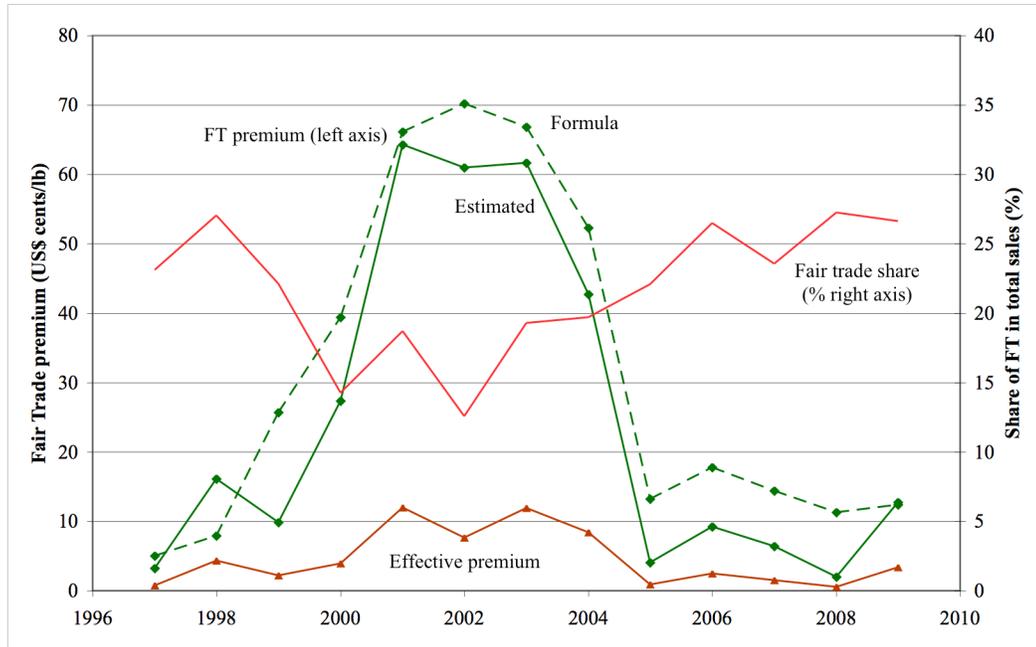


Figure 6. Share of non-organic coffee sold under Fair Trade contracts and effective premium

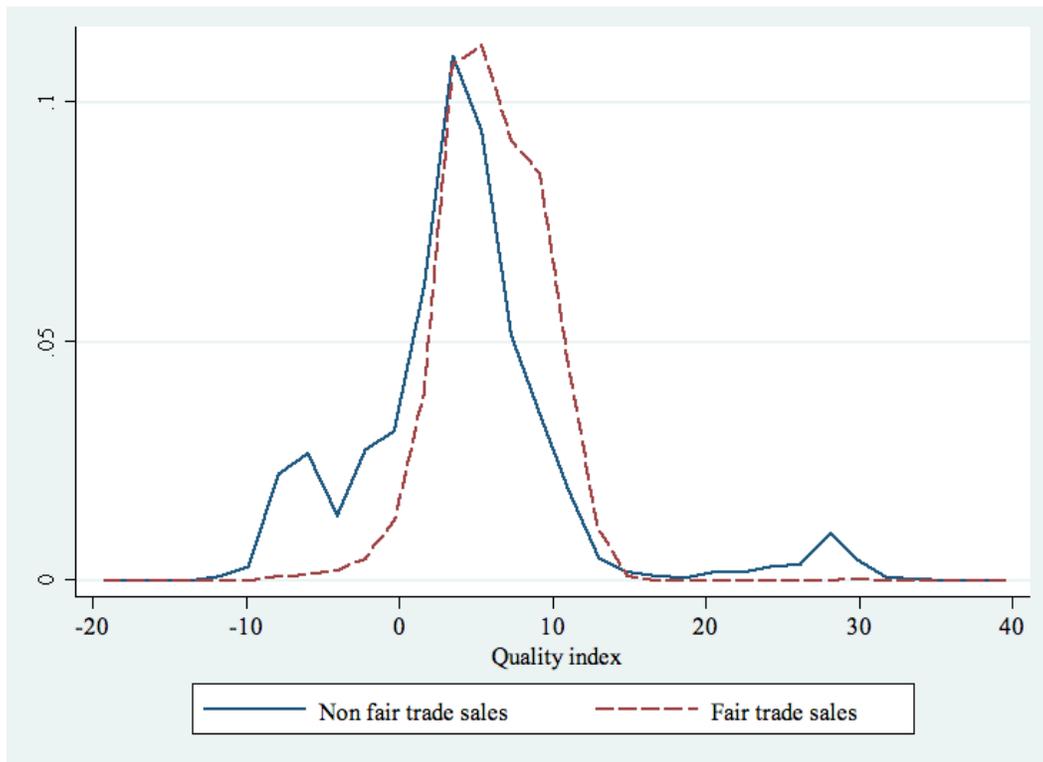


Figure 7. Observed quality distribution of non-organic Fair Trade and non Fair Trade coffee

Table 1. Estimation of the annual Fair Trade premium

	Contract price (US cts/lb) (1)	Contract price (US cts/lb) (2)	Price differential (US cts/lb) (3)	Contract price (US cts/lb) (4)	Contract price (US cts/lb) (5)	Contract price (US cts/lb) (6)	Price differential (US cts/lb) (7)	Contract price (US cts/lb) (8)
Fair trade premium								
1997	11.25 [5.16]*	6.31 [5.21]	10.07 [7.28]	3.26 [4.70]	14.86 [5.80]*	4.74 [4.47]	8.80 [7.00]	4.73 [1.03]**
1998	7.87 [3.19]*	11.79 [2.85]**	8.51 [1.95]**	16.12 [3.91]**	14.42 [4.45]**	15.75 [3.72]**	7.01 [3.24]*	18.22 [1.27]**
1999	10.79 [1.70]**	12.54 [1.50]**	15.60 [1.51]**	9.83 [1.48]**	13.06 [1.90]**	9.79 [1.49]**	13.45 [1.88]**	10.77 [0.61]**
2000	25.14 [2.94]**	24.03 [2.80]**	27.59 [2.71]**	27.36 [2.78]**	27.97 [7.49]**	27.42 [2.81]**	31.17 [2.86]**	27.27 [0.80]**
2001	64.57 [1.09]**	64.41 [1.08]**	58.52 [0.96]**	64.26 [0.88]**	64.73 [1.15]**	63.24 [0.82]**	58.08 [0.80]**	60.88 [0.60]**
2002	61.85 [1.24]**	61.90 [1.28]**	64.72 [1.08]**	60.97 [1.65]**	62.34 [1.07]**	60.84 [1.49]**	63.55 [1.15]**	53.71 [2.80]**
2003	60.60 [0.87]**	61.69 [0.79]**	60.66 [0.66]**	61.69 [0.55]**	61.57 [0.65]**	60.82 [0.49]**	58.33 [0.58]**	57.51 [1.16]**
2004	45.19 [1.45]**	46.51 [1.40]**	46.17 [0.87]**	42.71 [1.72]**	43.18 [1.47]**	41.92 [1.71]**	42.56 [0.94]**	41.21 [1.81]**
2005	6.73 [1.17]**	7.62 [1.10]**	12.24 [1.14]**	4.09 [1.11]**	3.92 [1.18]**	4.04 [1.06]**	9.91 [1.29]**	0.69 [1.64]
2006	12.58 [1.33]**	13.55 [1.30]**	16.54 [1.35]**	9.26 [0.69]**	9.19 [0.76]**	8.89 [0.67]**	10.14 [0.76]**	6.87 [0.80]**
2007	12.36 [1.27]**	12.86 [1.22]**	14.83 [1.11]**	6.44 [0.99]**	6.1 [1.03]**	6.59 [0.91]**	7.00 [0.95]**	8.27 [0.82]**
2008	17.79 [2.49]**	17.66 [2.41]**	19.63 [2.50]**	2.01 [1.28]	1.96 [1.45]	1.93 [1.25]	4.56 [1.58]**	0.14 [1.06]
2009	19.74 [2.54]**	21.49 [2.50]**	14.60 [2.32]**	12.77 [1.32]**	13.32 [1.33]**	11.44 [1.30]**	4.09 [1.43]**	5.55 [2.41]*
Controls								
Quality	N	Individual	Individual	Individual	Individual	Index	Individual	-
Organic, UTZ	N	Y	Y	Y	Y		Y	
Shipment month FE	Y	Y	N	Y	Y	Y	N	Y
Coop FE	N	N	N	Y	Y	N	Y	N
Delivery FE	N	N	N	N	N	N	N	Y
Unit of analysis	Sale	Sale	Sale	Coop delivery - sale				
Observations	3934	3934	3934	16312	12480	16312	16312	5759
Number of coops / deliveries FE				296	286		296	1874
R-squared	0.83	0.86	0.57	0.94	0.94	0.93	0.67	0.75

Robust standard errors in brackets (clustered at the sale level for columns (4) to (7)).

* significant at 5%; ** significant at 1%

Individual quality indicators are: Prime-washed, Extra Prime washed, HB, SHB, Fancy SHB, SHB-HH, SHB-EPW, GAP, and Small Beans. All regressions include also control for UTZ certification.

Restricted samples: (5) deliveries exclusively sold as FT or non-FT, (8) deliveries sold partly as FT and partly as non-FT

Table 2. Share of non-organic coffee sold under Fair Trade contract and effective premium

Shipment year	Total sales (bags of 69kg)	Fair Trade share (%)	NYC price US\$ cents/lb	FT av. price US\$ cents/lb	FT premium (US\$ cents/lb)		FT premium (% of FT price)
					FLO formula	Effective	
1997*	14,065	23.1	171.5	190.6	5.0	3.3	1.7
1998	65,025	27.1	143.0	161.4	7.9	16.1	10.0
1999	105,801	22.1	105.3	127.9	25.7	9.8	7.7
2000	131,805	14.3	91.6	126.7	39.4	27.4	21.6
2001	128,293	18.7	64.9	127.8	66.1	64.3	50.3
2002	153,290	12.6	60.8	129.8	70.2	61.0	47.0
2003	153,533	19.3	64.2	130.1	66.8	61.7	47.4
2004	164,237	19.7	78.7	130.2	52.3	42.7	32.8
2005	187,302	22.1	119.5	134.3	13.2	4.1	3.0
2006	200,744	26.5	113.3	133.0	17.8	9.3	7.0
2007	216,474	23.6	120.0	138.6	14.4	6.4	4.6
2008	251,739	27.3	143.6	159.1	11.3	2.0	1.3
2009*	227,360	26.6	139.4	153.0	12.4	12.8	8.3

NYC price: Indicator price for other Arabica, International Coffee Organization

The FLO formula is based on the FT floor price, the NYC price, and the social premium; The premium on FT sales is estimated, controlling for observed quality characteristics, and cooperative and shipment time fixed effects. The effective premium is obtained by multiplying the premium of FT sales by the share of the coffee sold with the FT label.

* Sales in 1997 are only those of the 1997 harvest, which occurred in November and December. Sales in 2009, up to July 2009.

Table 3. Quality of Fair Trade coffee and the international price

	Average quality		Variance of quality		Sale is Fair Trade	
	(1)	(2)	(3)	(4)	(5)	(6)
Fair Trade	2.814 (4.16)**	2.193 (3.28)**	14.204 -1.220	9.429 -0.810		
Quality index					0.01165 (4.12)**	0.01152 (3.99)**
NYC price	0.029 (7.74)**	-0.040 (3.44)**	0.398 (6.24)**	-0.521 (2.54)*	0.00233 (8.74)**	-0.00046 (0.63)
* Fair Trade	-0.025 (3.40)**	-0.019 (2.59)**	-0.477 (3.71)**	-0.436 (3.38)**		
* Quality index					-0.0001 (3.34)**	-0.0001 (3.29)**
Crop year FE	N	Y	N	Y	N	Y
Observations	10328	10328	10328	10328	10328	10311
R-squared	0.01	0.06	0.01	0.04		

Absolute value of t statistics in parentheses. * significant at 5%; ** significant at 1%

Marinal effects from probit estimation in columns (5) and (6)

Sample of sales in months where the NYC price was lower than the FT floor price by at least 10cts/lb.