The Impact of Fair Trade Coffee on
Economic Efficiency and the Distribution of Income

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Introduction

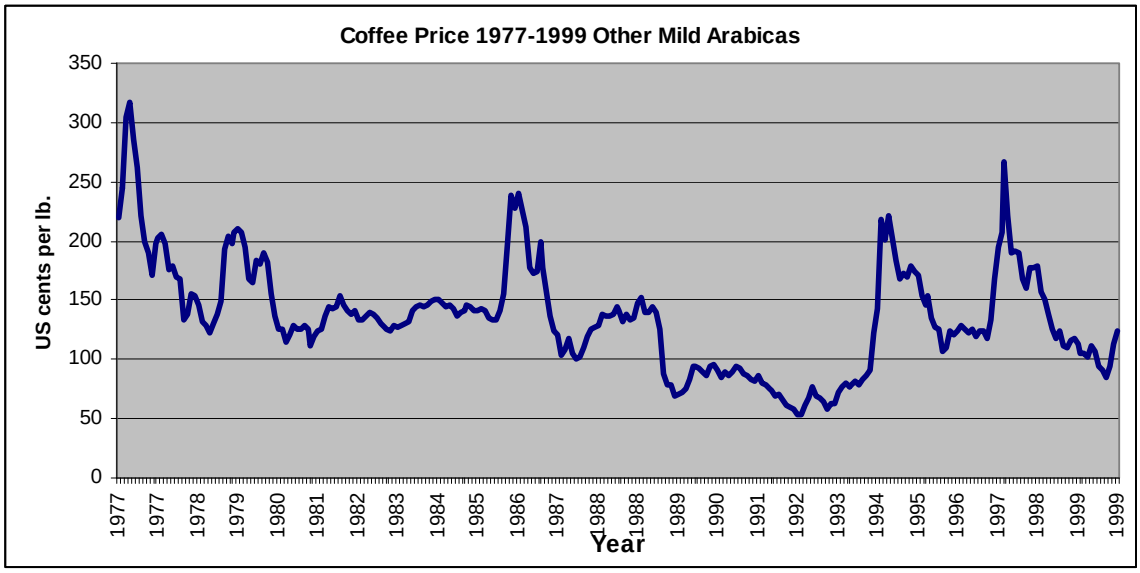
Fair Trade Certified™ coffee is receiving increasing attention both by the public and by academic researchers. Fair Trade[1] emerged as a response to the adverse conditions faced by small-scale coffee producers in developing countries. Individual small-scale producers have no direct access to international markets and must sell their coffee to local intermediaries. These intermediaries are widely perceived to have monopsonistic[2] power in the coffee market at the level of rural communities. The weak bargaining power of producers results in the producers receiving prices below market value, an amount which is ultimately as little as two to four percent of the final retail price of coffee (Transfair, 2007).

In addition to these difficult local conditions, coffee producers must also contend with the vicissitudes of the highly volatile global coffee market as illustrated in Figure 1. Coffee prices respond to many variables including weather conditions (particularly frosts in Brazil), pest infestations and the actions of traders and speculators in global coffee commodity exchange. This price instability results in dramatic income fluctuations for

[1] In this paper we follow the convention of the academic literature, capitalizing Fair Trade when used in reference to coffee certified under the Fairtrade Labeling Organizations International system, and using lower case when discussing more general issues of fairness in the international trading system.
[2] Monopsony is analogous to monopoly but concerns the buyer's side of the market. Whereas monopoly concerns markets in which there is only one seller of a product, monopsony concerns markets in which there is only one buyer.

producers and difficulty in targeting production levels based on expected prices at the time of harvest. Further, newly-planted coffee trees require three to five years before they begin bearing significant fruit. Thus, in this context of high price volatility, farmers must make production decisions based on what they expect coffee prices to be several years in the future.

Figure 1: Coffee Price for Other Mild Arabicas 1977-1999 (Source: ICO)



This price volatility has very real consequences in the lives of coffee producers. Lewin, Giovannucci, and Vargangis (2004) cite a Nicaraguan study from 1998-2001 where coffee producers saw a 2 percent increase in poverty rates while poverty rates of rural households as a whole fell 6 percent over the same period. The same trend was seen in primary school enrollment with net enrollment falling 5 percent for coffee producers while rising 10 percent for rural households.

Fair Trade seeks to improve the conditions of small-scale coffee farmers through a standards and certification system. For coffee to receive a Fair Trade certification, it must meet a set of economic, social and environmental standards. Included in these are:

1. Participation in Fair Trade is limited to small-scale producers organized in cooperatives. Fair Trade explicitly targets small-scale farmers. Organization in cooperatives can increase the bargaining power of producers and allow them to take advantage of economies of scale in production, processing, marketing and negotiating. In addition, certification of individual small-scale farmers would likely be prohibitively expensive.
2. Coffee Importers are required to buy directly from coffee cooperatives. Direct purchasing from the co-op eliminates middlemen taking a share of the value added.
3. A guaranteed floor price is paid directly to the producers' cooperative. The floor price is meant to represent a stable "living wage," that is, a price that gives a sufficient return so that producers can meet basic needs for nutrition, housing, health and education. [3]

These standards are designed to address each of the conditions described above and are intended to increase and stabilize the incomes of small-scale coffee farmers.[4] Fair Trade

[3] There are additional elements to the Fair Trade Model that we do not consider in this paper. Other important requirements include democratic decision-making processes and transparency in cooperatives, no structural dependence on hired labor, fair labor conditions for all people working on the farms and freedom of association for farmers and workers. There is also a requirement that buyers provide up to 60% of the order as pre-harvest financing, which we will address in a future paper.

[4] Fair Trade's objectives are much broader than just increasing income. According to Transfair USA, the Fair Trade certifying organization in the U.S., "Fair Trade Certification empowers farmers and farm workers to lift themselves out of poverty by investing in their farms and communities, protecting the environment, and developing the business skills necessary to compete in the global marketplace." (Transfair USA, 2007)

certified coffee is differentiated in the consumer market, allowing producers to reach a segment of consumers who are willing to pay a premium for products meeting social criteria much as consumers who value certain environmental standards pay a premium for organic certified products. The price premium theoretically allows producers to capture more of the final retail value (Lewin et al., 2004).

Fair Trade green coffee imports in the United States have grown from 76,000 pounds in 1998 to over 66 million pounds in 2007 (TransFair, 2007) and the more than 250,000 family coffee farmers participating in the Fair Trade system earned an additional $54 million in income through Fair Trade in 2006 (Byers, Giovannucci & Liu, 2008).

Despite these apparent successes, Fair Trade has been the subject of considerable controversy, provoking critiques from inside and outside the Fair Trade system. Internal debates have centered on whether the marketing and selling of Fair Trade by large corporations such as Nestle undermines the principles of Fair Trade. These concerns deserve careful consideration; however they are not the focus of the paper. External criticisms of Fair Trade have focused on its intervention in markets, suggesting that the Fair Trade system leads to an inefficient allocation of resources, discouraging the natural exit of less productive producers and encouraging overproduction in a market already characterized by chronic oversupply (Brendt, 2007; Economist, 2006; Lindsay, 2003). However, Fair Trade advocates contend that by keeping small-scale farmers in coffee production, Fair Trade internalizes positive externalities generated by small-scale production of high-quality coffee, particularly the environmental services such production

provides and the disincentives for migration created when coffee production is economically viable—and therefore enhances efficiency.

In this paper we look at several aspects of Fair Trade and ask the question, "Is Fair Trade diminishing or enhancing economic efficiency in coffee production?" Specifically, we ask whether Fair Trade decreases or increases allocative efficiency: the degree to which resources such as land and labor are put to their most productive uses.[5] In addition, we examine who is likely to gain and who is likely to lose from the Fair Trade system. We analyze the relative benefits and losses that Fair Trade brings to different groups within coffee-producing communities. Our second question is thus, "How is Fair Trade likely to affect income distribution in the communities in which it is implemented?" These questions have largely been unaddressed in the literature.

Outline

The paper is organized around several components of the Fair Trade system. In each section we examine a Fair Trade component through the lens of the economic theory, the existing literature and our own field observations. We try to emphasize the *de facto* operation of Fair Trade and its components rather than the system as it is ideally conceptualized and often described. We divide our analysis into five sections. Section one considers the barriers to entry in Fair Trade, including the intentional restriction to cooperatives of small-scale producers as well as constraints that arise from costs of

[5] Note that the use "most productive uses" does not require that the uses are marketed. For example, child care and, as will be discussed later in the paper, non-remunerated environmental services such as carbon sequestration, are considered productive uses.

certification, from market pressures and from various other cooperative and community characteristics. Section two concerns vertical integration: the assumption by Fair Trade cooperatives of activities previously undertaken by intermediaries in the coffee commodity chain . Section three looks at the price floor, the aspect of Fair Trade that many economists find most troubling. Section four examines that the role that Fair Trade may have in internalizing positive environmental and social externalities. We do not attempt to be exhaustive in our coverage of topics—for example, we leave for a future paper examination of the complex issue of the pre-harvesting financing required of Fair Trade importers—and instead cover a smaller range of topics in more depth.

1. Barriers to Entry

The Fair Trade market has a number of entry barriers, each of which excludes a certain segment of producers.[6] In this section we identify these barriers and discuss their likely implications for efficiency and income distribution. We begin with the most immutable barriers, that is, those barriers that producers are least able to overcome through their own actions.

Quality Potential

The Fair Trade coffee market is a subset of the "specialty" coffee market.[7] While there is no exact definition of what constitutes a specialty coffee as opposed to a "commodity" coffee, a distinction commonly used in the U. S. is that specialty coffees are the higher-

[6] It is important to note, that even cooperatives that gain access to the Fair Trade market typically only sell 30-50% of their coffee in this market as a result of demand constraints. The remainder is sold in the non-fair trade market (Levi & Linton, 2003)

[7] In this paper, we limit our attention to the Fair Trade market for *Arabica* coffee.

quality kinds of coffees popularized by Starbucks and small coffee houses, while commodity coffees are the kinds sold under brands such as Folgers and Maxwell House and traditionally packaged in large cans (and, hence, often collectively referred to as the "cans"). Fair Trade coffee must meet the quality standards of the specialty market. Further, while some socially-conscious consumers may have been willing to accept lower quality in Fair Trade coffee when it was first introduced—similar accommodation accompanied the introduction of organic coffee—recent research suggests that consumers now have the same quality expectations for Fair Trade coffee that they do for other specialty coffees (Obermiller et. al., 2008)

A prerequisite for meeting the specialty coffee quality requirements is producing in agro-ecologically suitable zones. Growing dense beans well suited to the roasting conditions of the specialty industry requires hot days and cold nights typical of higher elevation tropics.[8] Topography, soil type, rainfall amount and distribution and a variety of micro-climatic and micro-geographic factors figure importantly in determining the quality of coffee that can be attained in a given area; much like wine, the *terroir* is embodied in the coffee, and coffees coming from particular areas, for example, the Lake Atitlan region of Guatemala and the Yirgacheffe region[9] of Ethiopia, are particularly valued. While it is an overstatement to assert that geography is destiny in coffee production, it is the case production in agro-

[8] The favorable elevation depends on latitude: while in equatorial Kenya the best coffee is grown between 1200 and 2200 meters, in Brazil, where the coffee growing regions are mostly between 15 and 25 degrees South latitude and frost is a concern, coffee is largely grown between 600 and 1200 meters (Wintgens, 2004).
[9] There is some dispute about calling Yirgacheffe a region. Although this is this is commonly done, conversations with groups working on intellectual property in the Sbux-Ethiopia controversy have confirmed that Yirgacheffe is more a specific flavor profile than a region.

ecologically favored areas is a necessary (but not sufficient) condition for meeting the demands of the specialty market: the quality *potential* of coffee is determined by the place in which it is grown[10]. This means that producers in areas with low quality potential will be excluded from the Fair Trade market as a consequence of their exclusion from the specialty market. This is not a Fair Trade entry barrier *per se*, but it does significantly reduce the pool of coffee producers eligible for participation in the Fair Trade market.

The impact of quality potential entry barrier is difficult to asses and probably varies substantially across countries and settings. While, historically, small-scale producers have often been displaced from the best coffee growing land, quality premiums were also lower and what constituted the "best" land in many cases may have had as much to do with gross production potential and access to transportation infrastructure as with the quality characteristics now rewarded by the specialty market. In some cases, the marginal lands into which peasant producers were pushed have proven to have exceptionally-high quality potential.[11]

Small-Scale Producer Requirement

Only small-scale coffee producers may participate in the Fair Trade market; plantations are excluded. The reason for the exclusion of plantations lies in Fair Trade's origins as a

[10] *Realized* quality will also depend on a great many additional factors including varietal choice, cultivation and harvest techniques practices and post-harvest processing. Unlike geographic and climate factors, however, these factors are under the control of the producer.

[11] The Zaragoza community in the Mexican state of Oaxaca is one example. The exceptional coffee of this isolated, poor community was recently "discovered" by specialty coffee importer David Griswold and has changed many roasters' perceptions of the quality potential of Mexican coffees. (Beals, 2007)

response to the social, political and economic conditions faced by small-scale coffee producers.[12] Fair Trade explicitly privileges small-scale producers to redress their historical marginalization. FLO (2007) defines small-scale producers as "those that are not structurally dependent on permanent hired labor, managing their farm mainly with their own and their family's labor-force"; the distinction is made on the organization of labor in production rather than the physical size of the farms.

The efficiency implications of plantation exclusion depend on the relationship between farm size and productivity: if large farms are more productive than small farms—a direct relationship--then Fair Trade shifts market share to lower-efficiency producers, and vice versa. Development economists have devoted a great deal of energy to investigating the farm size-productivity relationship and have found strong empirical support for an *inverse* relationship between farm size and productivity: output and value added per unit area *decrease* with increasing farm size (Binswanger, Deininger & Feder, 1995). The most widely-accepted explanation for this relationship is rooted in the differential effective input costs for small and large farms: while large-scale farms face a lower cost of capital and benefit from the scale economies associated with mechanization, they also face higher labor costs because of the need to pay a market wage to and monitor hired labor. Small-scale family farms benefit from lower labor costs: family labor is largely self-monitoring and certain forms of household labor—often women's and children's labor—have lower opportunity costs than the prevailing market wage. The empirical evidence suggests that, in most cases, this labor effect dominates the capital effect (Binswanger et al., 1995).

[12] For examples of these conditions, see Ross (2000), Paige (1998) and Roseburry et al (1995).

It is an open question whether the inverse relationship holds for coffee. Consistent with relatively higher efficiency of small-scale producers is their continued importance in total coffee production: farms of less than 10 hectares produce 70% of all coffee (Common Fund for Commodities, 2001). In production environments with significant scale economies, we would expect substantial farm consolidation and large farm dominance in production; the enduring large market share of small-scale producers may mean that these scale economies are not that important. It is unlikely, however, that either a direct or an inverse farm size-productivity relationship holds in all the conditions in which coffee is cultivated. For example, the relatively flat *cerrado* of Brazil's central plateau lends itself well to capital-intensive technologies, and mechanization has minimized the need for human labor in nearly all aspects of production; modern mechanical harvesters are calibrated to hit the coffee plants just hard enough so that only ripe beans are removed. In this context, we might expect the capital effect to dominate. By contrast, in many of the rugged mountainous regions of Africa and Latin America, coffee is cultivated on vertiginous hillsides among shade trees[13], requiring that essentially all tasks be performed by hand; here the labor effect would more likely dominate. The few empirical studies analyzing farm size and productivity in coffee production give conflicting results, with some (Rios & Shively, 2005 in Vietnam and Perdomo et al., 2006 in Colombia) finding higher technical efficiency on larger farms and others (Odoul et al., 2006 in Kenya) finding the inverse

[13] Jaffee (2008) describes hillsides "so steep that farmers have actually been known to fall out of their fields" (p.39).

relationship.[14] It thus appears, as we might expect from the above discussion that the efficiency effect of plantation exclusion in Fair Trade depends largely on the production environment.

Plantation exclusion from the Fair Trade market has two, opposing effects on income distribution. Shifting earnings from plantation *owners* to small-scale producers is a progressive transfer, while shifting earnings from plantation *labor* to small-scale producers is a regressive transfer, because plantation labor households are generally poorer than small-scale producer households (e.g., Vakis, Kruger & Mason, 2004; Bacon et al., 2008). [15] Fair Trade's critics see this as a major shortcoming of the Fair Trade system. For example, Chris Wille of Rainforest Alliance's competing program that certifies plantations as well as small-producer cooperatives asserts that "limiting certification to co-ops means "missing out on helping the vast majority of farm workers, who work on plantations." (Economis, 2008). Similarly, Sidewell (2008), maintains that "Fair Trade not only disregards the poorest, it makes their condition worse by requiring that certified farms do not hire permanent full-time employees, reducing hired labor opportunities to infrequent seasonal work where wage levels are hard to monitor and may be illegally low." In an example often cited by Fair Trade's critics, Weitzamn (2006) notes that four of five Fair Trade farms he visited in Peru paid workers less than the Peruvian minimum wage. FairTrade Labeling Organization's

[14] It should be noted, however, that: 1) the Vietnam and Kenya studies concern only the relationship within small-scale farmers, that is, no farms that would be considered estates or plantations are include; 2) the Vietnam study would necessarily concern *Robusta* farmers and 3) the Kenya study looks the entire mix of crops cultivated by the farmers, not coffee alone.

[15] Interestingly, however, a World Bank study in Nicaragua found that coffee labor households experienced smaller welfare declines in response to falling coffee prices than coffee producer households, at least partially as a result of the labor households' greater ease in exiting the coffee sector (Vakis, Kruger & Mason, 2004).

standards for certification require that workers hired by Fair Trade farms on a casual basis "share the benefits of Fair Trade" (FLO, 2005).

There exist circumstances in which the regressive transfer from plantation labor to small-scale farmers is at least partially mitigated. Anecdotal evidence from our fieldwork in the Mexican state of Oaxaca suggests that some Fair Trade cooperative members who had previously been producer-cum-laborers: they produced coffee on their own farms and also served as seasonal laborers on a nearby plantation. When the plantation was abandoned in the face of low coffee prices, they lost their wage income, but they soon after became part of a Fair Trade cooperative; the increased earnings from participating in the Fair Trade market at least partially compensated for the lost wages.[16]

A related optimistic scenario imagines former laborers or producer-cum-laborers purchasing land from plantations to produce coffee for the Fair Trade market[17]. In production environments characterized by an inverse farm size-productivity relationship, a given piece of coffee land will be worth more to a small-scale producer than a plantation owner. This disparity in valuations would be increased by the producer's receipt of Fair Trade prices, making it possible for land sales at prices that are below the small-scale producer's valuation but above the plantation owner's valuation. While this Pareto-improving scenario might seem unrealistic, a World Bank-supported project in Brazil

[16] The wages may have had the additional advantage of coming at times of the year when there was no income from coffee. The timing of income is critically important for credit-constrained coffee producers (http://www.greenmountaincoffee.com)

[17] A Pareto-improving trade is one in which at least one party is made better off with no party being made worse off.

achieved these market-based "land reforms" through the creation of facilitating institutions, most importantly credit for land purchases by the landless (Economist, 1999).

Entry Barrier: Certification

A cooperative's desire to join the Fair Trade system is not by itself sufficient to ensure entry. Even well-run cooperatives in areas with high quality potential face additional entry barriers.

In order to apply for certification, a cooperative must first negotiate a contract with an importer or roasters in a coffee consuming country (FLO, 2008; Weber, 2006). This requires meeting the demanding quality requirements of the specialty market: the quality *potential* must be turn into *realized* quality—and realized consistently--through adoption of best practices for cultivation, harvest and post-harvest processing. The cooperative must be also able to ensure that their members will consistently sell their coffee to the cooperative, rather than to intermediaries, so that the cooperative can meet its contract obligations with the buyer. This generally requires that the cooperative have sufficient liquidity at harvest to pay producers a substantial share of their coffee's final value upon delivery. Finally, a cooperative must identify a buyer for their coffee, a process that requires integration in international specialty coffee markets.

Once they have a contract in hand, the cooperative must be able to meet the demands of the certification process itself. Until 2004, cooperatives faced no up-front fees for Fair

Trade certification. The *buyers* of the coffee paid the certifiers $0.10 per pound of coffee purchased. While this minimized the burden on cooperatives, it put the certifiers in the position of incurring their costs up front and recouping them much later, creating a serious cash flow problem that severely limited the number of cooperatives they could certify in a given period. A large backlog of certification applications developed. To remedy this problem, FLO introduced up-front certification fees for cooperatives in January, 2004. (Table 1). For a cooperative of 300 members, these fees amount to approximately €2,700.

Table 1. Fair Trade Initial Certification Fees (Source: FLO Cert)

1. Application Fee € 250
2. First Year Certification Fees

Number of Members	Amount
<50	€ 1,400
50-100	€ 2,000
101-250	€ 2,200
251-500	€ 2,400
501-1000	€ 3,000
>1000	€ 3,400

Additionally, meeting the demand conditions of the Fair Trade market increasingly require that Fair Trade coffee also be certified organic (Reynolds, Murray & Taylor, 2004; Weber 2006) the costs of which can be several times the Fair Trade certification costs (Calo and Wise, 2005). Cooperatives must also demonstrate adherence to high standards of transparency and democratic management. This requires not only that the cooperatives provide education of their members, dissemination of information and organizational development, but also that they adopt standard practices of accounting and recording keeping in order to demonstrate compliance with Fair Trade certification requirements.

Some authors have expressed concern about the consequences these requirements have on who can access the Fair Trade market (Mutersbaugh, 2005; Renard, 2005). As Renard (2005) says, "current niche market mechanisms may have the effect of limiting access to cooperatives with sufficient organizational capacity to maintain consistent quality, to meet the demands of international trade and to conform to democratic administrative principles." p. 426. Given these requirements it is also not surprising that many of the early entrants to the Fair Trade market had "cosmopolitan leaders," able to negotiate international markets and to develop relationships with foreign buyers and NGOs (Raynolds et al., 2004). The FairTrade Labeling Organization acknowledges this and has a "philosophic stance to offer aid to newly formed producer cooperatives so that they may meet democratic and economic principles" (Renard, 2005).

Finally, some authors are concerned that barriers to entry are increasing. Raynolds et al. (2004) suggest that current potential Fair Trade market entrants face a more competitive market because producers have been seeking alternatives to deal with low international prices. The previous necessities of a cooperative with high capacity may no longer be sufficient to gain entry into the Fair Trade market. This is echoed by Weber (2007) who argues that the limited supply of Fair Trade contracts has benefited those already in the market while making it more difficult for those new to the market to enter.

2. Vertical Integration

A central aspect of the Fair Trade market is the removal of intermediaries in the coffee value chain: coffee importers and roasters in destination countries are required to deal directly with Fair Trade cooperatives rather than with coffee exporters, brokers or other "middlemen." (Transfair, 2004). This is motivated by the widespread perception that the poverty of small-scale coffee producers is, to a large extent, the result of local coffee intermediaries exerting market power and suppressing farmgate prices (Milford, 2004). Fair Trade seeks to remove these intermediaries. This places new responsibilities on the producers, however, for, as Weber (2006) states "While Fair Trade eliminates market intermediaries … [it] does not eliminate the functions that intermediaries perform" (p. 30). Fair Trade producer cooperatives must take over many of the functions performed by intermediaries. This can be conceptualized as a two-stage process in which non-organized producers first engage in collective action to create a cooperative[18] and then vertically integrate into activities previously performed by intermediaries in the coffee value chain. These activities generally include purchasing and marketing their coffee (the producers are, in effect, buying the coffee from themselves and marketing their pooled product) as well as providing information about best practices for cultivation and harvesting, but may include milling, exporting and even roasting. These new responsibilities present substantial challenges to cooperatives: they must achieve a high level of efficiency to avoid dissipating any gains that might result from the reduction of market power.

[18] Alternatively, they might revive an inactive cooperative or simply add new responsibilities to an existing, active cooperative.

In this section, we begin by first examining the exertion of market power. As Van Driel (2003) and Hayami (1996) note, middlemen in the coffee value chain perform important functions that often have high transaction costs and considerable risk. Producers are indeed paid low prices for their coffee, but it may be that intermediaries are merely recouping the high costs they incur in their work. We consider the conditions in the coffee market that make intermediation costly as well as the conditions that may give rise to monopsony or oligopsony and examine the available empirical evidence on market power. We next consider the efficiency consequences of cooperatives vertically integrating into tasks formerly done by intermediaries. We look at the theoretical arguments regarding the efficiency of cooperatively-managed firms versus investor-owned firms (IOFs) and examine empirical studies on cooperative efficiency.

Market Power

The international coffee market shows a high degree of concentration, with just six firms controlling 50 percent of the market (Ponte, 2001). This market concentration is widely cited as a factor contributing to the low prices received by producers (Talbot, 2004). Coffee markets in producing countries also exhibit conditions that could give rise to monopsony or oligopsony power. These conditions include substantial entry barriers for intermediaries in the form of liquidity demands, high specific human capital requirements as well as information asymmetries between coffee buyers and coffee producers.

Entering the specialty coffee market in producing countries to buy, market, mill (buyers often work for mills), process, and export coffee involves very high setup costs (Milford, 2004). An individual (or firm) must gain considerable technical expertise and they must develop a network of buyers and producers. As consumers and roasters become increasingly exacting in the quality characteristics and flavor profile they desire in their coffee, intermediaries must acquire a large amount of specific human capital to correctly comprehend the expressed demands of roasters and map these to the coffee produced in a specific area or farmer and a specific time of harvest. This is costly: as Van Driel (2003) points out, "it is expensive to become an expert". The intermediary must also develop a reputation so that buyers will contract with him (or her) and producers will deliver their coffee to him, allowing him to meet his contractual obligations. Developing a reliable network is typically accomplished iteratively in repeated interactions over a number of years. The significant scale economies in the intermediaries' activities indicate the early years for the cooperative are likely to be characterized by low efficiency, with fixed transaction costs spread over a relatively small amount of product marketed if the cooperative is newly formed.

The working capital requirements for intermediaries are also high. There is a significant lag between when costs—capital purchases, storage, customs duties, etc.—are incurred by a buyer and payment from an importer or roaster is received. Coffee must be transported, stored, processed, samples sent to roasters, shipped, and ultimately verified for quality and consistency. Together with the startup costs, these working capital requirements represent

substantial liquidity barriers to market entrance and entry barriers are know to give rise to market power.

Asymmetric information is another factor that can give rise to market power (Stiglitz, 2002) and information asymmetries between coffee intermediaries and coffee producers are common because it is difficult for coffee producers to know the true value of their coffee. Coffee value is typically calculated as the "C" market price plus or minus differentials for country and region, organic certification and other factors. The "C" price (denominated in US dollars) is highly volatile, and dollar price volatility can be amplified by local currency exchange rate movements. Information infrastructure is often poorly developed in coffee growing regions and low-income producers rarely have the means to access the information even when it is available Intermediaries are typically better connected to urban centers and external markets and are in a much better position to know the external value of a given bag of coffee. This information asymmetry can be a source of market power for the intermediary in negotiations over price with the producer. For example, when a university in the Mexican state of Oaxaca established a network of radio broadcasts to transmit daily "C" prices and exchange rates to coffee producers, intermediaries and their employers immediately protested to the state government, saying the broadcasts were "distorting prices" and demanded that the broadcasts be terminated (Avalos-Sartorio, 2004).

In addition to the conditions above that can give rise to "natural" oligopsonies or other forms of market power, market power can also result from direct collusion among

intermediaries. Though Milford (2004, p. 50) cites producers' claims that "farmers were sure that [intermediaries] agreed on a specific price level and offered this to everybody," as possible evidence of collusion there is little empirical research on the subject.

The existence of the conditions for market power does not necessarily imply the exercise of market power. Some empirical studies of intermediaries in developing country markets in which they were believed to be exerting market power, for example, credit in Pakistan (Bottomley 1975, Aleem, 1993) potatoes in Peru (Scott 1985) have concluded that the intermediaries were not, in fact, earning above-normal returns.

Evidence of Market Power

There are many anecdotes about anti-competitive behavior and the exertion of market power by intermediaries in the coffee value chain. Milford (2004) describes an instance in Chiapas in which a transnational importer set up a processing facility directly adjacent to a cooperative facility and paid above-market—and loss-inducing—prices until the co-operative mill was put out of business. There are stories such as these in most, in not all, of the countries in which coffee is produced. Hayami (1996) cites evidence of these types of stories as stemming from differences between producers and intermediaries, such as ethnic or cultural differences.

Consistent with these anecdotes, a World Bank study found strong empirical support for the exercise of market power by coffee buyers for mills in Costa Rica (Ronchi, 2006). The

study used panel data on coffee purchases by 157 mills of four different types--domestic-owned non-cooperative mills, foreign-owned non-cooperative mills, non-Fair Trade cooperative mills and Fair Trade cooperative mills—and econometrically compared prices paid to producers in areas in which non-cooperative mills operated without competition from cooperative mills with price paid in areas in which they did face such competition. They found that the non-cooperative mills "marked down" (lowered through market power) the price paid to producers by 5 to 20 US cents/kg when they were not faced with competition from cooperative mills, supporting Fair Trade's claim that market power is, at least in part, responsible for the low prices small-scale producers receive for their coffee. Contrary to the common assumption that international market concentration is the source of market power, however, the study also found *lower* mark-down for foreign-owned non-cooperative mills than for domestic-owned non-cooperative mills. The exercise of market power is nevertheless evidenced in this case. Moreover, the author of the study asserts that these study results can likely be generalized to many coffee-producing countries, because of Costa Rica's strong social protections and well-developed regulatory environment. Costa Rica stands apart from most other coffee-producing countries for its relatively efficiency and uncorrupt civil servants and for its strict—and strictly enforced--competition policies in the coffee sector. The argument is, then, if coffee buyers are able to exert market power in the Costa Rican coffee market despite the safeguards in place, it is likely that they will also be able to do so in countries with weaker regulatory and institutional environments.

Efficiency Consequences

The World Bank study identified a pro-competitive effect from cooperatives: by reducing the exercise of market power, they raise market efficiency. There are also a number of efficiency gains that can be realized when non-organized farmers form cooperatives[19]. There are significant economies of scale in the provision of inputs and information as well in post-harvest processing, transport, and marketing (Binswanger et al., 1995). These activities involve fixed transactions costs that, in cooperatives, can be spread over spreading a large number of producers, raising efficiency and lowering costs. For example, cooperatives can take advantage of the substantial economies of scale in the acquisition and dissemination of information about coffee prices, quality standards, organic certification requirements, agricultural innovations and market opportunities. Similarly, per unit transportation costs generally fall as the quantity transported increases.

Cooperatives can also improve the efficiency of credit markets and thus improve producers' access to credit (Huppi & Feder, 1990). Banks will rarely loan to agricultural producers both because transaction costs are high and there is rarely enough information for banks to be able to assess risks. Cooperatives members can undertake these tasks – screening, monitoring, etc. at lower costs than banks: members' informational advantages over banks as well as their relative physical and social proximity to their peers make screening, monitoring and enforcement less costly, raising the efficiency of lending. Joint liability for loan repayment gives cooperative members incentives to mitigate common adverse selection and moral hazard problems in lending through careful screening loan

[19] By "cooperatives" we mean "service" cooperatives that provide inputs, credit, and information to their members, and purchase and market their members' produce. These are often contrasted agricultural production cooperatives in which production is undertaken jointly.

applicants, monitoring of loan use and enforcement of loan repayment; joint liability also provides incentives for risk pooling and mutual insurance, wherein members assist one another in repayment in the event of idiosyncratic shock, improving the efficiency of risk management and lowering the incidence of default.[20] If banks make larger loans to co-ops, and co-ops lend to individual members, transaction costs to the banks per unit of currency loaned are lower for bank, and loan agent tasks are undertaken at lower cost by co-op members. This raises the efficiency of lending and, by lowering the costs of lending, should increase access to credit for producers. Raynolds, et al. (2004) find that coops participating in the Fair Trade market have better access to credit due to increased legitimacy stemming from the stability provided by the Fair Trade price floor and long term relationships with importers and roasters.

Cooperatives may also increase the efficiency of risk management by allowing producers to take advantage of price-risk management mechanisms such as futures markets. Participating in futures markets requires large volumes of product and considerable specialized human capital (Ronchi, 2006). Though Ronchi (2006) finds that "the single most important limitation to recent commodity risk policies is the lack of organization among producers (Dehn, Gilbert, and Varangis 2003; Gilbert, 2003)" (p. 10), there is evidence that cooperatives may be able to overcome this by pooling product and hiring personnel with technical skills (Raynolds, et al., 2004). Weber (2007) also finds that cooperatives selling in the Fair Trade market have partnered with private export companies

[20] It should be noted, however, that cooperatives of producers of a single product are not ideal environments for risk pooling because of the high level of covariate risk.

to take advantage of their experience and the scale of their operations. This may give cooperatives the ability to gain not merely from the marketing and contractual experience of private export companies but also more sophisticated market participation, such as futures markets. Cooperatives therefore offer the possibility of substantial efficiency gains, as compared to non-organized producers, from spreading transactions costs over a larger number of people and a greater volume of product.

We must also consider the efficiency consequences of cooperatives taking over activities formerly undertaken by intermediaries. There are well-known incentive problems arising from cooperative ownership structure that may result in low efficiency (Binswanger et al., 1995) relative to producers dealing directly with intermediaries. Unlike with investor-owned firms (IOFs), there are no secondary markets for equity in cooperatives, that is, cooperative members cannot sell their "stock" in the cooperative if they decide to leave. The stock value of an IOF gives investors a metric against which to evaluate the performance of management. This "control" problem has long been recognized as key impediment to good cooperative management (Porter and Scully, 1987). The "horizon" problem is similarly rooted in the ownership structure of cooperatives (Binswanger et al., 1995). Because cooperative members do not have equity shares, the benefits they receive from investments made by the cooperative end when the members retire. This means that the closer a member is to retirement, the more he or she will undervalue investments. This will contribute to underinvestment in projects with long-term returns and overemphasis on the immediate distribution of any cooperative surplus.

There are also strong incentives in cooperatives to free ride (Binswanger et al., 1995). Members' benefits from cooperative services typically depend more on the volume of their production than on their contribution to the running of the cooperative. Cooperative demands can have significant costs for members. For example, in many coffee-growing regions, cooperative members are spread over large areas, and attendance at meetings can have high direct costs as well as opportunity costs.

Added to these theoretical concerns is the historical experience of government involvement in agricultural cooperatives in developing countries. Many cooperatives were created in a top-down manner by the state, rather than from bottom-up collective action by producers, and managers are often answerable to the government rather than to their members (Milford, 2004). In such situations, managers' rewards are often not closely tied to the returns they bring their members and efficient operation is not their highest objective.

Few empirical studies of the efficiency of coffee cooperatives have been undertaken, but those that exist find surprisingly high levels of efficiency of coffee cooperatives in general, and of Fair Trade cooperatives in particular. Though there may be a selection bias with Fair Trade cooperatives because they are the cooperatives with enough organizational and technical skill to obtain certification, the findings on cooperatives alone are telling. Mosheim (2002) applied a data envelopment analysis approach to data on the coffee processing sector in Costa Rica (a different data set from that used by Ronchi) and found

that cooperatives were as cost efficient and allocatively efficient as investor-owned firms (IOFs), but were not as scale efficient. Both cooperatives and IOFs were found to operate an inefficient scale (increasing returns), as a result of the difficulty of securing delivery of sufficient coffee for processing. Mosheim attributes the cooperatives' greater scale inefficiency to the control problem that results from increasing membership: the cooperatives appear to stay at an inefficient scale because the costs of managing a larger organization outweigh the scale gains from the additional members' coffee. This suggests that cooperatives would benefit from if their membership included larger-scale producers, which would make the cooperative ineligible for Fair Trade certification.

In the World Bank study, Ronchi (2006) isolated a positive "Fair Trade Effect" on price, meaning coffee producers in Fair Trade received less of a mark down for their coffee, even when Ronchi controlled for the positive effect that producing for a cooperative has on price (p.49). Furthermore, this positive effect on price attributable to participation in Fair Trade was independent of the Fair Trade price floor. She presents one interpretation of this effect as an improvement in scale efficiency resulting from FT cooperatives being able to secure delivery of more coffee because of the added liquidity coming from the FT premium. Ronchi sees these improvements in scale efficiency and added liquidity as evidence of the effectiveness of the support structure of Fair Trade certified cooperatives. Her analysis identified an equivalent positive price effect for those producers that link directly to vertically integrated transnational coffee companies. This final finding supports

Fair Trade's requirement for direct contracts with roasters, though it otherwise is contrary to the assumptions that underlie the Fair Trade market.

3. Price Floor

The certified Fair Trade coffee program uses a price floor to give producers of Fair Trade cooperatives the opportunity to receive a "living wage" for their coffee. The floor sets a minimum price based on estimates of sustainable production costs, including the cost of meeting basic needs (food, shelter, education, medical services, etc) averaged across producing countries. Unfortunately, the use of an average indicates that a number of producers in the Fair Trade system will not be able to cover all of their costs. To counter act this problem the price varies by production region and coffee type. Currently, the price floor ranges from $1.01 per pound for Robusta and $1.21 for conventional washed Arabica Fair Trade coffee[21], plus an additional $0.20 per pound for certified organic coffee[22]. If the conventional coffee market price rises above $1.21 per pound, an additional $0.10 per pound is paid to Fair Trade cooperatives as a social premium to contribute to community projects (Byers et al., 2008). This indicates, in theory, producers will receive a higher price in the Fair Trade market than the non-Fair Trade market[23].

[21] It is important to note that this is the price paid to the cooperative, not to the producer as is often assumed. A variety of costs are subtracted from the $1.21 per pound including cooperative administration costs, transportation costs and processing costs.
[22] Certified organic coffee has comprised 58 to 83-percent of the US Fair Trade market since 1999 (TransFair, 2007)
[23] There have been cases where Fair Trade producers have sold their coffee in non-Fair Trade markets when the local price was higher than the contracted Fair Trade price (Griswold, 2005).

The price floor has been a controversial element of the Fair Trade system for economists (Berndt, 2007; Economist, 2006; Sidwell, 2008; and Webber, 2006 and 2007). Economic theory and empirical evidence suggest that price floors create imbalances of supply and demand: producers respond to higher prices by producing more while consumers respond by purchasing less. In the case of coffee, a price floor could be expected to exacerbate the chronic oversupply that has characterized the coffee market for most of the last decade. In fact, it has been estimated that fifty to eighty-percent of Fair Trade certified coffee is sold in non-Fair Trade markets (Transfair[24]; Griswold[25]; Lewin et al., 2004). Consequently, critics contend the Fair Trade price floor reduces economic efficiency[26] in coffee markets while altering income distribution in favor of a small subset of small-scale producers (Lindsey, 2003).

The benefits from the Fair Trade coffee market are well documented and have made a tremendously positive impact on individual producers, their families, and the communities they live in. These benefits are not surprising when you consider the price floor sets a price that at times has been significantly higher than the composite price in the non-Fair Trade market. However, it is not just the price floor that leads to this result. The Fair Trade market establishes a niche product that consumers are willing to pay higher prices for,

[24] Representatives from Transfair USA indicated that individual cooperatives sell 10-percent to 100-percent of their fair trade produced coffee in the fair trade market, with a best guess of 50-percent overall.
[25] David Griswold (2007) from Sustainable Harvest estimated only about 30-percent of fair trade coffee production being sold in fair trade markets.
[26] Economic efficiency refers to an allocation of goods such that the maximum gains from trade are achieved. For example, if producers are being underpaid for their coffee due to buyers/exporters having market power, then less coffee is being produced than is efficient. Conversely, if the fair trade price floor is keeping producers in production that otherwise would not be, more coffee is being produced than is efficient. In a competitive market the efficient allocation is where the market price equals the economic cost of production.

which generally leads to an increase in total surplus[27]. Similar results have been witnessed in origin, organic, environmentally friendly and sustainable coffee markets (McCluskey & Loureiro, 2003). The price floor adds an additional element that removes downward price variability to the Fair Trade market niche.

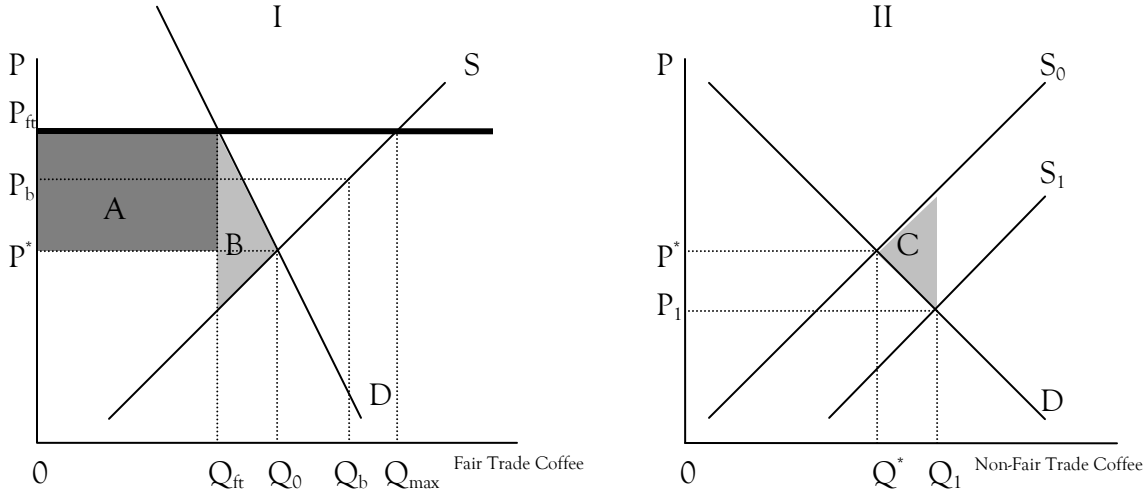
To understand the impact of the Fair Trade price floor we examine both the Fair Trade and non-Fair Trade markets, as shown in Figure 2. Note that, because the Fair Trade market is only a small fraction of the overall coffee market, we have adjusted the units for the Fair Trade market (Panel 1) and the non-Fair Trade markets (Panel II) for ease of exposition. Consequently, areas given in the Fair Trade panel represent a smaller amount of coffee than in the non-Fair Trade panel. Also, we begin by assuming the introduction of the Fair Trade market results in a one-for-one shift of supply and demand from the non-Fair Trade market to the Fair Trade market, which implies the introduction of the Fair Trade market does not increase the number of coffee consumers or producers. We will relax this assumption as we proceed. The point P^*, Q^* in panel II is the equilibrium in the non-Fair Trade market after introduction of the Fair Trade market. What occurs in the Fair Trade market, and how the non-Fair Trade market is impacted, from that point depends on how producers respond to the price floor. Panel I illustrates the Fair Trade market under a binding price floor where the Fair Trade price floor, P_{ft}, is above the non-

[27] Total surplus is the sum of producer and consumer surplus, which refers to the benefit received from producing or consuming a good. For producers this is often thought of as profit. For consumers it is considered the benefit that one receives from consuming a good above what they pay for it. Economic efficiency is often defined as maximizing total surplus (Schmitz, Just and Hueth, 1981).

Fair Trade price, P^{*}[28]. In terms of quantity: Q_{ft} represents the actual quantity of Fair Trade coffee sales in the Fair Trade market; Q_0 represents the quantity of coffee Fair Trade producers would have produced if there were not a Fair Trade market; and Q_{max} is the quantity Fair Trade producers would produce if they were guaranteed to sell all of their coffee at the Fair Trade price. The central question with respect to the price floor and economic efficiency is whether or not the Fair Trade market leads to an increase in overall production, thereby increasing quantity and lowering price in the non-Fair Trade market. Is a portion of the fifty to eighty-percent over production mentioned above due to the price floor, or is it simply the balance that Fair Trade producers were producing prior to the introduction of the Fair Trade market? That is, does the fifty to eighty-percent represent the difference between Q_{max} and Q_{ft} or Q_0 and Q_{ft}?

[28] Note that in theory P_{ft} will be above P^{*} since there is a guaranteed social premium for fair trade coffee. However, there are non-fair trade specialty coffees that receive a significant price differential that is larger than the social premium that is based on superior quality. Producers of these coffees are not likely to enter the fair trade market.

Figure 2: Fair Trade and Non-Fair Trade Markets



Fair Trade Non-Fair Trade

There are several cases to consider when addressing the question of over production that determine the range of efficiency effects that may result from the Fair Trade price floor. The first case is that Fair Trade producers continue producing the same quantity as before the Fair Trade market was established, so produce a total of Q_0. The second case is that producers assume they will be able to sell all the Fair Trade coffee they produce at the Fair Trade price, so increase production to Q_{max}. A third case is to estimate the level of production that is consistent with fifty to eighty-percent over production relative to Fair Trade coffee sales. A fourth case is to consider the level of over production that will just balance their Fair Trade gains by increasing quantity and lowering price in the non-Fair Trade market. Though none of these cases is assumed to be the correct case for all Fair Trade producers, analyzing them will help understand the production incentives faced by Fair Trade producers. Below we examine each of these cases relative to Figure 2 and

estimate the efficiency effects and changes to income distribution to producers and consumers.

Own-price elasticities[29] play a crucial role in measuring the response in quantity supplied and demanded due to a change in price. The absolute value of own-price elasticity ranges from zero to infinity, where $|e| < 1$ represents an inelastic response where a one-percent change in price will lead to a smaller percent change in quantity. Further, $|e| > 1$ represents an elastic response where a one-percent change in price will result in a larger percent change in quantity. Elasticities are also used to estimate deadweight losses[30] related to policies that cause markets to deviate from their natural equilibriums. Typically deadweight losses will be larger the more elastic the supply and/or demand curves are. In the Fair Trade market, the supply curve represents the production from the Fair Trade cooperative, which is derived from the Fair Trade producers. Fair trade supply elasticity is estimated as 1[31], which indicates a one-percent increase in price will lead to a one-percent increase in quantity supplied. The demand curve represents the demand of Fair Trade importers to purchase Fair Trade coffee, which is derived from consumer demand. Fair trade demand

[29] Own-price elasticity is defined as the ratio of the percentage change in quantity over the percentage change in price, where the change in quantity stems from the price change. Elasticity is a common economic concept used to measure changes in producer and consumer surplus that result from changes in price and quantity in the market.

[30] Deadweight loss is defined as the failure to maximize gains from trade to consumers and producers relative to an unregulated market, e.g. a market without a price floor. For example, a binding price floor will result in less of a good being traded since the price floor is above the natural market price. As such, some producers and consumers will not be able to trade in the market and will not receive gains from trade, which represents a deadweight loss.

[31] Made this number up, need an actual estimate and/or explanation why this makes sense. This should represent how producers expand acreage or move into fair trade relative to the cost of entering the FT market. Assuming FT is not prompting new coffee producers to enter the market.

elasticity is estimated as -0.8[32], which indicates a one-percent increase in price leads to an 0.8 percent decrease in the quantity of Fair Trade coffee demanded. In the non-Fair Trade market, supply represents production by all coffee producers and demand is from importers, though demand is derived from aggregate consumer demand. Non-Fair Trade supply elasticity is estimated as 3[33], which indicates a one-percent increase in price will lead to a three-percent increase in supply. Non-Fair Trade demand elasticity is estimated as -0.5[34], which indicates a one-percent increase in price leads to a 0.5 percent decrease in the quantity of coffee demanded by importers and roasters. These figures will be used below to estimate changes in surpluses and deadweight losses in each case.

Case 1: Coffee producers do not increase production with the Fair Trade price floor

In this case the impact of the Fair Trade market on the non-Fair Trade market is a reduction in both supply and demand. Assuming there is a one-for-one correspondence of supply and demand shifting to the Fair Trade market, the price in the non-Fair Trade market remains unchanged; however, the quantity traded is lower. How likely is this assumption to hold true? We have not found any compelling arguments to indicate that introduction of the Fair Trade market would cause coffee consumption to change significantly; however, there is reason to believe the Fair Trade price floor could increase production (Berndt, 2007; The Economist, 2006; Sidwell, 2008; and Webber, 2006 and 2007). Fair Trade organizations have responded by indicating that the Fair Trade premium is used for social and economic development of producers, such as improving their homes,

[32] Made this number up, need an actual estimate and/or explanation why this makes sense.
[33] Made this number up, need an actual estimate and/or explanation why this makes sense.
[34] Made this number up, need an actual estimate and/or explanation why this makes sense.

education, health care, and crop quality and diversification (FLO, 2007; TransFair, 2007). This reasoning may be justified by noting that unlike many governmental agricultural subsidies, most Fair Trade producers are unable to sell all of their coffee at the Fair Trade price floor. As such, any increases in production would simply be sold at the non-Fair Trade market price. That is, the marginal production is *not* sold at the Fair Trade price so there is no incentive to increase production. Unfortunately, we do not have the data to test this hypothesis, but this difference between the Fair Trade price floor and traditional agricultural subsidies is significant in how it impacts production incentives, and hence is a reasonable case to consider.

In this case Fair Trade producers continue to produce the same quantity of coffee as they did prior to the introduction of the Fair Trade market. The result is Fair Trade producers producing a total of Q_0, so there is no excess production relative to before the introduction of the Fair Trade market. Here, $Q_0 - Q_{ft}$ represents the fifty to eighty-percent sold in the non-Fair Trade market that would have been produced even if there were not a Fair Trade market. The equilibrium in the Fair Trade market is P_{ft}, Q_{ft} and that in the non-Fair Trade market is P^*, Q^*. In this case the gains to Fair Trade cooperatives and their producers is given by Area A in Figure 2, which is approximately $9 to $31 million. Gains to Fair Trade cooperatives grow as sales increase and as the price in the non-Fair Trade market decreases. Area A denotes a transfer of surplus (i.e. wealth) from consumers to Fair Trade producers and summarizes the change in income distribution for Case 1. That is, Case 1 indicates an increase in income to Fair Trade producers without loss of income to non-Fair Trade

producers since consumers are willingly paying more for Fair Trade coffee. Table 2 gives annual coffee quantities, prices, and estimates of the gains to Fair Trade cooperatives from selling in the Fair Trade market rather than the non-Fair Trade market.

The estimates in Table 2 do not include the change in consumer surplus from consuming Fair Trade coffee that more closely matches Fair Trade consumer preferences as compared to coffee from the non-Fair Trade market; it only includes the transfer of wealth from consumers to Fair Trade producers. Though the change in consumer surplus can be estimated by first estimating the demand curve for Fair Trade and non-Fair Trade coffee, then estimating the area between them for Fair Trade consumers, we leave that for a more detailed study of consumer behavior. Note that it is not apparent whether net consumer surplus increases or decreases from consuming Fair Trade coffee. For example, an individual's willingness to pay[35] for Fair Trade coffee could increase by more than the Fair Trade price increase. However, it is just as likely that willingness to pay could increase by less than the price increase[36]; hence their net consumer surplus from consuming coffee could decrease when they switch to Fair Trade.

Under a price floor the gains to Fair Trade producers are offset to some degree by deadweight losses to some producers and consumers, which are given by area B in Figure 2.

[35] Willingness to pay refers to the maximum amount an individual is willing to pay for a specific good. In this case it is likely that a fair trade consumer is willing to pay more for a fair trade good than a non-fair trade good (De Pelsmacker, Driesen and Rayp, 2005).

[36] This could be the case where the consumer's fair trade demand curve is more elastic than their non-fair trade demand curve, which is likely the case since the demand for specific goods is generally more elastic than for the demand for the general category of the specific good. As such, the specific demand curve will shift out and flatten.

The area B (and in other cases area C) can be estimated using market prices, quantities and own-price elasticities. Area B corresponds to unrealized gains from trade associated with the quantity of Fair Trade coffee producers and consumers would trade if there were not a price floor, albeit at a lower price. That is, though $Q_0 - Q_{ft}$ is produced under Fair Trade conditions and there are Fair Trade consumers that are willing to pay more than P^* (but less than P_{ft}) for it, it is sold in the non-Fair Trade market at P^*. The loss of B is a direct result of the price floor. These producers and consumers are still active in the non-Fair Trade market so they are in the same situation as they were prior to the introduction of the Fair Trade market. However, the loss occurs because the existence of the Fair Trade market has impacted their preferences, yet they are unable to participate in the market due to the level of the price floor. This is a standard outcome of using price controls. Table 2 shows the losses in the Fair Trade market given by area B as ranging from approximately $2 to $22 million, which increases with the quantity of Fair Trade coffee that is *not* sold in the Fair Trade market and decreases as the price in the non-Fair Trade market approaches the Fair Trade price.

In Case 1 there is a net increase in producer and consumer surplus in the Fair Trade market ranging from $2 to $24 million. The increase stems from the establishment of a niche market that better matches the preferences of consumers that value Fair Trade. Further, there are no ill effects to the non-Fair Trade market from establishment of the Fair Trade market since we assume a one-to-one switching of producers and consumers from the non-Fair Trade market to the Fair Trade market. Consequently, if the Fair Trade

market does not cause an increase in coffee production there will be net gains to Fair Trade producers.

Case 2: Fair trade producers produce the maximum quantity according to the floor price

The second case represents the extreme where Fair Trade producers anticipate being able to sell *all* of their coffee at the Fair Trade floor price so increase production to Q_{max}. As such, $Q_{max} - Q_{ft}$ represents the Fair Trade coffee that is sold in the non-Fair Trade markets. Note that Q_0 is the quantity that would have been produced prior to introduction of the Fair Trade market, so the actual increase is $Q_{max} - Q_0$, which would increase supply in the non-Fair Trade market to S_1. Based on the own-price elasticity of supply in the Fair Trade market we estimate production to be 401 to 1,728 thousand kilogram bags, compared to 259 to 1,046 estimated for Case 1. The reality is that producers would not be able to sell all their coffee in the Fair Trade market. There would be an increase in production costs that would be subsidized by the coffee sold in the Fair Trade market. The increase in quantity reduces price in the non-Fair Trade market to all producers to P_1, which in this case is an average decrease of $0.0013 per pound. The impact of this is a decrease in producer surplus by $6 to $27 million and an increase in consumer surplus of $$6 to $27 million. The difference in magnitude of the producer and consumer surpluses stems from: the different elasticities of supply and demand in the non-Fair Trade market, the increase of non-Fair Trade coffee being consumed due to the lower price, and the decrease in non-Fair Trade coffee being produced. This latter point is subtle in that the decrease in price drives

some non-Fair Trade coffee producers from the market; their production is replaced by Fair Trade coffee.

In addition to the changes in producer and consumer surplus, there is also a deadweight loss in the non-Fair Trade market given by Area C. Loss C occurs because the cost of producing the coffee is higher than consumers' willingness to pay. That is, over the range Q^* to Q_1 the supply curve S_0 is higher than the demand curve shown in Figure 2, Panel II. This is made possible by the increased income in the Fair Trade market given by Area A. The losses associate with Area C range from $1 to $30 thousand over time. This gives a net impact for producers and consumers in the non-Fair Trade market of an increase by $4.5 to a decrease of $126 thousand, giving an average net decrease of $37 thousand in total surplus. Case 2 has the same result of gains A and losses B as those in Case 1. The net impact for both coffee markets in Case 2 is $2 to $24 million, which indicates a larger benefit to consumers, but reduced benefit to producers when compared to Case 1. As a result, if the price floor is encouraging Fair Trade producers to increase their production, there is a negative impact on other producers and a benefit to all coffee consumers.

Case 3: Fifty to eighty-percent of Fair Trade production is sold in the non-Fair Trade market

The third case represents Fair Trade cooperatives selling some of their coffee at the Fair Trade floor price and some in the non-Fair Trade coffee market. As mentioned above, Fair Trade producers may also sell to buyers outside the cooperative to help cash flow as producers can often get payment quicker by selling to local intermediaries (Bacon, 2005).

Bacon (2005) notes that even though selling to the Fair Trade cooperative can bring a price that on average is more than twice as high as the conventional market, the time till payment averages more than four times as long. Case 3 differs from Cases 1 and 2 since producers receive a blended, or averaged, price from their Fair Trade cooperative and a separate price from outside buyers so the marginal price signal is lower than the price floor but higher than the non-Fair Trade market price, as indicated by P_b in Panel I of Figure 2. However, the producer is not likely to know in advance how much they will be able to sell in which market at what price so they may anticipate a blended price at the margin. Determining the blended price producers anticipate is difficult to quantify because prices, weather and agronomic conditions vary so dramatically. As such, we consider the previously mentioned range of production that results in fifty to eighty-percent excess production and estimate the impact on the non-Fair Trade market. Consequently, $Q_b - Q_{ft}$ represents the fifty to eighty-percent of Fair Trade coffee that is sold in the non-Fair Trade market. Note that Q_0 is the quantity that would have been produced prior to introduction of the Fair Trade market, so the actual increase is $Q_b - Q_0$, which would increase supply in the non-Fair Trade market to S_1. Based on the own-price elasticity of demand we estimate the increase in quantity to range from 394 to 4,340 thousand 60 kilogram bags, corresponding to the fifty to eighty-percent levels of over production. The increase in production is indirectly subsidized by the price floor in the Fair Trade market. The increase in quantity reduces price in the non-Fair Trade market to all producers to P_1, which ranges from a \$0.0007 to \$0.0027 decrease in price per pound. The impact of this is a decrease in producer surplus by \$4 to \$126 million and an increase in consumer surplus ranging from

$4 to $125. As mentioned above, the decrease in price drives some non-Fair Trade coffee producers from the market; their production is replaced by Fair Trade coffee.

In addition to the changes in producer and consumer surplus, there is also a deadweight loss in the non-Fair Trade market given by Area C similar to that discussed in Case 2. Again, this is made possible by the increased producer income in the Fair Trade market given by Area A. The losses associate with Area C range from $924 to $270,861 over time depending on whether the excess production is fifty or eighty-percent of Fair Trade coffee produced. The net impact for producers and consumers is a $20 thousand increase to $259 thousand decrease in the non-Fair Trade market. Case 3 has the same result of gains A and losses B as those in Case 1. The net impact for both coffee markets in Case 3 is $10 million which indicates a larger benefit to Fair Trade producers. As a result, if the blended price encourages coffee production to increase, there will be a negative impact on non-Fair Trade producers. This is best seen by comparing the gains given by Area A, $9 to $31 million, to the lost producer surplus in the non-Fair Trade market.

Summary

Fair Trade price floor redistributes income and creates market inefficiencies, as are represented by Areas A, B, and C and the changes in producer and consumer surplus. Though these values pale in comparison to the value of the non-Fair Trade market, it is important to consider the impact of the price floor. The benefits to small Fair Trade coffee producers from income redistributions such as Area A have been well documented.

4. Externalities

Environmental Externalities

In addition to the direct effects of fair trade policies, a variety of indirect effects have been suggested. These mainly take the form of externalities generated through the retention or exit of small-scale farmers from coffee production. While there are more than twenty species the coffee plants, the global coffee market is dominated by just two species: *Coffea arabica*, commonly referred to as arabica and *Coffea canephora* var. robusta, commonly referred to as robusta. The specialty market uses almost exclusively high-quality arabicas. The commodity-grade coffee market uses robusta and lower-quality arabicas. While robusta and low-quality arabica coffee can be produced in full-sun plantations, the production of high-quality arabica requires semi-shaded conditions. Particularly with small-scale farmers, much of the high-quality arabica production is undertaken on "rustic" or "commercial polyculture" farms that partially reflect the natural forest (Mas & Dietsch 2004). In studies undertaken in Chiapas, Mexico, the Smithsonian Migratory Bird Center found that traditional shade coffee farms contain 60 to 70 percent of the species in the surrounding natural forest (Rice, 1999) with greater diversity evident on small farms than on plantations. Thus, the production of high-quality Arabica coffee for the specialty market has been associated with significant positive environmental externalities. Coffee farmers provide a wide variety of unremunerated environmental services including CO_2 sequestration, watershed management, erosion control and biodiversity maintenance

(Philpott & Dietsch, 2005), and coffee production areas overlap almost entirely with global biodiversity "hotspots." (Myers et al., 2000; Hardner & Rice, 2003)

When coffee production becomes economically unsustainable, small-scale farmers often exercise their "exit option" by deforesting their coffee parcels and planting food crops, typically maize and beans in Central America, with substantial negative environmental consequences (Lewis & Runsten, 2008). The same tendency does not appear to be as strong on coffee plantations where neglect or abandonment is more common than deforestation. Conversely, Lewis and Ruston (2008) maintain that it is not uncommon for small coffee farmers to abandon their land and migrate, which would likely result in a Coffee plantations are commercial operations established in ideal coffee-growing environments. These environments, typically high-altitude and often in isolated mountainous regions, generally have unsuitable climates for commercial production of other crops and high transactions costs for getting products to market. Small-scale farmers, faced with limited alternative uses of their labor and land assets (IADB, et. al, 2002) redirect their efforts to crops that bring higher returns, in the short run at least, to their assets.

With these factors in mind, it is likely that substantial environmental benefits result from keeping small-scale farmers in coffee production. If fair trade channels achieve the goal of making small holder production economically viable where it would not otherwise be, then its positive environmental impact could be significant. This also brings up the specter of a

negative environmental externality. Rappole, King and Rivera (2003) voice the concern that by encouraging production in near-natural environments, certification schemes might actually be encouraging farmers to colonize natural areas.

Social/Economic Externalities

Keeping small-scale producers in coffee farming may produce other externalities. In Colombia there is evidence that some farmers exit coffee to produce other high-value crops suited to the altitude and climate in which coffee grows: coca and opium (Wilson, 2001). Additionally, advocates assert through a number of individual case studies that fair trade may be able to stem the tide of out-migration (Taylor, 2002; Martinez, 2002), but a study undertaken in a high migration capital community suggests that fair trade alone is not sufficient (Lewis and Runsten, 2005). An unexplored possibility is also that increased income from participation in Fair Trade markets might allow a family to afford to fund to migration of one of their members.

Conclusions

[PLACEHOLDER] The fair trade certified system generates a great many microeconomic questions. This simple analysis suggests that neither all of the claims of fair trade's advocates nor the fears of its detractors are likely to be borne out in practice, but very few of these claims and concerns have been examined in rigorous empirical economic studies. The transaction costs of the fair trade versus conventional supply chains seem especially deserving of research attention as do the employment and welfare consequences of shifting

market share from large to small-scale farmers. Up until now, academic consideration of fair trade has largely been confined to the non-economic social sciences. It appears that economists have an important role to play in enriching this discussion.

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