

# The Impacts of Fair Trade Certification: Evidence From Coffee Producers in Costa Rica (Preliminary and Incomplete)\*

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**ABSTRACT:** We estimate the effects of Fair Trade (FT) certification on coffee producers in Costa Rica. We begin by examining a panel of all coffee producers between 1999 and 2010. We find that FT certification is associated with higher export prices equal to approximately 5 cents per pound. We find no evidence that certification is associated with more sales (either domestic or for export) or with higher domestic prices. Linking the mill-level information on FT certification to individual-level survey data, we find that FT certification does increase incomes, but only for skilled coffee growers and farm owners. There is no evidence that many workers, including unskilled seasonal coffee pickers, benefit from certification.

**Keywords:** Fair Trade, poverty, education.

**JEL Classification:** F14, F63, O13, O54.

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## 1. Introduction

Fair Trade (FT) certification offers consumers the opportunity to help lift farmers in developing countries out of poverty. The appeal of Fair Trade to ethically-minded consumers is illustrated by the impressive growth of Fair Trade certified imports over the past decade. Since its inception in 1997, sales of Fair Trade certified products (under FLO International / Fairtrade International) have grown exponentially. Today, there are over 1.2 million FT-certified farmers located in 66 different countries. Fair Trade products are now sold in over 120 countries (Fairtrade International, 2012).

The aim of this study is to provide an examination of the impacts of FT certification on producers. We begin by examining the universe of coffee mills in Costa Rica from 1999 to 2010. We find that FT certification is associated with higher export prices (approx. 5 cents per pound), but that there is no evidence that certification is associated with more sales (either domestic or for export) or with higher domestic prices. This is not surprising since FT certification increases the price of coffee sold as Fair Trade – primarily exports – but does not itself guarantee increased sales. In addition, the fact that we do not see large increases in sales associated with FT certification provides some confidence that selection of ‘better’ coffee producers is not playing a large role. We also undertake a number of more formal tests of selection into certification. We do not find evidence of certification being spurred by increased sales, exports, or prices.

Having examined the effects of FT certifications at the producer level, we then turn to an examination of broader impacts of Fair Trade certification by linking our information on the locations of FT-certified mills to individual-level survey data. We construct a canton (i.e., district) level measure of FT intensity (i.e., share of production that is from FT certified producers) and examine the relationships between FT certification and individual incomes. Our analysis directly tests for differential benefits of FT certification for individuals employed in different parts of coffee production and those living in the area but not employed in coffee. We find that Fair Trade certification leads to an increase in average income for all households residing in the canton, but that the increase is concentrated only among the skilled coffee growers and farm owners. The majority of the workers in the coffee industry – who are those classified as unskilled or ‘other’ – do not see any benefits from Fair Trade. We also find some evidence of small positive spill-over effects for individuals not working in the coffee industry but living in cantons with Fair Trade

certified coffee mills.

We also examine the impact of FT certification on the school attendance of children. Our estimates show that FT certification has no impact on elementary school attendance. We also find that FT certification is associated with lower school attendance among children of coffee unskilled coffee workers. This could be due to increased economic opportunities that arise due to FT certification, drawing children out of school and into the workforce. Although, we do not find evidence of increased wages from FT certifications for the vast majority of the workers, the increased wages to skilled coffee growers may be enough to induce children and young adult out of high school and university and into the coffee industry.

These findings provide valuable evidence of the impacts of FT certification for developing countries. To date, estimates of the impacts of Fair Trade remain limited. Existing studies primarily rely on cross-sectional analyses based on surveys of producers in a few developing countries. For example, Bacon (2005) presents the results of a survey of 228 coffee farmers in Nicaragua, and shows that the farmers who participated in FT and organic networks received higher average prices and reported feeling less concerned about losing their farm in the following year. A similar approach is employed by Becchetti and Constantino (2008) who base their analysis on a survey of 120 farmers in Kenya. Their results show that FT certification is associated with higher self-reported household consumption, more diversified production, and lower infant mortality. They find no relationship with child labor or investments in education. Ruben and Fort (2012) look at the impact of FT certification on coffee producers in Peru using data from a survey administered to six cooperatives, three of which were Fair Trade certified. They find no relationship between FT certification and household income or prices received. However, they do find that FT certification is associated with higher household expenditures, greater investments in land-attached infrastructure, better access to credit, and greater investments in organic and similar forms of specialized farming. In a second paper, Ruben, Fort and Zuniga-Arias (2009) employ similar data-collection and empirical techniques to investigate the impact of FT on coffee and banana farmers in Costa Rica and Peru. They find that FT certification is associated with slightly higher income but insignificant difference in expenditures, access to credit, or investment. Arnould, Plastina and Ball (2009) examine a cross-section of 1,269 coffee farmers from Nicaragua, Peru, and Guatemala. They find that in all three countries, Fairtrade certification is associated with greater sales, higher prices, and higher incomes.

One shortcoming of the existing evidence is that it relies on cross-sectional correlations. In addition, spill-overs and the distributional impacts of FT certification are not examined. Our study aims to improve upon the existing evidence by examining a panel of individuals and coffee producers, by estimating differential impacts for coffee workers involved in different parts of the production process, and by allowing for the existence of spill-over benefits to those not working in the coffee industry.

The paper is organized as follows. In the following section, we provide background information about Fair Trade certification and coffee production in Costa Rica. In section 3, we examine effects at the mill-level and test for selection into certification. In section 4, we then examine the impacts of FT certification at the household level, examining effect on adult incomes and school attendance of children. Section 5 concludes.

## 2. Background

### A. *Fair Trade Certification Generally*

Fair Trade has its origins in an initiative started in Netherlands by a church-based NGO in 1988 in response to low coffee prices. The stated aim of the initiative was to ensure growers were provided “sufficient wages”. The NGO created a fair trade label for their products, Max Havelaar, after a fictional Dutch character who opposed the exploitation of coffee pickers in Dutch colonies. Over the next half decade, Max Havelaar was replicated in other European countries and North America, and similar organizations, such as TransFair, emerged. In 1997, the various labeling initiatives formed an umbrella association Fair Trade Labelling Organization International (FLO) along with three other organizations (including TransFair). The FT Certification mark was launched in 2002.

The stated goal of Fair Trade is to improve the living conditions of farmers in developing countries. In practice, this is accomplished through two primary mechanisms: a guaranteed *minimum price* for coffee sold and a *price premium* that is paid. Both are set by Fair Trade Labelling Organization (FLO). For coffee producers, the minimum guaranteed price (for conventional Arabica washed coffee) is \$1.40 per pound and the premium is \$0.20 per pound.<sup>1</sup>

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<sup>1</sup>The minimum price for organic coffee is \$0.30 more and for unwashed coffee is \$0.05 less.



# The Arabica Coffee Market 1989-2010: Comparison of Fairtrade and New York Prices

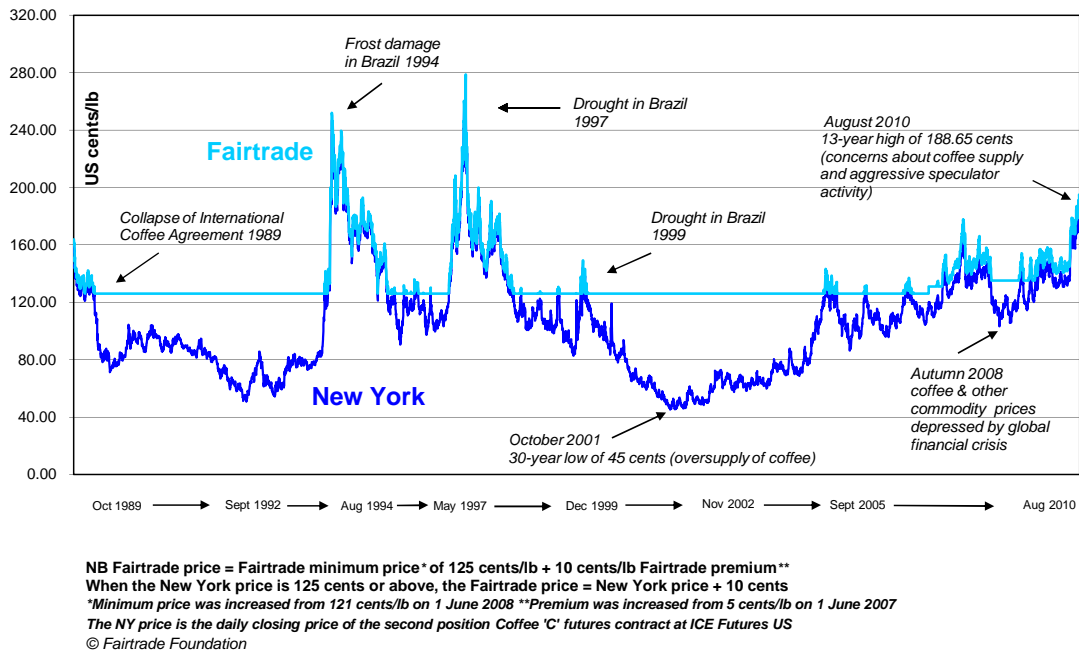


Figure 1: The Fair Trade minimum coffee price, 1989–2010

The minimum price is meant to cover the average costs of sustainable production, and acts as a price floor that reduces the risk faced by coffee growers. FT buyers must pay producers at least the minimum price when the world price is lower, and must pay the higher price when world price is above the FT minimum price. The relationship between the FT price floor and market prices between 1989 and 2010 is shown in Figure 1. As shown, for the much of the past two decades the price floor has been binding, although not since about 2006.

The guaranteed premium for coffee sold as FT must be set aside and invested in projects that improve the quality of life for producers and their communities. The specifics of how the premium is used must be decided upon in a democratic manner by the producers themselves. Potential projects that could be funded with the FT premium include the building of schools and health clinics, offering instruction courses for members of the community, provision of educational scholarships, investments in community infrastructure, improvements in water treatment systems, conversion to organic production techniques, etc. Since 2011, five cents of the premium must be invested towards improving the quality and productivity of coffee.

For coffee to be sold under the FT mark, all actors in the supply chain, including importers

and exporters, must obtain FT certification. On the production side, the certification is open to small farmer organizations and cooperatives that have a democratic structure, as well as commercial farms and other companies that employ hired labor (Fair Trade Foundation, 2012). The certification entails meeting specific standards that are set and maintained by FLO. An independent certification company FLO-CERT (which split from FLO International in 2004) is in charge of inspecting and certifying producers (Fair Trade Foundation, 2012).

For coffee, the FT compliance criteria focus on the social, economic and environmental development of the community. In terms of social development, the producer organization must have a democratic structure and transparent administration in place, and must not discriminate against its members. To satisfy the economic development criteria, organizations need to be able to effectively export their product and administer the premium in a transparent and democratic manner. The environmental development criteria are meant to ensure that the members work towards including environmental practices as an integral part of farm management, by minimizing or eliminating the use of certain fertilizer and pesticides and replacing them with natural, biological methods, as well as adopting practices that ensure the health and safety of the cooperative members and the entire community (Fair Trade Foundation, 2012). In the case of commercial plantations that employ a large number workers, the FT standards entail that hired workers are not children or forced workers, and are free to bargain collectively. Hired workers must be paid at least minimum wage in the respective region, and must be given a safe, healthy, and equitable environment (Fair Trade Foundation, 2012).

To obtain FT certification, producer organizations need to submit an application with FLO-CERT. If the application is accepted, the organization goes through an initial inspection process carried out by one of the FLO-CERT representatives in the region. If the minimum requirements are met, the organization is issued a certificate that is usually valid for a year. The certificate can be renewed following re-inspection. During the first few years inspection and certification were free of charge. However, since 2004 producer organizations must pay application, initial certification, and renewal certification fees.

## ***B. Coffee Production in Costa Rica***

Coffee-cultivation in Costa Rica began to flourish following independence from Spain in 1821. The first coffee plantation were situated in San Jose, the capital of Costa Rica today. The region

surrounding the capital, the Central Valley region, continues to play an important role in coffee production. The agro-climatic conditions in the area, and to a large extent in the country generally, are favorable for coffee cultivation: volcanic soils, high elevation, and a climate characterized by a wet/dry season, and warm temperatures that stay relatively constant throughout the year (del Café de Costa Rica, 2012).

Historically, the government encouraged the cultivation of coffee through various policies such as the delivery of free coffee-plants to growers, land concession to whomever was interested in cultivating coffee, exemption from paying taxes for coffee, and land titling for anyone who cultivated coffee for 5 years on wasteland (del Café de Costa Rica, 2012).

Today, with 1.575 million bags of coffee (weighing 60kg per bag) exported in 2010-2011, Costa Rica is the 10th largest exporter of Arabica coffee in the world, with Europe being its primary export market. Approximately, 4% of Costa Rica's rural workers are in the coffee industry.

Coffee tends to be cultivated on small plots in family farms. The Costa Rica Coffee Institute (*Instituto de Café*) estimates that there are approximately 50,631 coffee-producing families in Costa Rica, of which 92.3% produce less than 75 bags (of 60kg each) per year.

When the ripe coffee cherries are harvested (generally from September until January), coffee farmers deliver the cherries to a local mill (called *beneficio*) for further processing. The *beneficio* measures the volume of the cherries received and issues a receipt. Here the pulp of the cherries is removed and the beans are washed through wet-milling and the cherries are transformed into green coffee.

The mills then sell the coffee received from producers to either roasters or exporters. Exporting is done through specialized firms, and in many cases through the mill's own export arm. Wet-mills usually belong to farmer cooperatives.<sup>2</sup> In addition to coffee processing services, cooperatives also provide a range of services to their members such as the provision of agricultural supplies, technical assistance, marketing assistance, and credit.

Coffee processing and sales in Costa Rica are heavily regulated by the Instituto del Café de Costa Rica (ICAFFE), a government agency created in 1933 to oversee the coffee-growing industry and to provide a market that is equitable and fair for all parties involved. Each transaction between the mill and the exporter or roaster must be registered and approved by ICAFFE (even

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<sup>2</sup>Cooperative members generally take the cherries to be processed at their cooperative mill, although in principle they are free to sell their cherries to other mills.

if the transaction is intra-firm). ICAFE checks all transaction prices to ensure that each is in line with international coffee prices based on coffee type, denomination and quality.

Prior to the sale of the coffee by the mill, the farmer receives an advance payment for the cherries based on the international coffee prices prevailing at the time. The final price for the cherries sold is not determined until later in the year when the mill has sold all its coffee. Historically, the advance payment represents approximately two thirds of the total payment to the producer received for the harvest.<sup>3</sup> Every 15 days, the mill must report to ICAFE the coffee received from each producer.

Mills must make payment adjustments every 3 months, according to the sales advancements made to the farmer and the new sales made. In November, after all the green coffee has been sold and the average price for the harvest is determined, mills must make final payments to the coffee growers, also known as liquidation payments. The final payment to the producer is the residual payment after approved expenses by the law to the other actors in the coffee production chain.

The amount of the final sales/export price received by the mill must be distributed as follows: 3.3% is allocated to the exporter, 14.9% is allocated to the mill (this includes 9% mill profit and 5.9% for mill expenses), 1.2% is allocated to ICAFE, and 0.5% is allocated to Foncafe, which is an insurance fund established to protect farmers in the event of a coffee crisis. Therefore, the producer receives 80% of the total price.<sup>4</sup>

### *C. Anecdotal Evidence on Selection into Fair Trade Certification*

An important question, particularly for our subsequent empirical analysis, is what affects the decisions of mills to become FT certified. If FT has benefits, why aren't all mills FT certified? To better understand the source of variation underlying FT certification, we undertook interviews with FT-certified cooperatives in August of 2012. The interviews revealed a number of factors that underlie variation in certification status.

First, mills vary in the effective costs that FT requirements impose on the mill. For examples, several cooperatives mentioned the potential loss that they may suffer from being prevented from selling certain substances (mostly pesticides) in their stores. (Mills generally also operate a store

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<sup>3</sup>The mill obtains the funds for the producer advance payments from loans made by state banks, at a fixed exchange rate. In this way, the mill is exposed only to the fluctuation in the international price of coffee, while the bank has the exchange rate risk.

<sup>4</sup>The final liquidation prices for each mill must be published in Costa Rica's main newspapers in November, and the mill is obliged to pay the producer the balance of the payment within 8 days.



where they sell various agricultural supplies to the community.) The extent to which a mill earns revenue from the sale of agricultural chemicals banned by FT affects its costs of certification. If this characteristics of mills is historically determined and varies little over time, it will be captured by mill fixed effects in our empirical analysis.

Second, the perceived benefits of FT certification also vary by mill. One of the primary benefits of FT sales is the existence of a guaranteed minimum price. The expected future benefit of this depends on the farmer's belief about future prices. Those farmers that expect the future world price for coffee to be above the minimum price perceive lower benefits to FT certification than farmers that believe future coffee prices may drop below the minimum. This variation is likely idiosyncratic or correlated with time-invariant characteristics that are captured by mill fixed effects.

Third, the farmer's beliefs also play an important role. Farmer's who a priori believe in the importance of environmentally sustainable or socially responsible farming practices will be more willing to undertake the changes in production dictated by FT certification. These beliefs, although they affect the timing of certification, are likely time-invariant and captured by mill fixed effects.

The fourth factor mentioned includes access to information regarding the logistics of becoming certified, and the costs and benefits of certification. Another factor along similar lines is the managerial ability needed to obtain and maintain certification. These last two factors potentially vary over time and may be correlated with other factors that also affect our outcomes of interest. For example, improvements in management or in international sales connections, may affect FT certification, but may also be associated with increased exports and prices.

### **3. Evidence from Mill-Level Data**

We begin our analysis by examining the relationship between FT certification and outcomes measured at the mill/cooperative level. By examining what factors are changing for coffee producers that become FT certified, we are able to garner some evidence about the nature of selection into FT certification. If, for example, we find a surge in sales at the time when the producer becomes FT certified, then this provides evidence that economic conditions may be driving certification and potentially other outcomes of interest. Similarly, if we see a surge in exports, then this is evidence of foreign buyers (and access to a large foreign market) inducing

selection into certification. Again, this potentially omitted factor could have an independent effect on our outcomes of interest.

The analysis combines two types of data. The first is information on coffee prices and quantities sold by mills and cooperatives. These data are obtained from ICAFE. For each mill, the ICAFE data contain total production (total coffee received for wet-milling from coffee growers in that year's harvest), broken down into the quantity exported and sold on the domestic market (measured in kilograms), and average prices obtained for the harvest in export and domestic markets for different types of coffee (conventional, differentiated, organic etc.).<sup>5</sup>

The second source of information we use is the FLO certification rosters, which contain the name and date of certification for all producer-organizations that have been certified since 2003. From these we extract the names of the coffee producer-organizations located in Costa Rica, and create an indicator variable for FT certification that equals one in the years in which the cooperative has the certification and zero otherwise. Since official certification rosters from FLO are not available to us before 2003, we have supplemented this with historical and archival research to identify mills that were FT certified between 1999 (the first year of our sample) and 2003. We match the certification indicator variable available from FLO with the ICAFE data, using the name of the producer organization as a common identifier. The matched data produces an unbalanced panel from 1999 until 2010, containing data for 262 coffee mills.

We begin by estimating the following equation:

$$y_{i,t} = \alpha_i + \alpha_t + \beta_1 \cdot I_{i,t}^{FT} + \varepsilon_{i,t} \quad (1)$$

where  $i$  indexes a coffee mill and  $t$  years (1999–2010).  $y_{i,t}$  denotes one of our outcomes of interest which we describe in more detail below.  $I_{i,t}^{FT}$  is an indicator variable that equals one if mill  $i$  is FT certified in year  $t$ .  $\alpha_i$  and  $\alpha_t$  denote mill fixed effects and year fixed effects, respectively. As discussed, mill fixed effects control for time-invariant characteristics which may be correlated with the timing of FT certification.

We first estimate the relationship between FT certification and coffee sales, both domestic and foreign. The estimates are informative about the selection of firms into FT certification. For example, if firms that are prospering choose to become certified, then we expect to observe a re-

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<sup>5</sup>The ICAFE data are recorded by harvest years (rather than calendar years), which range from October to October. In our data, an observation in year  $t$  corresponds to the harvest which is from October in year  $t - 1$  to October in year  $t$ .

Table 1: The Effect of FT Certification on Producer Organizations

	Dependent variable:							
	In domestic sales	In domestic sales	In exports	In exports	In total sales	In total sales	Exports as a share of total sales	Exports as a share of total sales
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Fair Trade Certified, FTC	0.0441 (0.206)	0.0832 (0.212)	0.146 (0.143)	0.169 (0.109)	0.0489 (0.109)	0.0991 (0.0985)	0.0404 (0.0364)	0.0465 (0.0321)
Year FE	Y	Y	Y	Y	Y	Y	Y	Y
Mill FE	Y	Y	Y	Y	Y	Y	Y	Y
Lagged dependent variable	N	Y	N	Y	N	Y	N	Y
Observations	1,182	909	1,187	921	1,220	950	1,220	950
Number of clusters/mills	194	235	194	235	194	235	194	235
R-squared	0.832	0.849	0.923	0.939	0.933	0.951	0.626	0.622

Notes: Coefficients are reported with standard errors clustered at the mill level in parentheses. All regressions include year fixed effects and mill fixed effects. \*\*\*, \*\*, and \* indicate significance at the 1, 5, and 10 percent levels.

relationship between FT certification and domestic (or total) sales. Similarly, if firms with increased export opportunities choose to become certified, then we expect to observe a relationship between FT certification and exports.

Estimates of equation (1) are reported in table 1. Columns 1, 3, and 5 report estimates with the natural log of domestic sales, exports and total sales as the dependent variable, respectively. The even numbered columns report analogous estimates, but controlling for a lagged dependent variable (LDV). The benefit of the inclusion of a LDV is that it accounts for the persistence of sales over time, possibly arising due to fixed costs. It is important to account for dynamics since past production may be associated with current certification status. A shortcoming of the estimates with a LDV is that because our regressions also includes mill fixed effects, they suffer from the Nickell bias. We, therefore, report estimates of equation (1) with and without a LDV.

We do not find evidence of statistically significant relationships between FT certification and increased sales, either domestically or internationally. Columns 7 and 8 examine exports as a share of total sales. We find no evidence that producers that are FT certified tend to export more.

Overall, there does not appear to be significant relationships between FT certification and the quantity of coffee sold. This is perhaps not surprising since FT certification does not directly provide a larger market for coffee producers. It only provides a guaranteed minimum price and a premium for coffee sold as Fair Trade.

The lack of a relationship between FT certification and quantities provides valuable evidence

Table 2: The Effect of FT Certification on Producer Organizations

	Dependent variable:							
	Domestic price (colon/lb)	Domestic price (colon/lb)	ln domestic price	ln domestic price	Export price (USD/lb)	Export price (USD/lb)	ln export price	ln export price
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Fair Trade Certified, FTC	18.81 (12.66)	9.737 (14.42)	0.0458 (0.0473)	-0.00663 (0.0633)	0.0386** (0.0195)	0.0399** (0.0158)	0.0508* (0.0296)	0.0497* (0.0267)
Year FE	Y	Y	Y	Y	Y	Y	Y	Y
Mill FE	Y	Y	Y	Y	Y	Y	Y	Y
Lagged dependent variable	N	Y	N	Y	N	Y	N	Y
Observations	1,182	909	1,182	909	1,186	919	1,186	919
Number of clusters/mills	194	235	194	235	194	235	194	235
R-squared	0.946	0.949	0.933	0.935	0.935	0.939	0.922	0.929

Notes: Coefficients are reported with standard errors clustered at the mill level in parentheses. All regressions include year fixed effects and mill fixed effects. \*\*\*, \*\*, and \* indicate significance at the 1, 5, and 10 percent levels.

for the importance of selection into FT certification. If it was the most successful producers that selected into certification, then we would expect positive and statistically significant relationships between certification and sales. We do not observe this in the data.

We next turn to the relationship between FT certification and prices. Given that the stated intention of FT certification is to provide higher prices to certified producers, we do expect a positive relationship with prices.

Estimates are reported in table 2. Again the odd numbered columns do not include a LDV while the even numbered columns do. Columns 1–8 provide estimates of both average domestic prices and average export prices. Because of noisy price data, we have a number of large influential observations. We address this by reporting estimates using winsorized price data (at the 95th percentile) and using the natural log of prices.

As shown in columns 1–4, we estimate no statistically significant relationship between domestic prices and FT certification. This is not surprising given that the vast majority of coffee sold as FT certified is exported and not sold domestically. The estimates reported in columns 5–8 show that we do find a positive and statistically significant relationship between FT certification and the export price. According to the estimates certification is associated with a price that is 4 cents per pound higher or about 5% higher.<sup>6</sup>

<sup>6</sup>These estimates are broadly consistent with Ronchi's (2002) estimated FT price impacts of 3% (exclusive of the FT premium) for 1998–2002. This was based on fieldwork undertaken with nine COOCAFE cooperatives.

The estimated price impact may seem low given that the price premium alone during this period was either 10 or 20 cents per pound. However, it is important to keep in mind that producers in general are unable to sell all of their coffee under the FT label, even though it qualifies for certification. The supply of FT certified coffee is much greater than the demand. Therefore, FT certified farmers typically sell a large proportion of their coffee as conventional.<sup>7</sup>

As a further test of selection into FT certification, we examine whether there are observable producer characteristics that explain the onset of Fair Trade certification. In particular, we are interested in whether we see a significant increase in production, exports or sales prices, just prior to the onset of FT certification. If so, then this is evidence that an omitted factor, like a new contract to supply an overseas buyer, is causing the producer to become certified and may also be driving our other outcomes of interest, like prices, incomes, children's education, etc.

We examine this by estimating a variant of equation (1) but where the dependent variable is an indicator if period  $t$  is the first year that producer  $i$  is Fair Trade certified. We consider two sets of observable predictors. The first set is the value of domestic sales, exports, total sales, domestic prices, and export prices in the previous year. This tests whether the onset of certification was preceded by abnormally high levels of production, exports, or sales prices. Similarly, we also consider the growth rate of these variables in the previous two years (e.g., between periods  $t - 2$  and  $t$ ). This checks whether the onset of certification is preceded by exceptionally high rates of growth in sales, exports, or prices.

The estimates are reported in table 3. Panel A reports the coefficients for the lagged levels variables and panel B the coefficients for the two-year growth variables. For both, we are interested in whether we observe a positive relationship between the independent variables and the onset of certification, since this is evidence of positive selection into certification. We find no evidence of such an effect. All twelve reported coefficients are not statistically different from zero, with very small point estimates. In addition, most coefficients are negative rather than positive. In particular, all three sales variables – domestic, exports, and total sales – have negative coefficients, suggesting that certifications tend to be preceded by lower than average sales and lower than average growth in sales.

Overall, the producer-level estimates provide no evidence for positive selection of producers

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<sup>7</sup>For a discussion on over-certification and free entry into Fair Trade and its impacts see de Janvry, McIntosh and Sadoulet (2012).

Table 3: Determinants of FT Certification

	Dependent variable: Indicator for the onset of FT certification					
	Characteristic for independent variable:					
	In domestic sales	In exports	In total sales	Exports as a share of total sales	In domestic price	In export price
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Certification onset and lagged characteristics						
One year lagged characteristic	-0.00056 (0.00184)	-0.00639 (0.00436)	-0.00634 (0.00449)	-0.00557 (0.00917)	0.0102 (0.0125)	0.0313 (0.0522)
Year FE, Mill FE	Y	Y	Y	Y	Y	Y
Observations	949	949	971	971	949	948
R-squared	0.141	0.139	0.139	0.138	0.142	0.139
Panel B: Certification onset and 2-year growth of characteristics						
Prior 2-year growth ( $t-2$ to $t$ )	-0.00222 (0.00198)	-0.00081 (0.00310)	-0.00570 (0.00373)	0.0176 (0.0123)	0.0139 (0.0158)	0.0730 (0.0563)
Year FE, Mill FE	Y	Y	Y	Y	Y	Y
Observations	721	733	753	753	717	720
R-squared	0.160	0.158	0.158	0.158	0.171	0.175

Note: Coefficients for export price are reported at the 1% level and 10% percent levels at the mill level in parantheses. All regressions include year fixed effects and mill

into FT certification. FT certification is associated with higher export prices and their magnitudes can be accounted for by the FT premium. In addition, we find that FT certification is not associated with higher domestic prices, or greater quantities sold. We also do not find evidence that the onset of certification is preceded by better firm performance measures by levels or growth of sales, exports, or prices.

#### 4. FT Certification and Individual-Level Outcomes

##### A. Data and Estimating Equations

Our analysis begins uses the combined ICAFE and FLO mill-level data used in the previous section. Recall that for each mill/cooperative, we know total production, disaggregated into the quantity exported and the quantity sold domestically, and average prices for both exports and domestic sales.

To investigate the effect of FT certification on individual-level outcomes, such as employment, income, education, and community participation, we link the matched ICAFE-FLO data with household survey data from *Encuesta Hogares de Propósitos Múltiples (EHPM)*. EHPM has been carried out in July of each year since 1981. The survey contains information on individual and

household incomes, education, community participation, durable goods ownership, etc. During our period of analysis, 2003–2009, the survey includes between 43,000–48,000 individuals per year.

We link the two data sources using the canton in which the individual lives and the canton of the mill/cooperative. The canton is the secondary administrative level (Costa Rica has 81 cantons). We obtain information of the canton of each mill from the address recorded by ICAFE. In the few cases where the address of the mill is not available from ICAFE, we obtained the information by contacting the mill directly.<sup>8</sup> Because harvested coffee cherries immediately begin to decompose and ferment, compromising the quality of the coffee, harvesting and processing occur within a 24 hour period. Given this characteristic of coffee, the locations of farms and the mills are almost always within the same canton.

Our primary variable of interest is a measure of FT certification intensity in a canton  $c$  in year  $t$ , which we denote with  $FTI_{ct}$ . The measure is the share of exports from in a canton and year that are from FT certified producers. Our measure relies on the assumption that the coffee received by a mill comes from coffee growers residing in the same canton as the mill, an assumption that we feel is valid. The measure we construct is the fraction of total exports in a canton that are sold by Fair Trade certified producers.<sup>9</sup> More precisely, let  $X_{kct}$  denote total coffee exports in year  $t$  by producer-association  $k$  located in canton  $c$ , and let  $I_{kct}^{FT}$  be an indicator variable that equals one if producer  $k$  is FT certified in year  $t$ . Our measure of FT intensity of canton  $c$  in year  $t$ ,  $FTI_{ct}$ , is given by:

$$FTI_{ct} = \sum_k \frac{X_{kct} \cdot I_{kct}^{FT}}{X_{kct}}. \quad (2)$$

A map showing the Fair Trade certification intensity across cantons in 2003 and 2009 is provided in figure 2. Cantons with no coffee production are shown in grey. Of the 81 cantons in Costa Rica, 45 do not produce coffee during our sample period.<sup>10</sup> For the 36 cantons with coffee production, the value of  $FTI_{ct}$  is represented with colors shades between yellow (low) and red (high).

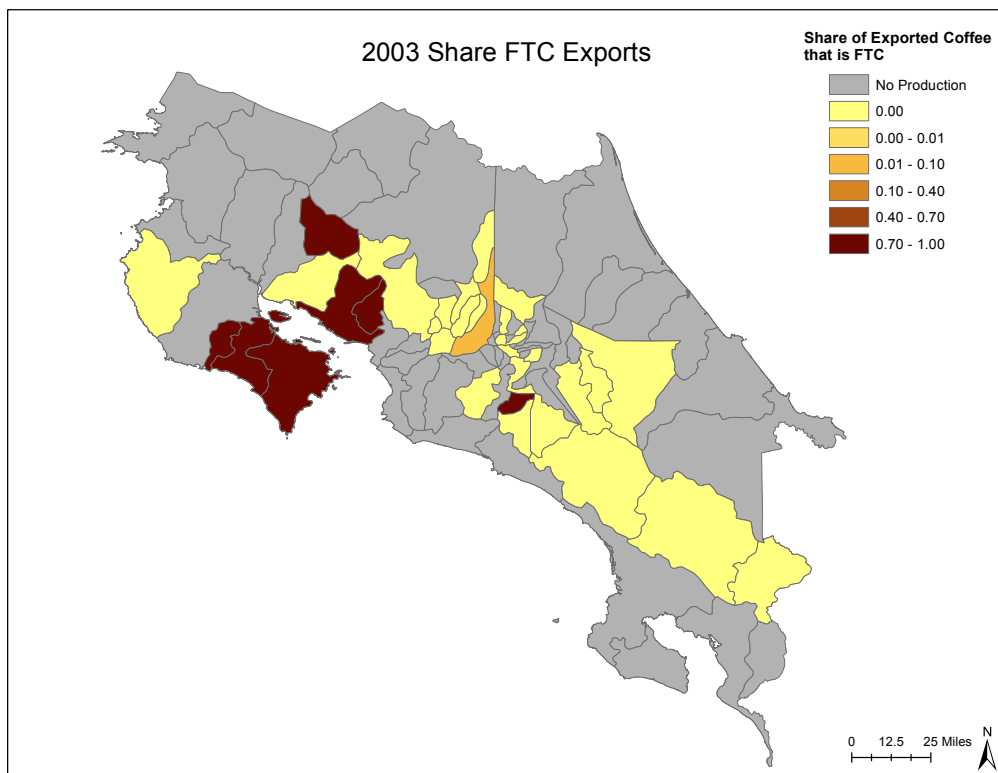
Variation in  $FTI_{ct}$  is from two sources: existing or new mills obtaining FT certification and existing FT certified mills increasing exports relative to non-FT certified mills.

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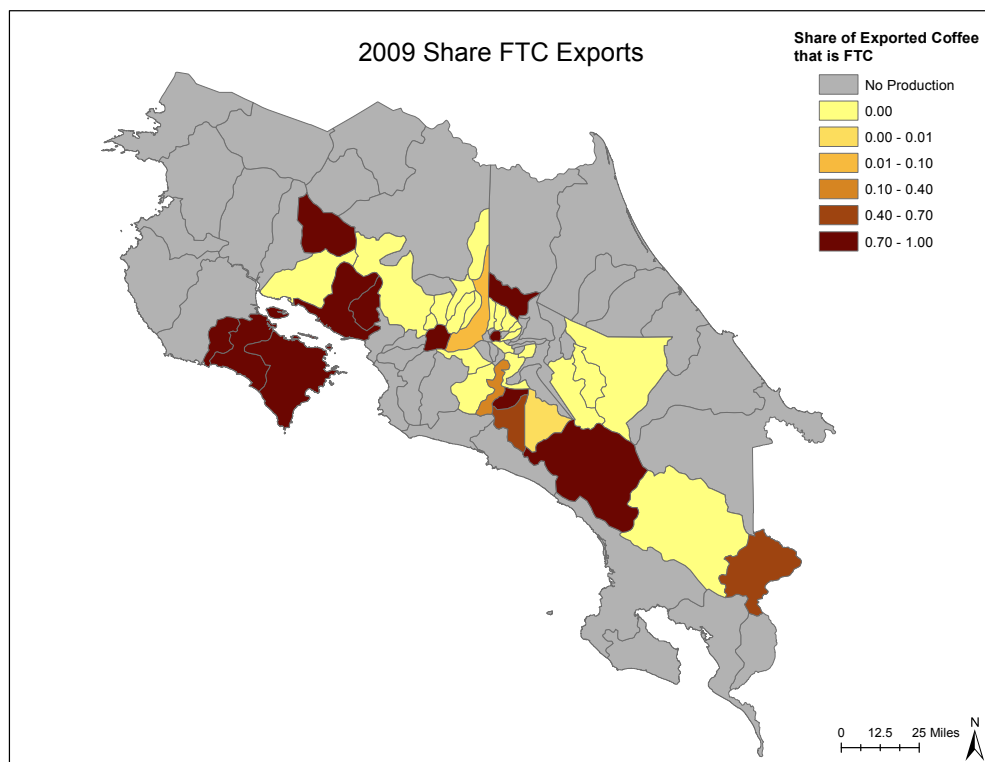
<sup>8</sup>We are able to identify the canton for over 90% of mills.

<sup>9</sup>It is important to emphasize that our measure is not a measure of the share of exports that are sold as FT certified. Because we do not know sales of FT certified coffee and non-FT certified coffee by mill, we are unable to construct this measure. Among the four cooperatives we interviewed in 2012, the share of their total sales in the previous year that was sold as FT was 80, 53, 40, and 10%.

<sup>10</sup>As we explain below, all empirical results are robust to restricting the analysis to only include the 36 coffee producing cantons. In addition, results are robust to only examining the rural areas within these cantons.



(a) Fair Trade certification in 2003



(b) Fair Trade certification in 2009

Figure 2: Share of coffee producers that are Fair Trade certified (weighted by total exports) in the first and last period of our panel.



As explained, we combine the FT intensity measure with the *EHPM* household survey data, linking households to Fair Trade intensity by their canton. Thus, our first estimating equation is given by:

$$y_{j,i,c,t} = \alpha_i + \alpha_c + \alpha_t + \gamma_c Year_t + \beta_1 FTI_{c,t} + \beta_2 FTI_{c,t} \cdot I_j^{i=\text{coffee}} + \mathbf{X}_{j,t} \mathbf{\Gamma} + \varepsilon_{j,i,c,t} \quad (3)$$

where  $j$  denotes individuals,  $i$  industries (480),  $c$  cantons, and  $t$  years (2003–2009). The dependent variable,  $y_{j,i,c,t}$ , indicates one of our outcomes of interest, which we describe in further detail below.  $FTI_{c,t}$  is our measure, described above, of the extent of Fair Trade certification in canton  $c$  in year  $t$ .  $\mathbf{X}_{j,t}$  is a vector of individual-level covariates: education fixed effects, age, age<sup>2</sup>, gender, gender  $\times$  age, and gender  $\times$  age<sup>2</sup>. The equation includes canton, time and industry fixed effects. The inclusion of canton fixed effects  $\alpha_c$  controls for time-invariant regional characteristics that affect the outcomes. Time-fixed effects  $\alpha_t$  control for macroeconomic shocks that are common to all industries and regions (coffee-producing regions). Industry fixed effects  $\alpha_i$  control for time-invariant industry characteristics. Finally, we also include canton-specific linear time trends,  $\gamma_c Year_t$ , which capture differential trends in cantons over time, which may be correlated with certification.

Although it is likely that many of the benefits of FT spillover to all individuals within a region, it is also likely that the benefits are greatest for individuals working directly within the coffee industry. Equation (3) allows for this differential effect. The variable  $I_j^{i=\text{coffee}}$  is an indicator variable that equals one if individual  $j$ 's reported industry is "cultivation of coffee". Therefore, the coefficient  $\beta_2$  measures the additional impact FT certification has on individuals directly involved in the coffee industry. The total effect on these individuals is given by  $\beta_1 + \beta_2$ . Because  $\beta_1$  measures the effect of increasing FT intensity within a region on individuals not working in the coffee industry, it can be interpreted as the spillover effect of increasing FT certification within that region.

Even within the coffee industry, it is possible that workers benefit differentially from FT certification. For example, the farm owners may benefit differently than the unskilled coffee pickers that are hired seasonally. Therefore, we examine the distribution of benefits of FT certification with an estimating equation that distinguishes between three different workers within the coffee industry. These are workers that are defined as being skilled agricultural workers, unskilled agricultural workers, and all other workers involved in the coffee industry. In practice, we augment equation

((3)) by adding an occupation dimension and allowing for a differential impact of FT certification to those in the coffee industry depending on their occupation.

The augmented estimating equation is:

$$\begin{aligned}
\ln y_{j,i,o,c,t} = & \alpha_{i,o} + \alpha_c + \alpha_t + \gamma_c Year_t \\
& + \beta_1 FTI_{c,t} + \beta_2 FTI_{c,t} \cdot I_j^{i=\text{coffee},o=\text{unskilled}} \\
& + \beta_3 FTI_{c,t} \cdot I_j^{i=\text{coffee},o=\text{skilled}} + \beta_4 FTI_{c,t} \cdot I_j^{i=\text{coffee},o=\text{other}} \\
& + \mathbf{X}_{j,t}\mathbf{\Gamma} + \varepsilon_{j,i,o,c,t}
\end{aligned} \tag{4}$$

where  $o$  indexes a workers occupation (413), and  $\alpha_{i,o}$  indicate occupation-industry fixed effects.  $I_j^{i=\text{coffee},o=\text{unskilled}}$  is an indicator if  $j$  is in coffee cultivation and has an unskilled occupation, such as “coffee picker” and “agricultural laborers”;  $I_j^{i=\text{coffee},o=\text{skilled}}$  is an indicator if  $j$  is in coffee cultivation and has a skilled occupation (or is owner), such as “farmers”, “growers” and “skilled workers” and  $I_j^{i=\text{coffee},o=\text{other}}$  is an indicator if individual  $j$  is in coffee cultivation and has an ‘other’ occupation, such as “farm administrator”, “farm foreman”, “plantation guard”, “coffee taster”, “driver”, etc.

The inclusion of the double interaction terms allow the impact of FT production in a canton to be different for unskilled, skilled and other occupations in the coffee industry. The coefficients  $\beta_2$ ,  $\beta_3$ , and  $\beta_4$  measure the differential impact of FT production on the outcomes of individuals involved in the coffee industry for each of the three categories defined above. The industry-occupation FEs  $\alpha_{i,o}$  capture the baseline coefficients for  $I_j^{i=\text{coffee},o=\text{unskilled}}$ ,  $I_j^{i=\text{coffee},o=\text{skilled}}$ , and  $I_j^{i=\text{coffee},o=\text{other}}$ .

An alternative estimation strategy is to explicitly include the double interactions (e.g.,  $FTI_{d,t} \cdot I_j^{i=\text{coffee}}$ ,  $FTI_{d,t} \cdot I_j^{o=\text{skilled}}$ ) by estimating the following equation:

$$\begin{aligned}
\ln y_{j,i,o,c,t} = & \alpha_{i,o} + \alpha_c + \alpha_t + \gamma_c Year_t \\
& + \beta_1 FTI_{c,t} \cdot I_j^{o=\text{unskilled}} + \beta_2 FTI_{c,t} \cdot I_j^{i=\text{coffee},o=\text{unskilled}} \\
& + \beta_3 FTI_{c,t} \cdot I_j^{o=\text{skilled}} + \beta_4 FTI_{c,t} \cdot I_j^{i=\text{coffee},o=\text{skilled}} \\
& + \beta_5 FTI_{c,t} \cdot I_j^{o=\text{other}} + \beta_6 FTI_{c,t} \cdot I_j^{i=\text{coffee},o=\text{other}} \\
& + \mathbf{X}_{j,t}\mathbf{\Gamma} + \varepsilon_{j,i,o,c,t}
\end{aligned} \tag{5}$$

This specification allows both the within-coffee impact and the outside-of-coffee spillover effect to differ depending on occupation (in this case differentially for unskilled agricultural workers).

The coefficient  $\beta_3$  measures the differential spillover effect of FT production on unskilled individuals within a district, while  $\beta_4$  measures the additional impact of FT certification on unskilled individuals in the coffee industry relative to unskilled individuals in other industries. The impact of FT production on unskilled workers not in the coffee industry is given by  $\beta_1$ , while the impact on unskilled workers in the coffee industry is given by  $\beta_1 + \beta_2$ . As in equation (4), in equation (5), the double interaction  $I_j^{i=\text{coffee}} \cdot I_j^{o=\text{unskilled}}$  is absorbed by the industry-occupation fixed effects.

## B. Results

We now turn to our estimation results, beginning first by examining the relationship between Fair Trade certification and average monthly income.

### a. Incomes

Estimates of equations (3)–(5) are reported in table 4. Column 1 reports estimates of equation (3). The estimates indicate a small positive impact of FT certification within the canton. In addition, we estimate an additional positive impact for individuals working in the coffee industry. The combined coefficient for this group is 0.168 compared to 0.068 for those not in coffee.

The estimates of column 2 show that the average impact for those in coffee masks significant heterogeneity. The baseline impact to those not the coffee industry remains similar (0.070) in column 2, although it is no longer statistically significant. In addition, there is no additional benefit to being an unskilled coffee worker. In fact, the combined effect of FT certification for these workers is very close to zero:  $0.070 - 0.082 = -0.012$ . By contrast, there is an additional benefit to skilled coffee growers. The combined benefit of FT certification is:  $0.070 + 0.329 = 0.399$ . For all other workers, again the combined benefit of FT certification is not statistically different from zero:  $0.070 - 0.224 = 0.154$ .

The finding of a large benefit to FT certification for skilled coffee growers, but not for other workers is confirmed in the estimates of equation (5) reported in columns 3-5.

The magnitudes of the estimated effects are sizeable. Consider the impact for skilled coffee growers. According to the estimates, an increase in FT intensity from 0 to 0.10 (approximately the sample mean) is associated with increase incomes by 40%. This is a very significant increase.

Table 4: The Effect of FT on Incomes by Industry and Occupation.

	Sample: Adults in all districts					
	Dependent variable: ln individuals' avg monthly income					
	(1)	(2)	(3)	(4)	(5)	(6)
Fair Trade Intensity, FTI	0.063** (0.031)	0.068 (0.050)		0.161* (0.082)	0.123 (0.079)	
FTI x Coffee	0.124 (0.094)			0.110 (0.096)		
FTI x Coffee x Skilled		0.334** (0.144)	0.434** (0.165)		0.320** (0.149)	0.421** (0.169)
FTI x Skilled			-0.035 (0.098)			0.018 (0.121)
FTI x Coffee x Unskilled		-0.059 (0.092)	-0.052 (0.101)		-0.071 (0.092)	-0.065 (0.101)
FTI x Unskilled			0.055 (0.068)			0.110 (0.092)
FTI x Coffee x Other		-0.205 (0.150)	-0.215 (0.149)		-0.225 (0.153)	-0.235 (0.152)
FTI x Other			0.075 (0.050)			0.131* (0.079)
Age, age2, gender & interactions	Y	Y	Y	Y	Y	Y
Education controls	Y	Y	Y	Y	Y	Y
81 District FE	Y	Y	Y	Y	Y	Y
7 Year FE	Y	Y	Y	Y	Y	Y
10,195 Industry x Occupation FE	N	Y	Y	N	Y	Y
480 Industry FE	Y	N	N	Y	N	N
District-specific time trends	N	N	N	Y	Y	Y
Observations	112,643	112,643	112,643	112,643	112,643	112,643
Clusters	79	79	79	79	79	79
R-squared	0.518	0.607	0.607	0.519	0.608	0.608

Notes: The unit of observation is an individual. The dependent variable is the natural log of annual income. Coefficients are reported with standard errors clustered at the district level. All regressions include education FE, district FE, year FE, and controls for age, age-squared, gender, gender x age, and gender x age-squared. Column 1 also controls for industry fixed effects, while columns 2-5 control for industry x occupation fixed effects. \*\*\*, \*\*, and \* indicate significance at the 10, 5 and 1 percent levels.

Overall, the estimates indicate that there are benefits of FT certification, but that these benefits are unevenly distributed among those within the coffee industry. While the owners of the coffee farms and their high-skilled workers received higher incomes from certification, there is no evidence that the other workers, including unskilled coffee pickers benefit in any way.

Our findings are not surprising once one considers the structure of FT. Unless the members of the cooperative (likely the ‘skilled workers’ in our sample) decide to allocate some of the premium to increasing the wages of coffee pickers and other hired workers (unskilled and ‘other’ workers in our sample), we should not expect to see any income effects for this group of workers from increasing FairTrade production. Our findings are also consistent with descriptive evidence from Valkila and Nygren (2009) indicating that Guatemalan coffee workers do not appear to benefit from Fair Trade.

In the sample, “other” occupations account for about 7% of all workers in the coffee industry, “unskilled” occupations account for 50%, and “skilled” occupations account for 43%. Therefore, in terms of overall impacts, it is important to keep in mind that the positive effects are felt among slightly less than half of coffee workers, while the majority of workers (57%) felt no impact.

In table 5, we test the robustness of our estimates by restricting the sample in a number of different ways. We first restrict the sample to only include: (i) cantons that produce coffee (36 in total), and (ii) rural areas of these coffee producing cantons. One could argue that these provide more comparable samples, since it is possible that individuals living in urban areas and/or in cantons that are uninvolved in coffee are irrelevant for our analysis. Estimates of equation (4) for these two subsample are reported in columns 3 and 5 (column 1 reproduces the baseline estimates for comparison). We also check the robustness of our estimates to only examining the incomes of household heads. We do this separately for all three samples: all cantons, coffee producing cantons, and rural parts of coffee cantons. The estimates are reported in columns 2, 4, and 6 of table 5.

The auxiliary estimates reported in table 5 confirm the estimates from table 4. The estimated impacts are very similar. We continue to find a link between FT certification and higher incomes, but only for skilled coffee growers. The estimated magnitudes are also very similar to the baseline estimates.

One difference between the specifications is that when we restrict the sample to the rural parts of coffee producing cantons, we estimate a larger positive and statistically significant impact of FT

Table 5: The Effect of FT on Incomes: Robustness to subsamples

	All districts		Coffee producing districts only		Rural parts of coffee producing districts	
	Household heads		Household heads		Household heads	
	All individuals	only	All individuals	only	All individuals	only
	(1)	(2)	(3)	(4)	(5)	(6)
Fair Trade Intensity, FTI	0.123	0.189	0.105	0.170	0.139	0.256
	(0.079)	(0.141)	(0.072)	(0.123)	(0.104)	(0.173)
FTI x Coffee x Skilled	<b>0.320**</b>	<b>0.347**</b>	<b>0.317**</b>	<b>0.340**</b>	<b>0.351**</b>	<b>0.382**</b>
	<b>(0.149)</b>	<b>(0.133)</b>	<b>(0.151)</b>	<b>(0.139)</b>	<b>(0.157)</b>	<b>(0.145)</b>
FTI x Coffee x Unskilled	-0.071	-0.092	-0.071	-0.104	-0.053	-0.073
	(0.092)	(0.101)	(0.095)	(0.102)	(0.094)	(0.104)
FTI x Coffee x Other	-0.225	-0.193	-0.104	-0.029	-0.090	-0.078
	(0.153)	(0.152)	(0.213)	(0.198)	(0.233)	(0.225)
Age, age2, gender & interactions	Y	Y	Y	Y	Y	Y
District FE	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y
Industry x Occupation FE	Y	Y	Y	Y	Y	Y
District-specific time trends	Y	Y	Y	Y	Y	Y
Observations	112,643	60,315	56,203	29,706	33,261	18,515
Clusters	79	79	36	36	36	36
R-squared	0.608	0.622	0.629	0.647	0.621	0.634

Notes: The unit of observation is an individual. Coefficients are reported with standard errors clustered at the district level. All regressions include district FE, industry-occupation fixed effects, year fixed effects, and controls for age, age-squared, gender, gender x age, and gender x age-squared. \*\*\*, \*\*, and \* indicate significance at the 10, 5 and 1 percent levels.

certification to all individuals in the area. This is as expected, since this subsample is the group that is most likely to be impacted by the spillover benefits from FT certification, such as subsidies to education, the building of infrastructure, etc.

It is unclear whether the full sample or subsamples are preferred. Although the smaller samples remove observations that are arguably irrelevant to the impacts of FT certification, their inclusion does help to more precisely estimate covariates in the regression equation, like the industry-occupation fixed effects, year fixed effects, and the coefficients on gender and age (as well as their interactions). Throughout the rest of the paper we report estimates from the full sample. All of our results are robust to using any of the subsamples reported in table 5.

We also check the robustness of our estimates to the use of different Fairtrade intensity measures. The estimates are reported in table 6. Column 1 reproduces the baseline estimate that uses exports to create an export weighted measure of FT intensity. In column 2 reports estimates using production weights. As shown, the estimates are nearly identical. Next, we use time-invariant export weights. In other words, in equation (2), we use  $\bar{X}_{kc}$  rather than  $X_{kct}$ , where  $\bar{X}_{kc}$  is average exports of mill  $k$  in canton  $c$  between 2003 and 2010. There is a potential

Table 6: The Effect of FT on Incomes: Robustness to using alternative FTI measures

	Fair Trade Intensity Measure Used:				
	Baseline: export weighted	Production weighted	Time invariant export weights	Initial (2003) export weights	Indicator if at least on mill is FT certified
	(1)	(2)	(3)	(4)	(5)
Fair Trade Intensity, FTI	0.123 (0.079)	0.124 (0.075)	0.111** (0.055)	0.104** (0.040)	0.074** (0.034)
FTI x Coffee x Skilled	<b>0.320**</b> <b>(0.149)</b>	<b>0.317**</b> <b>(0.155)</b>	<b>0.240*</b> <b>(0.126)</b>	<b>0.199*</b> <b>(0.115)</b>	<b>0.178*</b> <b>(0.093)</b>
FTI x Coffee x Unskilled	-0.071 (0.092)	-0.066 (0.095)	-0.062 (0.082)	-0.054 (0.079)	-0.002 (0.072)
FTI x Coffee x Other	-0.225 (0.153)	-0.220 (0.158)	-0.149 (0.134)	-0.131 (0.121)	-0.155* (0.092)
Age, age2, gender & interactions	Y	Y	Y	Y	Y
District FE	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y
Industry x Occupation FE	Y	Y	Y	Y	Y
District-specific time trends	Y	Y	Y	Y	Y
Observations	112,643	112,643	112,643	112,643	112,643
Clusters	79	79	79	79	79
R-squared	0.608	0.608	0.608	0.608	0.608

Notes: The unit of observation is an individual. Coefficients are reported with standard errors clustered at the district level. All regressions include district FE, industry-occupation fixed effects, year fixed effects, and controls for age, age-squared, gender, gender x age, and gender x age-squared. \*\*\*, \*\*, and \* indicate significance at the 10, 5 and 1 percent levels.

concerned with the variation in FTI arising from the year-to-year change in exports across mills. This measure, by using a time-invariant measure of exports, is purged of this variation. As shown in column 4, the estimates remain robust. In column 5, we report similar estimates, but using exports in the initial period, 2003, rather than average exports as weights. Again, the estimates remain robust. In the last robustness check we construct an extremely coarse measure of FTI that is completely independent of any cross-sectional or time series variation in production or exports. We use an indicator variable that equals one if there is at least one Fair Trade certified mill in the canton in that year. As shown, the results are robust the use of this coarse measure of Fair Trade intensity.

It is possible that although FT certification does not impact the wages of unskilled and ‘other’ workers in the coffee industry, it does increase the number of workers hired. We check for this by estimating equations (3)–(5), but with the dependent variable being an indicator variable for employment (either full or part time). This tests whether coffee workers in districts with more FT certified coffee production are more likely to have a job – i.e., less likely to be unemployed.

Table 7: The Effect of FT on Employment

	Sample: Adults in the labor force					
	Dependent variable: Employment indicator variable					
	(1)	(2)	(3)	(4)	(5)	(6)
Fair Trade Intensity, FTI	0.003 (0.006)	0.004 (0.008)		0.026** (0.013)	0.028** (0.013)	
FTI x Coffee	0.012 (0.015)			0.011 (0.014)		
FTI x Coffee x Skilled		-0.002 (0.010)	-0.009 (0.010)		-0.005 (0.010)	-0.013 (0.010)
FTI x Skilled			0.011 (0.007)			0.037*** (0.012)
FTI x Coffee x Unskilled		0.014 (0.025)	0.005 (0.026)		0.012 (0.024)	0.003 (0.025)
FTI x Unskilled			0.013 (0.014)			0.038** (0.017)
FTI x Coffee x Other		-0.059 (0.080)	-0.057 (0.080)		-0.060 (0.079)	-0.058 (0.080)
FTI x Other			0.003 (0.008)			0.027** (0.013)
Age, age2, gender & interactions	Y	Y	Y	Y	Y	Y
Education controls	Y	Y	Y	Y	Y	Y
81 District FE	Y	Y	Y	Y	Y	Y
7 Year FE	Y	Y	Y	Y	Y	Y
10,195 Industry x Occupation FE	N	Y	Y	Y	Y	Y
480 Industry FE	Y	N	N	N	N	N
District-specific time trends	N	N	N	Y	Y	Y
Observations	123,242	123,242	123,242	123,242	123,242	123,242
Clusters	79	79	79	79	79	79
R-squared	0.044	0.130	0.130	0.045	0.131	0.131

Notes: The unit of observation is an individual. The dependent variable is an indicator variable if an individual is employed (either full or part time) and in the labor force. Coefficients are reported with standard errors clustered at the district level. All regressions include education FE, district FE, year FE, and controls for age, age-squared, gender, gender x age, and gender x age-squared. Column 1 also controls for industry fixed effects, while columns 2-5 control for industry x occupation fixed effects. \*\*\*, \*\*, and \* indicate significance at the 10, 5 and 1 percent levels.

The estimates are reported in table 7. We find no evidence of that FT certification increases employment. All of the coefficients of interest are close to zero and statistically insignificant.

An important caveat about these estimates is that they rely on the assumption that unemployed workers have a well-defined occupation and industry. In reality this may not be the case. In the data, for 18.0 percent of the unemployed population either their industry or occupation is listed as missing. For employed individuals, the same data are missing for only 0.17 percent of the sample.

### C. Children's Education

We next turn to an investigation of effects of FT certification on education. There are three main channels through which FT production could impact education. First, by increasing household



incomes, FT certification may increase educational attainment. As we have seen, FT certification is associated with higher payments to skilled workers in the coffee industry, as well as a spillover to the incomes of other individuals residing in the same the canton. Second, Fair Trade certification, by making coffee production a more profitable endeavor, may increase the opportunity costs of going to school. We expect this to be particularly relevant for university-aged children. This is an effect has been found in other developing-country contexts (Atkin, 2012). Third, FT could affect educational attainment through enhanced provision of public goods in a region. As discussed, in Costa Rica, part of the Fair Trade premium is directed towards the building of schools, the provision of books, equipment and other materials, and the provision of scholarships for students to attend high school, university, and other classes. For example, since COOCAFE's creation of the Children of the Field Foundation (*Fundación Hijos del Campo*) in 1996, they have provided scholarships to 2,598 students and financial support to 240 schools. COOCAFE estimates that in all, over 5,800 students have been helped by their foundation.

To examine the impacts of FT certification on educational attainment, we estimate equation (4) among samples of children aged 7 to 12 years old (potential elementary school students), 13 to 17 (secondary school students) and 18 to 25 (university students). Rather than using the individuals' industries and occupations (as we did for the income regressions), we instead use the industry and occupation of the household head. This is because industry and occupation are undefined for children that are not employed. Thus, the estimates report how child school attendance varies with FT certification for households that are not in coffee production, and for households involved in different occupations within the coffee industry.

Estimates are reported in table 8 for elementary-aged children, secondary-aged children, and university-aged children respectively. The even numbered columns control for district-specific time trends while the odd numbered columns do not. An interesting pattern emerges. First, as reported in columns 1 and 2, FT certification appears to have no impacts on attendance in elementary schools. This is consistent with the fact that elementary school attendance rates are very high in Costa Rica. For example, in our sample 99.2% of children aged 8 report being enrolled in school. Further, there is no indication that Fair Trade premiums are directed towards elementary schools.

By contrast, we do find evidence of impacts of FT certification on secondary school and University attendance. The estimates reported in columns 3–6 indicate that for children aged

Table 8: FT Certification and School Attendance

	Dependent variable: Indicator for school enrollment					
	Ages 7-12		Ages 13-17		Ages 18-25	
	(1)	(2)	(3)	(4)	(5)	(6)
Fair Trade Intensity, FTI	-0.003 (0.005)	-0.006 (0.009)	0.076** (0.032)	0.063 (0.078)	-0.059** (0.025)	-0.065 (0.052)
FTI x Coffee x Skilled	0.022 (0.023)	0.021 (0.024)	-0.038 (0.109)	-0.047 (0.107)	-0.074 (0.057)	-0.071 (0.058)
FTI x Coffee x Unskilled	0.022 (0.027)	0.023 (0.025)	<b>-0.217***</b> <b>(0.101)</b>	<b>-0.213**</b> <b>(0.100)</b>	<b>-0.179**</b> <b>(0.080)</b>	<b>-0.168*</b> <b>(0.089)</b>
FTI x Coffee x Other	-0.001 (0.006)	-0.005 (0.007)	<b>-0.842***</b> <b>(0.165)</b>	<b>-0.837***</b> <b>(0.166)</b>	<b>-0.135</b> <b>(0.143)</b>	<b>-0.106</b> <b>(0.135)</b>
Age, age2, gender & interactions	Y	Y	Y	Y	Y	Y
District FE	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y
Industry x Occupation FE (of hh head)	Y	Y	Y	Y	Y	Y
District-specific time trends	N	Y	N	Y	N	Y
Observations	35,174	35,174	30,653	30,653	41,431	41,431
Clusters	79	79	79	79	79	79
R-squared	0.090	0.095	0.249	0.255	0.305	0.309

Notes: The unit of observation is an individual. The dependent variable is an indicator variable if a child attends school. Coefficients are reported with standard errors clustered at the district level. All regressions include district fixed effects, year fixed effects, fixed effects for the household head's industry x occupation, and controls for age, age-squared, gender, gender x age, and gender x age-squared. The even numbered columns also include district-specific time trends.

13-17 and 18-25, if a household is directly involved in coffee production, then the impact of FT certification is estimated to be negative and robustly significant for unskilled workers. The negative estimate is large and significant for high school aged children (13-17) with parents involved in “other” occupations in the coffee industry.

The reason that FT certification is associated with lower school enrollment among children of unskilled and “other” coffee workers is not immediately obvious. It is potentially explained by greater employment opportunities that arise because of FT certification. This may sound perplexing given that we have seen that unskilled and ‘other’ do not receive higher wages due to FT certification. However, the increased wages earned by the skilled workers, may provide a potential future reward that induces children to drop out of school and enter the coffee industry. Another potential explanation is that FT certification does provide benefits to workers that are not captured by income, such as safer working conditions, more stability, better health and dental care, etc. Due to lack of data, our analysis does not test for these benefits of Fair Trade.

This line of reasoning does raise the question of why we do not observe a decline in attendance for children of skilled coffee workers, particularly since they are the ones that actually receive

Table 9: FT Certification, Education, and Employment: Ages 13-17

	Sample: Individuals 13-17 years old				
	Attend School	Inactive	In labor force	Employed	Unemployed
	(1)	(2)	(3)	(4)	(5)
Fair Trade Intensity, FTI	0.063 (0.078)	-0.137* (0.074)	0.147** (0.070)	0.146** (0.058)	0.001 (0.015)
FTI x Coffee x Unskilled	-0.047 (0.107)	0.043 (0.104)	-0.037 (0.100)	-0.027 (0.094)	-0.010 (0.018)
FTI x Coffee x Skilled	-0.213** (0.100)	-0.012 (0.076)	0.003 (0.071)	0.003 (0.068)	-0.000 (0.033)
FTI x Coffee x Other	-0.837*** (0.166)	-0.466*** (0.059)	0.455*** (0.052)	0.469*** (0.055)	-0.013 (0.026)
Age, age2, gender & interactions	Y	Y	Y	Y	Y
36 District FE	Y	Y	Y	Y	Y
7 Year FE	Y	Y	Y	Y	Y
7,171 Industry x Occupation FE	Y	Y	Y	Y	Y
Observations	30,653	30,653	30,653	30,653	30,653
R-squared	0.255	0.261	0.256	0.237	0.138

Notes : The unit of observation is an individual. Coefficients are reported with standard errors clustered at the district level. All regressions include district FE, industry-occupation fixed effects, year fixed effects, district-specific time trends, and controls for age, age-squared, gender, gender x age, and gender x age-squared. \*\*\*, \*\*, and \* indicate significance at the 10, 5 and 1 percent levels.

higher wages. Certainly, the expected increase to incomes must be greatest for this group. However, the explanation may lie in a counteracting effect of higher incomes. As has been shown in other developing-country contexts low incomes prevent parents from being able to send children to school. Edmonds, Pavcnik and Topalova (2010) show this when examining the impacts of India's 1991 tariff reforms. Therefore, FT-induced increase in income may work as a counteracting force increasing school enrollment for this group. In other words, for children of parents in the coffee industry, higher incomes from FT induce children to drop out of school. But for children of parents that receive higher incomes from FT, this reduction is counteracted by an increase in enrollment due to higher incomes.

In an attempt to better understand the reason for the education results, we also examine the relationship between FT certification and the following alternative activities: being inactive, participating in the labor force, being employed, and being unemployed. Estimates are reported in tables 9 and 10 for children aged 13–17 and 18–25. Column 1 of the tables reproduce the education estimates of specification (3). Columns 2–4 of the tables report estimates where the dependent variable is an indicator for the individual being in the labor force (employed or unemployed), an indicator for being inactive, an indicator for employment, and an indicator for unemployment.

Consider first the estimates for 13–17 year old teenagers reported in table 9. The estimates show that the decline in school attendance for children of “other” coffee workers coincides with

Table 10: FT Certification, Education, and Employment: Ages 18-25

	Sample: Individuals 18-25 years old				
	Attend School	Inactive	In labor force	Employed	Unemployed
	(1)	(2)	(3)	(4)	(5)
Fair Trade Intensity, FTI	-0.065 (0.052)	-0.038 (0.058)	0.042 (0.046)	0.112** (0.050)	-0.070*** (0.019)
FTI x Coffee x Unskilled	-0.071 (0.058)	-0.064 (0.091)	0.104 (0.092)	0.025 (0.091)	0.079*** (0.029)
FTI x Coffee x Skilled	-0.168* (0.089)	0.027 (0.114)	-0.016 (0.115)	-0.121 (0.101)	0.104 (0.088)
FTI x Coffee x Other	-0.106 (0.135)	0.258** (0.106)	-0.258*** (0.092)	-0.252*** (0.092)	-0.006 (0.023)
Age, age2, gender & interactions	Y	Y	Y	Y	Y
36 District FE	Y	Y	Y	Y	Y
7 Year FE	Y	Y	Y	Y	Y
7,171 Industry x Occupation FE	Y	Y	Y	Y	Y
Observations	41,431	41,431	41,431	41,431	41,431
R-squared	0.309	0.327	0.303	0.299	0.135

Notes: The unit of observation is an individual. Coefficients are reported with standard errors clustered at the district level. All regressions include district FE, industry-occupation fixed effects, year fixed effects, district-specific time trends, and controls for age, age-squared, gender, gender x age, and gender x age-squared. \*\*\*, \*\*, and \* indicate significance at the 10, 5 and 1 percent levels.

a decrease in children that are inactive and an increase of children in the labor force that are employed. There is no association with unemployment. This suggest that FT is associated with children being drawn from school and from an inactive status and moving into employment. The estimates also show that for children of parents not in coffee, FT coffee production in a canton is associated with a movement of children from inactivity into employment.

Next, consider the estimates for 18–25 year old youths reported in table 9. For children of parents that are “other workers” in coffee, we see that FT certification is associated with an increase in inactivity and a decline in employment. In other words, FT is associated with children dropping out of employment (or being force to drop out) and moving into inactivity. We also see some evidence of that FT is associated with an increase in unemployment for the children of unskilled coffee workers and a decrease in unemployment (and increase in employment) for children of those not in coffee.

## 5. Conclusions

Our analysis has provided evidence, taken from coffee production in Costa Rica, that Fair Trade certification can have impacts in developing countries. However, our analysis also showed that the benefits of Fair Trade may not be distributed to the poorest workers in the industry. Examining individual-level survey data, we found that Fair Trade certification is associated with increased

incomes of a small group of skilled coffee growers and farm owners. For other workers in the coffee industry we find no evidence that FT certification increases income.

We also examined impacts on the education of children. We found that FT certification is associated with increased school attendance in the region. This is most likely due to the FT premium that is set aside for educational support and scholarships by FT certified producers. We also found evidence that FT certification is associated with lower school attendance among some children of coffee workers. This is likely due to increased economic opportunities that arise due to FT certification, drawing children out of school and into the workforce.

To gain further evidence on selection into certification and causal mechanisms, we moved to an examination of finer data at the producer level. We found that FT certification is associated with higher export prices (approx. 5 cents per pound), but that there is no evidence that certification is associated with more sales (either domestic or for export) or with higher domestic prices. This is consistent with expectations since FT certification increases the price of coffee sold as Fair Trade – primarily exports – while certification does not itself guarantee or attempt to directly generate increased sales. Further the fact that we do not see large increases in sales associated with FT certification provides some confidence that selection of ‘better’ coffee producers in ‘better’ regions is not playing a large part. We can therefore be more confident that the income and education estimates are close to causal estimates.

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