Does Fair Trade Deliver on Its Core Value Proposition? Effects on Income, Educational Attainment, and Health in Three Countries

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Does Fair Trade Deliver on Its Core Value Proposition?

Effects on Income, Educational Attainment, and Health in Three Countries

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TransFair USA was awarded a grant by the Tinker Foundation in the year 2003 to study the impact of Fair Trade practices on coffee producers with small productive units in Latin America. The Agribusiness program at the University of Nebraska initiated the study under agreement with TransFair USA. The study was implemented in 2004-2005. With additional funding, researchers associated with the Terry J. Lundgren Center at the University of Arizona conducted additional analyses in 2006-2007. Christopher Bacon and Moisés Leon provided outstanding support in design and field implementation of the survey, and local TransFair USA cooperative officers greatly facilitated fieldwork logistics. Thanks to Shirley Noble for a heads-up on health care related issues.

Abstract

Alternative trade organizations (ATOs) based on philosophies of social justice and/or environmental well-being are establishing new channels of trade and marketing. Partisans promote ATOs as systems to transfer benefits from consumers in the wealthy northern hemisphere to producers in the poor southern hemisphere. The central public policy question is whether the well-being of poor agricultural producers in the southern hemisphere is actually being improved by fair trade practices, or are consumers who buy products on this premise deceived? The research reported here partially answers the question of whether participation in a fair trade coffee marketing channel delivers benefits to small-scale producers in Latin America. We employed a survey methodology to compare TransFair USA cooperative participants and non-participating farmers in three countries on socio-economic indicators of well-being. According to our analysis, the economic effects of FT participation are unassailable; the effects on educational and health outcomes are uneven. However, TransFair USA cooperative participation positively effects educational attainment and the likelihood a child is currently studying. We find positive health-related consequences of TransFair USA coop participation.

Alternative trade organizations (ATOs) based on philosophies of social justice and/or environmental well-being are carving out spaces alongside traditional agricultural export sectors by establishing new channels of trade and marketing. Partisans of ATOs promote these as systems to transfer value from consumers in the wealthy northern hemisphere to commodity and craft producers in the poor southern hemisphere (Rice 2001; Witkowski 2005). At the same time, market trends confirm that ethical and social responsibility is becoming a major competitive factor in consumer marketing (Iwanow, McEachern and Jeffrey 2005; Runested 2007; Wells 2007; Zweibach 2007). Fairly traded products constitute a substantial and growing share of these trends (Anonymous 2005; Grolleau and BenAbid 2001; NCAUSA 2005; The Economist 2006). By 2001, global fair trade sales had grown to reach an estimated US$550m per annum with fairly traded goods, mainly food, being sold in over 43,000 supermarket locations across Europe (EFTA, 2001). The Fairtrade Foundation estimates that its own total UK retail sales were worth £92m in 2003, up by 100 per cent in two years; this trend has continued, with sales more than doubling in the two years to 2004 (Wall 2005).

The value proposition of fairly-traded products rests upon the idea that the consumer, by buying such products, can both satisfy his or her demand for benefits, and at the same time, improve the well-being of poor producers elsewhere in the world. In other words, fairly-traded products add value that consists of satisfying the consumer's altruistic or ethical demands. As a public policy matter, we evaluate this value proposition in the case of fairly-traded coffee. Are consumers receiving the value they anticipate, which is beyond their ability to evaluate individually, or are they deceived?

The research reported here provides a partial answer to the question of whether participation in a prominent US ATO, the TransFair, USA Fair Trade coffee marketing channel

delivers income, education and health benefits to small-scale coffee producers in developing countries. To address our research question, we collected quantitative measures in three countries with substantial Fair Trade marketing. We employed a survey methodology to compare TransFair USA cooperative participants and non-participating farmers on a number of socio-economic indicators of well-being.

Context: Fairly Traded Coffee

Coffee is a substantial part of the Fair Trade product portfolio. According to TransFair Canada, estimated retail sales for its coffee in Canada in 2003 rose to $19.3 million, from $12.7 million in 2002. Worldwide, fairly traded coffee experienced a 14% growth in 2003 over the previous year (Harris 2003). Fair trade coffee in Europe ranges from capturing less than one percent of the national coffee market in France to five percent in Switzerland. Organic coffee accounts for about 3% of the specialty coffee imports in the United States (Rice 2001, 40). Overall, the sustainable coffee market, which includes ATO produced organic, fair trade, bird-friendly and directly marketed "relationship coffees" without third party certification of environmental or social benefits represents 0.48% of the total coffee market and 2.8% of the specialty market in North America. Nevertheless, in 2003 over 18 million pounds of fair trade certified coffee were roasted in the US, a 91% growth rate from 2002 (Lyon 2006, 253-254). Further, by the end of 2006, according to TransFair USA, Fair Trade coffee farmers earned close to $91 million in social premiums from the U.S., all while earning the higher Fair Trade price for their coffee. As of June 1, 2007 the social premium price component has doubled, providing substantially more revenue for farmers to invest in their communities (http://www.transfairusa.org/content/certification/coffee_program.php). In the US, the dramatic

expansion of organic food retailing is among the factors fueling fair trade sales growth (Wells 2007).

Within the fair trade movement, Latin Americans produce the bulk of the coffee – especially certified organic coffee. In recent years, production and marketing cooperatives there have carved out a small but potentially significant space within the coffee sector – a realm traditionally dominated by powerful interests (often processors, creditors, and/or exporters) within the producing countries (Rice 2001).

The larger fair trade movement, of which coffee is a part, has its origins in Europe, where Catholic youth founded a development charity in the Netherlands in 1959. Conferences by UNCTAD (United Nations Conference on Trade and Development) during the 1960s produced the non-charity concept of "trade not aid" on the part of developing countries. The idea quickly spread all over Western Europe. In 1986, the fair trade coffee company Equal Exchange, was founded in Canton, Massachusetts. In 1988, the Netherlands became the first country to launch a fair trade consumer label, Max Havelaar that continues to figure prominently among fairly traded products. The label was created through a partnership between the Mexican coffee co-operative UCIRI and the Dutch development organization, Solidaridad (Lyon 2006, 454). The ideals and standards of fair trade have been incorporated into certification programs all of which now have joined into an umbrella group known as the FairTrade Labeling Organizations (FLO) International. As with other commodities moved within the FT community (cocoa, honey, sugar, etc.), the social justice concerns at the heart of these organizations means that the initial focus of coffee specialist ATOs was on growers receiving a fair price for the coffee they produce (Rice 2001, 47).

As part of a process of increasing mainstream marketing of fair trade, the message of fair trade is shifting from participation in an international program of trade reform to one about "shopping for a better world" (Low and Davenport 2005, 495), or "ethical globalization" (Witkowski 2005) "motivated by the political choices and conscious reflexivity of Northern consumers" (Lyon 2006, 452). Thus, creating a better, more equitable world especially for agricultural producers in the southern hemisphere has become central to the value proposition of many ATOs including TransFair, USA (see www.fairtradeusa.org, for example). Naturally, this trend has also generated criticisms that ATOs do little to fundamentally alter power relations between producers and consumers (Lyon 2006) and that encouraging more consumption does nothing to reduce consumption related pathologies considered by some to afflict the planet, its ecosystems and consumers in general (Johnston 2002). Consequently, in recent discussions of research priorities, several authors argue for prioritizing research to assess the social impact of Fair Trade practices on Southern hemisphere producers which are the raison d'être of ATOs, research that should lead to a greater understanding of the distribution of benefits and inform evaluation of the effectiveness of ATOs (Moore 2004, 84; Witkowski 2005, 30).

What practices define a Fair Trade ATO? Fair Trade normally involves all or a combination of the following practices:

- A marketing channel that does not use profit-oriented market intermediaries, but rather links producers organized in cooperatives directly with wholesalers through a single market intermediary, one of several fair trade organizations worldwide like TransFair USA, which is a subsidiary of TransFair International. TransFair assures product quality and logistics functions. In this way, a far higher share of the eventual retail price of his or her goods is supposed to be returned to the producer.

- Historically, qualifying ATOs like TransFair USA register with the International Coffee Register (ICR) in the Netherlands, and are approved to establish commercial agreements with licensed importers. The ICR maintains a database on fair trade coffee organizations and coordinates annual inspections of the groups (Rice 2001, 47).
- Monetary costs of certification and inspection in the fair trade sector are borne in part by the producer cooperatives and in part by the importers and licensed roasters/distributors. Importers like TransFair USA pay no license fee, but are expected to provide credit to producer groups (Rice 2001, 48).
- Fair Trade organizations guarantee a price floor (currently $1.30 per pound) that includes a social premium designed to protect producers from dramatic downward fluctuations in world market prices while passing on a portion of any windfalls to producer cooperative organizations.
- Participating importers like TransFair USA must buy their coffee directly from certified small coffee producers; they must offer long-term contracts that extend at least beyond one annual harvest; they must pay a price premium of $1.30 per pound and an additional $.20 per pound premium for dual-certified organic/fair trade coffee; and they must offer producer organizations pre-financing covering at least 60% of the annual contract (Lyon 2006; http://www.transfairusa.org/content/certification/coffee_program.php).
- An important aspect of ATOs is their distribution of technical, price and market information to producers through cooperative structures, information traditionally hoarded by market intermediaries to their advantage (Jones 2001, 58).
- Cooperatives are composed of local producers who cooperate on production, product quality marketing, and social welfare initiatives such as women's programs, health and education. A

share of the higher price paid to TransFair USA cooperatives for their coffee is reserved for investment in the latter initiatives.

- A not-for-profit agency, such as TransFair USA, provides support to cooperatives for developing educational programs on production techniques, marketing, and family education, health, and welfare.
- Retail marketing of the product as "fairly-traded," the addition of which credence attribute may increase the value perception among ethically-motivated end consumers.

In sum, the evolving intent of fair trade ATOs is to lift the living conditions and welfare of the local producers, who have traditionally found themselves in a vulnerable position (Bacon 2005)--price takers relative to global commodity markets and in a weak bargaining position relative to traditional local market intermediaries-- and as a result, have long experienced stagnant or declining incomes and family welfare. As can be inferred from the above summary, and from TransFair USA promotional material (e.g., http://www.transfairusa.org/content/Downloads/devo-impact-brochure.pdf), fair trade ATOs operate on the assumption that if given the chance, commodity producers in the southern hemisphere would prefer to invest in more sustainable production, send their children to Western-oriented schools, improve their health status and health care in terms of northern hemisphere health standards promoted by the UN and other aid organizations, and better their overall quality of life (see also Bacon 2005).

As stated above, the aim of the research reported here is to respond to calls for better evaluations of Fair Trade marketing channels, and in so doing provide a partial answer to the question of whether participation in the fair trade coffee marketing channel delivers economic and social welfare benefits to small-scale producers in developing countries as claimed. The

answer to this research question is critical for the continued credibility of the value proposition that differentiates fair trade products in the consumer marketplace of developed countries in terms of quality and social justice attributes (Lyon 2006, 455). The answer is also important to fair trade organizations such as TransFair, USA and their supporters that wish to evaluate the ethicality and effectiveness of their interventions in these market channels. The credibility of Fair Trade is also an important component of those transformative consumer discourses that seek alternative models of consumer conduct and economic development in an era of globalization, ecological, and political insecurity (Lyon 2006, 456; Nicholls 2002; Nicholls and Opal 2005). However, the presumption guiding our research, we hesitate to use the word hypothesis, is that this intervention like so many other interventions in the "development" of Latin America and other parts of the globe marginalized by the current organization of the world economy, will NOT produce detectable positive results (Easterly 2006; 2007; Sanchez 2002).

Method

TransFair USA, a major fair trade coffee broker, was awarded a grant by the Tinker Foundation in the year 2003 to study the impact of Fair Trade practices on coffee producers with small productive units in Latin America. The Agribusiness program at the University of Nebraska initiated the study under agreement with TransFair USA. The study was implemented in 2004-2005. Our basic research method was to select a random sample of TransFair, USA (FT hereafter) coffee farmers in each country, and compare them on measures of economic, educational, and health measures to a random sample of comparable non-FT farmers in that country, as a control group. Since the locations in which FT cooperatives exist are selected by

fair trade organizations like TransFair USA, and farmer cooperatives in those locations self-select regarding their participation, it is not possible to impose the conditions of random assignment to treatment conditions and random selection of participants as in a laboratory experiment. Rather, the study is a controlled comparison in which care must be taken to try to rule out major competing explanations for differences between FT and non-FT farmers.

To address the research question identified above, we chose a survey methodology designed to measure a combination of socio-economic indicators. Our desire to develop statistically reliable results to supplement those produced through case studies and journalistic reports that predominate in the existing literature and generally report favorable outcomes dictated this choice (Auroi 2003; MacDonald 2006; Nicholls and Opal 2005; Parrish, Luzadis and Bentley 2005; Raynolds, Murray and Taylor 2004; Ronchi 2002). Our desire to measure indicators familiar to philanthropic and donor organizations that are a source of grants to ATOs like TransFair USA, rather than those that are emerging in literatures on corporate social responsibility such as triple bottom line accounting, balanced scorecard, or return on social investments also dictated this choice.

Sample

Three countries with substantial FT marketing through TransFair USA, a major US non-profit fair trade wholesaling organization as noted above, were selected for the study: Nicaragua, Peru and Guatemala. Along with Ecuador and Mexico, these countries devote by far the largest amounts of land to the production of alternatives coffees in Latin America. Along with Mexico and Colombia, by far the largest numbers of coffee producers involved in fair trade initiatives

live in these countries. Mexico and Colombia were excluded from analysis because of ongoing civil strife in the coffee producing region that would have likely compromised research efforts, while Ecuador was excluded because it is not a major exporter through TransFair channels (Jones 2001). Thus, our study included the most important fair trade coffee exporting countries in Latin America in which conditions for proper survey administration could be guaranteed.

The population under study includes coffee producers and their families whose productive units are small and are thus FT certifiable (1-3 hectares of coffee production per adult over the age of 18 living in the household), and who are currently producing coffee in traditional coffee areas under homogeneous environmental and social conditions. The two types of farmers surveyed include FT certified farmers, who meet the additional criteria of at least three years of participation in FT cooperatives and affiliation with cooperatives with consistent sales of at least 30% of their production to FT cooperative buyers, and non FT independent farmers, who may or may not be affiliated with other cooperative entities.

We took as much care as possible to establish the sampling frame and sample selection procedures for this work, given that FT and non-FT farmers might vary in a number of ways besides FT participation that could affect their economic and personal outcomes. For example, FT farmers in a country might have different average size of holdings or might work under different climate, geological, infrastructure, or distance-to-market conditions than non-FT farmers. Further, the number of members in an FT cooperative might have an impact on the effect of FT participation, with larger cooperatives expected to offer more complete services and aid to their members. In order to counter a number of potential threats to the validity of FT vs. non-FT comparisons, therefore, a stratified cluster sampling plan was used.

First, the FT cooperatives in a country were stratified into 3 groups, small, medium, and large, based on the number of members of the cooperative. Each stratum had an approximately equal number of cooperatives in it. Then, FT cooperatives (the "clusters") were selected by simple random sampling from the strata in which they were classified. The number of FT farmers selected from each stratum was proportionate to the total number of FT farmers in that stratum. A sufficient number of cooperatives (but at least two) were selected at random from a stratum in order to account for the number of farmers that needed to be sampled from that stratum. This kept the number of cooperatives low, which controlled the costs of the survey field work within reasonable bounds.

In the second stage of the cluster sampling, coffee producers were selected by simple random sampling from within each cooperative, using as the sampling frame a recent list of all producers in each cooperative (cooperative census data). Since the number of FT farmers selected from each stratum was proportional to the total number of farmers in the stratum, fewer farmers from small cooperatives were selected and more from larger cooperatives were selected. This plan ensured that there was minimum bias in the sample towards FT farmers from larger or smaller cooperatives; an FT farmer from a large cooperative had very close to the same probability of being selected as one from a smaller cooperative.

The selection of non-FT farmers as a control group could not be made from the same communities in which the FT farmers were selected, since being a member of an FT cooperative is a matter of self-selection in each community where FT cooperatives exist. Farmers from the same community who chose not to participate in the FT system may have dramatic differences in their holdings, practices, demographics, or outlooks from the farmers in that same community who elected to participate. Thus, it was necessary for us to choose an adjacent community or

communities in which no FT cooperative operated, but with comparable climate, geographical and growing conditions such as altitude, and similar infrastructure and distances to market from which to select the non-FT control farmers. Ideally, all non-FT farmers selected had holdings of 1-3 hectares per adult household member, just as did the selected FT farmers. Through application of these procedures and criteria we sought to reduce systematic sources of error in our results

Local conditions affected sampling tactics. Due to the unavailability of detailed data on local farmers in Nicaragua, we employed a randomized grid sampling technique for choosing non-FT farmers in communities close to the FT cooperative community. In Guatemala, where data on local farmers were also unavailable, we employed random sampling of farmers from a list based on oral information from neighbors in communities adjacent to the randomly selected FT communities. In Peru, thanks to the existence of detailed census data, we were able to select individuals from the paired non FT communities at random, using a random numbering procedure. In total, we questioned over 1200 heads-of-household in the three countries, two-thirds of who were FT participants, as shown in table 1.

--Insert table 1 about here—

There are some possible ways in which sample design biases could theoretically account for differences in the outcomes of FT and non-FT farmers. For example, if the FT farmers on average have more land, it would be surprising if they did not sell more coffee, make higher incomes, and have better educational and health outcomes overall. If the FT farmers have larger families, they may have better outcomes due to having more available workers, or worse outcomes due to having more mouths to feed. If the heads of households in FT farms are older, perhaps they have more status in their communities and can achieve better outcomes; or if

younger, they may have more energy to build their farms up. So, we believed it necessary to measure these potential confounding effects.

As can be seen in tables 2, 3, and 4, FT and non-FT farmers were usually comparable in terms of their household sizes, ages, and holding sizes, although there were some statistically significant differences despite the careful sampling methods. Given the large sample sizes in this study, and the resulting power of the F-tests, it would be unlikely to find no significant differences at all in these characteristics between randomly-chosen FT and non-FT farmers. However, the differences, even when statistically significant, are small. Note that eta-squared results in the final columns of these tables indicate that members and non-members are comparable, because the degree of association is low. We can argue thereby that differences between FT and non-FT farmers on our dependent measures are probably not due very much to these kinds of demographic and size-of-holding differences. However, in making comparisons between FT and non-FT farmers, we have nonetheless controlled for these factors through ANCOVA and regression methods.

--Insert tables 2, 3 and 4 about here--

While we cannot claim that our sample selection matches the ideals outlined in sampling textbooks, we feel certain that most important sources of sample design error have been minimized or controlled.

Questionnaire Administration

The questionnaire was designed in Spanish, and except for a few questions that were modified to accommodate country specificities (i.e., local currency, units of land area, schooling characteristics, unique illnesses, or sustainable agricultural practices), the same set of questions

was implemented in the three locations. This consistency also reflects the fact that FairTrade USA emphasizes the same kinds of production, product quality, education and social welfare initiatives in the cooperatives in which it intervenes. The questionnaire consisted of four sections. The first section focused on the production and marketing processes. The second section focused on the local living conditions and a self-assessment of producers' wellbeing. The third section focused on household members' education. The last section inquired about the health condition of family members and their access to modern health care. In this paper, analysis concentrates on the results of sections one, three and four.

A field director who supervised data collection in all three countries, and thereby helped to guarantee quality across countries and local supervisors conducted workshops for data collectors that they held at central locations for regions targeted for study. Interviewers participated in a 1-day workshop, with additional training of several hours for those who would go to non-cooperative communities. Training groups were made up of 5-15 interviewers, mostly young men, in some cases with experience in coffee survey work. Interviewers either knew the coop members quite well and were members of coop families or were knowledgeable about the communities and were identified with the help of local community leaders or teachers. Those working with comparative communities were selected on the basis of their maturity, knowledge of the area and capacity to work under conditions of duress. In Nicaragua, for example, all interviewers in workshops were allowed to conduct field interviews but inexperienced ones were assigned fewer interviews and returned to field headquarters for evaluation on a given date. They were assigned interview areas closest to their home communities.

In general, interviewers were given numbered questionnaires and support materials and issued a list of names of persons to be interviewed; the list was to be assigned by the team. In

Nicaragua, for example, each group of 3-4 interviewers formed a team and usually worked together with one cooperative. The team leader was responsible for team coordination and collecting completed interviews as well as contacting fieldwork directors when necessary.

Interviewers were instructed on the need to record farmer responses objectively, if necessary writing additional comments on the empty back pages of the interview form. The need for complete interviews in order to receive pay was emphasized, as well as other contingencies of fieldwork. A calendar was set for execution of fieldwork and collection-review of interviews. Full payment to interviewers was made contingent upon all successfully completed interviews being handed to field directors.

Completed interviews were collected at workshop sites on days agreed with the interviewer teams. Interviews were evaluated individually with each interviewer and necessary corrections were made. Corrections made were based on discussion with interviewer and team leader and field director. Random spot re-interviews by independent interviewers were conducted to ensure that interviews were indeed conducted with those who were selected for inclusion in the sample. These procedures resulted in very few incomplete or spoiled questionnaires being returned. Completed questionnaires were coded and converted into computer files in each study country and both questionnaires and computer files sent to the US for analysis.

Analyses

Dependent variables

In this study, we sought to determine the effects of producers' participation in TransFair USA's Fair Trade coffee buying program on economic outcomes, educational outcomes, and

patterns of illness and treatment relative to those of non-FT producers. Furthermore, we explored differences between short- and long-term participants in Transfair USA. We selected two commonly employed indicators of educational outcome: maximum grade obtained in terms of years of formal education and the probability of being currently in school as dependent variables. For patterns of illness, we measured the frequencies of each of six locally common diseases per person in each family, described as they are generally understood in those countries: malaria, dengue, anemia, colds and fever, respiratory infections, and diarrhea. We also measured the frequency with which professional medical care was obtained in treating each type of disease. Finally, for global analysis, we constructed indices of health and treatment for each family from the frequencies of diseases and medical care

Analyses

To compare FT and non-FT farmers on the various dependent measures, we conducted analyses of covariance (one-between design) with covariates of coffee total area, age of head of household, and number of dependents in the household. Contrary to a priori expectations, our analyses revealed no consistent patterns of difference based on coop or community size and so these results are not reported.

For educational outcomes, we ran two separate sets of analyses, one in which the entire population of household members was included and one in which only those dependents 6 to13 years of age were included. In this paper we report the latter analyses. Our rationale for conducting the latter analysis is that children younger than 6, who make up a substantial share of the population, would not be expected to attend school; their presence in the sample would dilute

the effects of FT on educational outcomes. Second, persons older than 13 will include many persons too old to have their primary educational experiences affected by participation in FairTrade USA's initiative. In addition, expecting FT participation to dramatically affect tertiary or even secondary education attainment in rural areas of these poor countries (GNI per capita: Guatemala $2400; Nicaragua $910; Peru $2610; World Bank 2005, http://devdata.worldbank.org/data-query/) may be too strong a test of FT's impact. Indeed, net secondary school enrollment, 1997-1999 in Nicaragua is only 53% among girls and among boys 49%; in Guatemala, it is only 32%; among girls and among boys 38%; while in Peru, it is 61% among girls and among boys 62% (http://globalis.gvu.unu.edu; http://www.earthtrends.org). We report the analyses on children 6-13 because the results of these analyses are uniformly more robust, i.e., explain more variance than the analyses run on the entire sample from each country. The age of the head of household was replaced by the age of the child as a covariate in these analyses.

Furthermore, we employed two approaches in the analysis of the effects of producer's participation on educational outcomes. To assess maximum grade obtained in terms of years of formal education, we ran a series of standard regressions as described below. To assess the probability of being currently in school we ran binomial logistic regressions, because we measured the dependent measure on a binary scale (in school, not in school). Subsequently, to try to account for the indirect effect of participation in the Fair Trade marketing scheme on educational outcomes we analyzed paths of association among interrelated variables. In these analyses we also assess grade obtained and likelihood of a child currently attending school, but we sought to determine if the effects of higher income earned via participation in TF marketing scheme could be detected on these dependent measures.

Results

Economic Outcomes

--Insert Tables 5a-6c about here--

As can be seen from Tables 5a-c, after controlling for holding size, age of head of household, and number of household members, FT farmers out-produce non-FT farmers. Holding size, of course, is a significant predictor of productivity, but the results show that FT farmers out-produce non-FT farmers even with this effect is included; thus, FT farmers are more efficient users of their land, as well as more productive. Further, as can be seen from Tables 6a-c, FT farmers obtain higher prices than non-FT farmers. These results are gratifying since the Fair Trade concept is designed to accomplish exactly these outcomes, but this success comes against the backdrop of obdurate rural poverty in these countries. However, our study provides independent confirmation that TransFair USA is delivering on this aspect of its core value proposition. Participating farmers garner an increased share of coffee prices relative to non-participating farmers.

Educational Attainment

Regression Analysis

Pooling data across countries, we ran an ordinary linear regression of the level of education (years of formal education; maximum grade achieved) against:

1) Respondent (0= Female; 1= Male)
2) Number of dependents (numeric)
3) Total Income from Coffee (numeric in US dollars)

4) Live in finca (finca=farm; 0= No; 1= Yes)
5) Fair Trade membership (0=non-member ; 1= member)
6) Long-Term Fair Trade membership (0=less than 5 years of participation; 1=at least 6 years of participation)[1]
7) Sex of the Person (0= Female; 1= Male)
8) Age of the child (numeric)
9) Dummy Nicaragua (0=Guatemala or Peru; 1=Nicaragua)
10) Dummy Guatemala (0=Peru or Nicaragua; 1= Guatemala)

We included gender of the respondent as an independent variable because we know that male and female roles in child-rearing vary in these countries, and hence may report different levels of schooling for their children. We were concerned to factor out bias due to these differences in household roles. We included income as a proxy for TransFair USA participation since we found a consistent pattern in which higher incomes from coffee marketing accrued to TransFair USA cooperative members (see tables 6a-6c above). We also measured the effect of Transfair USA cooperative membership directly since we reason that membership is likely to entail exposure to interventions whose goal is to improve agricultural practice, education, and healthcare. Years of membership in the fair trade cooperative system was also included as an independent measure since we reasoned that household investments in education or health care might lag their experience of higher income from coffee sales. In other words other expenditure or investment priorities might intervene before households would risk investing in education. We included sex as an independent variable because disparities in educational attainment are regularly reported in these countries (see above) and TransFair USA places a priority on equality of treatment for girls and women in its member cooperatives. We included number of dependents as an independent variable for several reasons. School fees increase with numbers of school age children and thus may constrain school attendance, and sometimes peasant households limit the numbers of children they are willing to send to formal education programs to meet labor requirements in the household. We included living on the farmstead as an independent variable reasoning that

residential location might foster either heightened school attendance if proximate to local schools or absenteeism if farmsteads are scattered over the production area.

The results of the regression analysis are shown in Table 7. The model is statistically significant, and explains 63.3% of the variability in the level of education of children 6-13 years old ($F=225.92$; $df=11$ $p<0.0001$). As indicated by the highest condition index (16.54), the regression is not affected by multi-collinearity. The estimated coefficients for sex of the person, gender of the respondent, living in the farmstead and TF membership are not statistically different from zero at the 5% confidence level, suggesting that there are no direct FT effects on educational attainment. Only the age of the child and the level of household income from coffee are positively correlated with the number of schooling years of children 6-13 years old. In other words, there is an indirect effect of TF membership through higher coffee income on educational attainment. As expected, the number of dependents has a negative effect on the educational achievement of the members of the family. The fact that the country dummy variables are negative and statistically significant indicates that Peru has a higher average level of educational attainment among children 6-13 years old than Nicaragua and Guatemala, a confirmation of standard indicators (http://earthtrends.wri.org/pdf_library/country_profiles/pop_cou_604.pdf). However, the parameters of the country dummies are not statistically different from each other (F-test=0.40, p-value=0.5255, df=1).

--Insert Table 7 about here--

Path Analysis

We re-evaluated the effects of TF cooperative membership on the level of education of children 6-13 years old through a path analysis. This methodology allows us to capture not only the direct effects of TF membership on education but also its indirect effect through the income

level. The first equation of the structural model relates the level of education (Education) to the sex (Sex=1 if male) and the age (Age) of the person, the place of residence (Farmstead=1 if live in farmstead), the gender of the interview respondent (Respondent=1 if male), the number of dependents (Dependents), and the level of income. The second equation relates income to the social involvement of the producer (Involvement^2), the place of residence, TF membership (TF=1 if member), the area planted (Area) and the number of dependents. Community involvement is a self-reported measure collected during the survey work. We hypothesized that there might be a positive relationship between perceived community involvement (since this entails potentially greater contact with the TransFair USA cooperative and its development programs) and the likelihood of sending children to a local school. Note that Long-Term TF was not included in the second equation since the price paid by TF does not depend on the number of years a producer participates in the program. Schematically, the model is represented as:

(1) $\text{Education} = a_0 + a_1\,\text{Respondent} + a_2\,\text{Dependents} + a_3\,\text{Income} + a_4\,\text{Farmstead} + a_5\,\text{TF} + a_6\,\text{Long-Term TF} + a_7\,\text{Sex} + a_8\,\text{Age} + a_9\,\text{Dummy Nicaragua} + a_{10}\,\text{Dummy Guatemala} + e_0$

(2) $\text{Income} = b_0 + b_1\,\text{TF} + b_2\,\text{Dependents} + b_3\,\text{Area} + b_4\,\text{Farmstead} + b_5\,\text{Dummy Nicaragua} + b_6\,\text{Dummy Guatemala} + b_7\,\text{Involvement} + e_1$

Graphically, we represent the model showing the two component equations in contrasting shades in the Figure as follows:

--Insert Figure about here--

The model was estimated using 3 Stage Least Squares (3SLS). The direct effect of TF on Education is measured by the coefficient a_5 and the indirect effect by (a_3 x b_1). The total effect is the sum of the direct and the indirect effects. We also report the total effect of Farmstead and Dependents.

Table 8 summarizes the results of the mathematical model illustrated in the figure. It shows 63% of the variability in the level of education is explained. The maximum condition number is 17.45, indicating that the estimated model is not affected by multi-collinearity.

--Insert Table 8 about here--

As can be seen in Tables 9 and 10, that show the results of the 3 Stage Least Squares (3SLS) Regression, the data again show that income from coffee positively depends on TF membership, and also upon the number of dependents and the coffee area. Table 9 also shows that the average income from coffee in Guatemala, after controlling for the covariates, is not significantly different than the average income from coffee in Peru; however, income in Nicaragua is significantly higher than in the other two countries. We do not have an explanation for this except that Nicaraguan cooperatives may be passing on a greater share of income to coop members. The level of education is positively correlated with age and income, hence indicative of an indirect effect of TransFair USA membership on level of education. The number of dependents is negatively related to education, consistent with our expectations. However, as shown in table 11 below, the total effect of TF in the level of education of children 6-13 years old, although positive, is not significant. Only the indirect effect of TF membership on education is significant. Living in the farmstead does not have a significant effect on the level of education. The number of dependents is negatively related to the level of education, and the total effect is less than the direct effect due to the positive indirect effect of more hands in the farm that generate higher income.

--Insert Tables 9 and 10 about here—

Binomial Logistic Regression Analysis of the Probability of Being Currently Studying

After pooling data across countries, we ran a binomial logistic regression of "currently studying" (0= no; 1= yes) as a function of:

1) Number of dependents (numeric)
2) Respondent (0= Female; 1= Male)
3) Total Income from Coffee
4) Live in farmstead (0= No; 1= Yes)
5) TF Membership (0=non-member; 1=members)
6) Long-Term Fair Trade membership (0=less than 5 years of participation; 1=at least 6 years of participation)[3]
7) Sex of the Person (0= Female; 1= Male)
8) Age of the Person (numeric)
9) Years of formal education (numeric)
10) Coffee total area (numeric)
11) Dummy Nicaragua (0=Guatemala or Peru; 1=Nicaragua)
12) Dummy Guatemala (0=Peru or Nicaragua; 1= Guatemala)

The variables were entered in a single step.

--Insert Table 11 about here--

The results of the binomial logistic regression are shown in Table 11. The model overall is statistically significant (Likelihood Ratio Chi-Square= 33.15; df=10) and correctly predicts 66.4% of all responses. The statistically significant variables are the age of the child, and TF membership. The likelihood that the child is currently studying decreases with the age of the child; i.e., the older the child the higher the likelihood the child drops-out from school. Note for Guatemala, for example, the official school leaving age is fifteen (http://dev.prenhall.com/divisions/hss/worldreference/GT/education.html), which may heighten this school-leaving tendency. For children 6 to 13 years old, the effect of TF membership on the drop-out rate is negative and statistically significant; i.e. a child from a TF member household is 1.98 times more likely to be currently studying (everything else the same) than a child from a non-TF member household. Thus, we may conclude the TF participation has a positive incidence on current participation in primary education.

Incidence and Treatment of Illness

We report some selected results of analysis of the illness data collected. We first ask what variables influence health in Peru, Nicaragua and Guatemala. Then, we explore what variables influence the probability of not receiving medical treatment when needed. In each country, we collected data on reported illness of family members for a host of common ailments. And we also collected data on variables that might affect illness such as access to clean water. In this presentation, we summarize our results across countries and illnesses using two innovative indices to do so. To simplify the presentation of results across countries and illnesses and to address the first question, we construct an innovative index of health for each family:

$$(1)\quad Health_h = 100 * \left(1 - \frac{1}{N_h}\sum_{j=1}^{N_h}\sum_{i} w_{ic} I_{ij}\right),$$

where h indexes families ($h=1,2,\ldots$), j indexes family members within each family ($j=1,2,\ldots$), i indexes illnesses ($i=$*Anemia, Malaria, Dengue, Diarrhea, Colds, Respiratory Infections*), and c indexes countries ($c=$*Nicaragua, Peru, Guatemala*). N_h is the number of family members for which health information is available from the survey, I_{ij} is an indicator variable which takes the value of 1 if family member j suffered from illness i over the previous year, and w_{ic} is the ratio of total deaths caused by illness i to total deaths caused by all considered illnesses in country c drawn from secondary sources (World Health Organization 2004). The health index takes the value of one hundred when no family member suffered from any of the considered illnesses, and takes the value of zero when all family members suffered from all considered illnesses.

The proposed model relates the index of health to the source of drinking water, the gender of the person, participation in the TransFair USA program, the length of participation, long term FT membership, the number of dependents in the household, the availability of a latrine in the

household, accumulated family wealth, the place of residence, total income from coffee, and the gender of the interview respondent. Water source and latrine are included as variables in this index since water and sanitation quality are widely understood to affect morbidity, even though there may have been some confusion as to the local understanding of the term latrine. The source of drinking water is classed as *water =1*: river, creek, natural fountain or other; *water= 2*: communal or own well; *water= 3*: communal water system. Note that higher values for water indicate safer water sources. The availability of a latrine in the household is classed as *latrine=0*: no; *latrine=1*: yes. The type of floor in the house as a proxy for accumulated family wealth and is classed as *floor=0*: dirt or other; *floor=1*: wood, cement or brick because we presume that investments in improved housing stock, e.g., improved flooring, depend upon the availability of disposable income. All other variables are classed as previously defined. Schematically, the estimating regression can be expressed as:

$$\begin{aligned} Health = {} & \delta_0 + \delta_1 Water + \delta_2 Sex + \delta_3 TF + \delta_4 LongTermTF + \delta_5 Dependents + \delta_6 Latrine \\ & + \delta_7 Floor + \delta_8 Farmstead + \delta_9 \text{Re}\, spondent + \delta_{10} Income \\ & + \delta_{11} DummyNicaragua + \delta_{12} DummyGuatemala \end{aligned} \quad (2)$$

The estimated model suggests that safer water sources, more accumulated wealth (proxied by the type of floors), being male and living in the farmstead are positively associated with the index of health (table 12). The estimated model also suggests that Nicaragua and Guatemala have, ceteris paribus, lower indexes of health than Peru. Furthermore, a t-test of equality of $\delta_{11=}\ \delta_{12}$ suggests that, ceteris paribus, the average index of health is lower in Guatemala than in Nicaragua (F-test = 4.40; df numerator=1; df denominator=937; P-value=0.0362). Finally, after controlling for other variables, participation in Fair Trade is not statistically significant. However, participants with at least 6 years in the Fair Trade program had, on average, higher health indices than other families. While the absence of a direct TF membership effect is disappointing, we are pleased

that length of participation seems to translate into higher health indices. Moreover, we point out that social scientific work on disease shows that the relationships between poverty, illness, culture, and development interventions are anything but simple (Hahn 1999; Inhorn and Brown 1997; Loustaunau and Sobo 1997; Romanucci-Ross, Moerman, and Tancredi 1997).

--Insert Table 12 about here—

In order to explore what variables influence the probability of not receiving medical treatment when needed, we construct the following innovative index of No Treatment:

$$(3)\quad NoTreatment_h = 100 * \left(\frac{1}{N_h} \sum_{j=1}^{N_h} \sum_i w_{ic} DT_{ij} \right),$$

where DT_{ij} is an indicator variables, that takes the value of 1 if person j suffered from illness i and did not receive treatment, and zero otherwise. All other symbols represent the same variables and relationships as in equation (1). The index of No Treatment can take any value between zero (either no person of the family was ill or if someone was ill, s/he got medical attention) to one hundred (all persons of the family suffered from all the considered illnesses and nobody received medical attention for any of the illnesses).

The estimating model relates the index of No Treatment to all the independent variables included in equation (2). The estimated parameters indicate that access to safer water resources and having more accumulated wealth (proxied by type of floors) are associated with lower probabilities of not receiving medical treatment when needed. Stated positively, improved household wealth (proxied by floors) and access to improved water quality are associated with greater likelihood of treatment. The former is an indirect indicator of an FT effect. The mean of the index of No Treatment is not statistically different in Peru than in Nicaragua, but it is significantly higher in Guatemala than in the other two countries. Finally, producers' participation in the TF program is negatively associated with the index of No Treatment,

suggesting that producers that participate in TF, ceteris paribus, are more able to receive medical treatment when needed than non-participants. Furthermore, consistent with expectations long-term participants have even better access to medical attention than short-term participants.

--Insert Table 13 about here--

Discussion

In a review of Fair Trade as a strategy for "ethical globalization," Witkowski (2005, 29) notes,

> The websites of fair trade organizations like to feature their success stories in a variety of locations around the world. However, the efficacy of fair trade has not been adequately tested... Impact studies mostly consist of case analyses based upon qualitative interviews and participant observations. They typically overlook the effects of fair trade on plantation workers and fail to make comparisons with similar producers lacking access to fair trade marketing...

Our study is a response to this and other challenges to make systematic comparisons of FT effects on producer participants in fair trade marketing schemes with non-participants. So, does participation in Fair Trade coffee marketing deliver benefits to small-scale coffee producers as TransFair USA promises; does it contribute to a "better world," to "ethical globalization"? Specifically, are participating producer incomes higher than non participating producers? Are participating producers educational and health status positively impacted by their participation in the TransFair USA sponsored cooperatives charged with investing in these sectors. As we argued in the introduction, the answer to these questions interests researchers seeking for alternative

marketing approaches to foster economic development, consumers of fairly traded products, trade organizations that endorse fair trade (e.g., Specialty Coffee Association of America; www.scaa.org), and the retailers who offer fairly traded coffee in the consumer marketplace of developed countries (Lyon 2006). In sum, the truth value of these claims is central to the credibility of the value proposition that differentiates Fair Trade value chains and fairly traded products from others. Moreover, the answer to these questions is important from a public policy perspective since consumer expenditures on fairly traded products continues to experience explosive growth driven by the ethical concerns of consumers in the Northern Hemisphere (Nicholls and Opal 2005; The Co-Cooperative Bank 2007; FLO International 2007).[4]

According to our analysis (e.g., tables 6a-6c), TransFair USA cooperative participation positively and unequivocally affects income. Some might argue that this merely shows that TransFair USA is doing its job or that improved incomes are insufficient to protect small coffee producers from economic vulnerability (Bacon 2005). However, since we test against the null hypothesis of no effect, and since interventions in agricultural and agricultural marketing systems in the least developed countries have an overall track record of failure (Arnould 2001; Awanyo 2001; Davis 2006; Fonchingong 1999; Gera 2004; Govindand and Chandra 2001; Kaimowitz and Thiele 1999; Mwaisela 2000; Shriar 2007), reporting success for an innovative market-based value chain relying on quantitative measures across a cross-section of communities and countries allows us to reject the null hypothesis, and represents a step with positive policy implications for intervention.

According to our path analysis, TransFair USA cooperative participation unevenly effects educational attainment and the likelihood a child of primary school age is currently studying, an important component of quality of life for at least some participating farmers (Bacon 2005, 506).

We found that the level of education is positively correlated with age and income, hence indicative of an indirect effect of TransFair USA membership on level of education. However, the total effect of TF in the level of education of children 6-13 years old, although positive, is not statistically significant. Only the indirect effect of TF membership on education is statistically significant. By contrast, our binomial regression analysis showed that a child from a TF member household is almost twice as likely to be currently studying as a child from a non-TF member household. Thus, we may conclude the TF participation has a positive incidence on current participation in primary education.

In considering these results, two facts should be born in mind. First, our sample focused on truly small producers, whose livelihoods and well-being case studies of Fair Trade producing communities show are affected by other forces for good and ill than FT participation alone (Bacon 2005). Second, household decision making with regards to educational choices is complex and effected by factors we are not able to account for in these analyses. Consequently, it is only to be expected that the effects of FT participation on educational outcomes are uneven.

The study looked at illness and health seeking behavior. Reducing morbidity among the world's poor has become a renewed development priority (Sachs 2004; World Bank Group 2004) and is certainly an important component of quality of life for some participating coffee producers (Bacon 2005, 506). Although there are some new promising initiatives in health care provision for the poor (Carrin 2002; Rawlings 2005), the track record on reducing rural morbidity and mortality, especially among children; and, inequity in access to care has been mixed (Jones, et al. 2003; Wagstaff, et al. 2004), in part because illness and household health seeking like education is affected by a host of cultural and economic factors (Hahn 1999; Inhorn and Brown 1997; Loustaunau and Sobo 1997; Romanucci-Ross, Moerman, and Tancredi 1997).

Since illness is the result of complex causal mechanisms we should not expect dramatic positive consequences of TransFair USA participation on coop household members' health.

To address these issues in a parsimonious way, we innovated a pair of health indices, one dealing with illness and one with patterns of treatment. The estimated model of factors contributing to our index of health suggests that safer water sources, more accumulated wealth, being male and living in the farmstead are positively associated with the index of health. Participation in Fair Trade alone is not a statistically significant indicator of health. However, TF cooperative participants with at least 6 years in the Fair Trade program had, on average, higher health indexes than others, suggestive of a complex but positive association between participation in TransFair USA cooperatives and improved health.

The study also examined treatment patterns for illness in our samples. In general wealth indicators that are related to TransFair participation are positively related to treatment. Moreover, participation in the TF program is negatively associated with the index of No Treatment, suggesting that producers that participate in TF are more likely to receive medical treatment when needed than non-participants. Furthermore, consistent with expectations long-term participants in TF have better access to medical attention than short-term participants, indicative of cooperative investments in health care education or facilities.

Limitations

In general, while the relationship between FT participation and outcome measures was uneven, in the main, FT participation is associated with an equal or better income, childhood education, and medical care. We cannot show with these data a causal relationship; to do so

would require conducting a true experiment of randomly assigning farmers into FT and non-FT conditions regardless of their preferences, which would be unethical as well as impractical The Fair trade condition was not randomly assigned. Fair Trade cooperatives have been established in places where receptive populations of farmers and other conditions that were desired by a Fair Trade organization coalesced. Thus, at best, our "control group" of non-FT farmers can control for only certain potential alternative explanations, such as location, soil, weather, distances to market, etc. We could not control for enthusiasm for innovations, willingness to learn, or other alternative explanations for the results. While we think it unlikely that such psychological differences would be present from community to community, it is possible.

What we have presented instead is a cross-sectional baseline survey in which we tried to control for as many causal factors as possible, and tried to select comparison groups in a way that eliminated as many alternative explanations as practically possible. Further, our study was conducted on participants in Fair Trade coffee marketing chains in Latin America and its results should not be generalized to all Fair Trade coffee value chains, or to the experiences of producers of tea, bananas, cotton, or other fairly traded commodities. Nevertheless, this study has responded to calls for systematic assessments of fair trade impacts on producers employing quantitative measures (Moore 2004; Witkowski 2005).

Future Research

Our study focused on addressing measures of social and economic impacts of participation in fair trade initiatives. Consequently, we left much for future research. Not only may our measures be re-examined at a later point in time to assess longitudinal impacts and

causation, opportunities abound for further research on Fair Trade impact assessments using emerging business evaluation models such as triple bottom line accounting, social accounting, balanced scorecard, and social return on investment (Witkowski 2005), for example. Further, social impact assessment could be extended to assess how income windfalls are employed. If, for example, additional income is devoted to consumption at the expense of investments in health and education, the contribution of Fair Trade to the goals of improving producers' quality of life or the broader goal of sustainable human development may be called into question as Witkowski (2005, 30) notes. Finally, promoting agricultural sustainability and biodiversity are other facets of rural livelihood that a number of actors in the Fair Trade movement promote including TransFair USA. We examined sustainable practices in Guatemala only with positive results, but systematic review of the impacts of Fair Trade initiatives on agricultural sustainability or biodiversity remains to be undertaken.

Conclusion

To our knowledge, ours is the only study to conduct comparative quantitative analyses of the impacts of participation in Fair Trade coffee supply chains in Latin America among randomly sampled populations. This study shows that participants derive benefits in terms of standard social indicators from participation even if these results are mixed. Given the generally poor state of social indicators reported from the Southern hemisphere cited above despite decades of development assistance, our assessment of the results of TransFair USA's intervention in coffee marketing channels contributes to the positive assessments found in case studies of similar populations (Bacon 2005; Crowell 1997; Murray, Raynolds and Taylor 2003; Raynolds, Murray

and Taylor 2004; Ronchi 2002). Also consistent with these studies, our study suggests Fair Trade is not a panacea for third world poverty. Nevertheless, from a social policy standpoint, fair trade's contribution to "building a better world" through market disintermediation cannot be cynically dismissed.

Naturally, the mainstreaming of Fair Trade via ideas like "shopping for a better world" (Low and Davenport 2005, 495), or "ethical globalization" (Witkowski 2005) has generated criticisms from the ethical consumerism camp that calls ATOs to task for failing to alter power relations between producers and consumers (Lyon 2006) and encouraging more consumerism (Johnston 2002). Furthermore, as Witkowski notes (2005, 30),

> "The involvement of multinational corporations, especially the introduction of private lines of fair trade brands …increases the risk that fair trade might become perceived by suspicious ethical consumers as just so much ethical posturing (Argenti 2004)."

Thus, demonstrating that the core value proposition at the heart of fair trade is defensible in terms of social impact criteria may be of help to ATOs, and other firms and organizations seeking to develop and justify to "suspicious" consumers alternative marketing-based value chains. Such a demonstration may bolster support for Fair Trade policies and programs such as the Fair Trade certified towns program (http://www.fairtrade.org.uk/get_involved/campaigns/fairtrade_towns/default.aspx), as among the ways to address challenges of equitable global economic development.

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[1] Long-term FT members were only observed in Guatemala.

[2] Social involvement is codified as high, medium or low.

[3] Long-term FT members were only observed in Guatemala.

[4] Fair Trade continues to show strong growth, with sales of products carrying the FAIRTRADE Mark growing by 49 per cent to reach £285 million in 2006. The Fairtrade Foundation reports that the FAIRTRADE Mark is now recognized by 57 per cent of British adults, an increase of five percentage points in one year (Cooperative Bank 2007, 10). In the US, the volume of fair trade retail sales rose by 45% between 2005 and 2006 and the number of licensees increased from 534 to 615, a 15% increase (FLO International 2007, 10)

Table 1. Sample Size in Each Country

Country	Fair Trade				Non-Members	Total
	Small Coops	Medium Coops	Large Coops	FT Total		
Peru	30	117	130	277	125	402
Nicaragua	57	70	212	339	123	462
Guatemala	64	85	116	265	140	405
Total	151	272	458	881	388	1269

Table 2. Average Number of Dependents per Household:

ANOVA Test of Significant Differences

	Means		ANOVA		
Country	FT members	Non-Members	F-test	p-value	η^2
Peru	4.20	4.14	0.08	0.7808	**0.0001**
Nicaragua	2.78	3.15	8.74	0.0033	**0.0191**
Guatemala	**5.44**	**5.20**	**1.12**	**0.2898**	**0.0028**

Table 3. Mean Age of the Household Head

ANOVA Test of Significant Differences

	Means		ANOVA		
Country	FT members	Non-Members	F-test	p-value	η^2
Peru	55.73	51.94	7.2170	0.0075	**0.0178**
Nicaragua	44.29	43.78	0.1215	0.7276	**0.0003**
Guatemala	**45.19**	**43.51**	**1.4931**	**0.2225**	**0.0037**

Table 4. Mean Coffee Total Area (in hectares)

ANOVA Test of Significant Differences

	Means		ANOVA		
Country	FT members	Non-Members	F-test	p-value	η^2
Peru	3.36	2.43	31.5913	<0.0001	**0.0734**
Nicaragua	4.56	3.51	9.9459	0.0017	**0.0212**
Guatemala	**2.26**	**2.06**	**3.6531**	**0.0567**	**0.0090**

Table 5a. Guatemala. APO (Arabe Pergamino Oreado) Traded Volume Regression with Dependent Variable: Coffee Volume Sold by Family

Independent Variable	Estimate	Std Error	t-test	p-value
Intercept	0.727955738	0.46313849	1.57	**0.1168**
TF Membership**	0.376491611	0.16157863	2.33	**0.0203**
Age of the household head	-0.008157191	0.00603154	-1.35	**0.1770**
Coffee Total Area***	1.651723301	0.28586705	5.78	**<.0001**
Number of Dependents	0.052954796	0.03642561	1.45	**0.1468**
F-test (p-value)	12.23(<0.0001)			
R Square	**0.114297**			

Significance level: * at 10%, ** at 5%, *** at 1%

Table 5b. Peru. APO Traded Volume
Regression with Dependent Variable: Coffee Volume Sold by Family

Independent Variable	Estimate	Std Error	t-test	p-value
Intercept	0.9910849111	0.28023455	3.54	**0.0005**
TF Membership* **	0.4935280594	0.11271778	4.38	**<.0001**
Age of the household head*	-.0074467304	0.00394553	-1.89	**0.0599**
Coffee Total Area* **	0.8789442027	0.07761676	11.32	**<.0001**
Number of Dependents*	0.0397897384	0.02389013	1.67	**0.0966**
F-test (p-value)	49.89 (<0.0001)			
R Square	**0.338480**			

Significance level: * at 10%, ** at 5%, *** at 1%

Table 5c. Nicaragua. APO Traded Volume
Regression with Dependent Variable: Coffee Volume Sold by Family

Independent Variable	Estimate	Std Error	t-test	p-value
Intercept	0.079063638	0.49990307	0.16	**0.8744**
TF Membership* **	0.739124046	0.24288934	3.04	**0.0025**
Age of the household head	-0.002343556	0.00804379	-0.29	**0.7710**
Coffee Total Area* **	1.229703868	0.06905616	17.81	**<.0001**
Number of Dependents	0.151958406	0.09277638	1.64	**0.1023**
F-test (p-value)	92.02 (<0.0001)			
R Square	**0.506949**			

Significance level: * at 10%, ** at 5%, *** at 1%

Table 6a. Guatemala. Regression with Dependent Variable: Price Obtained

Independent Variable	Estimate	Std Error	t-test	p-value
Intercept	6.318387628	0.39226457	16.11	**<.0001**
TF Membership* **	1.149847202	0.13950664	8.24	**<.0001**
Age of the household head	0.002711125	0.00536272	0.51	**0.6135**
Coffee Total Area	-0.197793988	0.24262671	-0.82	**0.4155**
Number of Dependents	-0.013564784	0.03162345	-0.43	**0.6682**
F-test (p-value)	17.18 (<0.0001)			
R Square	**0.160325**			

Significance level: * at 10%, ** at 5%, *** at 1%

Table 6b. Peru. Regression with Dependent Variable: Price Obtained

Independent Variable	Estimate	Std Error	t-test	p-value
Intercept	1.829650066	0.15979086	11.45	**<.0001**
TF Membership* **	0.713667157	0.06427213	11.10	**<.0001**
Age of the household head	-0.003053039	0.00224976	-1.36	**0.1755**
Coffee Total Area*	0.083342087	0.04425739	1.88	**0.0604**
Number of Dependents*	0.022985847	0.01362225	1.69	**0.0923**
F-test (p-value)	39.35 (<0.0001)			
R Square	**0.287563**			

Significance level: * at 10%, ** at 5%, *** at 1%

Table 6c. Nicaragua. Regression with Dependent Variable: Price Obtained

Independent Variable	Estimate	Std Error	t-test	p-value
Intercept	3.630879780	0.41876181	8.67	**<.0001**
TF Membership* **	3.357192908	0.20515182	16.36	**<.0001**
Age of the household head	-0.002203877	0.00671067	-0.33	**0.7428**
Coffee Total Area	-0.025495129	0.05774812	-0.44	**0.6591**
Number of Dependents* **	-0.248341492	0.07645613	-3.25	**0.0013**
F-test (p-value)	76.60 (<0.0001)			
R Square	**0.438705**			

Significance level: * at 10%, ** at 5%, *** at 1%

Table 7. Regression with Dependent Variables: 6-13 Year Old Children's Educational Attainment

Variable	Parameter Estimate	Std. Error	t-value	p-value
Intercept	2.3436	0.1077	21.77	<.0001
Respondent	0.0546	0.0571	0.96	0.3388
Number of Dependents**	-0.0216	0.0097	-2.24	0.0252
Live in Finca	-0.0170	0.0494	-0.34	0.7312
Total Income from Coffee***	0.0001	0.0000	3.10	0.002
FT membership	0.0208	0.0436	0.48	0.6331
Long-Term Fair Trade membership	0.0688	0.0666	1.03	0.3016
Sex of the child	-0.0449	0.0375	-1.20	0.2314
Age of the child***	0.4587	0.0172	26.61	<.0001
Dummy Nicaragua***	-1.9242	0.0579	-33.21	<.0001
Dummy Guatemala***	-1.7252	0.0637	-27.07	<.0001
F-test (p-value)	225.92 (<0.0001)			
Adjusted R Square	0.6334			
Number of Observations Used	1303			
Degrees of Freedom	11			
Highest Condition Index	16.54			

Dependent Variable: Level of Education; Significance level: * at 10%, ** at 5%, *** at 1%

Table 8. 3 Stage Least Squares (3SLS) Regression, 6-13 Year Old Children's Educational Attainment: Model Summary

Equation	DF Model	DF Error	R^2	Adj R^2	F-test	p-value
Education	11	1282	0.6348	0.6320	202.58	<0.0001
Income	8	1285	0.5580	0.5555	180.11	<0.0001

Table 9. 3 Stage Least Squares (3SLS) Regression, 6-13 Year Old Children's Educational Attainment: Parameter Estimates

Effects	Parameter	Estimate	Approx Std Err	t Value	Approx Pr > |t|
Education					
Constant	a_0	2.3587	0.1078	21.880	<.0001
Respondent	a_1	0.0516	0.0574	0.900	0.369
Dependents**	a_2	-0.0225	0.0097	-2.320	0.021
Income***	a_3	0.0001	0.0000	4.080	<.0001
Farmstead	a_4	-0.0218	0.0495	-0.440	0.660
TF	a_5	0.0104	0.0441	0.240	0.814
Long-Term TF	a_6	0.0651	0.0669	0.970	0.330
Sex	a_7	-0.0416	0.0377	-1.100	0.270
Age***	a_8	0.4576	0.0173	26.440	<.0001
Dummy Nicaragua***	a_9	-1.9521	0.0583	-33.500	<.0001
Dummy Guatemala***	a_{10}	-1.7235	0.0640	-26.950	<.0001
Income					
Constant	b_0	-769.9210	86.7193	-8.880	<.0001
TF***	b_1	181.9992	38.7189	4.700	<.0001
Dependents * **	b_2	24.7572	8.3452	2.970	0.003
Area***	b_3	424.2320	17.5076	24.230	<.0001
Farmstead	b_4	-15.0365	43.3763	-0.350	0.729
Dummy Nicaragua***	b_5	704.3555	47.3304	14.880	<.0001
Dummy Guatemala	b_6	9.8406	53.3091	0.180	0.854
Involvement	b_7	27.4840	24.9444	1.100	0.271

Significance level: * at 10%, ** at 5%, *** at 1%

Table 10. 3 Stage Least Squares (3SLS) Regression, 6-13 Year Old Children's Educational Attainment: System-wide effects

Effect	Estimate	Approx Std Err	t Value	Approx Pr > |t|	Label
TF Direct	0.0104	0.0441	0.240	0.814	a_5
TF Indirect* **	0.019629	0.00638	3.08	0.0021	$(b_1. a_3)$
TF Total	0.030019	0.0433	0.69	0.4884	$a_5+(b_1. a_3)$
Farmstead Total	-0.02339	0.0496	-0.47	0.6373	$(b_4.a_3)+a_4$
Dependents Total**	-0.01981	0.00969	-2.04	0.0411	$(b_2.a_3)+a_2$

Significance level: * at 10%, ** at 5%, *** at 1%

Table 11. Binomial Logistic Regression: Model of Children 6-13 Years Old Currently Studying

	Estimates	S.E.	Wald	Df	Pr >ChiSq	Odds Ratio Estimates
Intercept	2.1787	0.6401	11.5858	1	0.001	
Number of dependents	0.0771	0.0507	2.3083	1	0.129	1.080
Respondent	-0.3255	0.3083	1.1148	1	0.291	0.722
Income*	-0.0002	0.0001	2.8019	1	0.094	1.000
Live in farmstead	0.1222	0.2600	0.2207	1	0.639	1.130
TF MEMBER***	0.6817	0.2157	9.9896	1	0.002	1.977
Long-Term TF Membership	-0.1458	0.4230	0.1188	1	0.730	0.864
Sex of the Person	-0.1590	0.1925	0.6823	1	0.409	0.853
Age of the Person***	-0.3060	0.1121	7.4529	1	0.006	0.736
Educational Level	0.0206	0.1325	0.0242	1	0.876	1.021
Coffee Area	0.0076	0.1098	0.0047	1	0.945	1.008
Dummy Nicaragua	0.2363	0.3737	0.3998	1	0.527	1.266
Dummy Guatemala*	0.7618	0.4068	3.5066	1	0.061	2.142
N	1294					
Likelihood Ratio (Chi-Square)			37.2301	10	0.0002	
Association of Predicted Probabilities and Observed Responses						
Percentage Concordant	66.4					
Percent Discordant	32.6					
Percent Tied	1.1					

Significance level: * at 10%, ** at 5%, *** at 1%

Table 12. Ordinary Least Squares Regression, Dependent variable: *Health*

Variable		Parameter Estimate	Std. Error	t-value	p-value
Constant	δ_0	32.248	5.822	5.539	0.000
Water***	δ_1	6.465	1.061	6.097	0.000
Sex*	δ_2	9.024	4.399	2.051	0.041
TF	δ_3	3.453	2.146	1.609	0.108
Long Term TF*	δ_4	8.017	3.717	2.157	0.031
Dependents	δ_5	-0.509	0.449	-1.133	0.258
Latrine	δ_6	2.548	3.708	0.687	0.492
Floor**	δ_7	5.817	1.977	2.942	0.003
Farmstead**	δ_8	7.720	2.497	3.092	0.002
Respondent	δ_9	2.395	2.614	0.916	0.360
Income*	δ_{10}	0.003	0.002	1.757	0.079
Dummy Nicaragua**	δ_{11}	-9.016	2.862	-3.150	0.002
Dummy Guatemala**	δ_{12}	-16.605	3.067	-5.415	0.000
R Square		0.14502			
N		950			
F-test (p-value)		12.22 (<0.0001)			

Significance level: * at 10%, ** at 5%, *** at 1%

Table 13. Ordinary Least Squares Regression, Dependent variable: *No Treatment*

Variable		Parameter Estimate	Std. Error	t-value	p-value
Constant	δ_0	25.330	4.996	5.070	0.000
Water***	δ_1	-6.605	0.910	-7.257	0.000
Sex	δ_2	4.217	3.775	1.117	0.264
TF*	δ_3	-3.923	1.841	-2.131	0.033
Long Term TF**	δ_4	-11.563	3.190	-3.625	0.000
Dependents*	δ_5	0.705	0.386	1.830	0.068
Latrine	δ_6	0.184	3.182	0.058	0.954
Floor**	δ_7	-6.957	1.697	-4.100	0.000
Farmstead	δ_8	-0.393	2.143	-0.183	0.855
Respondent	δ_9	0.776	2.244	0.346	0.729
Income*	δ_{10}	-0.002	0.001	-1.651	0.099
Dummy Nicaragua	δ_{11}	1.099	2.456	0.448	0.655
Dummy Guatemala**	δ_{12}	34.247	2.632	13.014	0.000
R Square		0.3276			
N		950			
F-test (p-value)		35.11 (<0.0001)			

Significance level: * at 10%, ** at 5%, *** at 1%

Figure. Path Model of 8-13 Year Old Children's Educational Attainment