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**Fair trade and
wellbeing
improvements:
evidence from Sri
Lanka**

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Abstract

This paper investigates whether and how Fair Trade certification improves the wellbeing of small-scale producers by drawing upon a field study carried out by the authors in 2009 in the Central Province of Sri Lanka. A point of departure from earlier studies is to use a mixed methods approach, combining qualitative and quantitative data to assess the impact of Fair Trade on a broader set of development indicators to capture both the monetary and non-monetary progress of farmers. Methodologically, to overcome the limitation of small sample sizes of non-experimental survey data, we propose the use of propensity-score weighted linear and non-linear regression models with and without instrumenting the farmers' participation in Fair Trade. Here we have made treatment and control groups observationally comparable by applying propensity score matching (PSM) to match and weight the data, following Hirano and Imbens. We have found that Fair Trade certification increased farmers' actual income from tea production significantly, with fewer hours of work per day and accelerated perceived improvement in overall household income, as well as empowering women in decision making. Our mixed methods approach led us to conclude that Fair Trade certification benefits Fair Trade tea farmers through increased tea income and risk reduction.

Keywords

Fair trade, improved income, wellbeing, mixed methods, PSM, probit, IV, Sri Lanka

JEL Codes

C21, C26, O13, Q17

1. Introduction

Fair trade is an alternative trading system intended to aid development and reduce poverty for small, marginalised producers.¹ While Fair Trade initially took the form of a solidarity and charity-based movement directly aimed at helping marginalised producers, it has grown and changed significantly from its original operational structure. The initiative has become more mainstream, with labelled products now available from conventional shopping outlets as opposed to specific charitable locations, such as Worldshops and church-based institutions. It has also taken a much more central position in political discussions following the second United Nations Conference on Trade and Development in 1968, when the phrase ‘trade not aid’ became prominent in development policy debates. The introduction of Fair Trade-labelled products initially assumed the existence of demand for such products from ethically minded consumers. The growth of Fair Trade sales in recent years indicates such demand does exist. In 2016, global sales of Fair Trade products were €7.88 billion, with over 1.6 million workers and farmers and over 1,140 producer cooperatives (Fairtrade Foundation, 2019).

In the context of a growing market, evaluating Fair Trade from the perspective of the producers can inform end-consumers of the actual impact of their decision to purchase a Fair Trade product. This paper adopts a mixed methods approach combining quantitative and qualitative data to investigate whether Fair Trade does or does not improve the wellbeing of small-scale producers, drawing upon a case study of Fair Trade tea producers in the Central Province of Sri Lanka. The results will be of interest to various stakeholders within the Fair Trade system for the following reasons. First, ethical consumers purchase these products in the belief that there are material benefits arising to small producers; hence demonstrating whether this is an important tool in the continuance of sales growth and market share is worthwhile. Second, if our results show the effectiveness of Fair Trade as a means of improving wellbeing for producers, they will serve as an evidence-based defence against some of the criticisms of the Fair Trade system, such as those found in Lindsey (2007) and Sidwell (2008). These authors argue that Fair Trade works to keep marginalised producers in low-income activities by subsidising their labour, and that Fair Trade producers do not benefit from the allegedly higher prices paid by consumers. Third, producers themselves need to know whether the Fair Trade system is beneficial or not beyond the potential increase or decrease in incomes, for instance in terms of non-monetary gains, as an indication of improved wellbeing. This information may encourage new members to join local Fair Trade cooperatives, and encourage loyalty during those times when world prices are above the

¹ The accepted definition of Fair Trade in academic literature “is a trading partnership, based on dialogue, transparency and respect, which seeks greater equity in international trade. Fair trade is seen to contribute to sustainable development by offering better trading conditions to, and securing the rights of, marginalized producers and workers, especially in the South. Fair trade organizations (backed by consumers) are engaged actively in supporting producers, raising awareness, and in campaigning for changes in the rules and practice of conventional international trade” (<https://wfto.com/fair-trade/definition-fair-trade>).

minimum guaranteed price and thus threaten Fair Trade production. Finally, for the cooperatives themselves, our study will provide vital information for improvement as well as facilitating the sharing of any observed good practice following the previous studies (e.g Bacon, 2005) which assess their performance and systems of support for producers

The villages selected for our study are located in Gampola, within the Central Province of Sri Lanka. The selection of the province and villages was made on the basis of whether tea production was a major activity.² The Central Province of Sri Lanka, the region of our focus, is located in the country's central hills and consists of three districts: Kandy, Matale and Nuwara Eliya. It is predominantly agricultural and has a land area of 5,575 square kilometres, which is 8.6% of the total land area of Sri Lanka (Central Bank of Sri Lanka, 2013). The elevation in the Province ranges from 600 feet to over 6,000 feet above sea level.³ Earlier studies on Fair Trade have tended to focus mainly on establishing its aggregate economic impacts (Ronchi, 2002a; Bacon, 2005; Beuchelt & Zeller, 2011; Weber, 2011; Ruben & Fort, 2012; Dragusanu & Nunn, 2018). These studies did not investigate the impact of Fair Trade on the non-economic wellbeing of producers using conventional trade as a benchmark. Nor did they pay much attention to which dimensions – economic or non-economic – in household wellbeing improved, despite growing evidence that broader human wellbeing is an important consideration in poverty studies (Kingdon & Knight, 2006; Schleicher et al, 2018). A few recent studies on Fair Trade certification, however, have started to examine the impact of Fair Trade on the non-economic aspects of farmers' wellbeing, such as social capital (Elder et al, 2012), and environmental standards (Elder et al, 2013). Our paper builds upon this new strand of literature to focus on both the economic and non-economic impacts of Fair Trade certification.

The paper also aims to make a contribution to academic and policy debates on Fair Trade by developing a methodology to measure the impact of Fair Trade on wellbeing. We identify variables that are important to achieving measurable gains in wellbeing for small-scale producers. The major strand in the empirical literature on measuring household wellbeing draws upon the capability approach, which focuses on what individuals can potentially do or potentially be (Sen, 1992), and typically measures household welfare using multidimensional indicators covering non-income dimensions of welfare, such as education, health and/or household assets (e.g Alkire & Foster, 2011; Yang, 2018). These multidimensional indicators, such as the Multidimensional Poverty Index, are based on objective assessment and typically ignore any subjective assessment of household wellbeing. Ravallion (2011) also argues that the multidimensional indicator needs to weight each dimension to construct the composite index where the weights are inevitably arbitrary; single-dimensional indicators may be better. If we follow Ravallion's (2011) argument, the next question is which dimension or indicator would best capture household wellbeing. While selecting single-dimensional measures to proxy the household welfare or capability is not straightforward and the selection of the variables is constrained by data availability, the literature on welfare

² The villages are Samarakoohena, Deenside, Nawa Gurukelle, Gurukele Village, Oruwel, Nillambe and Dewita.

³ Based on the website of Central Provincial Council <http://www.cp.gov.lk/en/home/administrative-geological-extent.html> (accessed on 3rd December 2019).

measurement suggests that both subjective and objective indicators should be used, as they have their own usefulness and they are independent (Cummins, 2000). The present study thus attempts to capture household wellbeing by using both subjective (eg perception of income improvement; the women's bargaining index) and objective indicators (eg hours of work for tea production, actual income from tea production) to reflect multiple dimensions in household wellbeing.

We analyse data from our 2009 survey of 157 Sri Lankan tea producers and use the propensity-score weighted linear and non-linear regression models to estimate the links between Fair Trade and improvement in producers' wellbeing. Following our strategy of measuring household wellbeing based on single-dimensional indicators, the former is measured by both income and non-income indicators, namely, income from tea production, improvement in overall household income, whether household members spend the money on non-necessity goods other than foods, clothing and housing, hours worked on tea production and bargaining power of women in the household.⁴ Our investigation of Fair Trade in the Central Province of Sri Lanka is, to the best of our knowledge, the first study within this region. The focus on tea rather than on more widely researched products, such as coffee or bananas, is a valuable extension to the empirical literature on Fair Trade (Jaffee, 2008; Fort & Ruben, 2009; Mendez et al, 2010; Smith, 2010; Beuchelt & Zeller, 2011; Ruben & Fort, 2012; Dragusanu & Nunn, 2018) because it adds a new empirical dimension to Fair Trade research.⁵ The collection of primary data provides a broader investigation than has been the case in previous studies, since our data capture a breadth of material and non-material indicators within a single study: *inter alia* improved income, working hours on tea production, household development, secondary income and women's empowerment.

The rest of the paper is organised as follows. In the next section, we situate the significance of our study in existing academic and policy debates on Fair Trade and wellbeing. Section 3 then presents our research methodologies and data collection, while Section 4 reports and discusses the results of the empirical analysis. Section 5, the concluding section, discusses our main findings and highlights lessons from this case study.

2. Literature review: evaluating the effect of Fair Trade on farmers' wellbeing

In this study we offer a wellbeing approach to Fair Trade in order to articulate and demonstrate the benefits of such trade to producers. Although Fair Trade has not been a

⁴ Bargaining power is proxied by a dummy variable created by the survey on whether a wife can make a sole decision or only a joint decision on important household spending, such as purchase of durable goods. The variable takes 1 if a wife can have an influence on decision making on household spending and 0 otherwise, where a husband makes a sole decision.

⁵ Exceptions include Qiao et al (2016), who showed that organic agriculture and fair trade certification provided small-scale tea growers with economic and social benefits in China, and Besky (2008), who showed that Fair Trade tea certification led to the dissolution of workers' unions in India.

major subject of economics research, there have been several notable contributions (eg LeClair, 2002; Hayes, 2006; Dragusanu et al, 2014). LeClair and Hayes debate the welfare benefits and conclude that the outcome is dependent on the definition of 'subsidy' in the model. A number of studies (eg Murray & Reynolds, 2000; Renard, 2003; Lewis, 2005; Le Velly, 2007; Dolan, 2010) have examined the sustainability of Fair Trade as a system in the long run. These studies have identified several challenges to the long-run viability of Fair Trade, such as the consequences of increased supply, diversification of product and labour, the mainstreaming of Fair Trade products, satisfying quality standards and poverty alleviation.

Many of the existing studies of Fair Trade adopted a case study approach, like ours, to analyse its impact on producers, with a particular focus on the role Fair Trade plays in supporting crop farmers in developing countries. These impact studies have identified some themes common to case studies in the specific country or regional context. Common findings on Fair Trade's positive impacts relate to: (1) the reduction in uncertainty faced by producers as the floor price is set to the selling price (Utting-Chamorro, 2005; Bacon, 2005); (2) the positive impact of the premium on local development (Smith, 2010; Ronchi, 2002); and (3) gains for farmers' organisational capacity through working within a cooperative (Utting-Chamorro, 2005; Bacon 2005). Areas of concern that were highlighted by these studies include continuing inequalities and poverty; low levels of awareness of Fair Trade within certified producer groups; and unstable farm-gate prices and financing (Utting-Chamorro, 2005).

While these studies focus primarily on the impact of Fair Trade on producers, it should be noted that Fair Trade may have a negative effect on the wellbeing of hired workers. For example, Cramer et al (2017) found that the Fair Trade certification for coffee production negatively affected wages of hired workers because of the poor monitoring of such wages and the working conditions of the coffee workers in the sites in Ethiopia and Uganda.⁶

The effect of Fair Trade may not be limited to the individual human capital or wellbeing of farmers or workers. For example, Elder et al (2012) examined the effects of Fair Trade certification on social capital – measured as farmer trust and participation – among coffee farmers in Rwanda and found a positive association between Fair Trade and a perceived higher level of participation of women. This is consistent with one of the findings of our study, that is, a positive association between Fair Trade certification and women's bargaining power. Elder et al (2013) showed that Fair Trade certification encouraged more sustainable agricultural practice, like agroforestry or use of manure, in Rwanda, which would influence farmers' wellbeing in the long run. While our study does not focus on the effect of Fair Trade on social capital or the environment, it builds upon the previous impact studies by examining both economic and non-economic impacts of Fair Trade certification on tea farmers. We also contribute to the empirical literature by applying an improved methodology to provide a more rigorous estimate in cases where the sample size is small. For this purpose, the qualitative method is combined with the

⁶ We do not have the data on wages of hired workers and we will not examine the effect of Fair Trade certification on hired labour, as our focus is on the effect of Fair Trade on producers.

quantitative method, based on Instrumental Variable (IV) and OLS (Ordinary Least Squares) models with propensity score matching (PSM) and weighting.

3. Research methodology and data

In order to identify both the material and non-material gains from Fair Trade to tea farmers in the Central Province region of Sri Lanka, we use a mixed methods approach to combine qualitative and quantitative methodologies. This approach involves data collection using a questionnaire and structured interviews to qualitatively analyse the economic and wellbeing impact of Fair Trade. The econometric analysis also draws on responses to the questionnaires to measure the relationship between producers and Fair Trade certification. This concurrent mixed methods approach, combining both quantitative and qualitative data, can lead to a better understanding of the research problem.

3.1. Sampling and data collection

We have used a stratified sampling method to reflect the purpose of the research. A basic requirement for the sample is the presence of sufficient data to carry out statistical analysis where we bear in mind that the number of cases selected is also dependent on the availability of producers and the costs involved in data collection (Van de Ven, 2007). Sample sizes from previous studies (Ronchi, 2002a; Becchetti & Constantino, 2006; Jaffee, 2008) provide a rough guidance for the appropriate sample size and in the empirical literature on Fair Trade a sample of 157 farmers would be deemed an appropriate and meaningful sample. To determine the sample size, we followed the general principles laid out by Singleton and Straits (2017) who suggest several interrelated principles – (1) the heterogeneity of the population; (2) the desired precision of generalisation; (3) the choice of sampling technique or method; (4) time/cost factors; and (5) the planned stratification of the data. On the desired precision of generalisation, we calculated the required sample size based on the power calculation (Djimeu & Houndolo, 2016).⁷ For the purposes of this study, the need to over-sample (Salkind, 1997) to allow for non-response is not relevant, as the questionnaires were completed during face-to-face meetings with the producers in the field (rather than being carried out via mail/email or telephone). In this way errors in data entries or interpretational mistakes were minimised to ensure the quality of data.

The study incorporated 40 Fair Trade and 40 conventional trade farmers in the Gampola area during 2009, the only region in Sri Lanka known to have Fair Trade operating at the

⁷ We determined the minimum size of the treatment group (43) and that of the control group (129), making 172 in total, if we planned to test the null hypothesis 'H₀: means of tea income are same for Fair Trade and conventional farmers' against 'H_a: the means are different', with the control group three times larger than the treatment group, the power (or the ability to detect the difference) 80%, the significance level 5% and the moderate effect size (the mean difference divided by the standard deviation of the control group) 0.5. The actual sample size (157) is slightly smaller than this but well above 101, with the significance level changed to 10%.

time. A further 77 tea producers were sampled in 2009 in the neighbouring village in Central Province where no Fair Trade cooperatives operate.⁸ It is noted that the Central Province was selected as a majority of tea production takes place in this province. The selection of the villages was made in such a way that Fair Trade tea farmers in Gampola could be compared with those in and outside that village in terms of both agro-ecological conditions and farmers' characteristics. Selection was based on the condition that each of the farmers had one acre of land primarily used to grow tea, with some farmers diversifying into the production of spices such as pepper, cloves and lemongrass.

All the 40 Fair Trade farmers were members of the Small Organic Farmers Association (SOFA) cooperative. The areas selected within Gampola for visits each day were randomly chosen from a selection of small villages in which SOFA operates. Within these villages, farmers were selected using a judgement framework based on whether they were Fair Trade or conventional trade farmers, operated with or independently of SOFA, and were tea producers. The Fair Trade farms were easily identified by the lot number indicated on the edge of each of their farms, which enabled a distinction to be made between Fair Trade and conventional trade farms in the area. In each village, farmers from each category were randomly selected. For the Fair Trade farmers, SOFA provided a list of all villages and members in Gampola with SOFA membership. The list included 21 villages and a total of 1082 farmers. From this, villages were randomly selected and then the farmers were randomly chosen from within each village. For conventional trade farmers, no list was available and therefore the same villages were selected in Gampola and the villages were randomly selected across the area outside Gampola and inside the Central Province. Participants were randomly chosen and asked to participate while we were administering the surveys in each village. None of the farmers declined the invitation to complete the survey.

Interviews were held in 2009 with three managers involved with the SOFA cooperative. Interviews were also held with 20 producers involved in SOFA. Producer participants were selected for interview based on their decision to participate, or remain outside the cooperative, from which heads of organisations were also selected for interview.⁹ A sub-group of the producers, used as part of the questionnaire process, was chosen for the purpose of triangulating answers and exploring the responses to surveys in greater detail. This sub-sample of tea producer participants was selected to be representative of the entire sample of tea producers in the study area by taking into account the age, gender and educational information provided in the questionnaires.

⁸ Eighty households were originally surveyed in various nearby villages outside Gampola with similar agro-ecological conditions, but three were dropped as a few variables were missing. Among 80 tea producing farmers, 40 were selected from the villages close to Udupihilla, namely, Poojapitiya, Botagalla, Palkumbra Village and Rajaphillia. The second 40 were selected from the villages near Warakapola, namely, Didigama, Pitagaldeniya, Dippitya, and Mahapallegama.

⁹ Under the SOFA cooperative contract, the member farmers are offered training on organic tea cultivation and provided with new plants, organic fertiliser and tools, and the farmers can sell the green leaf exclusively to the Bio Foods PVT (Ltd), a leading processor and exporter of internationally certified organic, biodynamic and Fair Trade teas, at the negotiated price of Rs.50–60 per kilo, according to quality. This is around double the price paid by local traders. See <https://www.fairtrade.org.uk/Farmers-and-Workers/Tea/Bernard-Ranaweera>. Accessed: 4 November 2019.

Interviews consisted of one-to-one sessions, set within the perspective of realistic interviews. The interviews comprised 25 questions posed to three organisational heads and 10 cooperative members. The interviews were clearly structured to allow for direct comparison and for triangulation against other collected data (ie questionnaires, observation, secondary data) to ensure its accuracy (Cassell & Symon, 2004).

In addition, a questionnaire was drawn up and completed by 157 tea farmers – 40 Fair Trade and 40 conventional trade tea farmers in Gampola – as well as a further 77 tea farmers in a separate tea-producing village where there was no Fair Trade operation. None of the farmers declined the invitation to complete the survey. As recommended in the literature (De Vaus, 2013), the survey was designed to determine behaviour, beliefs, knowledge, attitudes and attributes reflecting the objectives of our study, that is, identifying producer attitudes towards Fair Trade, and its impacts on an indicator of well-being, including improvement in overall family income, personal development and hours worked. Specifically, we investigated producers' beliefs with regard to causation of any gains or losses, and whether these beliefs differed between Fair Trade cooperative members and non-members. For 'belief' questions, our research was concerned with what the participants believed to be true regarding the effectiveness of Fair Trade. For instance, regardless of whether it can conclusively be shown that Fair Trade is solely responsible for the development or income difference between members and non-members, further expansion and increased membership of the cooperative will be markedly difficult if there is no belief that the cooperative is the cause of improvements. With regard to 'attitude' questions the research was concerned with what the producers believed was appropriate given their experiences, for instance, whether they had experienced any personal development. Third, the study considered the attitudes of different beliefs and knowledge, exploring relationships between such attitudes and variables such as age, number of children and educational attainment.

The questionnaire was designed to explore material and non-material indicators of the impact of Fair Trade on the lives of both Fair Trade and conventional trade tea producers, and was divided into six sections. The first section collected personal details such as name, age, gender, cooperative affiliation and type of tea production, whether organic or conventional. Sections two and three gathered data on material and non-material indicators of wellbeing, respectively. Non-material indicators included personal and local development. The questions were structured to allow for detailed investigation into a producer's home life and work commitments. Data were collected on the number of dependants, family educational achievements, and access to water, electricity and medical care. Section two also asked about the main crops farmers were cultivating, the principal food items they consumed, as well as their perception of local development indicators. Economic indicators were examined in section three, with questions designed to record producers' income from tea, and perceptions of income and price changes related to tea.

Further information on a producer's ability to save and invest in personal development, as well as their spending patterns on food, housing and clothing was also gathered in section four. Labour and leisure decisions were examined via questions on the number of hours spent working on farms, sources of second income and the ways in which

producers spent their time when not working on their farms. In section five, both Fair Trade and conventional tea producers answered questions on their knowledge of, and association with, the cooperative. For Fair Trade producers, the purpose of these questions was to understand any advantages and disadvantages arising from cooperative membership. Answers also offered insights into the cooperative's operational strategy and how producers were supported by it. Conventional trade producers were asked about their knowledge of the cooperative and whether they felt there were advantages to joining, in order to explore why they might, or might not, plan to join. The final section of the questionnaire was for completion by women only. It examined the time spent working on the farm, and their association with the cooperative, with a view to discovering gendered roles within the cooperative or family environment. Unfortunately, the sample of women was too small (eight Fair Trade producers and seven conventional trade producers) to enable any conclusions with respect to gender impacts to be drawn directly. So we constructed a 'women's empowerment index' focusing on the degree to which a wife was involved in making decisions over important family spending using the questions in other sections. With both the interviews and questionnaires, a single interpreter fluent in English, Tamil and Sinhalese was used to ensure consistency.

We now econometrically analyse qualitative and quantitative data of the Fair Trade tea sector in the Gampola area and in the neighbouring region in the Central Province. The focus on wellbeing adds conceptual significance to existing debates on poverty alleviation in Fair Trade production (Schleicher et al, 2018; Kingdon & Knight, 2006). Having collected data from three groups of farmers, the overall aim is to determine whether Fair Trade participation improves well-being for tea producers in Sri Lanka by comparing the groups across a range of characteristics and variables such as age, income from tea, educational achievement, working hours and household development.

3.2. Econometric methodology

In the recent development studies economics and social sciences literature, randomised control trials (RCTs) have been used for impact evaluations of policies or other factors where the 'treatment' (in our case access to Fair Trade) is fully randomly provided across treatment and control groups, for instance, in a village (eg Duflo & Banerjee, 2011). However, carrying out an RCT is not possible if, for instance, (1) the incentive among suppliers of 'treatment' or 'policy' (in our case Fair Trade cooperatives) to carry out formal impact evaluations is weak; (2) researchers have to work with a limited research budget for the field survey; or (3) it is deemed unethical to provide benefits only for some of the people in the study area. Another approach for impact evaluations is to use a large secondary household survey dataset over time and to apply non-experimental impact evaluation methods (eg difference in difference method, regression discontinuity, PSM). Recently, a few papers have adopted this approach in evaluating the effect of Fair Trade on sales or livelihood of farmers (Dragusanu & Nunn, 2018; Karki et al, 2016). The approach normally requires a large sample size over the periods

studied. A limitation is that it is difficult to combine qualitative data with quantitative data or match the quantitative results with ‘the feeling’ researchers may obtain in the field.

Given that our data are non-random and cross-sectional (only in 2009), and cover a small number of households (157), it is a challenge to identify the causality from Fair Trade to outcome variables. So we propose to adapt the non-experimental evaluation methods to our small-sample data, which were mainly focused on qualitative data. More specifically, we will use the propensity score (PS) weighted regression models to make treatment and control groups observationally comparable. First, we apply PSM using the probit model to estimate the probability of tea farmers having access to Fair Trade (ie the PS) based on variables of individual and household observable characteristics to reduce possible biases (Rosenbaum & Rubin, 1985; Dehejia & Wahba, 2002). Here, each unit in the treatment group (Fair Trade tea farmers) is matched to unit(s) in the comparison group based on PS and eliminating the sample of households which are not comparable (ie outside the region of common support). If researchers have access to a small sample (eg n=100), bias is likely to be non-negligible, but Busso et al (2014, p 896) have found that “nearest-neighbor matching tends to have small bias, especially with a small number of neighbors for a small sample PSM”. Our study thus adopts the nearest-neighbour matching for PSM, while use of kernel matching will not change the results significantly. We dropped those conventional trade tea farmers, who are not comparable to any of the Fair Trade farmers based on observable characteristics (ten producers inside, and 66 outside Gampola). In the end, 40 Fair Trade producers in Gampola were matched with 41 conventional trade producers (30 in Gampola and 11 outside Gampola).

Next we applied the weight using PSM to all the regression analyses so that differences in distributions in Fair Trade and conventional trade groups were adjusted, following Hirano and Imbens (2001), Hirano et al (2003) and Michalopoulos et al (2004). Under the unconfoundedness assumption for PSM that the treatment is independent of outcome conditional on pre-treatment variables (Rosenbaum & Rubin, 1985),¹⁰ we assign the sample weight of 1 for all the Fair Trade producers and $p/(1-p)$ for the conventional trade producers, where p is the estimated PS to derive the (conditional) average treatment effect on the treated (ATT) (Hirano & Imbens, 2001). The OLS and probit model, as well as 2SLS and IV probit are estimated with the weight based on the PS.

First, the probit model is estimated to carry out PSM.

$$P(\text{Fair Trade}_i = 1 | X_i) = \Phi(\alpha_0 + X_i \alpha_1) \quad (1)$$

¹⁰ A central issue in PSM is choosing the appropriate covariates to fulfil the unconfoundedness assumption that potential outcomes for Fair Trade certified and non-certified farmers are independent of the treatment (certification) given those covariates, or the PS as a function of the covariates. While it is generally difficult to test this assumption, we have tried to select mostly exogenous variables so that the Fair Trade certification will not affect them. However, where the perception of income improvement over the past five years is used, we cannot deny the possibility that this assumption may not hold. This is because we do not have the data on the length or history of the cooperative memberships and so it is unclear whether those farmers with cooperative memberships have been members for five years or longer.

where $Fair\ Trade_i$ is a binary variable taking 1 if a farmer has access to Fair Trade and 0 otherwise (with i denoting a farmer) and P is the probability of accessing Fair Trade conditional on the vector of covariates, X_i , (observable) socioeconomic characteristics of individuals and households and Φ is a standard cumulative normal distribution function. Following the previous literature (eg Elder et al, 2013), we have included in X_i mostly exogenous household or farmer characteristics,¹¹ such as age of the tea producer or landowner, gender of the main tea producer being female, the marital status of the tea producer, educational attainment of the producer, number of children, access to piped water or electricity, as well as the distance to a hospital or health facility and availability of family force (see Table 2). In PSM, it is necessary for the balancing property to be satisfied, for instance, by making sure that there are no statistically significant differences in each covariate in the t-test (Lee, 2013) and covariates need to be selected carefully to satisfy this property. In our case we chose the variables listed above (see Tables 1 and 2). The region of common support has been identified as 0.122 to 0.933, as shown in Figure 1. A relatively small share of conventional trade farmers with a low PS and a few with a high PS, both of whom are unlikely to match Fair Trade farmers, were dropped. The density of the distributions of conventional trade farmers was adjusted by PS to make both groups comparable.

¹¹ The exogeneity of explanatory variables is required to satisfy the assumption of unconfoundedness in PSM.

Table 1: Descriptive statistics of variables for Fair Trade and conventional trade tea farmers (after PSM, with weight)

Variable	Definition	Fair Trade farmers			Conventional trade farmers			Difference		
		Obs	Mean	Std. dev	Obs	Mean	Std. dev	t test *1		
Dependent variables										
Fair Trade	Whether tea farmer accessed Fair Trade (Yes=1; No=0)	40	1	0	41	0	0	1.00	-	(t stat)
Tea income (log)	logarithm of income from tea production (LKR)	38	10.47	0.53	41	10.19	0.53	0.27	2.09	**
Improvement in income	Whether there was improvement in overall income (Yes=1; No=0)	40	0.98	0.16	41	0.35	0.48	0.62	5.58	***
Excess money	Whether there was excess money beyond food, clothing and housing (Yes=1; No=0)	40	0.50	0.51	41	0.27	0.45	0.23	1.84	*
Hours worked for tea	How many hours per day on tea production	40	5.30	1.92	41	6.58	1.86	-1.28	-2.86	***
Women's bargaining index	Whether wife makes a sole or joint decision on important spending (=1) or not (=0)	40	0.70	0.46	41	0.26	0.44	0.44	3.83	***
Explanatory variables										
Age	Age of tea producer/landowner	40	55.90	13.40	41	56.34	10.07	-0.44	-0.16	
Female	Whether a tea producer is female	40	0.28	0.45	41	0.34	0.48	-0.06	-0.38	
Married	Whether a tea producer is married	40	0.98	0.16	41	0.97	0.16	0.00	0.01	
Education	Educational attainment of tea producer (0=has not completed primary; 1=completed primary; 2=completed secondary; 3=above secondary)	40	2.05	0.22	41	2.07	0.49	-0.02	-0.23	
No of children	Number of children	40	2.98	1.83	41	2.95	1.33	0.02	0.06	
Access to piped water	Whether the house has pipe-borne drinking water (Yes=1; No=0)	40	0.75	0.44	41	0.81	0.40	-0.06	-0.62	
Access to electricity	Whether the house has electricity (Yes=1; No=0)	40	0.90	0.30	41	0.81	0.40	0.09	0.57	
Distance to hospital/health facility	Distance from the doctor/medical facility (km)	40	4.99	1.81	41	5.28	1.89	-0.29	-0.71	
Availability of family labour force	The extent to which labour force is available for tea production (0= no help is available; 1= help from the spouse only; 2= help from children/ =parents; 3= labourer outside the family)	40	1.60	0.84	41	1.31	0.81	0.29	1.42	
Availability of Fair Trade information *2	Whether the tea producer accessed information related to Fair Trade	40	1	0	41	0.24	0.43	0.76	5.08	***

Notes:

1. *** Statistically significant at 1% level. ** Significant at 5% level. *Significant at 10% level. ; 2. It is used as an instrumental variable in the IV model and does not have to be balanced between Fair Trade farmers and conventional farmers.

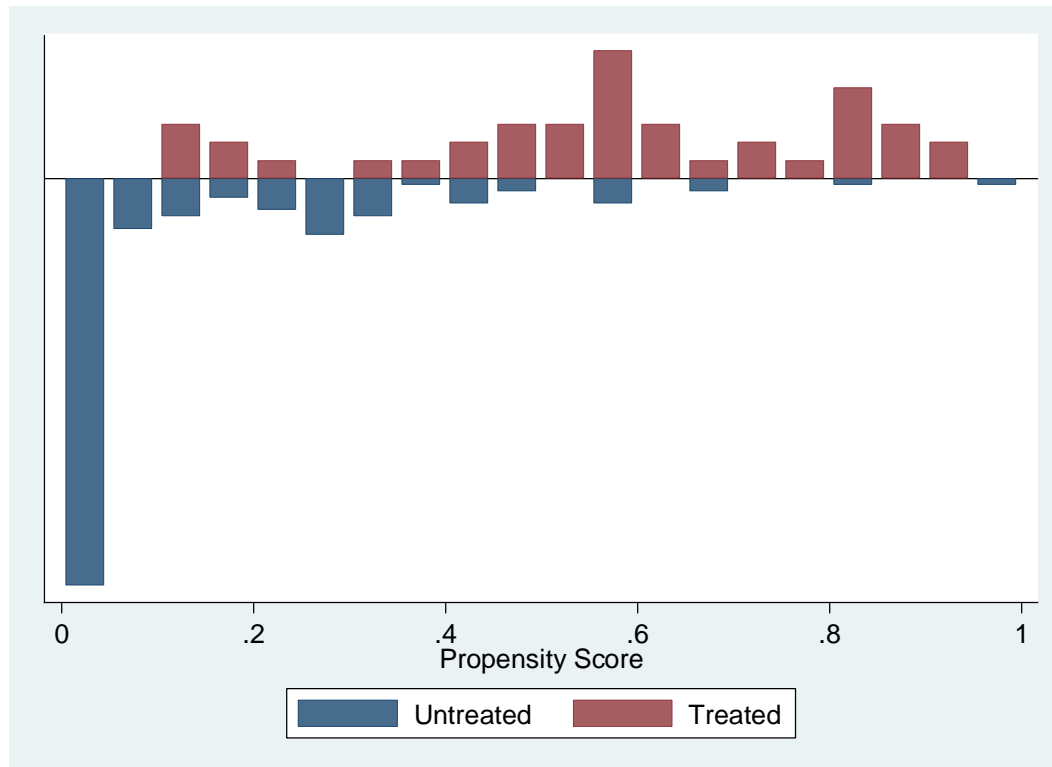
Table 2: Determinants of accessing Fair Trade

	Case 1	Case 2
	Probit model Full sample for PSM	Probit model Matched sample weighted by propensity score (first stage IV/IV-Probit)
Female	0.716* ^{1, 2} [1.822]	-0.159* ^{1, 2} [-1.902]
Education	-0.785*** ¹ [-2.640]	-0.0829 [-1.074]
No of children	0.122 [1.372]	0.00785 [0.462]
Access to piped water	0.580 [1.555]	-0.171* [-1.849]
Access to electricity	-0.383 [-0.628]	0.439** ¹ [2.088]
Distance to hospital/health facility	-0.218*** [-3.626]	-0.000390 [-0.0275]
Availability of family labour force	0.622*** [3.939]	0.0399 [1.375]
Age		-0.00219 [-0.876]
Married		0.210* [1.815]
Access_to_info		0.964*** [25.41]
Constant	1.271 [1.231]	[-0.835] [0.317]
Observations	157	81

Notes:

¹. Robust z-statistics in brackets. *** Statistically significant at 1% level. ** Significant at 5% level. * Significant at 10% level. ². It should be noted that the coefficients in Case 1 are those estimated by probit model in the PSM programme, while the numbers in Case 2 are marginal effects.

Figure 1: Distribution of Fair Trade farmers (treated) and conventional trade tea farmers (untreated)



While the balancing property was satisfied for each of ten blocks (or groups) of matched sample,¹² Table 1, reporting descriptive statistics, suggests that, after PSM is carried out, all the covariates are highly balanced, as there are no significant difference in means for Fair Trade and (matched) conventional trade farmers (except for one instrument we will discuss shortly). We then apply OLS and probit models weighted by PS after dropping the unmatched farmers (called ‘OLS–PSM’ and ‘Probit–PSM’) with a few more explanatory variables as well as the variable called *Fair Trade*, a dummy variable taking 1 for farmers with Fair Trade certificate and 0 otherwise. We estimate Equation (2) for both continuous and binary outcome variables and estimate Equation (3) only for a binary outcome variable.

$$\text{OLS-PSM: } Y_i = \beta_0 + \beta_2 \text{Fair Trade}_i + X'_i \beta_3 + e_i \quad (2)$$

$$\text{Probit-PSM: } P(Y_i = 1|X'_i) = \Phi(\beta'_0 + \beta'_2 \text{Fair Trade}_i + X'_i \beta'_3) \quad (2)'$$

¹² The balancing test was carried out after the Stata command, *pscore*. We also carried out an alternative test for the balancing property, using the command *pbalchk* (https://personalpages.manchester.ac.uk/staff/mark.lunt/propensity_guide.pdf) and found that all the covariates are balanced. Table 1 also suggests that the covariates are balanced. It is noted that, while the sample size is reduced after matching, this will not greatly affect the statistical significance in the second stage, thus we have decided to report the results for the matched sample given the objective of our study (ie an impact evaluation of Fair Trade certification).

Y_i is an outcome variable for farmers, namely, (1) log of tea income, (2) whether a farmer experienced improvement in overall income, (3) whether a farmer had excess money, (4) personal development, (5) hours worked for tea production and (6) women's bargaining index, capturing whether a woman was involved in decision making on important spending. e_i is assumed to be independent identically distributed.

The estimated coefficients for Probit-PSM are transformed to the marginal effect in Tables 3 and 4. We are interested in the coefficient estimate of $Fair Trade_i$, β_2 , as it captures the effect of Fair Trade on each outcome variable if the model is correctly specified. However, the possibility remains that Fair Trade is not fully an exogenous variable in the sense that, first, there is an unobservable factor (eg a farmer's incentive to do something new or entrepreneurial) influencing Y_i and $Fair Trade_i$ and, second, there is an opposite direction of causality where, for instance, a higher bargaining power would facilitate a change of attitude among household members and their access to Fair Trade, which would make the estimate of β_2 biased. This could happen however carefully we design the methodology as above and can be attributed to the data limitations. To overcome the limitation, as a robustness check, we estimate an IV Model and an IV probit model (called IV-PSM and IV-Probit-PSM), where $Fair Trade_i$ is instrumented by a dummy variable on whether the tea producer accessed information related to Fair Trade while making other specifications the same. This is a strong IV with specification test results reported at the bottom of Table 4. F test of excluded instruments exceed Stock-Yogo critical value, which statistically validates the IV in all the cases. The significant statistics in the under-identification LM test shows that an IV is relevant or has sufficient explanatory power in the first stage. Our survey found that many conventional farmers are not aware of the existence of Fair Trade, which suggests that the lack of information constrained their access to it. Under these circumstances, the access to the basic information about Fair Trade through, for instance, leaflets or direct communications with NGO members, would facilitate access to Fair Trade itself, but it does not influence outcome variables directly. Under these circumstances exclusion restrictions are likely to be satisfied. However, this will at best serve as a robustness check, given that the variable could capture both the supply and demand sides of Fair Trade information. That is, while it is true that there was variability in information provision about Fair Trade within our study area, farmers' incentives to join Fair Trade might also influence the variable. However, as is typical in a small-scale field survey mainly focusing on qualitative information, the options for IV are fairly limited. Given the limitations we have discussed, the above methodologies would probably be one of the best for *inferring* the causal relationship using a small cross-sectional dataset. Our use of quantitative methods and data overcomes these limitations.

4. Results and discussion

4.1. Qualitative analysis of the importance of Fair Trade to producer wellbeing

This subsection summarises and discusses the results of the qualitative data analysis of the importance of Fair Trade to producer wellbeing based on the structured interviews.

During the period of study, price support that would be provided beyond the guaranteed minimum price for Fair Trade producers was not actually required, as the market price exceeded the guaranteed minimum.¹³ This observation led us to focus on the impacts of Fair Trade on the wellbeing of Fair Trade farmers and the wider community beyond income effects, such as better payment arrangements, agricultural advice and the support and security arising from the knowledge of an existing floor price.

As we will show below, the econometric analysis has shown that Fair Trade significantly increased a farmer's income from tea production based on the matched sample. This result is in contrast to the case of the Kuapa Kokoo cooperative in Ghana (Ronchi, 2002b), where income benefits were not significant except when commodity prices slumped. Here, our result showing a significant improvement in tea incomes is important. Although it has been argued that the Fair Trade movement fails to improve farmers' incomes (Ronchi, 2002b), our results show otherwise. However, this argument against the positive wellbeing effect of Fair Trade is based on material considerations alone, in other words on income or consumption indicators. Price guarantee, as our qualitative data analysis demonstrates, creates benefits such as education opportunities for individual and/or family members, as well as savings or lifestyle improvements, as suggested by personal development indicators. Interviewees cited the 'price being good and better than the local buyer' as well as receiving payment quicker than from the local buyer, as positive outcomes of Fair Trade involvement. Interviewees involved in Fair Trade also claimed that the local buyer had 'reduced the weight and price, with reductions in price applied for reasons that were often unclear'. These factors combined create uncertainty about income flows and timing, making planning and investment decisions more difficult relative to smooth flows of income with transparent pricing. Although the price remained above the minimum price in our study period, evidence suggests that this price guarantee offered not only short-term income improvement but also long-term foundations for development through a reduction in risk and income volatility, the latter of which was confirmed by our interviews.¹⁴

Interviews with cooperative leaders identified characteristics of the Gampola co-operative and confirmed that Fair Trade producers were more protected than conventional trade producers. Our qualitative survey on the Gampola cooperative shows that 100% of their output was sold to one producer and exporter, called Bio Foods (Pvt)

¹³ The Fair Trade movement seeks to reduce the risk factors around farmers' incomes by means of the minimum guaranteed price. Indeed, the movement states that, when world prices are above the minimum, farmers will receive a higher price and therefore, implicitly during these times, there will be parity between the incomes of conventional and Fair Trade farmers (assuming similar output levels). It is this price guarantee that creates stability and conditions that provide non-material benefits.

¹⁴ The point was confirmed by interviews with Fair Trade producers, where discussions focused on their confidence in investing in home developments (eg extensions) as their incomes had improved. Interviewees compared their income and experience now, under Fair Trade conditions, with their previous experiences with the local buyer and reported improvements in transparency, pricing and payment times. It should be noted that the trend in tea selling prices for Fair Trade and conventional farmers, as well as the nature of buyers for the latter, would influence their perception of income changes and thus their estimates of the impact of Fair Trade certification. However, as we do not have any data on the price trends, we cannot model the effect of differential price trends on the outcome variables.

Ltd at a price above the minimum guaranteed price under the Fair Trade contract. This type of secured transaction was not possible for conventional farmers. The Fair Trade contract offered stability during periods of price slump, thereby providing a measure of risk mitigation as well as a sense of improved wellbeing among farmers. Interviews with the SOFA President, Bernard Ranaweera, who explained the buyer agreements with the exporter,¹⁵ confirmed how this mechanism assures members that they can sell all their products through Fair Trade without resorting to selling any excess to local buyers. The agreement between SOFA and Bio Food ensures that members do not face the same exposure to world price volatility as identified in other impact studies (eg Bacon, 2005).

Our qualitative data analysis confirmed that 97.5% of Fair Trade farmers felt their income had improved in the past five years compared to 27.5% of conventional trade producers. The guaranteed income allowed Fair Trade farmers to carry out future planning and investment over the long term, as their income was expected to be stable in the future. This is consistent with our qualitative data analysis on farmers' spending and investment choices; it showed that Fair Trade farmers were more willing to invest in their home building or to build savings than were conventional trade farmers. This was cross-checked and confirmed by several interviews with Fair Trade certified farmers in 2009. The interviewees discussed their experience as fair trade members versus their prior experiences of selling to the local buyer. In all cases, the interviewees noted an improvement derived from the price guarantee and the lack of delays in payments through the cooperative versus via the local buyer. The interviewees felt that they had more support from the cooperative and this, combined with the improvements in income flows, allowed them greater confidence to invest. One interviewee stated that "If [you] sell to local buyer you only get money. If [you] sell to SOFA you get other things for example plants, facilities, training programmes and advisory".

Survey questions asked how the reported improvement in income benefited the Fair Trade households more than conventional farming households. The responses revealed five main areas to which improved income contributed. Making improvements to the family home, included purchasing new furniture or funding necessary repairs, was identified by 20% of the respondents. Further to this, 15% of Fair Trade farmers reported that they were using the improved income to fund the construction of a new home for themselves or a family member. Some 15% of Fair Trade farmers explained that they used their improved income to support their children. This support included payments towards the costs of education or purchasing food for children who no longer lived at the family home but were unable to fully support themselves financially. Income improvements helped Fair Trade tea producers to save (17.5%) and diversify (10%). Diversification included the ability of farmers to develop and extend their cultivation beyond tea and, in one case, to start a secondary business working as a self-employed dressmaker.

¹⁵ This was made possible based on the agreement between SOFA and Bio Foods to buy all their production. The exporter has a sourcing plan in place to find buyers for any excess production by SOFA. Under this arrangement, increased supply is not a problem. While a problem may arise if buyers cannot be found for any excess supplies, this was unlikely in our survey areas because of the relatively low output levels.

Farmers reported that they spent the most amount of money on food, with 100% of respondents citing 'spending on food' as accounting for their largest financial outgoing. The results where farmers were asked about their diet would imply that Fair Trade farmers were more likely to purchase meat (85%), indicating that they had a greater choice to do this than did conventional trade farmers (52.5%). A similar outcome was found by both Becchetti and Constantino (2006) and by Jaffee (2008), who reported that farmers in Kenya and Mexico, respectively, had a higher relative consumption expenditure on food and an improved diet compared to those outside the Fair Trade system. In Sri Lanka, the average monthly household expenditure on meat is Rs517. However, in the rural province, this is reduced to Rs455, which implies that it is probably less common for rural inhabitants to purchase meat if there are no significant price differences between urban and rural areas (Census and Statistics, 2011). It is conjectured that the fact that Fair Trade farmers in the survey were able to purchase more meat adds support to the view that Fair Trade membership provides benefits beyond measurable income gains, and contributes to the fulfilment of Fair Trade objectives on improving producers' lives in developing countries.

Our findings with regard to income improvement are also interesting when considered alongside the results relating to the existence of secondary income and excess income. Our data suggest that Fair Trade producers were more likely to have excess money. This finding is supported by the qualitative data in which farmers outlined what they did with excess money, including spending on improving their home, paying for children's educational costs or saving, all of which enhance the household's welfare. Furthermore, 45% of Fair Trade respondents reported that this had enabled them to save regularly. Interviews held with the Fair Trade producers indicated that this was facilitated by "the savings scheme implemented by SOFA" and derived from the "better prices and income" and "pre-finance" received by producers since joining the cooperative. All of the interviewees identified t – access to pre-finance – as a positive, with one stating that "the local buyer only takes leaves but SOFA gives more" and that this "helps to support children in school, training for farmers to develop agricultural and non-agricultural skills, and easy savings systems". Another farmer identified how the support from the cooperative benefited the wider society, leading to indirect welfare gains for households. At a household level they said that SOFA "helps with funerals and education of children via scholarships as well as loans or saving schemes if necessary". For wider society one farmer identified the investment by SOFA on "chairs for community centres and water projects".

The responses to the questions on secondary incomes were similar across the two groups in the activities undertaken, in which both groups often included the additional income brought by other family members, such as spouses, children or a member of the extended family. Sources of secondary income included working as a labourer on neighbouring farms or in factories, selling excess fruit and vegetables to the local market or working as a driver in the nearby towns and villages. A small number of Fair Trade farmers indicated that they, or a family member, worked for the SOFA cooperative directly as a driver, a purchasing officer or a producer of reed baskets, which are used to package the processed tea for retail.

In the interviews held with the producers, they were asked: “Do you feel that the income of SOFA members has improved over the past five years?”. It was clear that all those interviewed felt that incomes had improved, although they did not feel their income was sufficient. Farmers talked openly about their ability to save and to access pre-finance through the cooperative. One producer said “better prices, better income” and another stated that “SOFA gives a better price than the local buyer or institutes”. One farmer said that “SOFA is good with fixed price, and now I can save something”. Finally, a member said “SOFA always gives the right amount, if we need money, we get donations from SOFA”.

The qualitative data analysis also implies that the ability to save and the availability of pre-finance, both enabled by the SOFA cooperative membership, led members to feel their income had improved. This is demonstrated by their ability to identify excess money, either in the form of savings or available to them as pre-finance should they require it.

Few studies on Fair Trade have collected data on producers’ working hours. This study gathered information on hours worked on tea production in order to make comparisons between the two groups and, importantly, to establish whether one group reported more free time than the other to spend on leisure and other activities both on and off the farm. Conventional trade farmers worked eight hours per day on average, while the Fair Trade farmers worked 5.3 hours.

Placing this result alongside the findings for tea income, the existence of secondary income and excess money is important. Fair Trade tea producers are working fewer hours per unit income than conventional farmers, while both are not significantly different in terms of their likelihood to be engaged in activities involving earning a secondary household income. This result suggests that Fair Trade farmers are more productive and efficient than conventional trade farmers. Qualitative responses to the interview and questionnaires indicate that this is most probably a result of the support Fair Trade producers receive from SOFA, such as advice on tea production techniques, or provision of dolomite and additional tea plants. All the interviewees mentioned the advisory role that SOFA played alongside the monetary gains of transparent pricing, loans and saving schemes. In addition to the advice and certificated training that members discussed, they also cited the provision of free dolomite, new tea plants, and animals such as goats and cows as having a positive effect. One interviewee stated that “we get good facilities and price with SOFA, free dolomite, plants and agriculture equipment”. Our findings show that Fair Trade farmers were able to gain free time and earn more income than conventional trade farmers, as our econometric results suggest in the next section.¹⁶ Qualitative data indicate that Fair Trade farmers were able to spend the free time with their family or on diversification of their crop, which would improve their living standards. This result is plausible, since only eight conventional trade farmers reported growing crops other than tea compared to all 40 of the Fair Trade producers, who were growing

¹⁶ We should note that the reduction in overall agricultural risks as a result of Fair Trade certification has only been confirmed by qualitative surveys, ie was enabled by the agricultural advice and other support provided by the cooperative. However, we cannot quantify the risks because of a lack of data. Quantifying the effect of Fair Trade certification on overall risks is a topic of future research.

vanilla, peppers, cinnamon, cloves and lemongrass on their farms. Although income from spices was not measured in this research, the farmers reported that they sold these crops through SOFA for additional income.

Differences emerged when we analysed responses on who was responsible for the improvements in the village – Fair Trade/SOFA or the government. The majority of Fair Trade producers (90%) stated that SOFA alone was responsible for development witnessed in the local area. The remaining 10% stated that responsibility was split between SOFA and the government. Of the conventional trade farmers, 60% attributed improvements to the government, 7.5% claimed that farmers themselves were personally responsible for the development that had taken place and a further 7.5% did not know where the responsibility lay. The remaining 25% did not provide an answer as they had stated, in a previous question, that they had not observed any improvements in their local area over the past five years.

Interestingly, as in other studies (e.g. Ronchi, 2002a; Taylor, 2002) where Fair Trade awareness levels are reported as low, our study indicates that many of the Sri Lankan SOFA members' perceptions focused on the cooperative organisation. Thus, our results provide support for Ronchi's (2002a) view that there should be better communication about the role of Fair Trade among both producer members and non-members. Such improvements in communication may then encourage more producers to join the cooperative, as well as increasing the likelihood of farmers remaining loyal to it by continuing to pay certification costs when prices are above the minimum guarantee. Conventional trade producers appeared to be unaware of the potential benefits from cooperative membership and thus reluctant to change to a new system, saying that it "is not good for farmers to change", that they "cannot afford to change", or that they are "too poor and it is too hard to change". In this survey, it was farmers over 40 who were most likely to report resistance to change. The fear of change and its potential consequences are considered by Nicholls and Opal (2006) to be an example of how the assumptions of free trade are not met in developing economies. It is a characteristic of study countries that producers will continue to produce despite sometimes making a loss, since unsuccessful change has serious consequences for survival.

Our findings did not show a significant difference in household development between the two groups. However, analysis of the qualitative results shows that 60% of Fair Trade producers provided an example of household development such as savings, improvements in cultivation, house improvements and funding for children's education. A similar share of conventional trade farmers reported household development, with examples equivalent to those in the Fair Trade group. These results are in line with those of Ronchi (2002a), who found that the majority of respondents within Fair Trade cited similar examples of improvements.

4.2. Econometric results

In this sub-section we will report and discuss the econometric results applied to selected outcome variables of farmers, including both monetary and non-monetary variables. The

results of OLS–PSM and Probit–PSM are shown in Table 3, while those of IV–PSM and IV–Probit–PSM are reported in Table 4. The first-stage result of IV models is found in the second column of Table 3. All the estimates are based on heteroscedasticity-consistent or robust standard errors.

Table 3: Results of OLS–PSM and Probit–PSM: effects of Fair Trade on income and development indicators

	Case 1	Case 2-1	Case 2-2	Case 3-1	Case 3-2	Case 4-1	Case 5-1	Case 5-2
	Tea income (log)	Improved income	Improved income	Excess money	Excess money	Hours worked for tea	Women's bargaining index	Women's bargaining index
VARIABLES	OLS–PSM	OLS–PSM	Probit–PSM	OLS–PSM	Probit–PSM	OLS–PSM	OLS–PSM	Probit–PSM
Fair Trade	0.276* ¹	0.605*** ¹	2.801*** ²	0.190	0.498 ²	-1.232***	0.402***	1.136*** ²
	[1.990] ¹	[6.097] ¹	[5.914]	[1.574]	[1.434]	[-2.781]	[3.432]	[3.395]
Female	0.123	-0.0525	-0.211	-0.00803	0.00417	0.103	-0.0158	-0.100
	[0.857]	[-0.571]	[-0.404]	[-0.0594]	[0.0109]	[0.172]	[-0.109]	[-0.242]
Education	-0.119	0.238** ¹	1.182*	-0.0272	-0.152	0.991	-0.00728	0.0310
	[-0.651]	[2.048] ¹	[1.854]	[-0.189]	[-0.387]	[1.478]	[-0.0508]	[0.0751]
No of children	0.0470	0.0209	0.245	-0.101***	-0.325**	0.155	0.0436	0.137
	[0.963]	[1.119]	[1.514]	[-3.080]	[-2.473]	[1.077]	[1.426]	[1.325]
Access to piped water	0.437***	-0.00669	0.0658	0.0408	0.131	0.781	-0.00542	-0.0920
	[2.840]	[-0.0628]	[0.125]	[0.243]	[0.281]	[1.267]	[-0.0346]	[-0.214]
Access to electricity	0.155	0.209*	1.248**	0.0985	0.388	0.315	0.269	0.881
	[0.901]	[1.682]	[2.189]	[0.623]	[0.726]	[0.396]	[1.539]	[1.624]
Distance to hospital/health facility	-0.0242	0.00999	0.0911	-0.0166	-0.0478	-0.186	0.0122	0.0451
	[-0.586]	[0.491]	[0.703]	[-0.450]	[-0.471]	[-1.286]	[0.324]	[0.433]
Availability of family labour force	0.0831	6.52e-05	-0.154	0.0903	0.274	-0.219	0.0555	0.150
	[1.081]	[0.00119]	[-0.454]	[1.135]	[1.243]	[-0.756]	[0.726]	[0.716]
Constant	9.796***	-0.400	-4.908**	0.486	0.0809	4.420**	-0.200	-2.212*
	[21.79]	[-1.187]	[-2.393]	[1.189]	[0.0647]	[2.249]	[-0.498]	[-1.746]
Observations	79	81	81	81	81	81	81	81
R-squared	0.185	0.526		0.223		0.207	0.247	

Notes:

¹ Robust standard errors in brackets. *** Statistically significant at 1% level. ** Significant at 5% level. * Significant at 10% level. ² Marginal effects are shown for the probit models.

Table 4: Results of IV-PSM and IV-Probit-PSM (weighted and matched by PSM): effects of Fair Trade on income and development indicators

VARIABLES	Case 1	Case 2-1	Case 2-2	Case 3-1	Case 3-2	Case 4	Case 5-1	Case 5-2
	Tea income IV	Improvement in income IV	Improvement in income IV-Probit	Excess money IV	Excess money IV-Probit	Hours worked for tea IV	Women's bargaining index IV	Women's bargaining index IV-Probit
Fair Trade	0.255*** ¹ [1.717] ¹	0.595*** ¹ [5.126] ¹	3.711*** ² [4.510]	0.213 [1.589]	0.534 [1.319]	-1.773*** [-4.175]	0.402*** [3.312]	1.159*** [3.050]
Age	0.00828 [1.078]	-0.00509 [-1.114]	-0.0680** [-2.391]	-0.00562 [-0.861]	-0.0185 [-0.926]	-0.0307 [-1.157]	-0.00483 [-0.878]	-0.0156 [-0.968]
Female	0.159 [1.175]	-0.0826 [-0.942]	-0.481 [-0.871]	-0.0506 [-0.404]	-0.140 [-0.365]	-0.0488 [-0.0886]	-0.0602 [-0.444]	-0.269 [-0.637]
Married	-0.00286 [-0.00932]	0.0333 [0.199]	-0.608 [-0.639]	0.413 [0.907]	1.401 [1.209]	-1.012 [-0.713]	0.671*** [3.040]	
Education	-0.104 [-0.550]	0.225* [1.934]	1.165 [1.490]	-0.0682 [-0.471]	-0.307 [-0.729]	0.949 [1.394]	-0.0710 [-0.504]	-0.103 [-0.227]
No of children	0.00641 [0.100]	0.0458 [1.434]	0.746** ¹ [2.373] ¹	-0.0845* [-1.855]	-0.298* [-1.732]	0.351* [1.705]	0.0491 [1.274]	0.152 [1.225]
Access to piped water	0.457*** [2.686]	-0.0261 [-0.239]	0.256 [0.420]	-0.0308 [-0.207]	-0.104 [-0.235]	0.817 [1.440]	-0.110 [-0.681]	-0.415 [-0.900]
Access to electricity	0.179 [1.005]	0.194* [1.649]	1.578** [2.541]	0.0731 [0.530]	0.330 [0.638]	0.319 [0.388]	0.249 [1.533]	0.896 [1.603]
Distance to hospital/health facility	-0.0237 [-0.573]	0.00943 [0.499]	0.0115 [0.0742]	-0.00842 [-0.255]	-0.0248 [-0.255]	-0.230* [-1.693]	0.0250 [0.676]	0.0807 [0.747]
Availability of family labour force	0.0697 [0.866]	0.0101 [0.205]	0.129 [0.393]	0.0995 [1.321]	0.323 [1.461]	-0.105 [-0.437]	0.0679 [0.915]	0.184 [0.847]
Constant	9.404*** [16.64]	-0.162 [-0.439]	-2.306 [-0.996]	0.457 [0.704]	0.0478 [0.0252]	7.019*** [2.768]	-0.440 [-0.911]	-1.029 [-0.640]
Observations	79	81	81	81	81	81	81	79
R-squared	0.202	0.536		0.245		0.213	0.286	
F test of excluded instruments	540.83***	565.08***	645.67***	565.08***	645.67***	565.08***	565.08***	645.67***
Stock-Yogo critical value(10% maximal IV size)	16.38	16.38	16.38	16.38	16.38	16.38	16.38	16.38
Under-identification test	37.448***	36.008***	-	36.008***	-	36.008***	36.008***	-
Wald test of exogeneity (corr = 0): chi2(1)	-	-	Chi2=0.67	--	0.16	-	-	0
			P>Chi2=0.41		P>Chi2 =0.69			P>Chi2 =0.96

Notes:

¹ Robust standard errors in brackets. *** Statistically significant at 1% level. ** Significant at 5% level. * Significant at 10% level. ² Marginal effects are shown for the probit models.

We will first discuss the factors influencing whether farmers participated in Fair Trade tea production based on Case 2 of Table 2 for the matched sample. It should be noted that the results in Cases 1 and 2 differ considerably in sign and statistical significance of coefficients, which reflects the fact that the conventional trade farmers outside the region of common support (thus not comparable with Fair Trade farmers) had different characteristics from those inside the region. In discussing the determinants of a farmer's access to Fair Trade, it would be better to focus on the results of the matched sample, as most of unmatched conventional trade farmers have a low incentive to join the cooperatives. Case 2 of Table 2 suggests that our IV, access to Fair Trade information, is closely associated with Fair Trade participation. The first stage IV is validated by the F test of excluded instruments, which ranges from 540.83 to 645.67, much higher than the Stock–Yogo critical value of 16.38 (Table 4). In IV–PSM, there is no problem of under-identification as the test result was significant. Also, in IV–Probit–PSM, an IV is validated by a statistically insignificant Chi² statistic, showing that there is no endogeneity problem once *Fair Trade_i* is instrumented. So our instrument has been validated. Case 2 of Table 2 also shows that: (1) female farmers are 15.9% less likely to access Fair Trade than men; (2) those with access to electricity are 43.9% more likely to access Fair Trade than otherwise; and (3) those who are married are 21.0% more likely to join Fair Trade.

We will summarise the results in Tables 3 and 4 with a focus on the estimate of coefficient of *Fair Trade_i*. Tables 3 and 4 show the similar estimates in terms of size and statistical significance. Given that our model is correctly specified, we can conclude that turning to Fair Trade certification will increase tea income by 27.6% (OLS) or 25.5% (IV) at the 10% statistical significance. This is a substantial increase. Our finding of positive and statistical significance is consistent with that of other studies (eg Dragusanu & Nunn, 2018). If we take the results of Case 2-1, accessing Fair Trade is about 60% more likely to lead to an improvement in overall income. We do not find any statistically significant result for 'Excess Money' in Cases 3-1 and 3-2 in Tables 3 and 4. That is, Fair Trade farmers and (matched) conventional trade farmers are equally likely to spend additional income for purposes other than food, clothing and housing. Using the same models, we also estimated the effect of Fair Trade on personal development and found that there is no statistically significant effect of Fair Trade on personal development. These results are not shown in the tables, but can be provided on request.

Case 4 in Tables 3 and 4 suggests that Fair Trade reduces the number of hours worked in tea production significantly, by 1.23 hours (OLS) to 1.77 hours (IV) on average. Combining the results of Case 1 and Case 4, farmers' productivity will improve significantly as a result of joining Fair Trade cooperatives. In Cases 5-1 and 5-2, women's bargaining power will increase significantly. In other words, Fair Trade farmers are more likely to have a higher bargaining power than conventional trade farmers, regardless of the model we have used. Causality from Fair Trade certification to bargaining power can be established as long as an IV is validated. During the survey we found some qualitative evidence to support this finding. The women in the survey

reported more cultivation of tea and spices than before and said that there had been improvements in education and “everywhere better houses”. The cooperative had supported scholarships for children’s education, provided a higher (special) price relative to the local buyer, and provided fertiliser and plants to aid cultivation. They all felt that their income had improved in the past five years and that this had led to home improvements, including building a home, and payment for children’s education. Seven of the women played an active role in the cooperative. Overall, we found that Fair Trade improved wellbeing in both economic and non-economic dimensions, ranging from increasing the income from tea production to improvements in overall income, in hours worked and in women’s bargaining power.

5. Conclusion and areas for future research

The main aims of this study were to investigate the effectiveness of Fair Trade by establishing its direct monetary and non-monetary impacts in the context of developing countries. We focused on tea producers in the central province of Sri Lanka, namely Gampola, and gathered quantitative and qualitative data through interviews and questionnaires administered across seven villages and comprising 40 Fair Trade and 40 conventional trade producers in 2009. A further 77 producers were interviewed in the villages near Gampola. Although these farmers experienced similar environmental and socio-cultural characteristics to those in Gampola, they did not have access to Fair Trade in 2009. Methodologically, we applied the PS weighted regression models (OLS and probit models as well as IV and IV–Probit models), where PSM was used to make treatment and control groups observationally comparable (Hirano & Imbens, 2001). We used access to information on Fair Trade as an instrumental variable to address the potential endogeneity problem associated with joining Fair Trade in order to establish the causality from Fair Trade certification to outcome variables.

From our econometric results we can conclude that Fair Trade membership in the Gampola region of Sri Lanka has led to some measurable gains for producer members, such as an increase in tea income by 25%–28%. The results also confirm an increase in the likelihood of achieving a greater overall income, a reduction in hours worked and increased productivity per hour, and greater bargaining power in the household for women. These results are broadly consistent with our qualitative observations. While we do not have the quantitative data which directly support women’s empowerment in household decision making, the qualitative results for women working for the Fair Trade cooperative focus on improvements in children’s education and in homes. The women in the survey reported that things were better in their community than before the introduction of Fair Trade and that further improvements would come if Fair Trade continued. However, our econometric results are subject to the limitation that we are able to use only observable data for matching and cannot control for unobservable factors, as in most studies applying PSM to cross-sectional data. We believe nevertheless that our results imply causality from the Fair Trade certification to more

income from tea, improvements in overall income, reduced hours of work in the tea plantations and a higher relative bargaining power for women in the household.

Combining both quantitative and qualitative results, the Fair Trade model was found to lead to income protection and uncertainty reduction by minimising price uncertainty. We also found social capital effects, such as support for access to education and household development. The significant effect of Fair Trade on tea incomes is confirmed by our econometric models, although the price support mechanism was not in operation during the period under study. The study concludes that the regular, stable payments that SOFA makes to members, partly through pre-financing, lead farmers to feel that their income has improved compared with their experience before joining the Fair Trade scheme. Arguably, it may be that previous income has been underestimated, as a result of the uncertainty and irregular payments farmers reported receiving from the local buyer. Nevertheless, the wellbeing of Fair Trade farmers has been improved by having a more stable and predictable income.

Evidence of improved income is seen in the increased savings and investments in household development of Fair Trade farmers. We argue that this income is earned from the cultivation of other crops or through other types of employment off the land. This is facilitated by the fewer working hours that Fair Trade farmers spend on tea production, thus freeing up time for crop diversification and secondary income-generating activities. Finally, we determined that Fair Trade farmers could take out loans from SOFA to fund their spending, especially as these were available with zero interest.

Policy makers examining the factors important to the success of Fair Trade should take note that it ensures measures to reduce income uncertainty, thereby leading to psychological gains for producers. This can be achieved through the provision of a guaranteed lower limit being established, and ensuring that any payments made are done in a regular and predictable manner, since this facilitates better planning of expenditure. If farmers feel more positive about their future and identify themselves as having excess income, then their consumption behaviour will be different from those who worry over future price falls. The Fair Trade farmers in our survey spent more on household investment and enjoyed a superior diet to the conventional trade farmers. This has resulted in positive spillover effects to the local community through higher spending and demand creation. In addition, the Fair Trade farmers may enjoy a higher standard of living not only thanks to a higher income from tea production but through improved health and household quality derived from their improved diet and household investment. Policy makers should also facilitate measures to improve knowledge, understanding and skills through training on farming techniques or provision of crop stimulants, such as dolomite, and by improving productivity and reducing economic and social risks, since the resulting reduction in working hours allows farmers more time to spend on alternative work like growing additional crops or spices, or on leisure. It is also important for policy makers to advertise widely the potential advantages of Fair Trade among conventional trade tea farmers. Finally, sound and transparent

management and organisation, as observed within the cooperative, has underpinned the success of the scheme, since it results in participants feeling supported and confident to undertake proposed new initiatives.

The present study has contributed to the empirical literature on the evaluation of the impact of Fair Trade (LeClair, 2002; Hayes, 2006; Dragusanu et al, 2014) by considering both the economic and non-economic aspects of farmers' wellbeing. It has done so by using a mixed methods approach of combining qualitative data analyses and rigorous econometric analyses based on the IV model with PS weighting and matching to establish the causal relationship. One limitation is that we have used cross-sectional data and cannot track the time-series changes in farmers' wellbeing before and after accessing the Fair Trade system. Future research should construct the panel data to carry out impact evaluations to control for unobservable household characteristics. Another limitation is that the variables on uncertainty, farmers' vulnerability, or social capital are not explicitly quantified in our econometric analyses. To confirm our conclusion on the wellbeing benefit of Fair Trade certification, future research should also use these variables as outcome variables.

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