Virtuous interactions in removing exclusion: the link between foreign market access and access to education.

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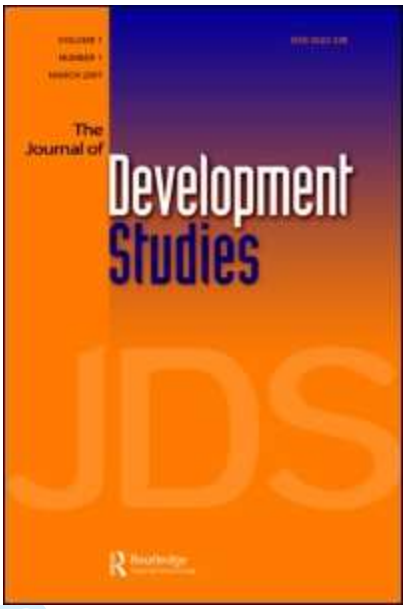

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Abstract

We outline a methodology which aims to give an answer to the widespread demand of impact methodologies by regulators or by funding agencies which need to evaluate the current and past performance of development projects and may lack of time series evidence. We devise a retrospective panel data approach to evaluate the dynamics of the effects of fair-trade affiliation on the schooling decisions of a sample of Thai organic rice producers across the past twenty years. We find that the probability of school enrolment in families with more than two children is significantly affected by FT affiliation years. We try to ascertain whether our finding is robust to endogeneity of producers' choices of local cooperative affiliation and adoption of organic techniques. The significant difference between pre- and post-FT affiliation performance documents that fair-trade participation generates a significant break in the schooling decisions of affiliated households.

Keywords: child schooling, market access, fair trade.

JEL numbers: O19, O22, D64.

1. Introduction

The aim of this paper is to extend the child schooling literature by examining the impact of affiliation to fair trade and its (income and non-income) effects on child schooling for a sample of Thai rice producers. It is widely acknowledged in the literature that income levels affect child education and that income variation changes the ability of households to afford the opportunity costs of education (Behrman and Knowles, 1999). The effect of parental income on child education, however, crucially depends on parental preferences and on the bargaining rules within the household.

On the one hand, Basu and Van (1998) assume that parents dislike sending their children to work and do so only out of necessity. On these premises, they develop the so-called "luxury axiom" stating that children only work when parental income is below a given threshold related to subsistence levels. On the other hand, the parental agency literature argues that parents do not fully internalize the present and future well-being of their children. When this approach is taken to the extreme, parents draw advantages from their children's work, and the child labour supply is mainly driven by labour demand on the market.

Theoretical and empirical findings show that the prevalence of one or the other model also depends on the evolution of bargaining power between the parents within the family and, in some cases, also on the bargaining power of working children (Moehling, 2005; Basu and Ray, 2002).

The subfield in the parental income-child labour and schooling literature which is most relevant to this work is the one that examines the dynamics of child labour and schooling when parental income is affected by price shocks of internationally traded goods.

In this regard, Edmonds and Pavcnik (2005a) show that the negative association between market openness and child labour depends mainly on the positive link between trade and income. In another empirical study on Vietnamese rice producers, Edmonds and Pavcnik (2005b) document that an increase in export prices significantly reduces child labour.

However, two other studies document quite the opposite, namely that higher crop prices may be associated with an increase in child labour. In the first of these studies, Kruger (2004) observes an overall increase in market work, especially in poor households in coffee-producing areas during the coffee boom of the mid-1990s in Nicaragua. In the second, Alessie et al. (1992) obtain similar findings when examining the cash crop price increase in the Côte d'Ivoir. An explanation as to why Kruger's (2004) results differ from those of Edmond and Pavcnik (2005a and b) is that, in the former, the observed price increase is perceived as temporary and the limited capacity of poor households to reap part of the gains in the value chain generates very modest wage increases from the price rise. Overall, these studies suggest that, in general, not only prices matter but also their past and future expected variability.

The original contribution of our paper within this literature is that it looks at a specific initiative (fair trade, henceforth also FT) aimed at promoting the inclusion of marginalized farmers. The distinctive feature of this initiative is that it is a bundle of elements comprising a price mark-up to producers, a cooperative premium,[1] reduced price volatility, credit financing facilities, and capacity-building actions (see the next section for a more detailed description of FT).

From this perspective, fair trade opens an additional trade channel, reduces the market power of local transportation intermediaries, and allows for sale diversification. It is therefore a good candidate for constituting an original nexus among trade, income, and child schooling which prevents the above-mentioned negative effects (volatility and temporariness of price rises and the weak capacity of producers to obtain part of the gains from price changes). It thereby creates the bases for a positive link between trade success and child education because the aim of FT principles is to improve the bargaining power of poor households and to create permanent effects through capacity-building and long-run relationships between importers and producers. Furthermore, FT initiatives on prices extend beyond mere mark-ups because they incorporate a minimum price floor which significantly reduces price volatility and prevents the latter from falling below a "decent minimum price" conventionally established by FT importers (see next section).[2]

All the above-considered FT features suggest that an empirical analysis on the effects of FT affiliation on child labour can make an original contribution to the literature by complementing the results obtained to date. The relevance of empirical analyses of this kind may also be clarified by looking at their potential effects on the logical framework of FT projects (see Appendix 1).

A second contribution of the paper is that it proposes a simple and effective retrospective panel data approach. The latter helps with investigation of research topics when the collection of information on the same sample of individuals over many years is too costly or, if not begun in advance, makes an *ex-post* impact analysis impossible. In this regard, we devise a very simple approach which enables the collection of panel data *retrospectively* without requiring unreasonable memory efforts by respondents (see section 4). Differently from McIntosh et al. (2010), who examine house restructuring events, we build our retrospective panel data on simple questions about children's age and schooling years. This approach allows us to reconstruct the pattern of household schooling decisions over a long time interval. The retrospective panel approach has the advantage of measuring the dynamics of child schooling across years, something which is not possible with the two most typical data structures to be found in the literature (cross-sections or short panels with observations repeated twice in time).

Given these potential advantages we are obviously aware of limitations in our analysis of the impact of fair trade on child education. Firstly, it is impossible to disentangle the effects of the different facets of the "bundle" of fair-trade initiatives. Nevertheless, examining whether the package works as a whole is, we believe, worthwhile.

Secondly, the focus of the analysis on a mechanism already at work prevents us from solving the endogeneity problem by implementing randomized control trials. Whilst the latter have documented the effect of conditional cash programs on child education (see for instance Schultz, 1994; De Janvry, et al. 2004), we cannot use them if we want to shed light on the effect of unconditional income changes on parental income.[3] In this regard, the fair-trade experiment

described is an interesting benchmark against which to measure the non-"artificial" reaction of child education to the income variability generated by affiliation/non affiliation with the project.

Thirdly, our retrospective panel approach allows accurate reconstruction of only child-schooling choices, and not also the interaction between school and (domestic or market) work, about which we have only current information.[4]

Summing up, with the application of retrospective data and several controls for endogeneity (e.g. comparison of pre and post affiliation child schooling trends) and in spite of the above mentioned limitations, our paper outlines an original methodology which may give an answer to the widespread demand of impact methodologies required by regulators or by funding agencies which need to evaluate the current and past performance of ongoing development projects.

The specific hypothesis tested in the paper is that FT affiliation has a positive effect on child schooling in large families (families with more than two children).

As well known, for a given budget constraint, the higher the number of children, the lower the investment in available per child education (Becker and Tomes, 1976). On this basis, a causal relationship between the number of children and the probability of school attendance may arise in the case of an exogenous increase in family offspring. This theoretical point has been confirmed by recent empirical studies (Booth and Kee, 2009; Iacovou, 2001) showing that education is negatively correlated with family size and birth order. The argument is also supported by the findings of Hanushek (2002), Steelman and Powell (1989) and Yilmazer (2008), the last two works showing that large families have fewer financial resources for school fees.[5]

This paper seeks to verify the impact of FT in situations in which the quality (of education)[6]/quantity trade-off is expected to matter (among agricultural producers in LDCs close to the poverty line). The trade-off may be eased by policies which ease FT certification and affiliation of producer cooperatives to FT importers.

The paper deals with these issues and is divided into eight sections (including the introduction and conclusions). The second section briefly explains FT characteristics and the

literature debate on them. The third section provides a short history of the cooperative investigated. The fourth section describes the survey design and the memorable event methodology used to transform cross-sectional into panel data. The fifth and sixth sections present and discuss the descriptive and econometric findings. The seventh section focuses on the endogeneity problem and discusses how we dealt with it.

2. What is FT ?

According to IFAT, the main umbrella organization gathering most fair-trade producers and importers, "*Fair Trade is a strategy for poverty alleviation and sustainable development. Its purpose is to create opportunities for producers who have been economically disadvantaged or marginalized by the conventional trading system*" (EFTA, 2009). Beyond official declarations, fair trade may therefore be conceived as an economic initiative promoted by organizations of importers, distributors and retailers from Europe and the US which aim to promote capacity-building, market inclusion, and the improved well-being of marginalized producers. The first and basic FT impact is its "antitrust" effect achieved with the simple diversification of sale channels offered to producers. Fair-trade criteria[7] potentially include: i) an anti-cyclical mark-up on producers' prices incorporating a price floor as an insurance mechanism against price falls below a decent standard of living threshold; ii) anticipated financing schemes reducing the likelihood of credit rationing; iii) export services and access to foreign markets; iv) direct investment in local public goods (health and education) through the premium provided to the local producers' associations.

Given these characteristics, FT has the potential to address market failures such as credit rationing, underinvestment in local public goods (health, education and professional training), monopsony of local intermediaries and/or moneylenders (Becchetti and Rosati, 2007).[8] On the consumer side, it has also been demonstrated that FT satisfies consumer willingness to pay for social and environmental intangibles incorporated in the final product, generating contagion effects on profit-maximising competitors (Becchetti and Solferino, 2008).[9]

What the above mentioned debate indicates is that impact studies on FT are of extreme interest, and they are so for three main reasons.

Firstly, the phenomenon is growing more rapidly than the capacity of economists to analyse it. Between 2006 and 2007, total FT sales registered a 127 percent increase by volume and 72 percent increase by estimated retail value. Growth in Europe has averaged 50 percent per year in the past six years, and FT has gained significant shares in some market segments (47 percent of bananas in Switzerland and 20 percent of UK bananas since the decision taken by some of the main UK distributors to import only these products).

A second reason for the importance of empirical investigations of this phenomenon is that they dispel the doubts of FT consumers about what really lies behind the products that they buy. In essence, the social and environment-friendly characteristics of the products are not those of experience goods (that is, the information gap on their socially responsible characteristics cannot be bridged by repeated consumption). Hence, rigorous empirical work is required to bridge informational asymmetries between buyers and sellers and to evaluate whether or not FT promises are fulfilled.[10] A third argument is that the results of FT impact analyses may be very useful for the critical evaluation of ongoing FT projects and possible revision of FT criteria.

Within this literature the specific goal of our study is to analyse the effects of FT affiliation on child schooling via creation of economic opportunities for poor producers. To be stressed in this regard is that fair trade does not explicitly ban child labour, so that its impact on it may only be indirect. This is clearly documented in the IFAT charter by criterion vii) on Working conditions, which states that "*The participation of children, if any, does not adversely affect their well-being, security, educational requirements and need for play and conforms to the UN Convention on the Rights of the Child as well as the law and norms in the local context*". However, FT should act indirectly on child schooling by creating the conditions for capacity-building and higher producer productivity and household income.[11] Moreover, as said, FT may help in addressing market failures like credit rationing by providing members with various advantages, such as interest-free credit

support, anticipated financial schemes, a countercyclical mark-up on producers' prices which incorporates an insurance mechanism, and product risk diversification which lowers the producers' vulnerability to shocks. As we synthetically document in the introduction the theoretical and empirical child-labour literature emphasises the importance of access to credit markets and the containment of shocks in determining household decisions on children's time allocation. The imperfections of both formal and informal credit and insurance markets represent, particularly in developing countries, a major cause of the suboptimal allocation of household resources to human capital investment.

3. The FT Project in Thailand

GreenNet is the main fair-trade producer and exporter of organic rice in Thailand. It was founded in 1993 and received fair trade certification from the Fair Trade Labeling Organization in 2002. Farmers affiliated to GreenNet produce organic long grain red, white and brown Jasmine rice. GreenNet provides advance payments for producer groups to stock their paddy. It receives export orders for the year and accordingly instructs producer groups on the quantity to be delivered. Producer groups then deliver the milled rice to GreenNet, which exports and/or sells it locally once packaged.

Organic farmers receive two main benefits from GreenNet: i) a fair-trade premium to be used for social needs and capacity-building activities (scholarships, emergency funds, credit facilities, training, etc.) in accordance with the FLO laws; ii) individually, an extra yearly fair-trade bonus as a mark-up on the sale price.

GreenNet is a second-level cooperative. The second level is generally necessary to coordinate production among local cooperatives, implement research and promote organic farming, as well as to provide export services on a wider scale. All members of first-level associations are also members of GreenNet. Our research on FT impact looked at two different (GreenNet-

affiliated) first-level organizations in Yasothorn province: the *Bak Reua Farmer Organization* (BRFO) and the *Nature Care Society* (NCS).

3.1 The Bak Reua Farmer Organization (BRFO)

Created in April 1976, the BRFO aims to: i) support members in growing rice without using chemical inputs and establish rice farmlands appropriate to local ecology; ii) strengthen farmer organization so that it can manage and control rice quality throughout the chain; iii) encourage learning among farmers so that they can manage rice mills as sustainable rural enterprises.

BRFO started pesticide-free rice farming in 1996 in accordance with the following certification standards: i) ACT Organic Standards according to IFOAM Basic Standards (IFOAM programme); ii) EU Regulation 2092/91; iii) BioSwiss organic standards.

Since 2002, BRFO has received the FLO's certification as part of the GreenNet Cooperative. The fair-trade premium is divided into several funds to which farmer members can apply to support: i) green manure seed; ii) farmer training; iii) member welfare, e.g. education of their children, iv) natural disaster relief.

3.2 The Nature Care Society (NCS)

The objectives and goals of the *Nature Care Society* (NCS) are: i) encourage members to grow rice without using chemical inputs; ii) solve farmers' problems of unfair price and trading in paddy; iii) expand milling capacity in order to exploit economies of scale; iv) strengthen farmer organizations; v) provide instruction on running a community business.

NCS began organic rice farming in 1992, while a group of farmers first received organic certification in 1996. The standards fulfilled by such a certification were: i) ACT Organic Standards according to IFOAM Basic Standards (IFOAM programme); ii) EU Regulation 2092/91; iii) BioSwiss organic standards.

As a partner of GreenNet Cooperative, NCS has received the FLO's certification since 2002. The fair-trade premium is allocated as follows: i) 50% to the mill for improvement of its management; ii) 25% to extension works; iii) 25% to the Organic Fair-Trade Fund, which provides credits to members willing to convert to sustainable production as well as other community benefits.

4. The dataset and the retrospective panel approach

On August 2008, 360 farmers were surveyed in the Kud Chun and Bak Reua districts. For each district, an equal number of respondents were randomly chosen between two extended lists of affiliated and non-affiliated farmers in order to create a treatment group (members of the two GreenNet organisations, BRFO and NCS, affiliated to FT) and a control group (non-members of GreenNet). A random selection from the list of all members in the two areas was drawn for the former group, whereas, for the latter, a random sample of farmers living close (within 10 km) to organic farmers was generated. Non-responses were extremely low (around 2 percent among treatment and 5 percent among control sample producers). The descriptive statistics will highlight that the treatment and control samples were not significantly different in terms of socio-demographic features (see Table A1 in the Appendix available online).[13]

As to the kind of data collected, the questionnaire contained 75 questions designed to measure qualitative and quantitative well-being. More specifically, in addition to the classic socio-economic variables, it collected information on income and wealth according to their various measures (i.e. land size, housing, sanitation and durables, etc.), savings and productivity, child schooling and farmer education, work activity and working conditions, price and trading information, human and social capital indicators, self-esteem and happiness.[14]

As already mentioned in the introduction, we used the retrospective approach to reconstruct the pattern of household schooling decisions over time with very simple questions.

Retrospective data are used in the literature when the costs of collecting data across time are too high, or when the researchers need to evaluate an economic phenomenon for which this information is not available. Among various examples see Peters (1988), McIntosh et al. (2010) and Becchetti and Castriota (2009).[15]

The reliability of this approach depends crucially on the identification of memorable events. In specifying what can be considered as memorable events, McIntosh et al. (2010) include major diseases, deaths, school enrollments, and major asset purchases, while they regard changes in profits and revenues among the events most difficult to remember with precision. More in general, the three above-mentioned papers consider the following to be facts which do not require strong memory efforts: divorces and remarriages (Peters, 1988), house restructuring decisions (McIntosh et al. 2010), and schooling years and age of children (Becchetti and Castriota, 2009).

Interesting evidence on the reliability of this approach is provided by Peters (1988), who draws on both panel and retrospective data to demonstrate the accuracy of retrospective information in his specific case, given that both sources of data yielded substantially the same results when hazard rates of divorce and remarriage were estimated.

In our case, respondents were asked about their family size, the age of their offspring, the schooling years of each family member, and the age at which they had started school (usually 5 or 6). A final question was whether and when school had been suspended and restarted by some of the respondent's children. Overall, we maintain that this information is highly memorable, considering that (besides age) parents must be informed and aware of this basic information about their children's education. Further details on the retrospective approach are given in section 7.

5. Descriptive findings

A first point to be mentioned is that cooperative membership was more common than fair trade affiliation, since 84% and 77% of farmers from Kud Chun and Bak Reua, respectively, were cooperative members. In other words, while all GreeNet affiliated farmers were by definition

cooperative members, 60% of non-GreeNet affiliated members belonged to cooperatives as well. By taking into account this feature, and by controlling separately for both cooperative and FT membership, it was possible to isolate the specific effect of FT and/or organic certification from a generic cooperative effect when conducting the econometric analysis (see econometric results in Tables 1 and 2).

In a previous paper, Becchetti, Conzo and Gianfreda (2008) documented that, in the same sample on which we perform our analysis, fair-trade-affiliated subjects had a significantly higher per capita income than the control sample. From a descriptive point of view, household income from agriculture was on average 60,942 THB (Thai Baht) for affiliated against 41,646 for non-affiliated producers (the average number of household members being around 3.8 for both subsamples) (Table A1 in the online Appendix) and the difference was significant at 95 percent level in both parametric and nonparametric tests. It remained significant as well when the authors considered the same variable adjusted for the market value of self consumption (the latter being significantly larger for affiliated producers) and total income (including other productive activities). From an econometric point of view, Becchetti et al. (2008) showed that any additional FT affiliation year raises per capita income from agriculture by an amount within the 600-1,200 THB range. The result remained significant after various robustness checks (propensity score matching, IV estimates with instruments satisfying exclusion restrictions, estimates on the treatment sample only). Unfortunately, here we cannot directly use this evidence on productivity gains of affiliated versus non-affiliated farmers since we do not have time series, but only evidence related to the year of the survey. However, this observed income effect is at the basis of our analysis, the purpose of which is to check whether the creation of higher economic value (reasonably assumed to work proportionally to affiliation years based on the above mentioned cross-sectional evidence) induces farmers to modify their schooling decisions.

Figures 1a and 1b document the relationship between the likelihood of school enrolment and birth order for FT-affiliated and non-affiliated control farmers. A first finding is that, on the whole,

the probability of school attendance is positively correlated with birth order. From a descriptive point of view, fair-trade affiliation seems to matter for children of lower birth order. The probability of school attendance for the fourth child is 80 against 65 percent in affiliated and non-affiliated farmer households respectively. The same numbers are 63 and 31 percent when the sixth child is considered.

The findings are similar when the probability of school attendance (irrespective of the age order) in smaller and larger families is considered. Such probability is roughly the same for affiliated and non-affiliated single-child families, while a gap progressively widens as the number of children grows and is largest (61 against 47 percent in families with six children).

6. Econometric findings

In the econometric analysis we check whether our descriptive findings on the effects of FT affiliation on child education are significant and robust when controlling for concurring determinants of child schooling.

Based on descriptive evidence showing that FT affiliation makes a difference when households have more children, and on the wider evidence on the quality of education/quantity of children trade-off reported in the introduction, we use the number of FT affiliation years for families with more than two children as a measure of the affiliation effect.

The following selected specification is estimated with a panel probit estimate with random effects

$$\begin{aligned} School_{ijt} = {} & \alpha_0 + \alpha_1 NChild_{jt} + \alpha_2 Area_j + \alpha_3 ParentEducation_j + \alpha_4 Controlcoop_j + \\ & + \alpha_5 AgricYears_{jt} + \alpha_6 ParentBirthYear_j + \alpha_7 TrendfutureFT_{jt} + \\ & + \alpha_8 FTyearbigfam_{jt} + \alpha_9 PosShock_{jt} + \alpha_{10} NegShock_{jt} + \alpha_{11} Childage_{ijt} + \\ & + \alpha_{12} Male_j + \alpha_{13} CoopYears_{jt} + \alpha_{14} OrganicYears_{jt} + \sum_l \beta_l DYear_l + \upsilon_j + \varepsilon_{ijt} \end{aligned} \quad (1)$$

with υ_j being a normally distributed random family effect. The dependent variable ($School_{ijt}$) is a dummy taking the value of one if the i-th child of the j-th family went to school in year t and zero

otherwise. Among regressors, $NChild_{jt}$ is the number of children in the family j at time t, *Area* is a dummy taking the value of one if the producer is located in Kud Chun, and zero otherwise, *ParentEducation* is father's schooling years, *Controlcoop* is a dummy for control producers which takes value one if they belong to a cooperative different from GreeNet, *AgricYears* is the respondent's job seniority (number of years worked in agriculture), *ParentBirthYear* is the producer's year of birth, *TrendfutureFT* is a (pre-affiliation) trend variable measuring the number of years in the sample of the child's family before entry into FT, *FTyearbigfam*, is the number of FT affiliation years for families with more than two children, *PosShock* (*NegShock)* is a dummy taking value one in the year in which the respondent declares to have experienced a memorable event with positive (negative) effects[16] on his income, *Childage* is child's age,[17] *Male* is a dummy for male children,[18] *CoopYears,* and *OrganicYears* are respectively years of affiliation in the cooperative and of adoption of organic farming techniques, *DYear* are time dummies (1989 is the omitted benchmark). Among socio-demographic variables we introduced those for which the theoretical and empirical literature on child schooling has extensively demonstrated their relevance and significance for child schooling decisions (see among others, Edmonds, 2007, Islam and Choe 2009 and Maldonado and Gonzalez-Vega, 2008).

We estimate the model in the overall sample (Table 1, column 1) and in the subsample which includes only families with more than two children (Table 1, column 2). Although we attempt to simulate the counterfactual situation as rigorously as possible by enhancing similarities between the two groups, a typical criticism of results such as ours is that they are driven by heterogeneity between treatment and control sample producers. In order to reduce this problem further, we reestimate all our specifications in the subsample containing GreeNet-affiliated producers only (Table 1, columns 3 and 4).

The regression findings show that the significance of affiliation years for families with more than two children is confirmed as positive and significant in both the overall and the FT-affiliated only estimates, with or without restriction of the sample to families with more than two children.

The marginal impact states that an additional affiliation year increases by 2.7 percent the probability of schooling in large families in the first specification (Table 1, column 1) and up to 7 percent in the estimate in large families of affiliated farmers only (Table 1, column 4). An important aspect of this finding is that it is not just the treatment *per se*, but also the graduation of the treatment (exposure to affiliation), which has significant effects on our dependent variable.

Among other variables, to be noted is that the pre-affiliation trend (*TrendfutureFT*) is positive but of far lower magnitude than the FT effect in three out of four estimates (the null of equality of coefficients is rejected in all estimates). This is an important indirect check of the validity of the assumption of homogeneity between the treatment and control samples. In the presence of selection bias and ex ante superior skills of the affiliated producers, we should observe a continuity between pre-affiliation and post-affiliation trend effects on our performance variable (the probability of sending children to school). This is not the case; indeed, the significant difference in coefficients indicates a break, and not a continuity, around the year of entry into FT. Consider as well that we also control for years of job experience in agriculture, of adoption of organic farming and affiliation to the cooperative (which includes the period before the cooperative enters fair trade).

Among other regressors, note that the negative shock variable is negative and significant when the sample is not restricted to large families, which supports the hypothesis that memorable events generating negative shocks on income matter. The significance and sign of the other regressors are consistent with the usual findings in the literature: children's age is negative and significant; females are relatively less likely than males to go to school; parent education is positive and parent age negative; the number of children in the family has a negative and significant effect. Note also that years of organic adoption and of cooperative affiliation are positive and weakly significant in the overall sample estimates.[19]

7. The endogeneity problem

The estimates just discussed suffer from potential endogeneity problems. Consider that each producer, by choosing to enter, remain with, or exit from the cooperative at a given moment in time implicitly took three important choices: affiliation to the GreeNet cooperative, adoption of organic farming, and participation in fair trade.[20] We therefore have three potential selection biases in affiliation, because unobservable factors related to the producer's innate ability and activism could affect both one of the three choices and the inherited pre-schooling talents of the children.

Moreover, we also have the traditional endogeneity problem related to the quantity/quality trade-off described in the schooling literature. Note that, in principle, we are interested only in the differential effect generated by affiliation on quality for a given level of quantity. Hence, if we assume that the two endogeneity problems are independent from each other, we can focus on the first one (selection bias). Since this assumption may be restrictive, however, we adopt a set of strategies with which to deal with both biases at a time.

More specifically, we devise the following three checks. First, we estimate the model in the treatment group only (Table 1, columns 2 and 4).[21] Second, we look at discontinuity between pre and post affiliation trends of affiliated farmers in child schooling (see the effect of this variable in Table 1). Third, as described in this section, we devise a way to tackle the endogeneity problem by using three stage least squares to estimate a system into which we introduce three selection equations for each of the three choices (organic adoption, fair trade, and cooperative affiliation), together with the performance equation in which an household schooling index (HSI) is the dependent variable and the regressors are those in (1).

The HSI variable is a time-varying household schooling index for each producer built on retrospective data and represented by the number of children attending school over the total number of children in the schooling age cohort in a given year. More formally, the household schooling index (HSI) ratio is given by the following expression:

$$HSI_{jt} = \sum_{i=1}^{n_i} \frac{TOTSCH_{ijt} \left| Entryage_{ijt} \le Age_{ijt} \le Endage_{ijt} \right.}{TOTPOT_{ijt} \left| Entryage_{ijt} \le Age_{ijt} \le Endage_{ijt} \right.} \quad (2)$$

where the HSI_{jt} index is the number of children of the j-th producer in a chosen school age cohort, - e.g. age range between 6(5)[22] and 18(17), if we are interested in elementary, middle and high school, and between 13 and 18 if we are only interested in high school, etc. - who actually went to school in a given year t ($TOTSCH_{ijt}$), divided by the number of children of the j-th producer who are in the related school age cohort in the same period ($TOTPOT_{ijt}$).[23] In other words, the HSI_{jt} index is a ratio of effective to potential household schooling. Using this indicator we estimate with 3 stage least squares (3SLS) a system (whose specification is described in Table 2) comprising three selection equations for cooperative and FT affiliation and organic choice.

Results from the 3SLS approach confirms the significance of FT affiliation years (Table 2 and Tables A2-A5 in the Appendix available online). Other effects in the first equation confirm the importance of negative shocks and are in the expected direction. An interesting finding from the selection equations is that negative and positive shocks on income are positively correlated with the three endogenous choices. This is as expected since cooperative affiliation, FT affiliation and organic adoption (required by the FT importers) reduce farmers' risk.[24] Moreover, schooling years positively and significantly affected all the three choices.

8. Further interpretation of our findings based on qualitative data

In order to provide a richer interpretation of our results we add to quantitative results information from a small qualitative survey used for a group interview with project coordinators and local government members. Here below is the synthesis of their answers which provides us additional insights to interpret our findings.

8.1 Social norms and schooling habits

Families who do not send their children to primary/elementary school (now 6 years) are rare, it is also rather rare not to continue until the 3rd year of high school (about age 15-16). At this point leaving school is much more common and would appear to relate to identified factors among which the number of total children. The costs of sending children to senior high school are significantly higher than junior high school or elementary school. As well, youth of 15/ 16 can work legally and find employment in many areas. Then, again, when looking at post-secondary school and university, costs increase significantly, and work opportunities are even greater for those 18 and older. Other factors leading to school abandonment might be earlier marriage and pregnancy, becoming a monk (although the temples often are alternative points of education) and attending military service (for men 18 years or older).

8.2 Parent attitudes

The interview confirmed that parents care a lot about children higher education reinforcing our assumption that the benevolent household model is a better framework than the bargaining model to explain household schooling choices.

The group agreed that Most Thais are very generous to their children and willing to invest a lot in them. For many farmers, farming is considered a low status job and they would like their children to do better, being teachers, doctors, engineers, etc, almost all of which require 12 yrs or more of education. Hence, it is normal to take loans to finance child education and it is sometimes necessary to sell land to send one's child to university. Of course there are budget limits, so for private schools and university both public and private, this may pose a challenge to the family to support these costs for their children. In larger families, it is not uncommon to invest more in a child with high potential. Birth order does not necessarily matter in this respect. There are cases where elder children leave school early to help earning money and taking care of house and other

work. Then a second or third child who is a good student can be supported. One of the incentive for child education is the expectation and tradition that a successful child will give money back to his or her parents and support his or her siblings particularly in such a case.

8.3 Difference of FT

Our additional qualitative information from project managers shows that farmer groups have a consciousness about expenses and how to reduce them and also have a fair and dependable market. Hence more farmers in these groups are likely to reduce their expenses as well as at least make some earnings from their agricultural activities, which is not at all guaranteed for normal conventional production. Many farmers may invest a lot in inputs and labor and then get low prices when they sell or have poor production, both of which can lead to losses and increased debt. With organic and self-sufficiency methods, there is less cash investment for production and more product (food and other) that are consumed and used by the family. This puts such farmers at less risk, combined with the FT price floor characteristic which reduces price volatility.

9. Conclusions

Poverty can be usefully conceived as a set of exclusions (from credit, product markets, insurance and education) which prevent individuals from fully exploiting their talents, limiting their productive contribution to society. In this paper we have shown how exclusions can interact with each other to generate virtuous or vicious circles. More specifically, by performing an impact study on the effects of affiliation to fair trade for a cooperative of organic farmers, we have documented that the improved access to foreign markets ensuing from the creation of an ad hoc trade channel (together with a package of initiatives promoting the inclusion of affiliated farmers) has positive and significant effects on access to education of the children when producers have large families.

Our findings document that years of FT affiliation significantly ease the well-known quantity/quality trade-off which implies the lower probability of school enrolment for children in larger families. From a methodological point of view, we have obtained these results by developing a retrospective panel data approach based on memorable events and controlling for selection bias and endogeneity with various techniques (analysis of preformation trends, restriction of the estimate to the treatment sample only, adoption of 3SLS estimates). We are aware that there is no perfect solution to the endogeneity problems in our as in many other studies, but we tried to do our best to solve them given the possibilities provided by our data.

Our findings are consistent with FT criteria and the prediction of the luxury axiom. A plausible interpretation of them consistent with FT criteria and characteristics is that FT affiliation increases producers' revenues by easing access to foreign markets and financing for technical innovation. This enables producer families to rise above income subsistence levels and induces them to send more children to school when families are large.

Notes

1. Both the price mark-up and cooperative premium are monetary transfers from the importers. The first goes to producers, and the second to the producers' organization for investment in collective goods.
2. This last point is important because income volatility forces households to adopt risk-coping strategies which may require the interruption of a child's education in the presence of negative shocks (Maldonado et al., 2008 and Kanbur and Squire, 2001).
3. Empirical papers using approaches akin to ours look at income changes generated by commodity price changes (Edmonds and Pavcnik 2005; Kruger, 2007) or shocks on production (Beegle, Dehejia and R. Gatti, 2006).
4. We nevertheless consider that our focus on FT affiliation and child schooling is appropriate to the study of child well-being. Whilst schooling obviously gives children opportunities to increase their future well-being, it is not so evident that child labour (especially if domestic) has a clear-cut negative effect on it, given the non-negative association found with children's health (O'Donnell et

al. 2002) and the non-significant effect on education (see Edmonds 2005's comments on UNICEF's Multiple Indicator Cluster Surveys data).

5. For a more general survey on related issues in the child labour literature see, among others, Deb and Rosati (2002) and Bhalotra and Heady (2003).
6. It is clear that here the quality/quantity trade-off is considered in its simplest form, that is, the trade-off between the number of children and the probability that they are enrolled at school.
7. See the IFAT (International Fair Trade Association) charter (EFTA, 2009).
8. For a theoretical evaluation of the effects of FT from the perspective of trade theories see Maseland and De Vaal (2002) and Reinsteing and Song (2008). Other relevant papers dealing with various aspects of the impact of FT are those by LeClair (2002), Moore (2004), Hayes (2004) and Redfern and Snedker (2002).
9. Nestlè introduced a fair trade product in its product range in October 2005; Co-op UK has launched its own fair-trade product line, while Starbucks has rapidly become the main buyer of FT coffee in recent years. The partial (or planned) adoption of FT practices has been made by Tesco and Sainsbury, and it has been announced by Mars. For a discussion on competition between fair-trade-dedicated retailers and supermarkets see also Kohler (2007). A chronology of the partial imitation steps of large transnationals toward fair trade is available on http://www.fairtrade.org.uk/what_is_fairtrade/history.aspx.
10. At present, the FT impact study literature mainly consists of some well-structured case studies (Bacon, 2005; Pariente, 2000; Castro, 2001; Nelson and Galvez, 2000; Ronchi, 2006) and a few econometric impact analyses. For a survey of these and other impact analyses on FT see Ruben (2008).
11. The FT approach to child labour is clearly non-prohibitionist. This is shown by a second point on the issue Working conditions in the 10 IFAT criteria, which states that "*Fair Trade means a safe and healthy working environment for producers. The participation of children (if any) does not adversely affect their well-being, security, educational requirements and need for play and conforms to the UN Convention on the Rights of the Child as well as the law and norms in the local context*. The IFAT Charter makes reference to the *UN Convention on the Rights of the Child*, which explicitly deals

with child labour at article 32. There is no explicit prohibition of child labour in this article, and no direct encouragement of child schooling. Note, however, that article 32 of the UN convention on child labour stipulates that "it must not interfere with child's education". Finally, the requirement of transparency on child labour from organizations working with fair trade is another point which suggests that child labour is not banned.

12. See, among others, Ranjan (2001) and Cigno, Rosati, and Tzannatos (2002).
13. Besides attention to the sample design, we addressed selection bias by: i) comparing preformation and postformation trends, ii) estimating our model on the restricted sample of affiliated producers only; iii) running a 3-stage least squares with selection equations for the three choices (see sections 6 and 7).
14. The questionnaire is omitted for reasons of space and available upon request.
15. Other examples of the use of retrospective data are provided by *i)* Garces at al. (2002), who use PSID data, with the addition of retrospective questions on early childhood education, in order to assess the impact of a public preschool program for disadvantaged children; *ii)* Smith (2009), who examines impacts of childhood health on socioeconomic status outcomes observed during adulthood relying on retrospective self-evaluations of the general state of one's health and *iii)* Ilahi et al. (2000) who, using unique retrospective data from Brazil, explore the relationship between child labor and future adult earnings and poverty status.
16. Surveyed events with a positive impact on respondents' income are: i) increase in the paddy rice market price, ii) a positive shock on production, iii) monetary or non-monetary gifts from farmers' sons and daughters, v) positive wage shocks in the second activity, vi) lottery wins and vii) granting of awards. Surveyed events with a negative impact on respondents' income are: i) disease, ii) car accidents, iii) fire, iv) car breaking, v) increase in the input market price, vi) the death of animals used as capital investment (such as water buffalos), vii) slow development of the soil.
17. As expected, the probability of leaving school grows with child age. Hence, the older the child, the more likely it becomes that she/he will show an education gap. This result has been confirmed by Maldonado (2005) and Islam and Choe (2009), who find that children of primary-school age have a

higher enrolment rate than their older siblings, the latter being more likely to drop out from school and go to work. For further comments on these findings see section 8.

18. We expected girls' education to be less valued than that of boys. In this regard, Edmonds (2007) shows with data from UNICEF's Multiple Indicator Cluster Surveys that there is a sizeable increase in participation rates in market and domestic work for males at age 12, while girls experience discrete jumps at age 8, 10, and 12. The increase at age 8 for girls appears to be most marked in domestic work, whereas most of the increase at age 10 and 12 for girls is in market work.
19. In order to check whether our findings are robust to the introduction of time invariant family traits we re-estimate our two specifications in the treatment sample only with logit fixed effects The fixed-effect estimate findings confirm the significance of FT affiliation years and the fact that their impact is significantly stronger than that of pre-affiliation years. Results are available on request.
20. Even if affiliation to fair trade is chosen by the GreeNet cooperative in 2002 and therefore automatically by all members at that date, late entries and stay decisions are also implicitly individual member's choices with regard to FT.
21. Consider that, for a spurious result between affiliation years and child education driven by heterogeneity between young and old affiliated, we should have that old affiliated are more likely to send their children to school. We controlled for this, however, and found that the problem did not apply because there was no significant difference between the preformation trends of young and old affiliated.
22. Entry age is generally 5 or 6 based on the respondent's declaration.
23. The total number of children for each farmer (n_j) is indexed to account for heterogeneity in household size.
24. See in particular the FT price floor insurance mechanism mentioned in section 2 which can be verified by inspecting the dynamics of FT coffee and cocoa prices between 1980 and 2000.

References

Alessie, R., Baker, P., Blundell, R., Heady, C. and Meghir C. (1992) The working behavior of young people in rural Cote d'Ivoire. *The World Bank Economic Review,* 6, pp. 139-154.

Arellano, M., and Bover, O. (1995) Another look at the instrumental variables estimation of error components models. *Journal of Econometrics*, 68, pp. 29-51.

Bacon, C. (2005) Confronting the Coffee Crisis: Can Fair Trade, Organic, and Specialty CoffeesReduce Small-Scale Farmer Vulnerability in Northern Nicaragua? *World Development*, 33(3), pp. 497-511.

Basu K. and Van, P.H., (1998) The Economics of Child Labor. *American Economic Review*, 88, pp. 412-427.

Basu, K. and Ray, R. (2002) The collective model of the household and an unexpected implication for child labor: Hypothesis and an empirical test. *The World Bank Policy Research Working Paper series*, 2813.

Becchetti, L. and Castriota, S. (2009) Fall and recovery. Disruption and catching up effects after tsunami on a sample of MFI borrowers. *CEIS working paper*, 258.

Becchetti, L., Conzo, P. and Gianfreda G. (2009) Market access, organic farming and productivity: the determinants of creation of economic value on a sample of fair trade affiliated Thai farmers. *Econometica Working Papers*, wp. 05.

Becchetti, L. and Costantino, M. (2008) Fair trade on marginalized producers: an impact analysis on Kenyan farmers. *World Development*, 365, pp. 823–842.

Becchetti, L., Solferino, N. (2008) On ethical product differentiation. *Economia e Politica Industriale*, (forth).

Becchetti, L. and Rosati, F. (2007) Globalisation and the death of distance in social preferences and inequity aversion: empirical evidence from a pilot study on fair trade consumers. *The World Economy*, 30 (5), pp. 807-30.

Becchetti, L., Costantino, M. and Portale, E. (2007) Human capital, externalities and tourism: three unexplored sides of the impact of FT affiliation on primary producers. *CEIS working paper*, 262.

Becker, G.S., and Tomes, N. (1976) Child Endowments and the Quantity and Quality of Children. *Journal of Political Economy*, 84(4), pp. 143-162.

Beegle, K., Dehejia, R. and Gatti, R. (2006) Child Labour and Agricultural Shocks. *Journal of Development Economics*, 81(1), pp. 80-96.

Behrman, J.R. and Knowles, J.C. (1999) Household Income and Child Schooling in Vietnam. *The World Bank Economic Review*, 13, pp. 211-256.

Bhalotra, S. and Heady, C. (2003) Child Farm Labor: The Wealth Paradox. *World Bank Economic Review* 17(2), pp. 197-227.

Black, S.E., Devereux, P.J. and Salvanes, K.G. (2005) The More the Merrier? The Effect of Family Size and Birth Order on Children's Education. *Quarterly Journal of Economics*, 120(2), pp. 669-700

Blundell, R. and Bond, S. (1998) Initial conditions and moment restrictions in dynamic panel data models. *Journal of Econometrics*, 87(11), pp. 53-78

Booth, A.L. and Kee, H.J. (2009) Birth Order Matters: The Effect of Family Size and Birth Order on Educational Attainment. *Journal of Population Economics*, april 2009, 22(2), pp. 367-97.

Castro, J.E. (2001) *Impact assessment of Oxfam's fair trade activities. The case of Productores de miel Flor de Campanilla* (Oxford: Oxfam).

Cigno, A. and Rosati, F. (2005) *The Economics of Child Labour* (Oxford University Press: Cambridge).

Cigno, A., Rosati, F. and Tzannatos, R. (2002) Child Labor Handbook. *WB Social Protection Discussion Paper*, 0206.

Davidson, R. and MacKinnon, J. (1993) *Estimation and Inference in Econometrics* (New York: Oxford University Press)

Deb, P. and Rosati, F. (2002) Determinants of Child Labor and School Attendance: The Role of Household Unobservables. Understanding Childrens. *Work Working Paper. Florence: Innocenti Research Center*.

De Janvry, A., Finan, F. Sadoulet, E. and Vakis, R. (2006) Can conditional cash transfers serve as safety nets in keeping children at school and from working when exposed to shocks? *Journal of Development Economics*, 79, pp. 349-373.

Edmonds, E. and Pavcnik, N. (2005a) Child labor in the global economy. *Journal of Economic Perspectives*, 19, pp. 199-220.

Edmonds, E. and Pavcnik, N. (2005b) The effect of trade liberalization on child labor. *Journal of International Economics*, 65, pp. 401-419.

Edmonds, E.V. (2007) Child labor. *NBER Working Paper*, 12926.

European Fair Trade Association (2009) www.european-fair-trade-association.org.

Garces, E., Duncan, T. and Currie, J. (2002) Longer-Term Effects of Head Start. *American Economic Review*, 92(4), pp. 999–1012.

Hanushek, E.A. (1992) The Trade-off between Child Quantity and Quality. *Journal of Political Economy*, 100(1), pp. 84-117.

Hayes, M. (2004) Strategic management implication of the ethical consumer. http://www.fairtraderesearch.org.

Iacovou, M. (2001) Family Composition and Children's Educational Outcomes. *Working Paper of Institute for Social and Economic Research*, 2001-12 -june.

Ilahi, N., Orazem, P. and Sedlack, G. (2000) *The implications of child labor for adult wages, income and poverty: Retrospective evidence from Brazil.* Manuscript (International Monetary Fund).

Kanbur, R. and Squire, L. (2001) The Evolution of Thinking about Poverty, in: G. Meier and J. Stiglitz (eds) *Frontiers of Development Economics: the Future in Perspective*, (Washington, D.C.: The World Bank).

Kohler, P. (2007) The Economics of Fair Trade: For Whose Benefit? An Investigation into the Limits of Fair Trade as a Development Tool and the Risk of Clean-Washing. *HEI Working Papers*, 06-2007.

Kruger, D. (2004) Child labor and schooling during a coffee sector boom: Nicaragua 1993 - 1998, in: Luis F. and L. Calva (eds) *Trabjo Infantil Teoría y Evidencia desde Latinoamerica*, (Mexico, D.F.: Fondo de Cultura Económica de México).

LeClair, M. S. (2002) Fighting the tide: Alternative trade organizations in the era of global free trade. *World Development*, 30(7), pp. 1099–1122.

Maldonado, J.H. and González-Vega, C. (2008) Impact of Microfinance on Schooling: Evidence from Poor Rural Households in Bolivia. *World Development*, 36 (11), pp.2440-2455.

Marquardt, D.W. (1970) Generalized inverses, ridge regression, biased linear estimation, and nonlinear estimation. *Technometrics*, 12, pp. 591–612.

Maseland, R. and De Vaal, A. (2002) How Fair is Fair Trade? *De Economist*, 150(3), pp. 251-272.

McIntosh C., Villaran, G. and Wydick, B. (2010) Microfinance and Home Improvement: Using Retrospective Panel Data to MeasureProgram Effects on Discrete Events, *World Development*, forthcoming.

Moehling, C. (2006) Children's pay envelopes and the family purse: the impact of children'sincome on household expenditures. Unpublished paper (Rutgers University, New Brunswick NJ).

Moore, G. (2004) The Fair Trade Movement: parameters, issues and future research. *Journal of Business Ethics*, 53(1-2), pp. 73-86.

Mundlak, Y. (1978) On the Pooling of Time Series and Cross Section Data. *Econometrica*, 46 (1), pp. 69–85.

Nelson, V. and Galvez, M. (2000) Social Impact of Ethical and Conventional Cocoa Trading on Forest-Dependent People in Ecuador. *University of Greenwich.*

O'Donnell, O., Doorslaer, E. and Rosati, R. (2004) Health effects of child work: Evidence from rural Vietnam. *Journal of Population Economics*, (18), pp. 1-31

Pariente, W. (2000) The impact of fair trade on a coffee cooperative in Costa Rica. A producers behaviour approach. *Université Paris I Panthéon Sorbonne working paper*, pp. 1161-98.

Peters H. E. (1988) Retrospective Versus Panel Data in Analyzing Lifecycle Events. *The Journal of Human Resources*, (23) 4, pp. 488-513.

Ranjan, P. (2001) Credit Constraints and the Phenomenon of Child Labor. *Journal of Development Economics*, LXIV, pp. 81-102.

Redfern, A. Snedker, P. (2002) *Creating market opportunities for small enterprises: experiences of the fair trade movement* (ILO: Geneva).

Reinstein, D. and Song, J. (2008) Efficient Consumer Altruism and Fair Trade. *Economics Discussion Papers*, 651, University of Essex, Department of Economics.

Ronchi, L. (2006) "Fairtrade" and Market Failures in Agricultural Commodity Markets. *World Bank Policy Research Working Paper*, 4011, Washington IBRD.

Ruben, R. (2008) *The impact of fair trade* (Wageningen Academic Publishers: Wageningen).

Schultz, T. (2004) School subsidies for the poor: Evaluating the Mexican progresa poverty program. *Journal of Development Economics*, 74, pp. 199-250.

Smith, J.P. (2009) The Impact of Childhood Health on Adult Labor Market Outcomes. *Review of Economics and Statistics*, 91(3), pp. 478-489.

Steelman, L.C. and Powell, B. (1989) Acquiring capital for college: The constraints of family configuration. *American Sociological Review*, 54, pp. 844–855.

Yilmazer, T. (2008) Saving for Children's College Education: An Empirical Analysis of the Trade-off Between the Quality and Quantity of Children. *Journal of Family Economic*, 29(2), pp. 307-324.

Figure 1a Schooling probability and birth order.

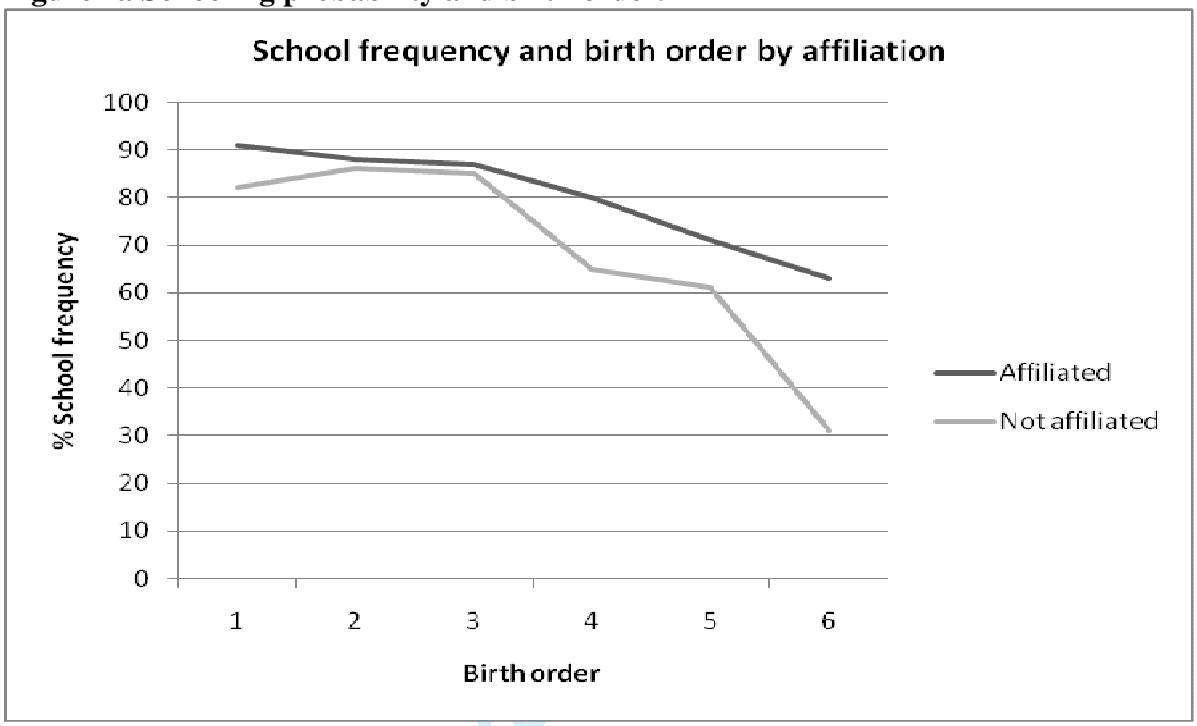

Figure 1b Schooling probability and number of children in the family.

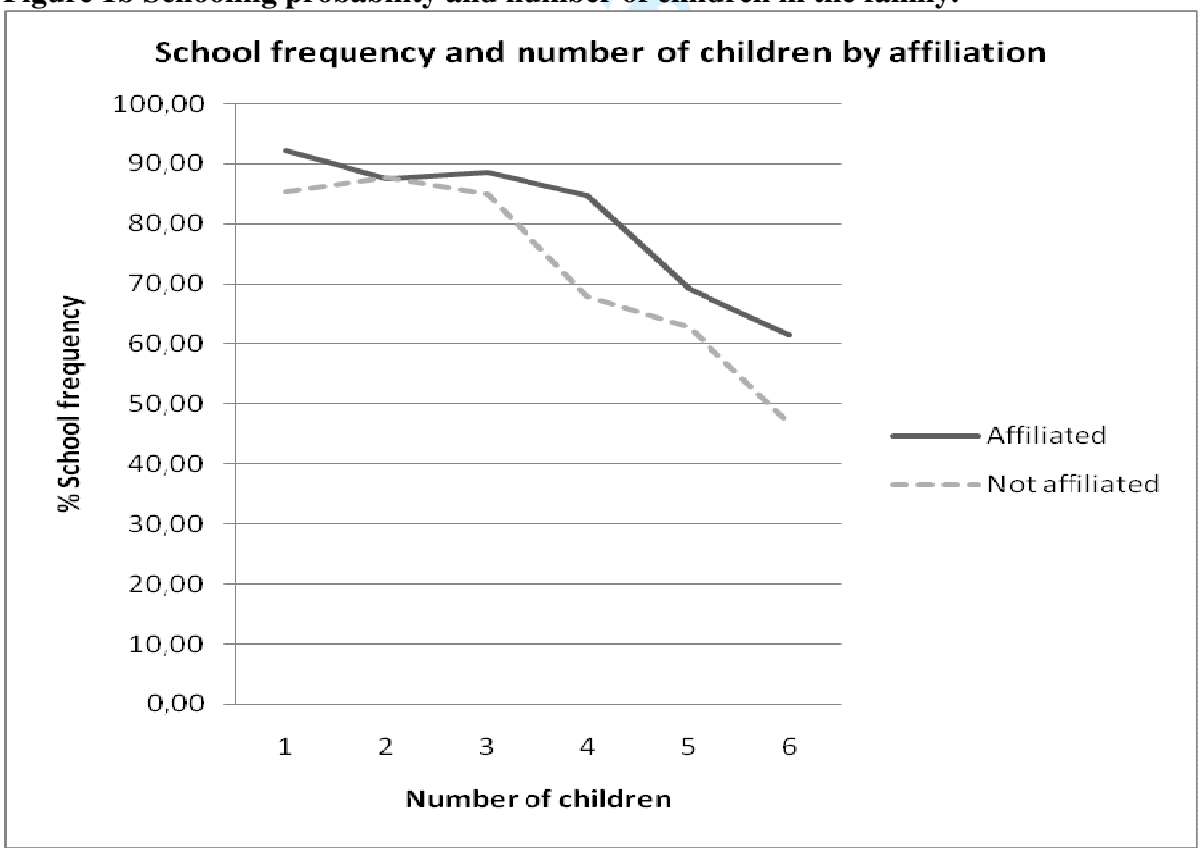

Table 1. The effect of fair-trade affiliation on schooling decisions: random effect probit regression

	All sample		GreeNet producers only	
	(1)	(2) ¥	(3)	(4) ¥
NChild	-1.15***	-2.39***	-1.03***	-1.47***
	(0.23) [-0.019]	(0.25) [-0.060]	(0.32) [-0.018]	(0.33) [0.028]
Area	-4.87***	-0.19	-5.13***	-2.50***
	(0.44)[-0.144]	(0.55)	(0.73) [-0.164]	(0.91) [-0.070]
ParentEducation	0.32***	0.61***	0.30***	0.46*
	(0.07)[0.005]	(0.17) [0.012]	(0.09) [0.005]	(0.24)
Controlcoop	1.73***	0.89		
	(0.47)[0.029]	(1.02)		
AgricYears	0.001	0.01	-0.39	0.05
	(0.02)	(0.03)	(0.02)	(0.05)
ParentBirthYear	0.12***	0.05	0.08*	0.16**
	(0.03)[0.003]	(0.05)	(0.05)	(0.08) [0.005]
TrendfutureFT	0.21***	0.29***	0.14**	0.30
	(0.03)[0.005]	(0.10) [0.005]	(0.05)	(0.24)
FTyearbigfam	1.38***	1.73***	1.16***	2.57**
	(0.18)[0.027]	(0.50) [0.032]	(0.28) [0.024]	(1.10) [-0.070]
PosShock	-0.14	-3.04	-0.71	-2.18
	(0.92)	(2.29)	(1.08)	(1.78)
NegShock	-2.70***	-1.96	-2.54***	-2.22
	(0.53)[-0.070]	(1.32) [-0.039]	(0.68) [-0.070]	(1.90)
Childage	-1.55***	-1.81***	-1.14***	-1.73***
	(0.1)[-0.024]	(0.12) [0.033]	(0.13)	(0.17) [0.032]
Male	-1.44***	-0.98*	-1.54***	-1.51*
	(0.35) [0.027]	(0.54)	(0.50) [0.029]	(0.87)
CoopYears	0.25**	0.12	0.13	0.24
	(0.13)[0.006]	(0.22)	(0.16)	(0.39)
OrganicYears	0.41**	-0.52	0.40*	-0.64
	(0.16) [-0.010]	(0.39)	(0.21)	(0.51)
Constant	-206.4***	-70.50	-143.6	-291.7*
	(69.91)	(100.73)	(97.08)	(152.6)
Dummy year	Yes	Yes	Yes	Yes
Observations	5652	2820	3870	1798
Number of id	717	385	489	244
Wald χ^2 (22)	425.65	430.35	231.3	244.12
Log Likelihood	-875.24	-641.68	-562.14	-242.23
Prob > χ^2	(0.00)	(0.00)	(0.00)	(0.00)
Wald χ^2 (1)(p-value) ±	(0.00)	(0.00)	(0.00)	(0.00)

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Marginal effect of the regressor on the probability of child schooling in square brackets.

¥ Only families with more than two children.The estimated specification is equation (1) at page 14.

± Null hypothesis: equality of coefficients of *FTyearsbigfam* and *TrendfutureFT*. Variable legend: The dependent variable ($School_{ijt}$) is a dummy taking value one if the i-th children of the j-th family went to school in year t and zero otherwise. Among regressors, $NChild_{jt}$ is the number of children in the family j at time t, *Area* is a dummy taking value one if the producer is located in Kud Chun and zero otherwise, *ParentEducation* is father's schooling years, *Controlcoop* is a dummy for control producers which takes value one if they belong to a cooperative different from GreeNet, *AgricYears* is the respondent's job seniority (number of years worked in agriculture), *ParentBirthYear* is the producer's year of birth, *TrendfutureFT* is a (pre-affiliation) trend variable measuring the number of years in the sample of the child's family before entry into FT, *FTyearbigfam*, is the number of FT affiliation years for families with more than two children, *PosShock* (*NegShock)* is a dummy taking value one in the year in which the respondent declares having experienced a memorable event with positive (negative) effects on his income (see footnote 16 for the event list), *Childage* is child's age, *Male* is a dummy for male children, *CoopYears,* and *OrganicYears* are respectively years of affiliation with the cooperative and of adoption of organic farming techniques, *DYear* are time dummies (1989 is the omitted benchmark).

Table 2. 3-stage least squares regression

The system estimated is

$$HSI_{jt} = \alpha_1 NChild_{jt} + \alpha_2 AgricYears_{jt} + \alpha_3 ParentBirthYear_j + \alpha_4 TrendfutureFT_{jt} + \\ + \alpha_5 FTyearsbigfam_{jt} + \alpha_6 PosShock_{jt} + \alpha_7 NegShock_{jt} + \alpha_8 Male_j + \alpha_9 Childage_{jt} + \\ + \alpha_{10} ParentEducation_j + \alpha_{11} FTyears_{jt} + \alpha_{12} OrganicYears_{jt} + \varepsilon_{jt}$$

$$FTyears_{jt} = \beta_1 NegShock_{jt} + \beta_2 PosShock_{jt} + \beta_3 DistFromCoop_j + \\ + \beta_4 LandSize_j + \beta_5 Area_j + \beta_6 ParentEducation_j + \eta_{jt}$$

$$CoopYears_{jt} = \gamma_1 DistFromCoop_j + \gamma_2 Area_j + \gamma_3 LandSize_j + \gamma_4 ParentEducation_j + \\ + \gamma_5 PosShock_{jt} + \gamma_6 NegShock_{jt} + \nu_{jt}$$

$$OrganicYears_{jt} = \delta_1 PosShock_{jt} + \delta_2 NegShock_{jt} + \delta_3 DistFromCoop_j + \delta_4 Area_j + \\ + \delta_5 Landsize_j + \delta_6 ParentEducation_j + \upsilon_{jt}$$

For variable legend see section 6 and Table 1 legend.

VARIABLES	HSI	FTyearsbigfam	CoopYears	OrganicYears
NChild	-0.09***			
	(0.002)			
AgricYears	0.00			
	(0.001)			
ParentBirthYears	0.00***			
	(0.001)			
TrendfutureFT	0.002***			
	(0.001)			
FTyearsbigfam	0.047***			
	(0.016)			
PosShock	0.027	0.216*	2.352***	1.191***
	(0.027)	(0.113)	(0.380)	(0.265)
NegShock	-0.128***	0.404***	3.091***	2.56***
	(0.020)	(0.055)	(0.186)	(0.13)
Male	-0.029***			
	(0.005)			
Childage	-0.016***			
	(0.001)			
ParentEducation	0.002*	0.022***	0.154***	0.070***
	(0.001)	(0.003)	(0.010)	(0.007)
FTyears	-0.012			
	(0.008)			
DistFromCoop		0.012***	-0.005	-0.004
		(0.002)	(0.006)	(0.004)
LandSize		-0.003***	-0.001	-0.003*
		(0.001)	(0.002)	(0.001)
Area		-0.022	0.280***	0.39***
		(0.021)	(0.073)	(0.05)
Wald χ^2 (1)(p-value) [±]	(0.00)			
Observations	4816	4816	4816	4816
R-squared	0.85	0.06	0.26	0.22

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

[±] Null hypothesis: equality of coefficients of *FTyearsbigfam* and *TrendfutureFT*.

Appendix 1 Analysis of FT and of the impact of our approach with a logical framework scheme

	Narrative	Objectively verifiable indicators	Means of verification	Assumptions
Goal or impact (long term)	*To create opportunities for producers who have been economically disadvantaged or marginalized by the conventional trading system* (EFTA 2009) and increase wellbeing and quality of life of them and of the future generation.	Positive effect of FT on the quantity of trading channels and on net sales coming from them. Increased bargaining power of producers along the value chain. Increase in wellbeing indicators of producers.	Missions of Fair Trade labeling institutions and importers (FLO, CTM, etc.), collection of descriptive statistics across time to identify trends Impact studies with field research, collection of qualitative and quantitative data and econometric analysis comparing outcomes of treatment (affiliated) and control (non affiliated) farmers as in our paper.	
Purpose or outcome (Medium term)	Capacity building, increased export capacity, increased bargaining power along the value chain, reduced vulnerability.	Analysis of descriptive data and trends (labeling and import FT organizations) Econometric evidence on the significance of differences in productivity, child schooling, wellbeing indicators between treatment and control sample (as in our impact study)	Missions of Fair Trade labeling institutions and importers (FLO, CTM, etc.), collection of descriptive statistics across time to identify trends Impact studies with field research, collection of data and econometric analysis from researchers (as in our paper)	Capacity building, increased export capacity, increased bargaining power along the value chain, reduced vulnerability are all factors which create opportunities for marginalised producers, foster market access and increase their wellbeing and quality of life

Component objectives or intermediate results	Positive effects from FT affiliation on net sales, product and trading channel diversification, child schooling, productivity and provision of local public goods from the producer cooperative.	Dynamics of net sales, child schooling, productivity between affiliated and non affiliated producers. Verification of product and trading channel diversification (number of products sold and number of trading channels).	Missions of Fair Trade labeling institutions and importers (FLO, CTM, etc.), collection of descriptive statistics across time to identify trends Impact studies with field research, collection of data and econometric analysis from researchers (as in our paper) comparing outcomes of treatment (affiliated) and control (non affiliated) samples.	Positive effects of FT affiliation on net sales, product and market channel diversification, productivity and provision of local public goods are all factors which promote capacity building, increased export capacity, increased bargaining power along the value chain, reduced vulnerability.
Outputs	(Application of FT criteria) Long run relationship of FT importers with FT producer, Fair trade price and cooperative premium, prefinancing opportunities for affiliated farmers, technical assistance and export services.	Verification on the field of the presence and persistence through time of price premium (difference between price paid to the FT importer and price paid to traditional intermediaries or local market buyers), cooperative premium (extra payment to the cooperative for social or technological purposes) and availability of prefinancing opportunities.		Long run relationship of FT importers with FT producers , Fair trade price and cooperative premium, prefinancing opportunities for affiliated farmers, technical assistance and export services are all elements which generate positive effects from FT affiliation on net sales, product and market channel diversification, child schooling, productivity and provision of local public goods.

The contribution of our methodology to FT with a logical framework analysis

If we look at the intermediate, medium and long term goals of FT with the logical framework approach we find that the first output (fifth row in the Table) coming from application of FT criteria (long run relationship of FT importers with FT producers, fair trade price and cooperative premium, prefinancing opportunities for affiliated farmers, technical assistance and export services) is assumed to lead to intermediate results such as positive effects in terms of net sales, product and market channel diversification, child schooling, productivity and local wellbeing indicators (fourth row). Such intermediate results are assumed to be crucial to achieve medium term outcomes (capacity building, increased export capacity, increased bargaining power along the value chain, reduced vulnerability) (third row) which ultimately allow to achieve long term goals (create opportunities for producers who have been economically disadvantaged or marginalized by the conventional trading system and increase their wellbeing and quality of life) (second row).

Our impact study based on retrospective data mainly concerns columns 2 and 3 of the logical framework (objectively verifiable indicators and means of verification) as it aims to implement the capacity of verifying assumptions on the links between different rows in order to evaluate the effectiveness in terms of achievements of the FT approach. Standard monitoring from FT importers and collection of qualitative and descriptive evidence on the field fails to verify rigorously assumptions on the links between application of FT criteria intermediate results and medium and long term goals. In order to do so what is needed is the identification of treatment and control groups, and an econometric analysis of the effects of FT affiliation on measurable indicators which verifies whether effects are robust to controls and, possibly, potential biases.

Appendix not to be published -

N°	Question	Alternatives
1	Case number	CG or TG
2	Sex	female [1]
		male [3]
3	Age	number
4	Civil status	Unmarried [1]
		divorced [3]
		married [5]
5	Are you member of a cooperative/producers' group?	yes [1]
		no [0]
6	If 5 = yes: How far do you live from the cooperative center (in Yasothon)?	km
7	How many people in your household migrated in the last five years?	number
8	If 7 = yes: What for?	Relatives moved as well [1]
		Schooling [3]
		Marriage [5]
		Look for work/start new job [7]
		Famine, draught, disease [9]
		Other (specify)_____[11]
9	if 7 = yes: Where?	Other village [1]
		Bangkok [3]
		Other-Non-Bangkok [5]
		Other-non-Thailand [7]
10	How much do you consider yourself happy *(from 0 to 10)*?	0-10
11	How many years have you attended the school?	years
12	How many children do you have? *[fill the tab below]*	number

13 Children tab

	Sex	Age	How old when started the school?	How many years did he/she attend the school?	How many years did he/she repeat? *[if not = 0]*	Activity			how many hours/day does he/she work on that activity?
	Male [1] Female [3]					help the family [1]	work outside the family [3]	not working [5]	
First									
Second									
Third									
Fourth									
Fifth									
Sixth									
Seventh									
Eighth									

14	How far do you live from the school?	km
15	During the last year your children went to school how much have you spent on education for?	baht
	Fees	
	Uniforms	
	Textbooks	
	Exercise books, pens, pencils	

	Meals, transportation	
	Other expenses	
16	Where was your last child born?	at home [1]
		in a rural clinic [3]
		in the hospital [5]
		other (specify) [7]
17	Has your last child been vacccinated?	yes [1]
		no [0]
18	How much did you spend this year for dental care for the whole family?	baht
19	Has one of your children died?	number of children died
20	Have you seriously injured yourself during the last year?	how many times
21	How many days have you got sick and could not go to work?	days
22	If you were to sell your plot of land today, how much could you sell it for?	baht/RAI
23	Do you use any chemical fertilizer/pesticide?	yes [1]
		no [0]
24	If 23 = no: Did you use chemical ferilizer/pesticide in the past?	yes [1]
		no [0]
25	if 24= yes: When did you stop using them?	year
26	How many people do usually live in your house?	number
27	During the past year, how many times have you attended extension training activities?	times *[0 if not attended]*
28	If 27>0: What kind of training courses?	Use of fertilizers [1]
		Irrigation [3]
		New seeds [5]
		Pest infestation [7]
		Blight problems [9]
		soil problems [11]
		weather problems [13]
		general crop advice [15]
		marketing advice [17]
		insemination services [19]
		other (specify) _____ [21]
29	If 27=0: Why?	I am not interested [1]
		I don't have time [3]
		I can't afford them [5]
		there aren't training courses [7]
30	Which is the main building material used for your house?	timbers [1]
		bricks and concrete [3]
		other [5]
31	Which kind of floor is there in the house?	bare ground [1]

		cement [3]
		wood boards [5]
		tiles [7]
		other [9]
32	Which is the main light source you have at home?	electricity [1]
		gas [3]
		oil lamp [5]
		candle [7]
		other (specify) [9]
33	What type of fuel does your family mainly use for cooking?	wood [1]
		coal [3]
		gas [5]
		electricity [7]
		dung [9]
		other (specify)_____ [11]
~~34~~	~~Has your family access to drinkable water?~~	~~yes [1]~~
		~~no [0]~~
35	Bathroom location and sharing:	inside and exclusive [9]
		inside and shared [7]
		outside and exclusive [5]
		outside and shared [3]
		no bathroom [1]
36	How much do usually you spend in food for all your family in a week?	bath

37	Consumption TAB	How many times does your family eat the following food?					Which share of each food consumed do you produce by yourself?
		every day [1]	twice a week [3]	once a week [5]	once a month [7]	never [9]	0 - 100 %
	Rice						
	Noodles						
	Vegetables						
	Green Papaya						
	Fresh fruit						
	Eggs						
	Milk						
	Chicken						
	Other meat						
	Fish						
	Fresh noodles						

38	How do you consider your standard of living compared to the one of other people who live in this village?	much better [1]
		better [3]
		equal [5]
		lower [7]
		much lower [9]

39	Besides agriculture do you have another activity?	craftwork [1]
		construction [3]
		other (speficy)_____ [5]

40	Activities' Tab	Years	Earnings/year	Days worked/Year	Hours worked/day
	Agricolture				
	Second				

41	How many employees do you have?	Number of employees	Daily wage
	stable employees		
	temporary employees		

42	Are you usually involved in a labour exchange system?	yes [1]
		no [0]

43	Buyers Tab - Who do you usually sell Jasmine Rice to?	Which share of production do you usually sell to each type of buyer?	Which price do you usually receive per ton sold?	Do you receive money in advance?	How much did you receive as profit/dividend from the producer's group?	How much are you satisfied with the price?
		%	baht/ton	Yes [1] No [0]	baht	[1= very much 2= enough; 3= not very satisfied; 4= not at all]
	Local cooperative					
	Other buyers					

44	During last five years have you changed your production system?	yes [1]
		no [0]
45	Please tell me the yearly income in your family.	baht
	husband/wife	
	sons/daughters	
	other members	
46	Do you have other sources of non work income (subsidies, donations, etc.) ?	yes [1]
	from the community	no [0]
	from the state	
	from private persons	
	from development agencies/ngos	
	remittances from relatives	
	rents	
	other (specify)_____	
47	Which of the following things does your family own?	yes [1] no [0]
	tv	
	entertainment devices (CD, DVD players, etc.)	
	fridge	
	bicycle	
	motorcycle	
	car	
	water pump	
	plowing machine	
	gas stove	

	truck	
	mobile phone	
48	How much are you satisfied with your household's living conditions?	[0 - 10]
49	How much do you consider yourself a good farmer?	[0 - 10]
50	In your opinion, how much should your monthly wage be to live in a satisfactory way?	baht
51	What do you do with your production's wastes?	You burn it [1]
		You throw it [3]
		You re-use it as manure [5]
		You sell [7]
		other (specify) _____ [9]

52	Have you ever asked/received loans in the past three years? From whom?	Asked	Received	What is the average interest rate charged?
		Yes [1] No [0]	Yes [1] No [0]	%
	friends			
	relatives			
	privates/neighbours			
	producers' group/other buyers			
	ngos			
	bank			
	financial institutions			
	other (specify)_____			

53	What is the total debt of your household?	baht
54	How much did you save approximately last year in percent of your earnings?	%
55	How many of the following animals do you own?	number
	water buffalos	
	cows	
	pigs	
	fishes and frogs	
	chickens	
56	How much did you spend for investment in your working activity (replacement of working tools, etc.) last year ?	baht
57	Do you know FAIR TRADE?	yes [1]
		no [0]
58	if yes, to with of the following statements do you agree the most?	fair trade is charity [1]
		fair trade means getting a better earning [3]
		fair trade is an equal commercial relationship [5]
		fair trade is an alternative approach which is based on dialogue, transparency and respect trying for equity in international trade [7]
59	Do you speak english?	yes [1]
		no [0]

60	Which groups or associations do you participate in or are you more interested in?	yes [1] no [0]
	sporting groups	
	religious groups or associations	
	farmers' cooperative	
	local community groups	
	cultural groups (music, dance)	
	political parties	
	other (specify)_____	
61	Do you voted in the last election (at national or local level)?	yes [1]
		no [0]
62	Have you ever asked the other farmers to take care of your son?	yes [1]
		no [0]
63	Have you ever asked for help from the other farmers?	yes [1]
		no [0]
64	Do you collaborate with your neighbours?	yes [1]
		no [0]
	ONLY FOR AFFLIATED FARMERS	
65 A	How did you know about GreenNet?	from other farmers/peoducer's group [1]
		from relatives [3]
		other (specify)_____ [5]
66 A	Was it easy to enter in GreenNet?	yes [1]
		no [0]
67 A	Which year did you receive the organic certification?	year
68 A	Have you ever exit from GreenNet?	yes [1]
		no [0]
69 A	How do you consider the sale conditions of GreenNet compared to the other buyers' ones?	better [5]
		worse [1]
		same [3]
70 A	Comparing with conventional producer, do you think:	yes [1] no [0]
	your field enjoy more birds?	
	your soil keep the moisture longer?	
	your field enjoy the presence of more small animals?	
	ONLY FOR NOT AFFLIATED FARMERS	
65 NA	Do you know any other farmer who works with any local cooperative?	yes [1]
		no [0]
66 NA	If yes:Do you think they have better sale conditions?	yes [1]
		no [0]
67 NA	Would you like to get the organic certification?	yes [1]
		no [0]
68 NA	If 67 = yes: What are the main contraints you find in doing that?	costs [1]

		not enough sales [3]
		lower price [5]
		other (specify)_____ [7]
69 NA	Since your organic neighbours have been working here, has your situation improved?	improved [1]
		worsened [3]
		same [5]
	FOR ALL	

List a series of memorable economic events in the last years (*i.e., purchase of machinaries; house renovation; marriage; famine; drought seasons; education decisions; etc.)*

Events	Year

72	What is the total size of your land?	Rai
73	What is the size of the plot where you grow jasmine rice?	Rai
74	What was your total production of jasmine rice last year?	tons
75	How many tons of this total production have you sold last year?	tons