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**When consumption heals producers:
the effect of fair trade on marginalised
producers' health and productivity**

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When consumption heals producers: the effect of fair trade on marginalised producers' health and productivity

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Abstract

Concerned consumers in the US and Europe are increasingly willing to pay an “ethical premium” for the social and environmental value of fair trade products. One of the fair trade criteria (aimed to enhance wellbeing and capacity building of marginalised producers) relates to producers health and creation of healthy working conditions.

We evaluate its significance by comparing days lost for illness of FT and non FT affiliated Kenyan farmers. We find that FT affiliation years have a significant effect in the expected direction on the dependent variable after controlling for selection bias effects.

Keywords: Fair trade, health, impact study

JEL Classification: O19, O22, D64, I1.

1.Introduction

Consumers' grassroot action in the fight to poverty is one of the novel features of the contemporary economic society. Several surveys run in most industrialised countries show that the willingness to pay for social and environmental features of consumption goods is high (Becchetti and Rosati, 2005). Revealed preferences confirm that virtual choices translate into actual purchases since consumers pay a premium for this special kind of intangibles incorporated in them and market shares of "fair trade" products reached remarkable levels in some segments (47 percent for bananas in Switzerland and 20 percent of ground coffee in the UK, for an annual 20 percent rise in overall net sales in the last 5 years).

Fair trade products originate from an innovative value chain which aims at providing higher economic value and social benefits to marginalized primary producers. The fair "trade package" includes capacity building, an anticyclical price premium which compensates producers for their

low market power and never falls below a defined “subsistence threshold”¹ and an anticipated financing scheme which is aimed at breaking the monopoly power of local moneylenders. Part of the premium is paid to the local producers’ association to finance the provision local public goods (training courses, health facilities, schooling support, etc.).

The interest of economists for fair trade goes beyond the specific characteristics of this initiative.² Fair trade is an example of “portfolio vote” which shows that grassroot participation and economic democracy may be extended when economic agents choose goods and services by looking not just at price and quality, but also at their social and environmental features. The phenomenon is expected to grow as far as consumers become increasingly aware of the interdependence of their “vote” and their own wellbeing.

FT is also an economic process which gives a new dimension to the market. If traditional welfare theories tell us that the market transactions generate a mutual benefit to transactors but can not help to solve social problems beyond the transaction (i.e. inequality in agents’ endowments, lack of equal opportunities, etc.-), the opportunity of buying FT products gives to the market a new capacity of addressing directly social imbalances, thereby overcoming one of its traditional limits.

Informational asymmetries are one of the main problems of fair trade as they are in many other economic domains. The problem here is particularly relevant since fair traders’ reputation is not an “experience good” (I do not bridge my information gap on the social and environmental features of the products by tasting or buying more of it).

This is one of the reasons why serious impact analyses on the effect of fair trade affiliation on marginalized producers are urgently needed.

¹ To provide an example, the Ecuador 2005 conventional market price for 1.14 kilos of bananas was 2.91 US \$ against a FT price of 7.75 US \$. Evidence for such premium on prices of coffee beans and cocoa in the last 20 years is also well known and available from the authors upon request.

² For a theoretical evaluation on the effects of FT from the perspective of trade theories see Maseland and De Vaal (2002). Other relevant papers dealing with various aspects of the impact of FT are those of Moore (2004), Hayes (2004) and Redfern and Sneker (2002).

At the moment the empirical literature in this field is limited to several case studies and a few econometric analyses. Bacon (2005) finds that access to certified markets generates a positive effect on sale price for a sample of Guatemala coffee producer, although without controlling for other concurring factors. Pariente (2000) finds a positive impact of minimum price on coffee producers' security in the Coocafé cooperative in Costa Rica. Becchetti and Costantino (2008) show that, after controlling for selection bias, fair trade affiliation has a significant impact on several wellbeing indicators, even though it does not seem to improve significantly human capital investment. In a parallel study on two cooperatives of producers in Peru, Becchetti, Costantino and Portale (2007) find evidence of two types of externalities (FT affiliates have higher bargaining power with local intermediaries and, in one of the two projects, FT improves conditions of local non FT affiliates). The FT price premium (difference between FT and traditional importers price) is above 100 percent in this study, even though "ethical travelers"³ pay more than FT importers. In both projects, producers' income, human capital investment, weekly food consumption expenditure, the non food consumption share on total income, self evaluated relative standard of living and professional self esteem are significantly and positively correlated with affiliation years.

Our paper follows this strand of the literature by testing the impact of fair trade affiliation on a previously unexplored dimension: workers' health.

In order to test whether fair trade maintains its promises in this field we need to stick to its criteria. IFAT, the international "umbrella" organizations of importers, producers associations, and final retailers establishes the following criteria for fair trade products: i) Creating opportunities for economically disadvantaged producers; ii) Transparency and accountability; iii) Capacity building; iv) Promoting Fair Trade; v) Payment of a fair price; vi) Gender Equity; vii) Working conditions;

³ Ethical and responsible tourism is a worldwide initiative. It aims at organising tourist activities taking special care for environmental and social sustainability of travellers' impact on the visited countries and fostering social-cultural exchange with the people met. The socially responsible element generally implies that a higher share of the value generated by this kind of tourism goes to the local population.

(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.); viii) The environment; ix) Trade Relations. (Fair Trade Organizations trade with concern for the social, economic and environmental well-being of marginalized small producers and do not maximise profit at their expense. They maintain long-term relationships based on solidarity, trust and mutual respect that contribute to the promotion and growth of Fair Trade. Whenever possible producers are assisted with access to pre-harvest or pre-production advance payment).

The condition directly related to health is therefore item vii) (*working conditions which include healthy working environment for producers*). The importance of such criterion is twofold. First, as it is well known, health is probably the most important dimension of individual wellbeing and self declared life satisfaction (Frey and Stutzer, 2002a and b; Clark et al., 2006). Second, health crucially affects individual productivity and may be considered as an indirect factor of conditional convergence in growth models, given that poor health conditions undermine investment in human capital and hours worked.

The paper is divided into six sections (including introduction and conclusions). In section two we provide a synthetic overview of the theoretical and empirical literature on the determinants of health and of the health/development literature. In sections three and four we describe the project and the survey design. In sections five and six we present and comment descriptive and econometric findings. Section seven concludes.

2. Health status and poor countries

In general terms health conditions have been traditionally related to socio-economic status (SEC), such as education, income and wealth. In this literature, as in many other parallel fields, we have a typical problem of biunivocal causality. On the one hand, poor health is considered as influencing

the capacity to raise income and accumulate wealth, as it affects productivity and wages and implies higher expenses for health care. On the other hand, income restriction implies physical stress as well as limited access to health care.⁴

The relationship between income and health has a quite different interpretation for rich and poor countries, as poor countries dramatically suffer from problems such as malnutrition, poor sanitation and illiteracy. In this respect, there is strong evidence suggesting that poverty is a major cause of mortality and that – the other face of the token - increased wealth has a positive effect on health status, although the question if growth is per se sufficient to cause health improvement in poor countries is still at issue⁵. The channels through which increased wealth influences health status in poor countries are not confined to a better access to health care and drugs availability. Not surprisingly empirical studies have highlighted the importance of factors such as the quality of nutrition, the access to clean water, access to electricity, and all the facilities which allow better sanitation⁶. It must also be added that sanitation is deeply linked to education in developing countries; here the focus has been mostly on the relationship between adults' education and their health status as well as on parental education on children's health status⁷.

Among factors different from income, growing attention has been recently devoted to a variety of other political and institutional variables capable of influencing both health and growth, such as

⁴ See Cantarero and Pascual (2005), Case (2001), Drenea and Lavrakas (2000), Smith (1998 and 1999), Lyons and Yilmazer (2005), Wu (2003), Zagorsky (1999). More specifically, on the endogeneity problem, Godlonton and Kesweel (2005) examine the impact of health conditions on poverty in South Africa, accounting for the endogeneity of health status and showing that health conditions, measured by the body mass index, strongly influence poverty status. As far as the other causality direction is concerned, Acemoglu and Johnson (2005), when estimating the effect of life expectancy at birth on economic growth, did not find any evidence suggesting that an increase in life expectancy has led to a significant increase in per capita income growth.

⁵ See Pritchett and Summers (1996), Filmer and Pritchett (1999). See also Deaton for an overview (2006). Another issue investigated is the relationship between health and income inequality. Evidence in this respect is still controversial (see Deaton, (2003) and Hongbin Li and Yi Zhu (2004) for different views on this topic).

⁶ See Wang (2002), Lawson (2004) and Zwane and Kremer (2007).

⁷ On the role of education on health see Hobcraft (1993) and Wolfe and Behrman (1984). On the relationship between women's education and fertility see Drèze and Mamta Murthi (2001).

public spending⁸ and governance.⁹ Finally, also, access to financial facilities and to microfinance has been investigated as factor enhancing the capacity of poor families to smooth consumption in periods of adverse health shocks¹⁰.

As far as the reverse causality is concerned, poor health in developing countries has been considered as a determinant of low income mainly as it affects labour market outcome. Indeed, malnutrition and infectious diseases - which afflict mostly children - have functional consequences in all the lifecycle, dwarfing adults' productivity. The impact on income is worsened by the fact that in poor countries working activities are mostly based on physical strength and endurance¹¹.

Within this framework a main question still remains unexplored. Is it possible to contribute to improve health in LDCs by exploiting the increasing willingness to pay of rich consumers in developed countries for fighting poverty? May grassroot action contribute to this goal under this form, independently or complementarily to the traditional action of international economic institutions ?

Our study addresses this question. It therefore follows the literature on health as determined by living conditions, although from a different perspective as compared to the previously cited literature. The focus is here on the impact of market driven institutional changes, i.e. the effect of affiliation to the fair trade project and to the "Meru Herbs" producers' association on the beneficiaries' health status. The rationale for this investigation is that Fair Trade incorporates a series of criteria which, if applied, may improve poor farmers' working conditions directly (the healthy working condition criterion) and indirectly (via higher income). The hypothesis we want to test in this paper is whether therefore FT affiliation has positive effects on producers' health.

⁸ However, this topic is still controversial; see Anand and Ravallion (1993) and Filmer and Pritchett (1999) for different views.

⁹ Chaudhury et al (2006) highlight the high absence rates among health care workers in developing countries. See also Deaton (2006) and Das and Hammer (2004).

¹⁰ See Gertler, Levine and Moretti (2003).

¹¹ See Strauss and Thomas (1998) for an overview.

3. The Meru Herbs Project and its beneficiaries

Meru Herbs is a commercial organization created in 1991 by an association of local farmers (Ng'uuru Gakirwe Water Committee)¹² in order to raise income through the commercialization of food products and thus afford the canalising of the Kitcheno River. The latter was a successful project which provided water to local houses and farms, increased fertility and value of lands and reduced the time spent (mainly by women and children) to get water at less favourable conditions. As soon as Meru Herbs was created, it developed experimentally a commercial partnership with CTM (the leading Italian Fair Trade Importer) to break the monopsony of Nairobi traders in the commercialization of food products. In 2000 Meru Herbs was granted organic certification by the British company Soil Association Certification Ltd.

At present, as much as 97 percent of Meru Herbs net sales are through fair trade organizations: almost 80 percent by People Tree (Japan), whilst the remaining share by CTM and CEM (Equo Mercato).

Local farmers' trade relationships with Meru Herbs are not on an exclusive agreement basis: as much as 40 percent of farmers' production is still sold locally.

In order to affiliate to Meru Herbs, farmers must have obtained (or be in the process to obtain) an organic certification. According to the contract with their organisation, farmers agree to sell part of their produce to Meru. Meru's obligations are, in turn, the following ones: i) provision of complimentary seeds and organic fertilisers to affiliated farmers; ii) provision of fruit trees for production at subsidised prices; iii) organisation of complimentary training courses for the implementation of organic farming techniques and iv) offer of the services of two of its employees

¹² The Committee was set up by 430 families living in various plots (10 to 40 acres) which had been granted by the Kenyan Government in the 1960s; the plots are located in the districts of Meru Central and Tharaka, at 200 km from Nairobi, on Mount Kenya's eastern slopes.

(the farmer manager and vice-manager) with the specific task of supervising and providing technical assistance to the affiliated farmers.

Furthermore, since organic farmers' production does not allow in itself to reach an efficient scale of activity, Meru Herbs also buys fruits for producing jams from non-organic farmers without requiring the above-mentioned contract. As a consequence, these farmers do not enjoy the organization benefits i) to iv).

Farmers trading with Meru can be thus classified into three categories: full members - that is, organic farmers who have underwritten the contract with Meru Herbs ("Bio farmers"), as well as farmers who have recently underwritten the contract with Meru and started the procedure to obtain organic certification ("Conversion Farmers") and simple sellers of fruit to the producers' association ("Onlyfruit farmers").

In order to highlight the effect of the Fair Trade-Meru Herbs project on socio-economic variables, a control group has been included in the investigation. The control group was selected among non affiliated farmers living in the same area and therefore shares the same advantages arising from the irrigation project (higher value of land, less time spent for access to water sources, improved yields, etc.). This ensures a good level of homogeneity between treatment and control groups.

The above described differences among the four groups are clarified, with some additional information, in Table 1. Bio farmers have the higher share of products sold through the fair trade channel (60 percent), followed by Conversion (55 percent) and Onlyfruit (38 per cent) farmers. Bio farmers also have, by far, the highest number of average affiliation years (more than 13) against (2.8) of Conversion farmers. Onlyfruit farmers are not affiliated but have on average a trade relationship with fair trade of 1.8 years.

4. The Survey design

In order to perform our analysis, an equal number of components from the four (Bio, Conversion, Onlyfruit, Control) groups described above has been randomly selected from a population of 474

farmers living in the Ng'uuru Gakirwe Water Project area, on the basis of trade relations with the Meru Herb-Fair Trade Programme.

This four group classification makes it possible not only to appreciate the effects of various degrees of trading relationships with Meru, but also to distinguish between long-term (Bio group) and short term (Conversion group) effects of the affiliation to Meru. Thus, descriptive findings will be presented by using the four group distinction, even though in the econometric estimates the variable directly indicating years of affiliation will be used.

Moreover, as Meru Herbs has been strictly related to Fair Trade organizations from the very beginning, benefits from the Meru Herbs affiliation cannot be separated from those produced by relationships with Fair Trade.

During January 2005 members of the four groups responded to a 100 question Survey in personal interviews³. Information obtained concerned demographics, product sale conditions, monetary and non-monetary sources of income, health status, food consumption expenditure and dietary quality, schooling years and working status of household members, various social and capability indicators, subjective measures of price satisfaction and satisfaction about living condition as well as social capital indicators.¹³

5. Descriptive findings

Descriptive findings and summary characteristics of the four groups are shown in Tables 3 and 4 respectively.¹⁴

¹³ The research has been developed according to the following timetable: i) 1st of February 2005 – Meru Herbs, Nairobi office: research beginning; ii) 2nd – 11th of February 2005 – Meru Herbs Base Camp: community analysis and provisional questionnaire checking; iii) 12nd – 20th of February 2005 – Meru Herbs, Nairobi office: data collection for the indirect impact study; iv) 21st of February – 15th of March 2005 – Meru Herbs Base Camp: interviews using questionnaires (direct impact study); v) 15th – 18th of March 2005 – Meru Herbs, Nairobi office: research ending.

¹⁴ Variables legend is in Table 1.

For the large majority of sample respondents (77.7 percent) farming is the main activity. Only 30 per cent of respondents have another activity, almost uniformly distributed among the four groups. Summing up monthly revenues from both the main and second activity, the Onlyfruit group has the highest average monthly total income, followed by Bio, Conversion and Control farmers. However, Control farmers are on average younger than farmers belonging to the other groups, with a ten year average difference as compared to Bio farmers (38 against 48 years), and have the lowest number of sons living in the family. The difference in age is significant at 5 percent since 95 percent confidence intervals do not overlap.

It must be added that households in poor countries often rely on crops and animal breeding for self consumption. In the questionnaire respondents were asked to say whether they grow crop (maize, millet, beans, potatoes, greens and fruit) for self consumption or they breed animals. Only the Bio and Conversion groups did grow crops for self consumption; while, as far as animal breeding is concerned, all the groups but Onlyfruit declared that they breed sheep, chicken, cows and goats. All the interviewed people declared that they manage to have 3 meals during the day.

The questionnaire included questions about durable goods bought during the last two years, which can be considered a proxy of wealth. The control group has the highest number of durables bought on average, followed by the Conversion group.

Most people work with their own relatives (78 percent), while others work alone (13 percent) or are helped by one or two seasonal workers during the yield season. Almost half of farmers working alone belong to the Bio group. As far as payment agreements are concerned, most farmers (80 percent) are paid per kilo or per piece, while the others are paid a fixed income on a monthly basis.

As far as schooling is concerned, farmers belonging to the Bio group have the lowest number of school years attendance. In particular, it is noteworthy that around one third of the Bio group farmers have not attended school at all. The share of uneducated respondents is smaller for the other groups.

Finally, two more variables taken into consideration can help to explain health status among the farmers, i.e. the occurrence of serious injuries on the work place and the type of health service they resort to.

As far as the occurrence of serious injuries is concerned, respondents were asked to say whether they had ever been seriously injured on the work place during the last years; the possible answers were never, one time, two times and more than 2 times. 39 percent of respondents did not have serious injuries, while 24 percent were injured once, 17 percent twice and 20 percent more than twice during the last year. Finally, in case of illness, most farmers (47 percent) resort to public hospital, while other to the dispensary (19 percent) and a residual share (13 percent) to private clinics.

With regard to health conditions, farmers were asked to indicate the numbers of working days lost for illness during the last year, the possible answers being none, less than 5 days, 6-15 days, more than 15 days. 16 percent of respondents did not lose any working days for illness, 23 percent lost 1 to 5 days, 40 percent 6 to 15 days and, finally, the remaining 21 percent more than 15 days.

Farmers belonging to the Bio group are the more represented in the first range (no days lost) and the less represented in the last range (more than 15). More in detail, 37 percent of farmers who did not lose a working day for illness belong to the Bio group, 21 percent to the Conversion group, 11 percent to Onlyfruit group and 32 percent to the Control group.

As far as the last range is concerned, only two farmers belonging to the Bio group lost more than 15 working days for illness, (8% of all respondents in this category which is composed by a 28% of Conversion, 32% percent of Onlyfruit and 32% of Control farmers).

As far as intermediate ranges are concerned, Bio farmers are the most represented and the Control group farmers the least represented in the second range (1-5 days), while shares are more proportionate in the third range (27 percent for Conversion group, 23 percent for the Control group, 25 percent for both the Bio and the Onlyfruit groups).

These descriptive findings are very interesting since they show that the positive effect of the Meru Herbs project on poor farmers health status need not to be explained by differences in income. Indeed, interviewed farmers are quite homogeneous as far as living conditions are concerned: they all benefit from the Ng'uuru Gakirwe Water Project and therefore share the same irrigation infrastructure. Furthermore, the group of respondents affiliated to the Meru Herbs project and those in the Control group do not exhibit strong differences in income, while affiliated farmers tend to be older and with lower schooling years.

6. Econometric findings

Descriptive analysis highlights a relationship between affiliation to the Bio group and health status, as measured by the number of working days lost for illness. In particular, farmers belonging to the Bio group are the most represented among workers who did not loose a day, and the least represented among those who lost more than 15 days for illness.

Furthermore, the correlation between health status and affiliation to the Bio group cannot be explained by differences in revenues or in schooling among the groups. Indeed, farmers belonging to the Bio group, on average, do have neither the highest income, nor the highest number of school years attendance as compared to the other groups.

To evaluate the effect of FT affiliation years, net of the impact of other standard controls, and to account for composition effects which may affect our descriptive findings, we test econometrically the relationship between affiliation to the Meru Herbs project and health status, as measured by the number of working days lost for illness.

As a dependent variable we build the following two “illness indexes” based on the question in which we ask to choose one of the following items: no days lost for illness, 1-5 days, 6-15 days, more than 15 days.

“*Illnessindex1*” is built by assigning the value of 0 to the first range (no days lost for illness), of 1 to the “1-5 days lost” range, of 2 to the “6-15 days lost” range and of 3 to the “more than 15 days” lost range.

Alternatively, we create the “*Illnessindex2*” variable which takes values which fall in each range and coincide (where possible) with the average between the lowest and the highest value of the range¹⁵; more specifically, this second index takes the value of 0 for the first range (no days lost for illness), of 3 for the 1-5 days lost range, of 10.5 for the 6-15 days lost range and 20 for more than 15 days lost range. As compared to the first, the second index gives more weight to the higher ranges: this implicitly enhances the importance of variables affecting long absence from work.¹⁶

The impact of Fair Trade on health status is measured through the variable *workyear*, indicating the number of years farmers have been affiliated to the project. Among controls we consider various socioeconomic characteristics considered relevant in the literature, working conditions and other variables potentially able to influence health status. Among socioeconomic variables, *totalincome*, is a direct indicator of the households’ living standard (Strauss, 1990 and Thomas et al., 1990), and the variable *durablerecought* (i.e. durable goods bought during the previous two years) is an indirect measure of wealth. In order to “equivalise” income the households’ composition has to be accounted for. For this reason the number of sons and daughters living in the family (*sonsinsidefamily*), and the total number of people living in the household (*peopleinhouse*) are included among the regressors¹⁷. In compliance with the standard literature, education has been

¹⁵ Of course, the average value criterion does not apply to the last (“more than 15 days lost”) range which does not contain an upper interval. The value for that range is a guess estimate. Sensitivity analysis shows that our findings are invariant to reasonable (up to plus 4 days) variations of such value.

¹⁶ This reclassification makes sense only if we consider our variable a continuous proxy of the underlying continuous hidden value and not categorical variable. This is what we will do in our estimates.

¹⁷ We prefer not to divide the income source for the number of household members (and leave the number of members as regressors) given the lack of consensus on the right formula to use when calculating equivalised household income. As it is well known the OECD standard establishes a .5 weight for the partner and a .3 weight for each children. Development empirical studies tend to build equivalence scales by attributing unit weights to all members when working with poor

proxied by the numbers of schooling years (*schoolyears*).¹⁸ Furthermore, available variables related to health conditions and habits have been included among regressors. They include application to dispensary (*dispensary*) rather than hospitals in case of illness and an additional dummy (*doctor*¹⁹).

An additional measure of well-being, which does have a direct impact on health in poor countries, is nutrition (Strauss and Tomas, 1998). It may be worth recalling that all the interviewed people declared that they can afford three meals during the day. However, apart from quantity, food variety is also important and can affect independently workers' health.

In our survey we have information about the frequency of consumption (more than once a day, once a day, once every three days, once a week, rarely, never) of the following food items (*ugali, chapati, rice, maize, beans, eggs, milk, chicken, other meat, fish, potatoes, greens, fresh fruit*). On this basis we build an index of dietary quality giving descending values (from a maximum of five to a minimum of one) to the above mentioned frequency modalities. Finally, we calculate our synthetic index as an average of the values given to each food item.

Health status is obviously related to various characteristics associated to working conditions since individuals in the working age spend large part of their time in the workplace. In this respect we consider three variables: i) a dummy taking value of one for those whose main activity is agriculture (*mainactagr*); ii) a dummy taking value of one if the form of payment is on a quantity base rather than on a fix wage base (*paykilopiece*). The rationale is that precarious income (particularly because of the poor living standard of the population) can cause stress and, hence, negatively influence health status; iii) a dummy taking the value of one if the farmer works alone (*workalone*) and not in

households, since it is more difficult to realise economies of scale in food consumption, the dominant source of expenditure of the poor (Deaton and Paxson, 1998).

¹⁸ A significant and positive relationship between health and *schoolyears* has been found among others by Appleton (1992) and Thomas et al. (1991). See Appleton (2000) for a survey.

¹⁹ The dummy is drawn from the following question "Who did help you/your wife during last birth?" (possible answers are nobody, friends/relatives, traditional doctor, nurse, doctor).

group with other farmers. Lastly, standard controls such as sex (*man*) and age (*age*. i.e. the birth year: *hai lasciato l'anno di nascita?*) have also been included. The selected specification is therefore

$$\text{Illnessindex}_i = \alpha_0 + \alpha_1 \text{workyear} + \alpha_2 \text{durablerecbought} + \alpha_3 \text{peopleinhouse} + \alpha_4 \text{sonsinsidefamily} + \alpha_5 \text{paykilopiece} + \alpha_6 \text{age} + \alpha_7 \text{man} + \alpha_8 \text{workalone} + \alpha_9 \text{mainactagr} + \alpha_{10} \text{totalincome} + \alpha_{11} \text{schoolyears} + \alpha_{12} \text{dispensary} + \alpha_{13} \text{doctor} + \alpha_{14} \text{dietary} + \alpha_{15} \text{selfconsumption} + \varepsilon.$$

[1]

Given the characteristics of our dependent variable we use ordered probit estimates with robust standard errors. Results of estimates using the two indexes are presented in Table 5 (columns 1 and 2). [manca la spiegazione della doppia stima, probit e ols]

The variable indicating years of affiliation to Fair Trade is negative and significant. Age is also positive and significant as expected (but only under the first index) since being younger decreases the log odds of losing working days for illness. It is noteworthy that socioeconomic variables (income indicators as well as school years) are not significant. This result does not contradict previous literature; indeed, it can be explained by the fact that the four groups are quite homogeneous as far as standard of living is concerned.

As it is well known, the calculation of the marginal effect of a change in a regressor on the probability of falling, say, into the highest category of days lost for illness in the ordered probit estimate is obtained with the following formula:

$$\Delta \Pr(\text{highestill}) = F(S + \Delta S - c) - F(S - c). \quad (3)$$

where F is the cumulative normal distribution, S the predicted average satisfaction level and c the highest cutpoint.

By applying this formula we find that one additional year of affiliation reduces by 1.8 percent the probability of falling into the groups of farmers declaring more than 15 days lost for illness. It is a

remarkable effect since, using for our calculation the average number of affiliation years of Bio farmers, their affiliation to FT reduces by around one fourth (23.4 percent) such probability.

6.1 Controlling for selection bias

Econometric findings clearly show a positive impact of the years of affiliation to the Meru Herbs – Fair Trade project on the beneficiaries' health conditions, as measured by the number of working days lost for illness. However, this result does not imply per se a positive impact of fair trade in presence of an explicit (discriminatory admittance rules established by the organisation with characteristics related to health conditions) or implicit (decision to affiliate significantly affected by characteristics which also influence health conditions) selection bias effect. In simpler terms, the observation that affiliated farmers are healthier may not depend on the effect of affiliation but on that of selection (FT farmers were already healthier when they got affiliated).

The observation that days lost for illnesses are progressively reduced as far as affiliation years grow reduces in part this suspicion, but it does not eliminate it completely.

In order to rule out selection bias, we re-estimate both equations of the model [nella tabella c'è solo un indice] with a selection equation, where the decision not to affiliate (i.e. being in the Control group) is endogenously determined by socioeconomic variables, such as sex, age, the number of people living in the house and total income.²⁰ This helps to distinguish between the effect of affiliation to the project on health conditions and the selection effect. The model specification is as follows:

²⁰ For references to this model in the literature see, among others Barnow, Cain and Goldberger (1981) and Maddala (1983).

$$\text{Illnessindex}_i = \alpha_0 + \alpha_1 \text{workyear} + \alpha_2 \text{durablerecbought} + \alpha_3 \text{peopleinhouse} + \alpha_4 \text{sonsinsidefamily} + \alpha_5 \text{paykilopiece} + \alpha_6 \text{age} + \alpha_7 \text{man} + \alpha_8 \text{workalone} + \alpha_9 \text{mainactagr} + \alpha_{10} \text{totalincome} + \alpha_{11} \text{schoolyears} + \alpha_{12} \text{dispensary} + \alpha_{13} \text{doctor} + \alpha_{14} \text{dietary} + \alpha_{15} \text{selfconsumption} + \alpha_{16} \text{Control} + v$$

[2.1]

$$\text{Control}_i = \beta_0 + \beta_1 \text{age} + \beta_2 \text{schoolyears} + \beta_3 \text{peopleinhouse} + \beta_4 \text{totalincome} + z$$

[2.2]

In the two equation system (v) and (z) are bivariate normal random variables with zero mean and covariance matrix $\begin{bmatrix} \sigma & \rho \\ \rho & 1 \end{bmatrix}$. The likelihood function for the joint estimation of [2.1] and [2.2] is provided by Maddala (1983) and Greene (2003).

Results for the two illness indexes are shown in Table 4 (columns 3 and 4).

In the second equation we find that both age and the intercept are significant. Hence, there exist characteristics which discriminate ex ante between treatment and Control group and need to be controlled for. FT affiliation years remain still significant when controlling for the selection bias. The form of payment is significant as well, although at a lower confidence level. More specifically, more precarious working conditions seem to affect negatively health, since payment on a quantity base is positively correlated to the number of working days lost for illness. This is definitely not an effect under suspicion of reverse causality since, differently from those being paid on a fixed wage base, days lost for illness are not paid to these workers.

Furthermore, as far as the Control group determinants are concerned, the positive and significant effect of the birth year is no surprise: members belonging to the Control group are on average younger.

The limit to the application of the treatment regression model to our data is that we need to approximate the dependent variable to a continuous one.

We therefore follow an alternative way to check the robustness of our results. We estimate a maximum-likelihood probit model with sample selection (Van der Ven and Van Pragg, 1981) in which the dependent variable (*moderateillness*) is dichotomic (takes value of one in case of less than 15 days lost from illness and zero otherwise). In such model the dependent variable of the selection equation needs to be continuous and we therefore use affiliation years.

Hence the selected specification is

$$\begin{aligned} \text{Moderateillness} = & \alpha_0 + \alpha_1 \text{workyear} + \alpha_2 \text{durablerecought} + \alpha_3 \text{peopleinhouse} + \alpha_4 \\ & \text{sonsinsidefamily} + \alpha_5 \text{paykilopiece} + \alpha_6 \text{age} + \alpha_7 \text{man} + \alpha_8 \text{workalone} + \alpha_9 \text{mainactagr} + \alpha_{10} \\ & \text{totalincome} + \alpha_{11} \text{schoolyears} + \alpha_{12} \text{dispensary} + \alpha_{13} \text{doctor} + \alpha_{14} \text{dietary} + \alpha_{15} \text{selfconsumption} + \\ & v \end{aligned} \tag{3.1}$$

$$\text{workyear} = \beta_0 + \beta_1 \text{age} + \beta_2 \text{schoolyears} + \beta_3 \text{peopleinhouse} + \beta_4 \text{totalincome} + z \tag{3.2}$$

Results from this model confirm the significance of the affiliation year variable. The evaluation of the magnitude of our effect with our approach gives a probability of 1.2 percent. Hence, by comparing this finding with the one obtained without controlling for the selection bias, one third of the effect of affiliation years on health may be considered due to the selection effect.

7. Conclusions

Global market integration has increased interdependences among different countries and raised the awareness of consumers and investors that care for social and environmental consequences of their choices is not just a matter of altruism, but of long-sighted self-interest.

Concerned consumers voting for “greener” products know that their choice may have positive effects on their health and reduce adverse environmental consequences (ie. global warming), which ultimately fall also on themselves. In the same way, a revealed preference for “socially responsible” products may contribute to reduce poverty, a plague which is a dominant source of illegal migration and has also the effect of reducing reservation wages becoming, indirectly, a competitive threat for unskilled workers in developed countries.

Due to such awareness, or just to consumers’ enlightened altruism and sympathy for marginalised producers in LDCs, fair trade has evolved from a niche to a significant phenomenon.

Unfortunately, environmental and social responsibility is not an “experience good” and consumers always remain with two fundamental doubts (the consistence of the fair trade movement with its principles and the effectiveness of the latter in the improvement of marginalised producers’ wellbeing).

In our paper we investigate in this crucial direction by testing whether FT significantly improves health conditions of affiliated workers.

Our findings on a sample of Kenyan farmers show that affiliation years significantly reduce the numbers of days lost for illness, net of the effect of traditional controls (income, wealth, age, education, dietary quality) considered in the literature. The result is remarkable because affiliated farmers are significantly older and less educated than those of the Control sample. A typical problem in impact analyses is evaluating whether the difference between the treatment and the Control sample depends on the treatment (affiliation to FT) or already existed *ex ante*, due to an explicit or implicit selection process for which healthier individuals are more likely to enter the producer association (Meru Herbs) working with FT. Our econometric results prove to be robust when we correct for this selection bias.

From a quantitative point of view we find that ten years of affiliation reduce by around one fourth the probability of falling into the group of farmers with more than 15 working days lost for illness.

Correction for the selection bias shows that one third of this effect depends from ex ante implicit or explicit selection.

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Table 1 Characteristics of the four sample groups

	Bio farmers	Conversion farmers	Onlyfruit farmers	Control farmers
Sign a contract with MERU ?	YES	YES	NO	NO
Are organic farmers ?	YES	In conversion to	NO	NO
Share of products sold to Meru	60	55	38	0
Sell fruits to Meru	YES	YES	YES	NO
Receive services from Meru*	YES	YES	NO	NO
Receive benefits from FT ?	YES**	YES**	YES**	NO
Average years of trade relationship with the Meru organisation***	13.3	1.1	2.8	0

* Complimentary seeds and organic fertiliser to organic farmers; ii) sale of trees for production at subsidised prices; iii) complimentary formation courses for the implementation of organic farming techniques and iv) engagement of one of Meru employees (the Farmer manager) to the task of supervising and providing technical assistance to the affiliated farmers.

** Product diversification, price stabilisation and price premium in proportion to the amount sold to Meru Herbs.

*** Years of affiliation for Bio and Conversion farmers, years of trade relationship for Onlyfruit farmers.

Table 2. Variable legend

<i>Illnessindex1</i>	Index taking the value of 0 if respondents did not loose working day for illness, of 1 if they lost from 1 to five days, of 2 if they lost 6 to 15 days and 3 if they lost more than 15 days
<i>Illnessindex2</i>	Index taking the value of 0 if respondents did not loose working day for illness, of 3 if they lost from 1 to five days, of 10 if they lost 6 to 15 days and 20 if they lost more than 15 days
<i>Peopleinhouse</i>	Number of people living in the household
<i>Sonsinsidefamily</i>	Number of children living inside family
<i>Paykilopiece</i>	Dummy taking the value of 1 if the form of payment is per kilo or per piece sold and 0 otherwise,
<i>Age</i>	Respondents' age
<i>Injurenot</i>	Dummy taking the value of 1 if the respondent has never had serious injuries in the workplace and 0 otherwise;
<i>Man</i>	Dummy taking the value of 1 if the respondent is a man and 0 if she is a woman
<i>Workalone</i>	Dummy taking the value of 1 if the respondent works alone and 0 otherwise
<i>Mainactagr</i>	Dummy variable taking the value of 1 if agriculture is the respondents' main activity and 0 otherwise
<i>Totalincome</i>	Sum of the respondents' income both from main and second activity
<i>Shooyears</i>	Number of schooling years
<i>Dispensary</i>	Dummy variable taking the value of 1 if the respondent applies to dispensary in case of illness and 0 otherwise
<i>Doctor</i>	The dummy is drawn from the following question "Who did help you/your wife during last birth?" (possible answers are nobody, friends/relatives, traditional doctor, nurse, doctor) and takes the value of one if the answer is doctor and zero otherwise
<i>workyear</i>	Number of years the respondents have been affiliated to the project
<i>selfconsumption</i>	Dummy taking value of one if the respondent grows crops also for self consumption
<i>Dayslostnot</i>	Dummy taking the value of 1 if the respondents did not loose a working day for illness and 0 otherwise
<i>dayslost15more</i>	Dummy taking the value of 1 if the respondents lost more than 15 days for illness and 0 otherwise
<i>publichospital</i>	Dummy taking the value of 1 if the respondents apply to public hospital in case of illness and 0 otherwise
<i>Durablerecbought</i>	Sum of durables bought during the previous two years
<i>dietary</i>	Average consumption frequency of the following food items (<i>ugali, chapati, rice, maize, beans, eggs, milk, chicken, other meat, fish, potatoes, greens, fresh fruit</i>) in which descending values (from a maximum of five to a minimum of one) have been given to the following modalities of consumption (more than once a day, once a day, once every three days, once a week, rarely, never)
<i>Moderateillness</i>	Dummy variable taking value of one if the respondents has lost less than 15 days for illness and zero otherwise

Table 3: Descriptive findings

Variable	Obs	Mean	Std. Dev.	Min	Max
Workyear	120	4.316667	5.568494	0	14
Totalincome	115	5224.496	9455.12	0	83333
Mainactagr	119	.7731092	.4205923	0	1
Schoolyears	115	5.843478	5.163284	0	16
age (ma hai lasciato anno di nascita?)	120	43.99	14.70751	22	93
Man	120	.4916667	.5020267	0	1
Sonsinsidefamily	114	1.570175	1.640037	0	6
Peopleinhouse	119	2.991597	2.207444	0	8
Selfconsumption	120	2.533333	2.611974	0	6
Durablerecentlybought	120	.9916667	.983014	0	4
Paykilopiece	119	.8067227	.3965382	0	1
Payfixmonth	119	.1848739	.3898367	0	1
Workalone	120	.1333333	.3413599	0	1
Dispensary	120	.25	.4348283	0	1
Injurenot	120	.3916667	.4901695	0	1
Dispensary	120	.25	.4348283	0	1
Doctor		.74	.4348283	0	1
Publichospital	120	.625	.4861528	0	1
Dayslostnot	120	.1583333	.3665839	0	1
Dayslost15more	120	.2083333	.4078192	0	1
Dietary	120	2.34	.4090842	0	3.2
Illnessindex1	120	1.658333	.983014	0	3
Illnessindex2	120	8.866667	6.870878	0	20
Moderate illness					

Table 4: Summary characteristics of the four groups

	Bio	Conversion	Onlyfruit	Control
Workyear	13.33333	1.066667	2.8	.0666667
Totalincome*	5411.333	4807.069	6602.333	3884.692
Mainactagr**	24	22	22	24
Schoolyears*	3.964286	7.413793	5.413793	6.517241
Age*	48.14	42.32	48.25	38.21
95 percent conf. intervals	[43.3 - 52.9]			[32.3 - 43.2]
Man**	16	10	21	12
Sonsinsidefamily*	2.285714	.8333333	1.517241	1.703704
Peopleinhouse*	2.633333	3.448276	2.766667	3.133333
Selfconsumption*	5.2	4.933333	0	0
Paykilopiece**	25	23	23	25
Doctor	.8	.9	.86	.63
Dietary	2.40	2.36	2.45	2.25
Workalone**	1	4	5	6
Dispensary**	4	8	7	11
Publichospital**	26	8	23	18
Dayslostnot**	7	4	2	6
Dayslost15more**	2	7	8	8

* mean values

** number of cases

Table 5: estimates

Model	Ordered probit	OLS	Treatment regression model	Heckman probit model
Dependent variable	<i>Illnessindex1</i>	<i>Illnessindex2</i>	<i>Illnessindex2</i>	Moderateillness
Workyear	-0.06315 (-1.99)	-0.39391 (-2.18)	-0.39412 (-2.61)	.08434802 (1.95)
Dietary	-0.14029 (-0.44)	-1.29165 (-0.7)	-1.10109 (-0.59)	.38017575 (0.51)
Durablerecentlybought	0.09011 (0.84)	0.428911 (0.67)	0.405707 (0.64)	.0352735 (0.11)
Selfconsumption	0.02248 (0.36)	0.181126 (0.5)1	0.219248 (0.64)	-.05457947 (-0.19)
Peopleinhouse	-0.00276 (-0.05)	-0.00304 (-0.01)	-0.02183 (-0.07)	-.12758699 (-0.82)
Sonsinsidefamily	-0.04737 (-0.6)	-0.09742 (-0.21)	-0.12614 (-0.31)	.10705235 (0.55)
Paykilopiece	1.263282 (1.67)	7.429314 (1.9)	7.354151 (2.2)	3.077512 (0.02)
Age	0.026644 (3.37)	0.14656 (3.54)	0.13107 (1.88)	-.03403989 (-1.13)
Man	-0.0786 (-0.34)	-0.59487 (-0.43)	-0.62738 (-0.47)	.25537736 (0.44)
Workalone	0.171665 (0.43)	0.912109 (0.4)	0.925552 (0.48)	-.09733887 (-0.10)
Mainactagr	-0.72034 (-1.01)	-4.53603 (-1.24)	-4.4825 (-1.39)	-2.8663525 (-0.02)
Totalincome	-9.57E-06 (-1.6)	-7.8E-05 (-2.24)	-8E-05 (-1.2)	.0001073 (0.78)
Schoolyears	-0.03432 (-1.06)	-0.21314 (-1.15)	-0.22007 (-1.43)	.04457153 (0.54)
Dispensary	0.00793 (0.03)	-0.34739 (-0.2)	-0.26095 (-0.17)	.17631305 (0.20)
Doctor	0.135057 (0.42)	0.283212 (0.15)	0.13988 (0.09)	.40350169 (0.09)
Control			-0.39996 (-0.52)	5.459709 (0.91)
_Cons		2.5806 (1.03)	1.5835 (1.34)	6.190097 (0.96)
Cut1 _Cons	-0.17646 (-0.16)			
Cut2 _Cons	0.644198 (0.59)			
Cut3 _Cons	1.954041 (1.77)			
Control				
Age			-.05336156 (-3.35)	.00440213 (2.48)
Peopleinhouse			-.04664471 (-0.64)	.02474348 (0.43)
Schoolyears			-.00739739 (-0.23)	.00640053 (0.25)
Totalincome			-.00005015 (-1.16)	-3.561e-06 (-0.28)
Constant			1.6264318 (2.01) (21.83)	-.27379481 (-2.12)
Statistics				
R ²		0.26		
χ ²	34.13		34.48	32.15

N	101	101	101		107
P				0.004673	.00992724
