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# The Effects of Fair Trade on Affiliated Producers: An Impact Analysis on Kenyan Farmers

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**Summary.** — We analyse the impact of fair trade (FT) affiliation on monetary and non-monetary measures of well-being in a sample of Kenyan farmers. Our descriptive and econometric findings document significant differences in terms of varieties of products sold, price satisfaction, monthly household food consumption, (self declared) satisfaction with living conditions, dietary quality, and child mortality for affiliates of fair trade and Meru Herbs (first-level local producer organization) with respect to a control sample. Methodological problems such as FT's *vis à vis* Meru Herbs' relative contribution, control sample bias, FT and Meru Herbs selection biases are discussed and addressed showing that *ex ante* (self) selection of Meru Herbs members contributes to explaining some but not all of our results.

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**Key words** — impact analysis, child labor, fair trade, monetary and non-monetary well-being

## 1. INTRODUCTION

Fair trade schemes use consumption and trade in an aim to promote the inclusion of poor farmers in global product markets through a package of benefits that includes anti-cyclical mark-ups on prices, long-term relationships, credit facilities, and consultancy to build producers' capacity.<sup>1</sup> The distribution channel offered to affiliated producers by fair trade importers does not intend to be exclusive, since one of the movement's goals is to strengthen these producers' positions in global product markets. Skill advancement and progressive independence are therefore two of the most critical issues in the relationship between fair traders and affiliated producers.

The literature on FT impact analyses is surprisingly scarce, given the importance of evaluating claims that participation in the FT chain brings advantages to producers.

To our knowledge, one of the very few impact studies testing the statistical significance

of fair trade is performed by Bacon (2005) on a sample of Guatemalan coffee producers. The study uses a two-way ANOVA approach to show that access to certified markets has a positive and significant effect on sale prices.

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49 The finding is not controlled for other potential  
50 concurring factors.

51 A statistical and econometric approach is  
52 also used by [Pariante \(2000\)](#), who observes  
53 the positive impact of minimum price on coffee  
54 producers' security in the Coocafè cooperative  
55 in Costa Rica. The research documents a re-  
56 duced price variability (and a minimum price  
57 higher than the world price) when local produc-  
58 ers sell to FT. All other existing impact analyses  
59 are based on non-systematic, though qualita-  
60 tively very rich, evidence collected in case stud-  
61 ies ([Castro, 2001a, 2001b](#); [Hopkins, 2000](#);  
62 [Nelson & Galvez, 2000](#); [Oxford Policy Man-  
63 agement, 2000](#); [Ronchi, 2002](#)).

64 The main findings of these studies are: (i) FT's  
65 relationships are predominantly with first-level  
66 producer organizations rather than individual  
67 producers; (ii) the fair trade premium is managed  
68 by the organization to satisfy the individual's  
69 welfare needs (in such cases, the evaluation of  
70 the impact of FT is dependent on the particular  
71 merits of the decision to certify a given local pro-  
72 ducer organization); and (iii) the main role of fair  
73 trade is capacity building, an activity which is  
74 deemed crucial to support inclusion of local pro-  
75 ducers in international trade.

76 Many of these papers acknowledge the impor-  
77 tance of a rigorous impact evaluation. [Nelson  
78 and Galvez \(2000\)](#) conclude their work by argu-  
79 ing that "*as with many organisations involved in  
80 fair-trade MCCH has not yet been able to make  
81 an assessment themselves of the longer-term im-  
82 pact of its involvement in cocoa marketing for  
83 smallholders and their livelihoods. There is a  
84 growing recognition amongst organisations in-  
85 volved in fair-trade that more attention needs to  
86 be paid to impact assessment.*" In a similar man-  
87 ner, [Oxford Policy Management \(2000\)](#) agrees  
88 that it would be important to compare (levels  
89 and changes of) quality of living indicators of  
90 farmers affiliated to FT with farmers from a ran-  
91 domly selected control sample.

92 The aim of this paper is therefore to evaluate  
93 econometrically the FT impact on various indi-  
94 cators of well-being. To do so, we constructed a  
95 survey and collected information from a sample  
96 of 120 Kenyan farmers divided into four  
97 groups, three of which (Bio, Conversion, Only-  
98 fruit) had varying intensities of relationship  
99 with fair trade while the fourth (Control sam-  
100 ple) had no fair trade relationship at all.

101 The paper is divided into seven sections  
102 (including the introduction and conclusion), pre-  
103 senting and commenting on descriptive and  
104 econometric findings from the survey. In Section

2, we provide concise descriptions of (i) fair  
105 trade, its current diffusion, and debates sur-  
106 rounding it; (ii) the main features of the Ng'uuru  
107 Gakirwe Water Project from which the Meru  
108 Herbs producers' association originated; (iii)  
109 the relationship between Meru Herbs and FT  
110 importers; (iv) the main features of the Meru  
111 Herbs organization and, finally; (v) details on  
112 the construction of our survey.  
113

114 In Section 3, we use descriptive statistics to  
115 compare characteristics among the four groups  
116 of farmers by examining market conditions (crop  
117 variety, average market price for each product  
118 sold, sale conditions, and subjective price satis-  
119 faction) and selected socio-economic indicators.

120 In Section 4 our econometric analysis high-  
121 lights the following main results: Meru Herbs  
122 members with access to the FT channel have  
123 a more diversified product portfolio, relatively  
124 higher price and living condition satisfaction,  
125 spend significantly more on food consumption,  
126 have higher nutritional standards and have rela-  
127 tively fewer episodes of infant mortality in  
128 their households.

129 Section 5 highlights FT's lack of clear-cut ef-  
130 fects on child labor and human capital invest-  
131 ment.

132 A discussion of the econometric results and  
133 associated methodological problems such as  
134 FT's *vis-à-vis* Meru Herbs' relative contribu-  
135 tion, control sample bias and FT and Meru  
136 Herbs (self) selection biases is included in Sec-  
137 tion 6. This section also indicates that *ex ante*  
138 selection of members contributes to explaining  
139 some but not all of our results.

140 Section 7 concludes that FT benefits are  
141 mainly related to risk reduction (product diver-  
142 sification, price stabilization, *etc.*) and the pro-  
143 vision of in-kind services (technical assistance,  
144 for example) to affiliated members.

## 2. FAIR TRADE 145

146 Fair trade is a production chain created by  
147 importers, distributors, and retailers of food  
148 and textile products that have been partially  
149 or wholly manufactured by poor rural commu-  
150 nities in developing countries under specific so-  
151 cial and environmental criteria.

152 In 2003, the European Fairtrade Labelling  
153 Organization (FLO) certified 315 organizations  
154 representing almost 500 first-level producer  
155 structures and around 1,500,000 families of  
156 farmers and workers from 40 countries ([Moore,  
157 2004](#)). FT products were sold by 2,700 dedi-

158 cated outlets (known as *World Shops*) and  
159 43,000 supermarkets across Europe (7,000 in  
160 the United States).

161 The Fair Trade in Europe Report, 2005 (Fair  
162 Trade Advocacy, 2005b) documents that Euro-  
163 pean FT net sales grew by 20% per year in the last  
164 five years. Also in 2005, FT products achieved  
165 significant market shares in specific sectors such  
166 as the banana market in Switzerland (49%) and  
167 the ground coffee market in the UK (20%).

168 To obtain the “fair trade” label, these prod-  
169 ucts need to comply with the following require-  
170 ments, defined by the Fairtrade Labelling  
171 Organization (FLO) (Fair Trade Advocacy,  
172 2005a) and hence must: (i) pay a fair wage  
173 (price) in the local context; (ii) stabilize price  
174 fluctuations; (iii) offer employees opportuni-  
175 ties for advancement (including investment in  
176 local public goods); (iv) provide equal employ-  
177 ment opportunities for all, particularly the most  
178 disadvantaged; (v) engage in environmentally  
179 sustainable practices; (vi) be open to public  
180 accountability; (vii) build long-term trade rela-  
181 tionships; (viii) provide healthy and safe work-  
182 ing conditions within the local context; (ix)  
183 provide technical and financial assistance (price  
184 stabilization insurance services and anticipated  
185 financing arrangements which reduce financial  
186 constraints) to producers whenever possible.

187 Opponents of fair trade argue that the “fair  
188 price” is a distortion of market prices and pro-  
189 vides mistaken incentives to affiliated farmers,  
190 increasing their dependence on products which  
191 are overproduced in the market.<sup>2</sup> Fair trade  
192 advocates counter this argument by pointing  
193 out that the fair price should not be considered  
194 as a price distortion since transactions between  
195 first-level producers and intermediaries often  
196 do not occur in a competitive framework but  
197 rather in a monopsonistic (oligopsonistic) one  
198 where producer prices fall below the marginal  
199 value of the product. A second criticism of the  
200 above argument is that the food industry has  
201 historically produced highly differentiated prod-  
202 ucts with continuous waves of innovation, creat-  
203 ing new varieties. Fair trade continues this  
204 tradition; there is not one coffee but many  
205 different varieties of coffee products, each differ-  
206 entiated by varying combinations of quality,  
207 blends, packaging, and now also “social respon-  
208 sibility” features. Each of these products has a  
209 specific and different market price that is influ-  
210 enced by consumer tastes according to the par-  
211 ticular coffee variety. In creating a new range  
212 of products, fair trade is an innovation in the  
213 food industry.

A final point shared by the empirical litera-  
ture is that the impact of FT must be assessed  
not just on the price rule but mainly on the  
whole set of criteria with particular attention  
to those of price stabilization, prefinancing,  
and provision of technical assistance.

Our empirical analysis aims to provide new  
evidence to solve this *querelle* by answering some  
crucial questions: Are FT criteria effectively ap-  
plied on the field? What is their impact on socio-  
economic well-being of affiliated farmers? Is  
impact of FT due to the official criteria or are  
there other hidden elements emerging from the  
empirical analysis which can neither be identified  
by FT organizations nor by their opponents? Q2 228

(a) *The irrigation project, Meru Herbs, and free  
trade* 229 230

Meru Herbs is the commercial organization  
created by the Ng’uuru Gakirwe Water Com-  
mittee, an association of local farmers who  
started the project with the aim of bringing  
water to every house and farm by canalizing  
the Kitheno River. The Committee originates  
from a group of 430 families that established  
themselves in various plots (between 10 and 40  
acres) that were granted by the Kenyan Govern-  
ment in the 1960s. The plots are located in the  
districts of Meru Central and Tharaka, approx-  
imately 200 km from Nairobi, on Mount Ken-  
ya’s eastern slopes. 231 232 233 234 235 236 237 238 239 240 241 242 243

Meru Herbs was established in 1991 to gener-  
ate income to cover the project’s costs by com-  
mercializing several food products. Regional  
commercialization of these products had nor-  
mally been under the control of traders from  
Nairobi. To reduce their monopsonistic power  
and create new trade opportunities, Meru  
Herbs decided to develop a partnership with  
CTM (the leading Italian fair trade importer).  
The partnership therefore began experimentally  
in 1991 and continued in 1992 with the delivery  
of a container of karkadé to diversify the  
households’ production possibilities. In 2000,  
the organization received organic certification  
from the British company Soil Association Cer-  
tification Ltd., and today it exports a significant  
part of its production (see Section 2(c)) through  
the fair trade channel (in Italy and Japan). 244 245 246 247 248 249 250 251 252 253 254 255 256 257 258 259 260 261

(b) *The composition of Meru Herbs producers* 262

Meru Herbs signs a contract with farmers  
who have organic certification (or who are in  
the process of obtaining it), in which farmers 263 264 265

266 agree to sell part of their produce to Meru  
267 Herbs. In exchange, the organization under-  
268 takes the obligation to provide a series of bene-  
269 fits in terms of services and technical assistance.  
270 More specifically, Meru Herbs (i) provides com-  
271 plimentary seeds and organic fertilizers to farm-  
272 ers; (ii) sells them fruit trees for production at  
273 subsidised prices; (iii) organizes complimentary  
274 training courses in the implementation of or-  
275 ganic farming techniques; and (iv) offers the ser-  
276 vices of two of its employees (the farmer  
277 manager and vice-manager) with the specific  
278 task of supervising and providing technical  
279 assistance to the affiliated farmers.

280 Since organic farmers' production is not en-  
281 ough for the organization to reach efficient

scales of activity, Meru Herbs also buys fruit  
for producing jams from non-organic farmers  
without requiring the above-mentioned con-  
tract.

Based on these characteristics, we divide pro-  
ducers having relationship with Meru Herbs  
into three groups: Bio farmers (organic farmers  
who have signed the contract with Meru  
Herbs), Conversion farmers (farmers who have  
recently signed the contract with Meru Herbs  
and started, but not concluded, a process of  
conversion to organic production), and Only-  
fruit farmers (farmers who sell fruit for jams  
to Meru Herbs but who have not signed any  
contract with the organization and who there-  
fore do not enjoy organization benefits (i)–(iv)

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Table 1. Summary characteristics of the four farmer groups

	Bio	Conversion	Onlyfruit	Control
Male (percent)	54.94	33.57	74.7	43.4
Catholics (percent)	46.23	56.6	60.24	46.24
Age	48	43	48	38
Average years of commercial relationship with Meru Herbs	13.3	1.1	2.8	0
Schooling years	6.3	9.17	7.53	8.97
Tharaka ethnic group (percent)	86.7	60	76.7	70
Meru ethnic group (percent)	6.6	3.3	26.7	10
Acres	10	7.16	9.36	6.8
No. of employees hired during harvesting season	1.3	1.9	1.96	0.7
No. of children	3.1	2.5	3.6	1.9
Other income <sup>a</sup>	23.15	26.14	20.16	20.34
No other activities <sup>a</sup>	80.27	73.73	70.26	76.12
Share of products directly sold to customers (percent)	17	18	28	38
Share of products sold to intermediaries (percent)	9	7	12	20
Share of products sold to Meru Herbs (percent)	60	55	38	0
Avg. varieties of products sold	8.8	7.7	6.6	4
[95% confidence intervals]	[8.00–9.66]	[6.40–9.10]	[5.74–7.85]	[3.05–4.94]
Papaw <sup>b</sup>	5 (20)	5 (18)	5 (19)	5 (1)
Mango <sup>b</sup>	7 (20)	7 (15)	7 (25)	–
Okra <sup>b</sup>	26 (6)	32 (9)	30 (10)	31 (11)
Karkadé <sup>b</sup>	7 (30)	7 (1)	7 (28)	–
Sorghum <sup>b</sup>	12.2 (17)	11.7 (16)	12.4 (13)	10.2 (18)
Maize <sup>b</sup>	12.4 (15)	12.8 (15)	13 (21)	11.7 (18)
Millet <sup>b</sup>	15 (16)	12 (15)	16.7 (14)	13.5 (20)
Pilipili <sup>b</sup>	40 (13)	30.5 (19)	30.7 (13)	14 (4)
[95% confidence intervals]	[40–40]	[28.54–32.50]	[23.77–37.76]	[7.42–22.02]
Guava <sup>b</sup>	7 (18)	7 (7)	7 (8)	–
Lemon <sup>b</sup>	5 (19)	5 (10)	5 (14)	–
Number of respondents	30	30	30	30

Group legend: *Bio*: certified organic farmers with long-term affiliation to Meru Herbs and access to FT export channels. *Conversion*: Meru Herbs members of recent affiliation undergoing conversion towards organic certification. *Onlyfruit*: non-affiliated farmers selling fruit to Meru Herbs. *Control*: farmers with no commercial relationship with Meru Herbs or FT who share the same productive environment and advantages of the local irrigation infrastructure with affiliated farmers. The survey was undertaken in January 2005.

<sup>a</sup> Share of respondents for which the item applies.

<sup>b</sup> Price in Kenyan shillings, with the number of group farmers selling the product on the market in parenthesis.

298 described above. These apply only to full mem- 350  
 299 bers such as Bio and Conversion farmers). 351

300 (c) *The overlap between Meru Herbs and fair 352*  
 301 trade 353

302 In 2004, 97% of net sales of Meru Herbs 354  
 303 came from export via fair trade organizations 355  
 304 (three different fair trade organizations—Con- 356  
 305 sorzio CTM Altromercato and Centrale Equo 357  
 306 Mercato from Italy and People Tree from Ja- 358  
 307 pan—with CTM having the lion's share with 359  
 308 around 80%). Export through FT channels 360  
 309 started as soon as Meru Herbs was created. It 361  
 310 is not possible, therefore, to separate FT from 362  
 311 Meru Herbs effects since FT exports and the 363  
 312 characteristics of the first-level producers' asso- 364  
 313 ciation were two parts of an integrated project 365  
 314 from the very beginning. 366

315 However, affiliated farmers are more inde- 367  
 316 pendent, since they sell no less than 40% of pro- 368  
 317 duction locally (see Table 1 in descriptive 369  
 318 statistics below). 370

319 (d) *Construction of the survey 371*

320 A crucial step in our research consisted of 372  
 321 identifying a control group of farmers in the 373  
 322 same irrigation area who had no relationship 374  
 323 with Meru Herbs. This control group selection 375  
 324 was made easier by the homogeneity of the 376  
 325 population living in the project area: All the 377  
 326 interviewed farmers benefit from the Ng'uuru 378  
 327 Gakirwe Water Project and therefore all of 379  
 328 them share the same irrigation infrastructure. 380  
 329 They differ only in marketing channels (Meru 381  
 330 Herbs with or without FT partnership, local 382  
 331 middlemen or direct sale in local markets). 383

332 More specifically, our reference population is 384  
 333 composed of the 474 farmers who benefit from 385  
 334 the irrigation project. Within this population, 386  
 335 we randomly selected four groups according 387  
 336 to the composition described in Section 2(b), 388  
 337 which includes Bio, Conversion, Onlyfruit, 389  
 338 and Control farmers.<sup>3</sup> 390

339 The advantage of having four groups is that 391  
 340 we can distinguish between long-term and 392  
 341 short-term effects of the relationship with Meru 393  
 342 Herbs and FT (Bio and Conversion farmers 394  
 343 respectively), relationship with Meru Herbs 395  
 344 without the full FT relationship (Onlyfruit 396  
 345 farmers) and the absence of any relationship 397  
 346 with FT (Control farmers). 398

347 During January 2005, the four groups re- 399  
 348 sponded to a 100-item questionnaire in per- 400  
 349 sonal interviews.<sup>4</sup> From the responses, we 401  
 402

obtained information on demographics, prod- 350  
 351 uct sale conditions, monetary and non-mone- 352  
 353 tary sources of income, food consumption 354  
 355 expenditure and dietary quality, schooling 356  
 356 years and working status of household mem- 357  
 357 bers, various social and capability indicators, 358  
 358 subjective measures of price satisfaction and 359  
 359 living condition satisfaction as well as social 360  
 360 capital indicators. 361

The final version of the questionnaire was 362  
 363 modified with respect to an initial draft on the 364  
 364 basis of considerations regarding the quality 365  
 365 of responses and their possible biases.<sup>5</sup> 366

367 3. DESCRIPTIVE STATISTICS 368

369 Table 1 describes the characteristics of the 370  
 370 four groups. Control group farmers are rela- 371  
 371 tively younger (ten year difference on average 372  
 372 with respect to Bio and Onlyfruit farmers) 373  
 373 and are less educated when compared with 374  
 374 Conversion farmers. Bio and Onlyfruit house- 375  
 375 holds are relatively larger. Farmers belonging 376  
 376 to the Control group employ, on average, rela- 377  
 377 tively fewer workers during the harvesting sea- 378  
 378 son. 379

380 With regard to the ethnic composition of our 381  
 381 sample, we consider 15 potential affiliations 382  
 382 (Embu, Kalenjin, Kamba, Kikuyu, Kisii, Luhya, 383  
 383 Luo, Maasai, Meru, Mijikenda, Somali, 384  
 384 Taita, Tharaka, Turkana, Kuria) and observe 385  
 385 that a large majority of interviewees belong 386  
 386 to the Tharaka group (from 60% to around 87% 387  
 387 in the four groups). The second largest ethnic 388  
 388 group is Meru (around 27% among Onlyfruit 389  
 389 farmers). 390

391 An important difference among the three 392  
 392 groups selling to Meru Herbs is that, as ex- 393  
 393 pected, Bio farmers declare a much longer com- 394  
 394 mercial relationship with the organization 395  
 395 (more than 13 years on average), while Con- 396  
 396 version and Onlyfruit farmers have initiated the 397  
 397 relationship more recently (one and three years, 398  
 398 respectively, on average). The already men- 399  
 399 tioned non-full membership of Onlyfruit farm- 400  
 400 ers is, therefore, also associated with a much 401  
 401 more recent commercial relationship with Meru 402  
 402 Herbs. 403

404 The four groups appear quite homogeneous 405  
 405 in terms of the availability of other sources of 406  
 406 income, whilst we register a 10% difference 407  
 407 between two groups when asking farmers whether 408  
 408 they have other working activities (30% of 409  
 409 Onlyfruit respond affirmatively as opposed to 410  
 410 20% of Bio farmers). 411

403 As an initial observation regarding this data, 423  
 404 it should be noted that no access restrictions exist 424  
 405 in principle to affiliation to Meru Herbs. The 425  
 406 differences we observe in the descriptive analy- 426  
 407 sis should therefore not be correlated to the 427  
 408 organization's selection criteria (even though 428  
 409 we will control for any such differences in the 429  
 410 econometric analysis). However, such differ- 430  
 411 ences imply that we cannot just compare aver- 431  
 412 age subgroup values to infer the impact of 432  
 413 Meru Herbs and FT relationship on farmers' 433  
 414 living standards. An econometric analysis is 434  
 415 needed to single out the Meru Herbs affiliation 435  
 416 and the FT impact effects from those of addi- 436  
 417 tional controls which differentiate the four 437  
 418 groups and are expected to affect our target 438  
 419 variables. 439

420 We continue our descriptive analysis by 440  
 421 focusing on crop variety, sale conditions, and 441  
 422 quality of life (Table 2). In the survey we ask 442

questions about production, sale conditions, 423  
 and price satisfaction concerning the 18 prod- 424  
 ucts that represent the whole range of crops 425  
 produced in the area. <sup>6</sup> For each of these prod- 426  
 ucts we have information about production and 427  
 distribution channels (Meru Herbs, traditional 428  
 local intermediaries, directly to customers). 429  
 Descriptive evidence on this point shows that 430  
 FT is not an exclusive channel for affiliated 431  
 farmers, consistent with FT criteria and previ- 432  
 ous research findings. <sup>7</sup> Bio, Conversion, and 433  
 Onlyfruit farmers also sell between 17% and 434  
 28% of their products directly to customers 435  
 and between 7% and 12% to local intermediar- 436  
 ies. Again, as expected, the share of products 437  
 sold to FT importers is far smaller for non-or- 438  
 ganic farmers not signing a contract with Meru 439  
 Herbs (Onlyfruit farmers) than for fully affili- 440  
 ated members (38% against 60% and 55% for 441  
 Bio and Conversion farmers, respectively). 442

Table 2. Price satisfaction and income satisfaction, socio-economic indicators

	Bio	Conversion	Onlyfruit	Control
<i>Wage income, prices and consumption</i>				
Weekly household consumption expenditure <sup>a</sup>	425	510	429	357
Satisfaction of living conditions (percent)	75.23	28.14	45.64	22.16
Household monthly earnings <sup>a</sup>	4,972	5,257	4,394	3,195
Equivalentized monthly earnings <sup>a</sup>	974	1,168	784	819
Desired monthly earnings <sup>a</sup>	26,333	28,750	31,436	28,000
Share of respondents declaring the highest level of price satisfaction (percent)	7.35	6.26	3.68	0
Share of respondents declaring the next to highest level of price satisfaction (percent)	24	24	19	11
<i>Technical assistance</i>				
Technical assistance from buyers (percent)	100	100	30.00	33.33
[95% confidence intervals]			[12.59–47.40]	[15.42–51.23]
<i>Health</i>				
Infant mortality (percent)	14.20	17.32	7.33	29.75
Child vaccination (percent)	100	100	93	93
Last child born in hospital (percent)	93.33	83.33	60.00	60.00
[95% confidence intervals]	[83.85–102.80]	[69.17–97.48]	[41.39–78.60]	[41.39–78.60]
<i>Child labor and human capital</i>				
Child labor	0.87	0.55	0.92	0.77
[95% confidence intervals]	[0.79–0.95]	[0.40–0.70]	[0.75–1.09]	[0.60–0.94]
Human capital investment	0.09	0.25	0.04	0.19
Number of respondents	30	30	30	30

Variable legend. *Income satisfaction*: share of respondents declaring the highest, or next to highest, satisfaction of living conditions; *Equivalentized monthly earnings*: household monthly earnings scaled by the number of family members. *Infant mortality*: share of group respondents with a child between zero and five years old who died in the last three years; *child labor*: children between six and 15 not attending school expressed in relation to the total number of household children in that age cohort; *human capital investment*: teenagers between 15 and 18 going to school expressed in relation to the total number of household members in that age cohort. Group legend (see Table 1).

<sup>a</sup> In Kenyan Shillings.

443 Control farmers seem to differ markedly from  
 444 those affiliated to the other three groups in  
 445 terms of average sale prices and crop variety,  
 446 with a relatively lower variety of products sold  
 447 on the market (on average four) against a value  
 448 ranging from six to nine for the rest of the sam-  
 449 ple. By examining 95% confidence intervals of  
 450 these means we find that both full membership  
 451 (Bio and Conversion) and Onlyfruit groups  
 452 produce a significantly higher variety of crops  
 453 than the control sample. Furthermore, long-  
 454 term full members (Bio farmers) have a signifi-  
 455 cantly higher variety of products sold than non-  
 456 full members such as Onlyfruit farmers. These  
 457 findings confirm that diversification benefits  
 458 crucially depend on full membership and are  
 459 consistent with Meru Herbs' specific FT trade  
 460 channel and in-kind benefits (see Section 2(b))  
 461 that give affiliated farmers the trade opportuni-  
 462 ties and the skills, respectively, to cultivate the  
 463 new products. Among such benefits, the provi-  
 464 sion of technical assistance to farmers is defi-  
 465 nitely an advantage for all Meru Herbs affilia-  
 466 tes since only around 30% of non-full  
 467 members receive such assistance from their  
 468 buyers (Table 2).

469 From this evidence it is clear that an explicit  
 470 test on the FT price premium criterion is diffi-  
 471 cult to perform since (i) FT, in cooperation  
 472 with Meru Herbs, introduces four new prod-  
 473 ucts (mango, karkadé, guava, and lemon)  
 474 which are cultivated only by affiliated farm-  
 475 ers.<sup>8</sup> It is therefore impossible to make a price  
 476 comparison with the Control group on these  
 477 products; (ii) Sorghum, maize, millet, and okra  
 478 are produced by all of the four groups and sold  
 479 only on the local market, not to FT. For these  
 480 products, there is no evidence of better price  
 481 conditions for affiliated farmers; (iii) pilipili  
 482 (red pepper in Swahili) is the only product that  
 483 is both sold to FT by affiliated farmers and pro-  
 484 duced (and sold through traditional trade chan-  
 485 nels) by Control group farmers. For this  
 486 product the price premium is strong and signif-  
 487 icant (see also confidence intervals in Table 2).

488 At this point, three main conclusions may  
 489 therefore be drawn: (i) the price premium seems  
 490 to exist when we compare products cultivated  
 491 by all farmers and for which affiliated farmers  
 492 have the additional FT trading channel (though  
 493 our observation is based on only one product);  
 494 (ii) a more generalized effect of FT in the area  
 495 seems to be product diversification rather than  
 496 price premium; and (iii) FT and Meru Herbs  
 497 affiliation do not help to reinforce (as it often  
 498 happens when producers' organizations are

499 formed) bargaining power when selling prod-  
 500 ucts on local markets (affiliated farmers do  
 501 not have significantly better price conditions  
 502 on the four products sold on the local market).

503 When we look at the socioeconomic indica-  
 504 tors in the four groups we observe that the  
 505 Control group exhibits lower weekly household  
 506 consumption expenditure and lower monthly  
 507 earnings (Table 2).

508 We must remember, though, that Control  
 509 group farmers have relatively smaller families.  
 510 This explains why the gap is significantly re-  
 511 duced when earnings are equivalized for house-  
 512 hold size using a suitable approach for our  
 513 sample.<sup>9</sup>

514 Another relevant finding is that farmers in the  
 515 group with longer Meru Herbs and FT affilia-  
 516 tion (Bio farmers) declare lower desired monthly  
 517 earnings than those of the Control group.

518 The combination of average group values on  
 519 perceived and desired income is consistent with  
 520 a far higher level of declared satisfaction about  
 521 living conditions for Bio farmers compared to  
 522 the control sample. If we compare, in Table 2,  
 523 the ratio between declared (non-equivalized)  
 524 and desired household income we find that it  
 525 is approximately one to five for Bio farmers  
 526 against approximately one to nine for Control  
 527 farmers. This finding is likely to be related to  
 528 two important distinguishing features of affilia-  
 529 ted farmers: (i) greater product diversification;  
 530 (ii) in-kind benefits received by Meru Herbs'  
 531 farmers (see Section 2(b)).

532 More specifically, the reduction of risk that  
 533 affiliated farmers have for the more diversified  
 534 product portfolio, the stability of prices, and  
 535 purchases from Meru Herbs and from fair  
 536 trade in the export channel suggests that a low-  
 537 er risk premium may be asked by farmers for  
 538 their activity. This should imply relatively high-  
 539 er price and income satisfaction for a given lev-  
 540 el of price and income.

541 The same risk reduction effect should raise  
 542 permanent disposable income (i.e., reducing cur-  
 543 rent or expected precautionary savings in mone-  
 544 tary or non-monetary forms), thereby increasing  
 545 the level of consumption for a given level  
 546 of monthly earnings. These hypotheses will be  
 547 tested in the econometric analysis which follows.

548 With regard to health indicators, the share of  
 549 those declaring episodes of infant mortality  
 550 during the last three years is markedly higher  
 551 in the Control group (around 30%) than in  
 552 the other three groups (between 17% and 7%).  
 553 This evidence seems to be related to the fact  
 554 that, while the gap in child vaccination between

555 long-term full Meru Herbs members (Bio farm-  
556 ers) and non-affiliated farmers is reduced (100%  
557 against 92%), 93% of Bio farmers had their  
558 most recent child born in hospital compared  
559 with 83% of Conversion, 78% of Control and  
560 60% of Onlyfruit farmers.

561 A somewhat unexpected result concerns the  
562 share of child labor (according to our definition,  
563 the number of children between six and 15 not  
564 attending school on the total number of house-  
565 hold children in that age cohort) and the human  
566 capital investment rate (according to our defini-  
567 tion, the number of those between 15 and 18  
568 going to school on the total number of house-  
569 hold members in that age cohort). While Con-  
570 version households exhibit the best figures  
571 (0.55% for the child labor rate and 0.25 for the  
572 human capital investment rate), Bio and Only-  
573 fruit household figures appear to be worse than  
574 Control group households (though this differ-  
575 ence is not statistically significant).

#### 576 4. ECONOMETRIC ANALYSIS

577 The descriptive findings presented in the previ-  
578 ous section suggest that farmers participating in  
579 the FT initiative have more diversified crops,  
580 higher food consumption, fewer episodes of child  
581 mortality, and superior income satisfaction.  
582 However, observed findings do not allow us to  
583 conclude that participation *per se* in the FT chan-  
584 nel has assured significant effects on these indica-  
585 tors. There are several reasons for this.

586 First, composition effects and heterogeneous  
587 characteristics of the four groups may influence  
588 some of our findings. As an example, one of the  
589 most obvious considerations is that Control  
590 group farmers may have lower household con-  
591 sumption expenditure because they have, on  
592 average, fewer children, slightly less cultivated  
593 land, and are relatively younger (if age and work-  
594 ing experience, presumably correlated, have  
595 some effects on performance and standard of  
596 living).

597 Second, endogeneity and a selection bias in  
598 the affiliation to Meru Herbs seem difficult, in  
599 principle, to disentangle from the concurring  
600 interpretation of the positive impact of FT.  
601 Do all our findings reflect advantages obtained  
602 Q3 during and thanks to the affiliation with Meru  
603 Herbs and the FT project, or do they measure  
604 characteristics which were already present  
605 (and, presumably, contributed to the affiliation)  
606 at the moment in which farmers became affili-  
607 ated to Meru Herbs?<sup>10</sup>

608 Whilst some of the problems considered  
609 above (Meru Herbs selection biases) may lead  
610 us to believe that observed findings on the FT  
611 impact could be excessively optimistic, two  
612 further arguments may counterbalance this  
613 interpretation. First, if the Meru Herbs project  
614 generates positive spillovers in the area, differ-  
615 ences between the three project groups and  
616 the control group may be underestimated.<sup>11</sup>  
617 Second, a Meru Herbs survivorship bias may  
618 also arise since it is likely that the most success-  
619 ful farmers leave the project.

620 In the following section, we attempt to answer  
621 at least some of these questions, while recogniz-  
622 ing the limits of our longitudinal database. With  
623 regard to the first point (composition effects),  
624 the vast amount of information collected in  
625 the survey allows us to control our results for  
626 a wide range of concurring factors.

627 In an initial econometric exercise we test  
628 whether findings on: (i) price satisfaction; (ii)  
629 weekly household consumption expenditure;  
630 (iii) dietary quality; (iv) satisfaction about living  
631 conditions; (v) infant mortality; and (vi) child  
632 labor are robust to the inclusion of proper con-  
633 trol factors.

#### (a) Price satisfaction

634  
635 To measure econometrically whether FT sig-  
636 nificantly improves price conditions for affili-  
637 ated farmers, we have chosen to use declared  
638 price satisfaction instead of a simpler index of  
639 price conditions. The first reason for this is  
640 that price satisfaction depends not just on price  
641 levels but also on other important price charac-  
642 teristics (such as price stabilization which is  
643 among FT criteria), which are conveyed by  
644 other questions in the survey (advanced/antici-  
645 pated payment conditions, price stability, the  
646 absence of sharp price declines). By taking just  
647 one of these complementary aspects of price  
648 satisfaction, we observe that a significantly  
649 higher proportion of farmers in the control  
650 sample declare that they had suffered price de-  
651 creases. A second reason is that there is not  
652 much more that can be added about price levels  
653 beyond what is shown in Table 2 and com-  
654 mented in detail in Section 3.

655 A third reason is that a standardized index of  
656 price conditions would downweigh the effects  
657 of crop diversification which are dominant in  
658 the Meru Herbs project and would be condi-  
659 tioned by the fact that affiliated farmers are  
660 the only ones who sell additional goods (kar-  
661 kadé, mango, guava, lemon).<sup>12</sup>



662 We therefore build an index of the farmer's  
663 subjective perception of price satisfaction under  
664 the assumption that the latter can successfully  
665 incorporate the above-mentioned complemen-  
666 tary factors not included in the standardized  
667 price index. To build this index we consider  
668 that, for each of the products sold, farmers  
669 are asked whether they are satisfied a lot, en-  
670 ough, a little or not at all. Our index of price  
671 satisfaction (IPS) for the  $i$ th farmer is therefore  
672 equal to

$$674 \quad IPS_i = (3 * muchperch_i + 2 * enoughperc_i + afewperch_i) / 3, \quad (1)$$

675 where *muchperc* is the share of products sold on  
676 the market for which the  $i$ th farmer declares  
677 highest price satisfaction, *enoughperc* (*afewp-*  
678 *erc*) the share of products sold on the market  
679 for which he declares next to highest (next to  
680 lowest) price satisfaction. The construction of  
681 the price satisfaction index implies that, as it  
682 is reasonable to be, the "not at all" answer is  
683 given a zero weight.

684 We regress the index on monthly income and  
685 several additional demographic controls to  
686 evaluate whether differences among groups in  
687 terms of price satisfaction are spuriously driven  
688 by other economic, sociologic, and demo-  
689 graphic factors.

690 The selected specification is <sup>13</sup>

$$691 \quad IPS_i = \alpha_0 + \alpha_1 Bio + \alpha_2 Conversion + \alpha_3 Control + \alpha_4 Income + \alpha_5 Male + \alpha_6 Birth + \alpha_7 Married + \alpha_8 Schoolyears + \alpha_9 Famsize + \alpha_{10} Catholic + \alpha_{11} Tharaka + \alpha_{12} Meru + \alpha_{13} Acres + \alpha_{14} Employees + \alpha_{15} Othincome + \alpha_{16} People home + \alpha_{15} Noothact + \varepsilon_i, \quad (2)$$

693 where *Control* is a dummy that takes a value of  
694 one if the respondent belongs to the Control  
695 group and zero otherwise, *Income* is monthly  
696 household income, *Male* is a dummy variable  
697 taking the value of one for male respondents  
698 and zero otherwise; *Birth* is the year of birth;  
699 *Married* is a dummy variable taking the value  
700 of one for married farmers; *Schoolyears* are  
701 the schooling years of the respondent; *Famsize*  
702 is the number of the respondent's children;  
703 *Catholic* is a dummy variable taking the value  
704 of one if the farmer is Catholic; *Tharaka* (*Meru*)  
705 is a dummy variable taking the value of one if  
706 the respondent belongs to the Tharaka (*Meru*)  
707

708 ethnic group; *Acres* is the extension in acres  
709 of the farmer's land; *Employees* is the number  
710 of workers hired during the harvesting season;  
711 *Othincome* is a dummy variable taking the val-  
712 ue of one if the respondent has additional  
713 sources of income and zero otherwise; *People-*  
714 *home* is the number of individuals (beyond fam-  
715 ily members) living at the respondent's home;  
716 *Noothact* is a dummy variable taking the value  
717 of one if the respondent has another working  
718 activity. <sup>14</sup>

719 Since participation in the Onlyfruit group is  
720 the omitted variable among group dummies,  
721 our findings must be read in the sense that Con-  
722 trol group farmers exhibit significantly lower  
723 price satisfaction than Onlyfruit farmers, while  
724 the opposite occurs for Bio and Conversion  
725 farmers (Table 3).

726 These results imply a hierarchy of effects and  
727 are consistent with the hypothesis that only full  
728 membership provides all of those benefits (sta-  
729 bilization of prices and of trade channels, price  
730 premia on a wide range of products) that gener-  
731 ate price satisfaction. Onlyfruit farmers are on  
732 a lower step (as shown in Table 1 they sell a re-  
733 duced share of products to Meru Herbs), but  
734 still better than Control group farmers who  
735 are fully excluded from these benefits. Consider  
736 also that price satisfaction rankings extracted  
737 from the econometric estimate therefore corre-  
738 spond not only to the ranks in term of product  
739 diversification but also to rankings in the share  
740 of production sold to Meru Herbs (see Table  
741 1). <sup>15</sup> Among control variables, only income  
742 (and male) is (weakly) significant; spurious ef-  
743 fects seem to be excluded.

(b) *Food consumption and dietary quality* 744

745 Well-being in developing countries depends  
746 on a mix of monetary and non-monetary com-  
747 ponents (wage income, government and local  
748 transfers, self-production and self-consump-  
749 tion, livestock, education, dietary quality, so-  
750 cial capital). All of these factors contribute to  
751 enhance capabilities and functionalities of the  
752 local farmers and therefore their quality of life.  
753 Our survey collects information on these differ-  
754 ent types of indicators. A relevant component  
755 within this framework capturing both formal  
756 and some of the informal aspects of economic  
757 well-being is weekly household food expendi-  
758 ture.

759 To evaluate the effect of FT affiliation on this  
760 variable we must necessarily control the main  
761 factors affecting it. The standard theoretical ref-

Table 3. *The impact of Meru Herbs and FT affiliation on the index of price satisfaction (IPS)*

Var. Dip.	IPS	Var. Dip.	IPS
Bio	0.171** [0.058]	Famsize	0.008 [0.009]
Conversion	0.174** [0.069]	Catholic	-0.013 [0.043]
Control	-0.132** [0.059]	Acres	0.051 [0.084]
Income	0.0042** [0.0003]	Employees	-0.042 [0.053]
Male	0.114* [0.052]	Othincome	0.071 [0.034]
Birth	0.002 [0.002]	Peoplehome	-0.016 [0.013]
Married	-0.026 [0.095]	Noothact	-0.0029 [0.065]
Schoolyears	-0.005 [0.005]		
Constant	-1.992 [2.774]		
LR $\chi^2$ (17)	45.25		
Prob > $\chi^2$	0.0001		
Pseudo $R^2$	0.5913		
Observations	106		

Variable legend:  $IPS_i = (3 * muchperc_i + 2 * enoughperc_i + afewperc_i) / 3$  where *muchperc* is the share of products sold for which the farmer declares highest price satisfaction, *enoughperc* (*afewperc*) the share of products sold for which the farmer declares next to highest (next to lowest) price satisfaction. The index is the dependent variables in Tobit a specification since it has upper and lower bounds.

Legend of regressors: *Control* (*Bio*, *Conversion*): dummy variable taking the value of one if the farmer belongs to the Control (*Bio*, *Conversion*) group and zero otherwise, *Income*: monthly income from the respondent's working activity, *Male*: dummy variable taking the value of one for male respondents and zero otherwise; *birth*: year of birth; *married*: dummy variable taking the value of one for married respondents and zero otherwise; *schoolyears*: schooling years of the respondent; *Famsize*: number of the respondent children; *catholic*: dummy variable taking the value of one if the farmer is catholic and zero otherwise; *Acres*: extension in acres of the farmer land; *Employees*: number of employees hired during the harvesting season; *Othincome*: dummy variable taking the value of one if the respondent's family has additional sources of income and zero otherwise; *peoplehome*: number of persons living at the respondent's home; *noothact*: dummy variable taking the value of one if the respondent has another working activity and zero otherwise. Results on ethnic group affiliation dummies are omitted for reasons of space. Robust standard errors in square brackets.

\* 90% significance.  
\*\* 95% significance.

762 erence for consumption equations is the “per- 785  
763 manent (household) income” hypothesis (Hall, 786  
764 1978). Few empirical tests of the PIH for devel- 787  
765 oping countries exist and are based on models 788  
766 of intertemporal optimization which require 789  
767 lagged (as well as current) levels of consump- 790  
768 tion and income (Khan, 1987; Rao, 2005). 791  
769 In our case, we do not have a time dimen- 792  
770 sion and must consider that sample farmers 793  
771 live in rural areas close to the poverty line. 794  
772 Two distinctive features, therefore, are: (i) food 795  
773 consumption is a large share of total consump- 796  
774 tion hence positive changes in permanent in- 797  
775 come are likely to translate into positive 798  
776 changes in food consumption and *vice-versa*, 799  
777 and (ii) food consumption does not depend 800  
778 only on what is purchased at market prices 801  
779 since non-monetary sources (self-consumption 802  
780 and self-production) play an important role as 803  
781 well. 804

782 Our modified permanent income benchmark 805  
783 must therefore consider that weekly house-  
784 hold food consumption expenditure is a func-

tion of the unobserved, permanent, disposable 785  
flow of monetary and non-monetary resources 786  
(PFMNR) and of the number of family members 787  
(since food consumption cannot be suppressed 788  
beyond certain levels, larger families should ex- 789  
hibit higher food consumption expenditure for a 790  
given level of household monetary income) as 791  
expressed by the following specification: 792

$$Foodcons_i = a_0 + a_1 PFMNR + a_3 MEMBERS + v_i. \tag{3} \quad 794$$

To proxy these variables we refer to a more 795  
complex set of regressors including household 796  
monthly income as well as measures of self-con- 797  
sumption and self-production (which should re- 798  
duce consumption expenditure for a given level 799  
of monetary income) and effective number of 800  
individuals living in a given household. More 801  
specifically, we include among regressors (i) 802  
*peoplehome* and *famsize* which help us to see 803  
how household food consumption expenditure 804  
relates to the number of individuals (see vari- 805

806 able description in Section 4(a)), (ii) *Othincome*  
807 and *Noothact*, capturing the existence of addi-  
808 tional sources of income; (iii) *employees* which  
809 are a proxy of labor costs for the producers,  
810 and (iv) land size (*Acre*s) and dummies of own-  
811 ership of livestock which help us to proxy  
812 unobserved self-consumption and self-produc-  
813 tion variables.

814 To these variables we add some demographic  
815 ones that may proxy for future changes in pro-  
816 ductivity affecting permanent income beyond  
817 what is captured by current monthly income  
818 (age, education, gender) and the dummy for  
819 participation in the Control group that mea-  
820 sures the effects of not having any kind of eco-  
821 nomic transaction with Meru Herbs. A  
822 rationale for the FT effects (years of affiliation  
823 or affiliation dummy) in this specific case is that  
824 in-kind services provided by Meru Herbs re-  
825 duce farmers' investment costs. As well as this,  
826 the reduction of risk generated by product  
827 diversification and price stabilization raises per-  
828 manent disposable income (i.e., reducing cur-  
829 rent or expected precautionary savings in  
830 monetary or non-monetary forms), thereby  
831 increasing the level of consumption for a given  
832 monthly wage.

833 We therefore adopt the following specifica-  
834 tion:

$$\begin{aligned}
 \text{Foodcons}_i &= \alpha_0 + \alpha_1 \text{Income} + \alpha_2 \text{Control} \\
 &+ \alpha_3 \text{Male} + \alpha_4 \text{Birth} \\
 &+ \alpha_5 \text{Married} + \alpha_6 \text{Schoolyears} \\
 &+ \alpha_7 \text{Famsize} + \alpha_8 \text{Catholic} \\
 &+ \alpha_9 \text{Tharaka} + \alpha_{10} \text{Meru} \\
 &+ \alpha_{11} \text{Acre} + \alpha_{12} \text{Employee} \\
 &+ \alpha_{13} \text{Othincome} + \alpha_{14} \text{People} \\
 &\times \text{hom}e + \alpha_{15} \text{Noothact} \\
 &+ \sum_{l=1}^5 \gamma_l \text{Cattle}_l + \varepsilon_i, \quad (4)
 \end{aligned}$$

836

837 where *Foodcons* is weekly household food  
838 expenditure in Kenyan shillings and the regres-  
839 sors are defined as in (2).

840 Regression findings illustrate that the absence  
841 of relationships with FT and Meru Herbs has a  
842 significant and negative effect on weekly house-  
843 hold food expenditure, net of the variables con-  
844 trolling for demographic factors and various  
845 controls affecting permanent household flow of  
846 monetary and non-monetary resources. In a

second specification, we replace the control dum-  
847 my with an indicator of price (dis)satisfaction  
848 (*nopricesatisf*), which measures the share of prod-  
849 ucts sold for which the farmer is not satisfied at  
850 all about price conditions (Table 4, column 2).  
851 Again, the results are significant and negative.  
852 This result reveals an important link between  
853 one of the most important FT criteria (price sat-  
854 isfaction) discussed in Section 4(a) and the eco-  
855 nomic well-being of local farmers in our survey.  
856

857 A complementary and relevant indicator of  
858 household well-being is the dietary quality of  
859 their food consumption. In our survey, we have  
860 information about the frequency of consump-  
861 tion (more than once a day, once a day, once  
862 every three days, once a week, rarely, never)  
863 of the following food items (*ugali, chapati, rice,*  
864 *maize, beans, eggs, milk, chicken, other meat,*  
865 *fish, potatoes, greens, fresh fruit*). On this basis,  
866 we build an index of dietary quality giving  
867 descending values (from a maximum of five to  
868 a minimum of one) to the above-mentioned fre-  
869 quency modalities. Finally, we calculate our  
870 synthetic index as an unweighted average of  
871 the values given to each food item.<sup>16</sup>

872 Since in subsistence economies higher dispos-  
873 able flows of monetary and non-monetary re-  
874 sources should raise both quantity of food  
875 consumed and dietary quality, the reasons for  
876 the selection of regressors given above also apply  
877 here. We therefore regress the dietary quality  
878 synthetic index on the usual set of controls and  
879 on measures of affiliation to the project or partic-  
880 ipation in the control sample. In this case, we ob-  
881 serve that participation in the control sample is  
882 related to a significantly lower value of the  
883 dependent variable (Table 4, column 3). A sec-  
884 ond estimate in which we replace the control  
885 dummy with the duration of Meru Herbs affilia-  
886 tion ("workyears" measuring years of affiliation)  
887 documents the significance of this variable, to-  
888 gether with the absence of other sources of in-  
889 come and ownership of livestock (chicken and  
890 cows) (Table 4, column 4).<sup>17</sup> The link between  
891 affiliation and dietary quality (beyond the in-  
892 creased food consumption effect) is explained  
893 by the fact that product diversification is *per se*  
894 a source of nutritional improvement if part of  
895 that production is self-consumed.

896 Since findings in both estimates support the  
897 hypothesis that advantages of full affiliation  
898 (such as product diversification, price stabiliza-  
899 tion, and in-kind services) affect quality and  
900 quantity of food consumption via an increase  
901 of the "permanent household flow of dispos-  
902 able monetary and non-monetary resources"

Table 4. *The impact of FT and Meru Herbs affiliation on price satisfaction (PRICESAT), household weekly food expenditure (FOODCONS), and dietary quality (QUALCONS)*

Dep. Var.	FOODCONS	FOODCONS	QUALCONS	QUALCONS
Nopricesatisf		-143.214** [72.932]		
Control	-125.024** [62.365]		-0.362* [0.202]	
Income	0.0062** [0.0024]	0.0056** [0.0021]	0.0008** [0.00001]	0.0009** [0.00002]
Workyears				0.038** [0.012]
Male	-10.325 [29.352]	-10.325 [51.352]	0.214 [0.213]	0.152 [0.183]
Birth	4.315 [3.262]	4.132 [3.241]	0.009 [0.003]	0.005 [0.007]
Married	-20.251 [33.465]	-10.214 [30.241]	0.262 [0.325]	0.203 [0.347]
Schoolyears	-5.251 [6.352]	-4.023 [6.345]	0.031 [0.023]	0.034 [0.064]
Famsize	21.264 [19.262]	21.352 [14.241]	0.008 [0.024]	-0.053 [0.065]
Catholic	-93.243 [54.251]	-81.241 [52.141]	0.129 [0.122]	0.510 [0.316]
Acres	-4.753 [3.032]	-44.321 [64.241]	0.010 [0.010]	0.032 [0.007]
Employees	-0.264 [9.032]	0.620 [3.042]	0.041 [0.042]	0.132** [0.050]
Othincome	-10.244 [58.254]	45.231* [22.241]	0.0394 [0.125]	0.025 [0.340]
Peoplehome	-9.214 [10.251]	-2.031 [11.231]	-0.063 [0.041]	-0.073 [0.031]
Noothact	-23.214 [61.352]	-93.224 [68.241]	0.321 [0.303]	0.693** [0.251]
Chickens	0.423 [0.254]	0.401 [0.235]	0.600 [0.391]	0.701* [0.401]
Goats	0.214 [0.932]	0.325 [0.251]	-0.352 [0.295]	-0.542 [0.366]
Cows	0.534 [0.215]	0.524 [0.352]	0.704** [0.392]	0.712** [0.432]
Pigs	0.042 [0.142]	0.254 [0.153]	0.123 [0.205]	0.311 [0.354]
Constant	-4625.321 [2415.435]	-5264.251 [4253.352]	-8.635 [10.362]	-12.318 [13.427]
R <sup>2</sup>	0.1001	0.1301	0.169	0.3512
Observations	102	105	103	75

In columns 1 and 2 the dependent variable (*Foodcons*) is monthly household food expenditure. In columns 3 and 4 the dependent variable (*qualcons*) is an index of nutritional quality built as an unweighted average of frequencies 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, tubers (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 and, finally, we calculate our synthetic index as an average of the values for each food item. The regression is estimated with a Tobit model since the dependent variable has upper and lower bounds. Variable legend: *workyears*: years of affiliation to Meru Herbs, *Nopricesatisf*: share of products sold on the market for which the farmer is not at all satisfied about price conditions over products sold on the market. Column 4 legend: *chickens, goats, cows, pigs*: dummy variables taking the value of one if the relevant animal is raised and zero otherwise. For the other variables see Table 3 legend and Section 4(a) in the paper. Robust standard errors in square brackets.

\* 90% significance.  
\*\* 95% significance.

903 we should also observe a significant effect of  
904 affiliation on satisfaction concerning living con-  
905 ditions. We will go on to test this in the follow-  
906 ing section.

907 (c) *Living satisfaction and infant mortality*

908 We measure income satisfaction by directly  
909 referring to the qualitative question concerning  
910 the level of satisfaction with living condi-  
911 tions.<sup>18</sup> The dependent variable is discrete  
912 and qualitative, assuming values from three to  
913 one. We, therefore, estimate the following or-  
914 dered logit model:

$$\begin{aligned}
 Livsat_i = & \alpha_0 + \alpha_1 Bio + \alpha_2 Income + \alpha_3 Male \\
 & + \alpha_4 Birth + \alpha_5 Married + \alpha_6 Schoolyears \\
 & + \alpha_7 Famsize + \alpha_8 Catholic + \alpha_9 Tharaka \\
 & + \alpha_{10} Meru + \alpha_{11} Acres + \alpha_{12} Employees \\
 & + \alpha_{13} Othincome + \alpha_{14} People\ home \\
 & + \alpha_{15} Noothact + \sum_{l=1}^5 \gamma_l Cattle_l + \varepsilon_i. \quad (5)
 \end{aligned}$$

917 For the selection of regressors, we again refer to  
918 all of the possible factors affecting disposable  
919 monetary and non-monetary sources of income  
920 (see Section 4(a) for variable legend). Our find-

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921 ings document a significant and positive effect  
922 of affiliation in the Bio project (Table 5, column  
923 1) or duration of project affiliation (Table 5,  
924 column 2) on the dependent variable. Both  
925 findings indicate that affiliation years matter  
926 in this case. The only additional regressor that  
927 is significant and positive is the availability of  
928 other sources of income confirming the reason-  
929 able assumption that, *Ceteris paribus*, this vari-  
930 able should reduce risk and increase the  
931 satisfaction with living conditions.

932 It should be noted that the positive relation-  
933 ship between satisfaction of living conditions  
934 and project duration is consistent with the low-  
935 er desired wage declared by Bio farmers (see  
936 descriptive statistics in Table 2). Again, the rel-  
937 evance of this dependent variable to our analy-

938 sis lies in its capacity to capture the provision  
939 of public or private goods and services which  
940 cannot be measured by the information on per-  
941 ceived income. In fact, it is reasonable to as-  
942 sume that a lower desired wage is significantly  
943 related to a higher quality of monetary and  
944 non-monetary goods and services, since in-kind  
945 benefits and product diversification are ex-  
946 pected to increase satisfaction with living con-  
947 ditions for a given level of monthly income.

948 Finally, we wanted to test whether participa-  
949 tion in the project generates significant differ-  
950 ences in an important indicator such as child  
951 mortality, thereby validating the descriptive  
952 evidence provided in Table 3.

953 The dependent variable is a dummy taking  
954 the value of one if the respondents' household

Table 5. *The impact of FT and Meru Herbs affiliation on life satisfaction and on infant mortality*

Dep. Var.	LIVSAT	LIVSAT	INF MOR	INF MOR
Bio	1.052** [0.463]		-1.942* [1.090]	
Control				1.532** [0.632]
Income	0.0003** [0.0001]	0.0002** [0.00007]	-0.0002** [0.00007]	-0.0002* [0.00001]
Workyear		0.074** [0.032]		
Male	0.058 [0.525]	0.094 [0.315]	1.832 [1.252]	0.753 [0.622]
Birth	-0.013 [0.031]	-0.012 [0.024]	-0.090 [0.094]	-0.085 [0.121]
Married	-0.052 [0.321]	-0.043 [0.342]		
Schoolyears	-0.063 [0.042]	-0.085 [0.044]	-0.005 [0.063]	0.010 [0.094]
Famsize	-0.055 [0.043]	-0.057 [0.047]	0.193 [0.201]	0.183 [0.176]
Catholic	0.643 [0.432]	0.631 [0.430]	0.008 [0.639]	0.062 [0.652]
Acres	0.007 [0.018]	0.006 [0.019]	-0.210 [0.315]	-0.254 [0.652]
Employees	-0.004 [0.086]	0.003 [0.083]	0.381 [0.311]	0.251 [0.143]
Othincome	1.812** [0.631]	1.913** [0.695]	-2.712** [1.415]	-2.964* [1.542]
Peoplehome	-0.142 [0.103]	-0.123 [0.094]	-0.083 [0.201]	0.065 [0.231]
Noothact	-0.214 [0.843]	-0.325 [0.722]	1.831 [1.532]	1.042 [1.042]
Chickens	0.392 [0.812]	0.932 [0.539]	-2.938** [1.154]	-2.923** [1.152]
Cows	0.304 [0.832]	0.823 [0.732]	-0.742 [0.593]	-0.642 [0.503]
Goats	-1.732 [0.732]	-1.532 [0.623]	0.532 [1.325]	0.422 [1.125]
Pigs	1.425 [1.512]	2.352 [1.039]	-0.831 [1.842]	-0.731 [1.32]
/cut1	-21.312 [36.320]	-18.031 [37.250] Const.	105.253 [80.325]	104.132 [72.12]
/cut2	-19.893 [34.254]	-16.032 [32.359]		
/cut3	-17.032 [35.153]	-13.943 [32.351]		
LR $\chi^2$ (20)	28.43	29.23 LR $\chi^2$ (21)	21.32	(16) 16.04
Prob > $\chi^2$	0.0554	0.0646 Prob > $\chi^2$	0.4140	0.4012
Pseudo $R^2$	0.093	0.095 Pseudo $R^2$	0.2723	0.1991
Observations	103	103	86	86

The dependent variable of the first and second column regression (LIVSAT) is based on answers to the following question: *Are you satisfied with your household's living conditions?* We give the following score to qualitative answers: a lot = 3; enough = 2 a little = 1 not at all = 0. The specification is estimated with an ordered logit approach. The dependent variable of the third and fourth column (INF MOR) is a dummy taking the value of one if the respondent had episodes of infant mortality in the last three years and zero otherwise. For the legend regarding other variables see Table 3 and Section 4(a) in the paper. Robust standard errors in square brackets.

\* 90% significance.

\*\* 95% significance.

955 had an episode of infant mortality in the last  
956 three years and zero otherwise.

957 The empirical literature on this point indicates  
958 that, beyond the usual cultural and economic  
959 factors, one of the main factors affecting this  
960 variable is the availability of healthcare (see,  
961 among others, Mosley & Chen, 1984; Wang,  
962 2003) (hospital births, vaccinations, etc.) which  
963 depend, in turn, on disposable income, parental  
964 education, and availability of free-of-charge  
965 health services. The usual set of controls is included  
966 in the estimates to capture these effects.

967 Econometric estimates confirm the significance  
968 of the difference in child mortality between  
969 Control group farmers, on one side, and Meru  
970 Herbs and FT-affiliated, on the other (Table 5,  
971 columns 3 and 4). Both higher disposable income  
972 and/or the culture promoted by the Meru  
973 Herbs association should therefore contribute to  
974 a wider use of health services (i.e., hospital  
975 births) reducing child mortality. The empirical  
976 differences, described earlier, concerning hospital  
977 births (Table 2) may contribute to the explanation  
978 of this result. Additional significant regressors  
979 (in the expected direction) in this estimate  
980 are the availability of other sources of income  
981 and ownership of chickens, both of which  
982 reduce the likelihood of child mortality.

## 983 5. FAIR TRADE AND EDUCATION

984 Finally, we investigate the impact of FT on  
985 child labor (according to our definition, children  
986 aged between six and 15 not attending  
987 school expressed in relation to the total number  
988 of household children in that age cohort) and  
989 human capital (according to our definition,  
990 young aged between 15 and 18 going to school  
991 expressed in relation to the total number of  
992 household members in that age cohort) investment  
993 rates in the year of the survey. The estimated  
994 specification is  
995

$$\begin{aligned}
 Eduperf_i = & \alpha_0 + \alpha_1 Project + \alpha_2 Income \\
 & + \alpha_3 Male + \alpha_4 Birth + \alpha_5 Married \\
 & + \alpha_6 Schoolyears + \alpha_7 Famsize \\
 & + \alpha_8 Catholic + \alpha_9 Tharaka \\
 & + \alpha_{10} Meru + \alpha_{11} Acres \\
 & + \alpha_{12} Employees + \alpha_{13} Othincome \\
 & + \alpha_{14} Peoplehome + \alpha_{15} Noothact + \varepsilon_i.
 \end{aligned}
 \tag{6}$$

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As opposed to previous specifications the  
dependent variable here ( $Eduperf_i$ ) is, alternatively,  
 $CHILDLAB$  (children aged between six  
and 15 not attending school over the total number  
of household children of that age cohort),  
(Table 6 column 1) or  $HUMCAP$  (children  
aged between 15 and 18 attending school over  
the total number of household children of that  
age cohort) (Table 6 column 2). We include a  
measure of *Income* among regressors, one of  
the most important determinants of the dependent  
variable.<sup>19</sup> Use of the variable *Project*  
indicates whether affiliation to one of the four  
sample groups affects the dependent variable  
(*Project* is alternatively represented by the already  
defined *Bio* and *Conversion* dummies). It should  
also be noted that the *Schoolyear* variable is  
particularly important here as several contributions  
to the child labor literature have shown that  
parental education has significant effects on  
household child labor choices.<sup>20</sup> Unfortunately,  
our cross sectional estimate has a lower number  
of observations in this case because of the  
presence of households without children of  
school age in the period the survey was  
conducted.

Our results confirm descriptive findings  
(Table 2) and show that affiliation to the  
Conversion group is associated with reduced  
child labor and increased human capital  
investment. The only other significant variable  
in the cross sectional estimate is the absence  
of other working activities, which has effects  
in the opposite direction.

Here again, the selection effect seems  
dominant. FT affiliation does not seem to  
affect significantly either child labor or  
investment in human capital since participation  
in the group of (Bio) long-term affiliated  
members is not significant in the estimate  
and the positive relationship in the Conversion  
group, with only one year of membership on  
average, seems more related to an *ex ante*  
characteristic than to an effect of FT. We  
presume that two effects are at work here.  
On the one hand, higher disposable income  
should reduce the likelihood of child labor  
(and, conversely, should increase that of  
human capital investment). On the other  
hand, the increased farmer activity could  
raise household demand for unskilled labor  
and therefore child work. Without an explicit  
policy of Meru Herbs addressed to achieve  
child labor problems it is therefore reasonable  
to observe inconclusive findings.

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Table 6. *The impact of Meru Herbs and FT affiliation on human capital investment and child labor*

CHILDLAB		HUMCAP	
Conversion	-1.012* [0.432]	Conversion	0.901* [0.441]
Bio	0.019 [0.536]	Bio	-0.164 [0.215]
Income	-0.0001 [0.0001]	Income	0.0001 [0.0001]
Male	-0.531 [0.412]	Male	0.0142 [0.031]
Birth	-0.053 [0.062]	Birth	-0.040 [0.021]
Married	0.912 [0.843]	Married	0.042 [0.215]
Schoolyears	0.009 [0.046]	Schoolyears	-0.012 [0.020]
Famsize	0.062 [0.093]	Famsize	0.052 [0.031]
Catholic	0.312 [0.403]	Catholic	0.932 [0.823]
Acres	0.006 [0.029]	Acres	0.031 [0.041]
Employees	0.022 [0.192]	Employees	0.062 [0.143]
Othincome	-0.752 [0.532]	Othincome	0.251 [0.403]
Peoplehome	-0.042 [0.101]	Peoplehome	-0.191 [0.121]
Noothact	1.032* [0.503]	Noothact	-1.028* [0.425]
Constant	93.241 [62.323]	Constant	82.294 [70.142]
LR $\chi^2$ (19)	30.421		27.010
Pseudo $R^2$	0.309		0.250
No. of observations	70		69

The base Tobit estimate specification of the two regressions is described in Section 5 (Eqn. (6)). Dependent variables: *childdlab*: children aged between six and 15 not attending school expressed in relation to the total number of household children in that age cohort; *humcap*: teenagers aged between 15 and 18 attending school expressed in relation to the total number of household members in that age cohort.

\*\*95% significance. Robust standard errors in square brackets.

\* 90% significance.

6. ROBUSTNESS TEST FOR THE SELECTION BIAS FINDINGS: A TREATMENT REGRESSION APPROACH

Results presented in Sections 4 and 5 show a significant association between affiliation to Meru Herbs and the FT project with monetary and non-monetary objectives and subjectively perceived components of individual well-being. Dataset limitations do not completely enable us to respond to objections. Do these findings depend on a significant impact of FT on farmers' well-being or are they affected by project selection and control sample bias? On the one hand, we can argue that descriptive findings show that the four groups are not so different in terms of equalized monthly earnings, and that differences in household size, extent of cultivated land, and number of employees in the harvesting season are controlled for in our econometric estimates. On the other hand, it is always possible that hidden variables affecting the selection of the four groups are also the determinants of differences in well-being, even though this is

more difficult to believe in the case of some of our findings. More specifically, the link between price satisfaction and affiliation to Meru Herbs and the FT project (Table 3, columns 1 and 2) seems an obvious direct consequence of FT criteria and the link between household food consumption expenditure and price satisfaction (Table 4, column 2) seems to demonstrate that FT criteria have positive effects on farmers' well-being.

To provide a more rigorous evaluation of the effects of project affiliation, net of the Meru Herbs and fair trade selection biases, we specify a treatment regression model in which the previously estimated model equation is re-estimated together with a selection equation in which affiliation/no affiliation to FT is regressed on a set of individual characteristics. This estimate helps to disentangle the effects generated by the project (affiliated farmers are better off in terms of a given indicator for the effects of FT) from the selection effect (affiliated farmers have a superior outcome because affiliation to FT was somehow related to farmers' high outcome or to characteristics correlated to high outcome).

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The estimated two equation model is

$$\begin{aligned}
 Perform_i = & \alpha_0 + \alpha_1 Income + \alpha_2 Workyears \\
 & + \alpha_3 Male + \alpha_4 Birth + \alpha_5 Married \\
 & + \alpha_6 Schoolyears + \alpha_7 Famsize \\
 & + \alpha_8 Catholic + \alpha_9 TharakaMeru \\
 & + \alpha_{10} + \alpha_{11} Acres \\
 & + \alpha_{12} Employees + \alpha_{13} Othincome \\
 & + \alpha_{14} Peoplehome + \alpha_{15} Noothact \\
 & + \sum_{l=1}^5 \gamma_l Cattle_l + \alpha_{16} Ftrade + \varepsilon_i
 \end{aligned}$$

(7.1)

$$\begin{aligned}
 Ftrade_i = & \beta_0 + \beta_1 Income + \beta_2 Workyears \\
 & + \beta_3 Male + \beta_4 Birth + \beta_5 Married \\
 & + \beta_6 Schoolyears + \beta_7 Famsize \\
 & + \beta_8 Catholic + \beta_9 Tharaka + \beta_{10} Meru \\
 & + \beta_{11} Acres + \beta_{12} Employees + v_i
 \end{aligned}$$

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In the two equation system, (v) and (ε) 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 (7.1) and (7.2) is provided by Maddala (1983) and Greene (2003).

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Table 7. Effects of FT affiliation on nutritional quality and living condition satisfaction when controlled for the FT selection bias

Dep. Var.	QUALCONS		FTRADE		Dep. Var.	LIVSAT		FTRADE	
	coeff.	s.e.	coeff.	s.e.		coeff.	s.e.	coeff.	s.e.
Workyear	0.038**	[0.021]			Workyear	0.039**	[0.018]		
Income	0.0009**	[0.0003]	0.0007	[0.0007]	Income	0.0008**	[0.0003]	0.0006	[0.0008]
Male	0.213	[0.301]	-0.504	[0.208]	Male	-0.042	[0.315]	-0.463	[0.254]
Birth	0.006	[0.006]	-0.009	[0.009]	Birth	-0.005	[0.008]	-0.009	[0.032]
Married	0.008	[0.141]	0.028	[0.221]	Married	-0.032	[0.153]	0.025	[0.264]
Schoolyears	0.032*	[0.016]	0.035	[0.028]	Schoolyears	-0.021	[0.032]	0.036	[0.033]
Famsize	0.013	[0.093]	-0.023	[0.027]	Famsize	-0.032	[0.031]	-0.063	[0.076]
Catholic	0.103	[0.214]	[0.058]	[0.151]	Catholic	0.201	[0.188]	0.097	[0.356]
Embu	-0.813	[0.231]	-0.203	[1.035]	Embu	-1.415*	[0.707]	-0.463	[1.035]
Meru	0.214	[0.241]	-0.425	[0.253]	Meru	-0.054	[0.320]	-0.352	[0.362]
Tharaka	-0.842	[0.243]	0.153	[0.215]	Tharaka	-0.454	[0.325]	0.463	[0.953]
Acres	0.007	[0.006]	0.032	[0.021]	Acres	0.015	[0.013]	0.046	[0.047]
Employees	0.040	[0.031]	0.393**	[0.135]	Employees	0.121	[0.143]	0.332**	[0.136]
Othincome	0.093	[0.124]			Othincome	0.894**	[0.244]		
Peoplehome	-0.053	[0.045]			Peoplehome	-0.053	[0.025]		
Noothact	0.240*	[0.201]			Noothact	-0.194	[0.223]		
Chicken	0.104	[0.204]			Chicken	0.104	[0.204]		
Sheep	-0.096	[0.392]			Sheep	-0.096	[0.392]		
Cows					Cows	0.194	[0.204]		
Goats				Goats	-0.612*	[0.321]			
Pigs					Pigs	1.043	[0.942]		
FTRADE	-0.302	[0.304]			FTRADE	-0.423	[1.354]		
Constant	-1.395	[10.314]	12.214	[21.251]	Constant	10.594	[19.305]	3.943	[6.436]
No. of observations			106					106	
Log L				-194.213					-199.325

Legend: the two equation treatment regression model is described in Section 6 (Eqns. (7.1) and (7.2)). Variable legend: see Tables 5 and 6.

\* 90% significance.

\*\* 95% significance.



iation to FT) is the treatment variable which is both a regressor in the first equation and the dependent variable of the second equation. Since we focus on the Meru Herbs affiliation selection bias, our treatment variable is equal to one if the farmer belongs to the Bio or Conversion groups and zero otherwise.

It should also be noted that, to evaluate the dynamic impact of the project over time, in the first equation we add the *Workyears* variable indicating the years of affiliation to FT.

Selected results of treatment regression estimates are presented in Table 7. These findings show that for two performance variables (nutritional quality and satisfaction in living conditions), years of FT affiliation remain positive and significant, even after controlling for both FT and Meru Herbs selection biases.<sup>21</sup> It should be noted that the only other variable which is significant in the second equation is the number of employees hired in the harvesting season. This finding implies that this variable affects the process of participant selection in the FT project.

## 7. CONCLUSIONS

Over 4,000 small-scale producer groups in more than 50 developing countries participate in fair trade supply chains. More than five million people in Africa, Latin America, and Asia benefit from fair trade terms (Fair Trade Advocacy, 2005b).

It is therefore not appropriate to draw general conclusions about the impact of FT from an analysis carried out on just one of these projects. Findings from this paper may, at most, give an indication on whether the partnership with Meru Herbs was a good choice for FT and whether the joint impact of FT criteria and Meru Herbs activity has had a positive influence on affiliated farmers. However, we believe that our results, though project-specific, provide interesting evidence to the fair trade debate and develop a methodological approach which can be successfully replicated and implemented (i.e., with a "difference in difference" approach based on two analyses repeated at a later date) on a larger scale in similar projects.

In the case of the observed Kenyan farmers, our main conclusions are that fair trade affiliation seems to be associated with superior capabilities, economic and social well-being, but also that more can be done on the human capital side. Fair trade is definitely responsible for the

creation of an additional trade channel, crop diversification, and provision of in-kind services including technical assistance. Fair trade and Meru Herbs affiliates also have higher price satisfaction, food consumption expenditure, and dietary quality. Another interesting result is the remarkable difference between fair trade affiliated and control farmers in terms of income satisfaction. Such difference is not only due to the higher earned income, but also to a relatively lower desired income which is likely to be determined by a higher supply of complimentary (or cheaper) goods, services, lower trade risk, and technical assistance.

Among these findings, those of higher satisfaction of living conditions and superior nutritional quality seem to be the most robust since the two variables are positively related to the duration of FT affiliation and are robust to controls for the FT selection bias in a two equation treatment regression model.

A less clear cut result is related to the impact of fair trade on human capital investment. We note in this case the negative association between affiliation to the younger Conversion project and child labor, but no significant association between incidences of child labor and affiliation to the other groups.

Overall, our findings indicate that FT works in directions which seem to directly contribute to the improvement of farmers' well-being, but also that one aspect (support for human capital investment) may be improved.<sup>22</sup> It should be remembered, however, that in our analysis the composition of the Control group is quite similar to the other three, since all four groups share the same geographical area, basic infrastructure, and equal access to any positive FT externality affecting the whole region. Our analysis of the impact of FT is more severe given this homogeneity and the reduction of confounding factors. Moreover, the survivorship bias caused by the most successful farmers leaving the project may also contribute to an underestimation of the effects of FT.

We observe that the fair trade impact on farmers is crucially determined by the application of certain criteria, specifically price premium, price stabilization, and in-kind benefits, including technical assistance plus an additional one not directly included in formal criteria (product diversification). This combination reduces farmers' risks and seems to generate positive effects on price, living condition satisfaction, and other relevant socio-economic indicators.

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## NOTES

- 1229 1. Redfern and Snedker (2002) ILO working paper summarizes fair trade success in recent years, noting that  
 1230 FT: “(i) has created a growing US \$500 million network of  
 1231 businesses that seeks to push the benefits of that trade to the  
 1232 poorest; (ii) has provided a wide range of embedded services to  
 1233 producers who would not have been able to source or afford  
 1234 them locally; (iii) has provided market access to groups  
 1235 whose mainstream business was not interested in trading  
 1236 with; (iv) has facilitated or influenced the increasing number  
 1237 of fair trade products on supermarket shelves; (v) has  
 1238 successfully campaigned at many levels of policy making to  
 1239 bring real pro-poor changes in legislation; (vi) has raised the  
 1240 issue of trade with millions of consumers—particularly across  
 1241 Europe—changing attitudes to business and development;  
 1242 (vii) has been a significant catalyst in the development of  
 1243 ethical issues within mainstream trade and business practices,  
 1244 influencing the development of Corporate Social Responsibility,  
 1245 approaches like Social Accounting and the development of the Ethical Trade Initiative in the UK”.
- 1247 2. For the theoretical debate concerning the role and impact of fair trade at micro and aggregate level, see  
 1248 Becchetti and Rosati (forthcoming), Hayes (2004) and  
 1249 Leclair (2002), Maseland and De Vaal (2002), Moore  
 1250 (2004).
- 1252 3. The sample of the 120 farmers is randomly selected on the list of the overall population of the 479 farmers living in the irrigation area. Sizes of the four groups are representative of the shares in the population, which are close (though not exactly equal) to 25%. The Bio share is actually slightly lower than the Control group one (around 20%), but since farmers with long-term relationship with fair trade are the direct object of our work, we choose to over represent them.
- 1253 4. Full details of the questionnaire are omitted for reasons of space. They are, however, available upon request.
- 1262 5. The research has been developed according to the following timetable: (i) 1st of February 2005—Meru Herbs, Nairobi office: research beginning; (ii) 2–11th of February 2005—Meru Herbs Base Camp: community analysis and provisional questionnaire checking; (iii) 12–20th 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.
- 1264 6. Papaw, mango, french beans, okra, karkadé, camomile, lemongrass, tobacco, banana, potatoes, soya beans, maize, sorghum, millet, tomatoes, pilipili, guava, lemon.
- 1277 7. More specifically, non-zero export or distant domestic market sales of FT farmers via traditional intermediaries are documented in Oxford Policy Management (2000), Nelson and Galvez (2000), Bacon (2005), Hopkins (2000), and Ronchi (2002), without providing explicit statistics. Sales to local market and self-consumption are also mentioned in Castro (2001a), Castro (2001e), Castro (2001b), and Pariente (2000), in addition to all of the previously mentioned studies.
- 1279 8. Amongst these, Karkadé was not previously cultivated in the country (it comes from Sudan) and is explicitly introduced with this project. It should also be considered that since 2006 (after our survey in 2005), FT importers have introduced additional products such as passion fruit and bananas, as well as onions, tomatoes, and garlic for the preparation of sauces.
- 1288 9. Under the current OECD rule, earnings are divided by a scale factor  $A$ , where  $A = 1 + 0.5(N_{adults} - 1) + 0.3N_{children}$ . However, in our sample, a large part of consumption is food consumption. It is therefore advisable to reduce the extent of economies of scale by increasing weights in the equivalence scale. The standard suggestion is to give unit weights to each member (for a discussion of the methodological problems in creating equivalence scales see Deaton & Paxson, 1998).
- 1295 10. While Meru Herbs does not create access restrictions for membership, a process of self-selection may nonetheless arise if the opportunity to affiliate is taken by farmers with greater “enterprise initiative” and if such a variable is related to socio-economic indicators.
- 1304 11. Externalities may arise because (i) local knowledge assimilated by affiliated farmers via technical assistance may spread through verbal communication to control group farmers, (ii) the presence of Meru Herbs may increase both the attraction of remaining independent and the bargaining power of non-affiliated farmers since the latter may ask for better price conditions from traditional intermediaries under the threat of affiliating with Meru Herbs. General points concerning the effect of externalities in impact analyses are well discussed by Armendariz de Aghion and Morduch (2005).
- 1309 12. If control farmers’ non-participation in these product markets is involuntary (i.e., they would like to diversify and sell these products but cannot since they do not have access to the relative trade channels), the

## THE EFFECTS OF FAIR TRADE

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- 1324 standard choice of assigning them missing values would 1375  
 1325 therefore downweigh the positive effect of FT on sale 1376  
 1326 conditions. 1377
- 1327 13. The dependent variable has an upper limit of three 1378  
 1328 and a lower limit of zero. We therefore perform a Tobit 1379  
 1329 estimate to keep the characteristics of its distribution 1380  
 1330 into account. Consider also that in estimates like ours, 1381  
 1331 the choice of regressors always entails some degree of 1382  
 1332 arbitrariness. Our point is that we want to control our 1383  
 1333 results on the effects of Meru and fair trade affiliation for 1384  
 1334 all possible composition effects. With regard to our 1385  
 1335 dependent variable, even though prices are hardly 1386  
 1336 affected by demographic variables, price satisfaction 1387  
 1337 can, since the recent “economics of happiness” literature 1388  
 1338 (surveyed, among others, by Frey & Stutzer (2002) & 1389  
 1339 Clark *et al.* (2006)) tells us that various measures of 1390  
 1340 satisfaction are affected by demographic factors and by 1391  
 1341 inherited psychological traits related to them. This is 1392  
 1342 why we include all demographic variables in this 1393  
 1343 specification and in those which follow. 1394
- 1344 14. We compute the correlation matrix of regressors 1395  
 1345 and find that the multicollinearity problem is not severe 1396  
 1346 in our estimates (the highest pairwise correlation is 1397  
 1347 between sons and birth  $-0.46$ ). However, a problem of 1398  
 1348 multicollinearity may arise when the covariance of one 1399  
 1349 of the regressors against all of the others is strong even if 1400  
 1350 pairwise correlations are low. We therefore calculate the 1401  
 1351 VIF factor (Marquardt, 1970), which uses the  $R^2$  of the 1402  
 1352 regression in which one of the independent variables is 1403  
 1353 regressed on all the others. We never obtain a VIF 1404  
 1354 higher than 1.5, which shows that multicollinearity is not 1405  
 1355 an issue. 1406
- 1356 15. We perform a robustness check on this indicator by 1407  
 1357 modifying the weight given to the different types of 1408  
 1358 answers (one for much, enough and a few price 1409  
 1359 satisfaction and zero otherwise). Results are substan- 1410  
 1360 tially unchanged and available from the authors upon 1411  
 1361 request. 1412
- 1362 16. We perform a robustness check and find that our 1413  
 1363 results are still valid under a different approach used for 1414  
 1364 building our dietary quality synthetic index (i.e., pre- 1415  
 1365 sumed number of times food items consumed per week). 1416  
 1366 Results are omitted for reasons of space and available 1417  
 1367 upon request. 1418
- 1368 17. We further focus on the frequency of consumption 1419  
 1369 of fish and greens (as additional indicators of dietary 1420  
 1370 quality) and observe that the negative effect of affiliation 1421  
 1371 to the control sample is strong here again. The regres- 1422  
 1372 sion on the determinants of fish consumption also shows 1423  
 1373 the expected signs for the number of people living in the 1424  
 1374 household (negative) and the presence of additional
- sources of income (positive). These estimates are omitted 1375  
 for reasons of space and are available from the authors 1376  
 upon request. 1377
18. The question is: *Are you satisfied with your house- 1378  
 hold's living conditions?* The qualitative answers have 1379  
 been given the following points: very much = 3, 1380  
 enough = 2, a few = 1, not at all = 0. 1381
19. On the role of income among determinants of child 1382  
 labor see, among others, Basu (1999), Basu and Van 1383  
 (1998), Baland and Robinson (2000), and Becchetti and 1384  
 Trovato (2005). 1385
20. On this point consider the following quotation from 1386  
 Marshall (1920), “*The less fully children's faculties are 1387  
 developed, the less will they realise the importance of the 1388  
 faculties of their children, and the less will be their power of 1389  
 doing so. And conversely any change that awards to the 1390  
 workers of one generation better earnings, together with 1391  
 better opportunities of developing their best qualities, will 1392  
 increase the material and moral advantages which they have 1393  
 the power to offer to their children*” and, among recent 1394  
 literature contributions, those of Haddad and Hodinott 1395  
 (1994), Manser and Brown (1980) and Cigno (1991). 1396
21. When estimating the two equation model with other 1397  
 performance indicators such as weekly household food 1398  
 expenditure and price satisfaction, we do not find the 1399  
 same significant results on the impact of years of project 1400  
 affiliation. Consider, however, that a typical problem of 1401  
 tests of selection bias with a limited number of observa- 1402  
 tions is that there may be many “false positive” cases 1403  
 (Greene, 2003), that is, in our case, insignificance of the 1404  
 FT effect after controlling for the bias, due only to the 1405  
 weakness of the test power. Following this line of 1406  
 approach, we interpret the robustness of our FT impact 1407  
 to the test as a signal of stronger effect and do not consider 1408  
 the cases of non-robustness as necessarily invalidating our 1409  
 previous results. More specifically, the somewhat more 1410  
 robust effect of affiliation on dietary quality rather than on 1411  
 consumption expenditure probably depends on the fact 1412  
 that product diversification through self-consumption 1413  
 adds, *per se*, an additional positive impact on the 1414  
 dependent variable. Product diversification and increased 1415  
 self-consumption may generate positive effects on the 1416  
 quantity of food consumption that are not captured by 1417  
 food expenditure. In the same way, the price satisfaction 1418  
 finding may also be weaker because of the absence of a 1419  
 price premium on the products sold on the local market. 1420
22. It should be noted that in 2006 Meru Herbs created 1421  
 a system of scholarships for children of affiliated 1422  
 farmers. The effects of this decision cannot obviously 1423  
 be captured in our analysis. 1424

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