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Implication of Fairtrade Marketing Outlet Selection on Income of Coffee Farmers in Gimbo district

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Abstract

Fairtrade coffee segments have shown consistent growth over the last two decade and exhibit price premiums over traditional coffee market in international markets. Coffee farmers in Gimbo district have been participating in Fairtrade coffee marketing since early time of millenniumHowever, whether those prices are passed on to coffee farmers or accessing to fair trade markets could improve their earning is not clear in the district. Therefore, this article attempts to identify factors influencing Fairtrade coffee marketing channel choice and its effect on the income of coffee farmers in Gimbo district, using cross-sectional survey data. Whilst the probit model result showed that education, membership of farmer organization, gaining market information and training, and small-size coffee farm increases the likelihood of farmer's participation in the Fairtrade coffee market, remoteness from cooperatives lessens the probability of farmer's participation in the Fairtrade coffee market. Furthermore, the OLS model result confirms that coffee farming experience, larger coffee farm size, and participation in training lead to an increasein income receiving of farmers from coffee. However, access to credit leads to cut in income getting of farmers from coffee. The finding also designates that Fairtrade marketing participation yields significant income over traditional markets. Based on these, policy measures that advance farmers' capacity via training, physical access to market places, market information services, participation cooperatives, expansion of Fairtrade markets, and coffee yield improvement will lead to increase earnings of farmers' from the coffee sector.

Keywords: 1. Coffee, 2. Fairtrade marketing outlet selection 3. Farmers, Income 4. Treatment effect

1 Introduction

Global coffee production and business offer economic benefits for both exporting and importing countries. Coffee production delivers employment opportunities and generates income for approximately 25 million households. With a total export worth of US$19 billion in 2016, coffee is one of the most traded agricultural products in the world. Furthermore, coffee is an essential source of foreign exchange earnings and represents a high share of their total exports for several coffee-growing countries, especially for lower-income earners, such as Burundi, Uganda, and Ethiopia. Coffee export earnings represent 10% to 40% of their export earnings. However, reliance on coffee might be a great concern in these countries since coffee is exposed to price fluctuations and market risks (International Coffee Organization, 2018).

As coffee-exporting countries are price takers, they are exposed to external shocks during the coffee price crisis. As a result, smallholder coffee farmers will continue to be highly vulnerable to the risk of coffee price volatility (CIDIN, 2014). Although coffee obviously renders profit for food companies, it is a different case for coffee farmers. The share of the retail value of coffee taken by farmers has dropped over the years. In the 1970s, coffee producers retained 20% of the retail prices of coffee sold in shops on average. Moreover, coffee producers received 1-3% and 2-6% of the price of a cup of coffee sold (in a café in Europe or America) and the price of coffee sold in a supermarket, respectively. Farmers are also seriously influenced by the instability of world coffee prices and the growing complicated risk of climate change. However, Fairtrade can create confidence and stability for producers, as it guarantees a fair and stable price for their coffee, which covers the average costs of sustainable production (Fairtrade Foundation, 2016).

Based on GAIN (USDA, 2018), Ethiopia is the leading Arabica coffee producer in Africa with 40% of regional production, the sixth largest coffee producer in the world, representing 4% of world coffee production and placed in the tenth position in coffee exports worldwide. Coffee farming generates living revenue for estimated 15 million Ethiopians (15% of the population), from four million smallholder coffee farms (Tefera & Tefera, 2013).

Even though coffee production doubled over the past two decades in Ethiopia, coffee productivity has been stagnant and lower than that of other coffee producer countries like Vietnam and Brazil (Kikkawa, 2018). Furthermore, Ethiopian smallholder coffee farmers take only a small fraction of the retail price and continue to engage in subsistence farming (CIDIN, 2014). Therefore, Ethiopia must improve coffee productivity and create advanced value-added products to keep its competitiveness in the global coffee market. Despite the fact that contradictory components exist between productivity improvement and value addition advancement, given the situation of coffee production in Ethiopia, there exists an

opportunity for both productivity and value addition improvement simultaneously (Kikkawa, 2018).

On the other hand, Fairtrade can result in superior prices, pleasant working conditions, local sustainability, and fairer relations of trade for farmers and workers in developing countries and reduces the unfairness of traditional trade against weakest producers by necessitating companies to pay sustainable prices (that never fall below market prices). Furthermore, the Fairtrade movement is an endeavor to connect producers involved in socially progressive and environmentally sound farming in the south (developing countries) with socially and environmentally conscious consumers in the North (developed countries). Consumers and producers are linked directly and producers are be more benefited from the marketing of their products than conventional production and trade have allowed (Negash, 2016). In particular, Fairtrade certified cooperatives can get at least the Fairtrade minimum price of $1.40 per pound for Arabica coffee sold on Fairtrade terms (30 cents more if organic), plus an extra 20 cents per pound Fairtrade premium to invest as they realize appropriate – 5 cents of which is dedicated to improving productivity and quality (Negash, 2016).

Currently, the Fairtrade system encompasses more than 1.66 million farmers and workers in 1,411 producer organizations. It works to empower small-scale farmers who are disadvantaged by conventional trade by setting and ensuring social, economic, and environmental standards for both companies and farmers and workers of the products. Promoting and licensing the Fairtrade mark guarantees that products have been produced in accordance with internationally agreed Fairtrade standards. The standards for farmers and workers involve safeguarding workers' rights and the environment, and that of companies include the Fairtrade minimum price and Fairtrade premium to invest in business or projects of the community's interest (Negash, 2016).

In recent years, Fairtrade coffee has become the fastest growing market. According to According to Fairtrade Labeling Organizations International (FLO) 2018 for the years 2016 to 2017, the volume of Fairtrade coffee sold increased by 15 %, reaching 214,106 metric tons. The overall quality improvement of Fairtrade coffee and its visibility increment among buyers have helped producers gain access to the specialty coffee market and have brought successful results in acquiring higher recognition from both brands and consumers' sides (Fairtrade International, 2018).

The outcomes of the empirical studies conducted on impact Fairtrade coffee vary widely. Some studies reveal that farmers using Fairtrade coffee marketing channel receive three times as much for their coffee as farmers using conventional coffee marketing. Other studies observe insignificant effects or find it difficult to measure the impacts of Fairtrade coffee totally (CIDIN, 2014)

The Ethiopian coffee marketing chain follows mainly two marketing channels, ECX (Ethiopian Commodity Exchange) and coffee cooperative unions. Fairtrade certified coffee is only traded directly through coffee cooperative unions to different countries in the world (Dahlberg, 2011). The unions have been legally allowed to bypass the national coffee auction system and the ECX, starting from 2001 and 2009, respectively. Now, coffee cooperatives that are certified for Fairtrade purchase coffee not only from their members but also from nonmembers directly or indirectly as long as the coffee supplied by farmers meets the standard quality requirements in the Gimbo district. Accordingly, coffee farmers in this area supply their coffee to the Fairtrade coffee marketing channel or traditional coffee marketing channel.

In Gimbo districtcoffee farmers have been participating in Fairtrade coffee marketing since early time of millennium. As of Fairtrade reports,Fairtrade prices and additional premiums supposed to establish various social and productive programs as well as increase sales and revenue year after year in the district. However, whether such revenue increments yield considerable earnings for coffee farmers supplying their coffee to the Fairtrade marketing outlet is not yet clear in Gimbo district. In addition to this, Gimbo district, is an eminent potential for coffee production, but the income derived by coffee farmers from the sector is low.Furthermore, factors influencing Fairtrade coffee marketing channel choice and its effect on the income of coffee farmers are not yet clear in the study area. Thus, this study is designed to identify factors determining the Fairtrade Coffee Marketing channel choice and its effect on the income of farmers in Gimbo district.

2 Materials and Methods

2.1 Description of the study area

The study was conducted in in Gimbo District, Kaffa Zone of SNNPR (South Nation Nationalities and People Region) in Ethiopia. Gimbo district is one of the 10 districts of the Kaffa Zone of SNNPRS located at 496 km to the South west of Addis Ababa in Ethiopia and 18 km in west of Bonga, the Kaffa zone capital. The district is bordered on the Southwest by Oromia regional state, on the North by Decha district, on the Northwest by the Addiyo district and on the Southeast by Gawata district. The mean annual temperature of the district is 25^0C and its annual rainfall ranges from 900mm to 1150 mm (GDOARD (Gimbo District Agriculture and Rural Development Office), 2018).

The district has 31 rural *kebeles* (the smallest administration units) and four urban kebeles. Based on (CSA, 2008) population census extension, the Gimbo district had an estimated total population of 300200, of whom 153095 were males and 147105 were females in 2019. Coffee is major cash crop in the district where it is the mainstay for about 40% farmers in the area. Moreover, about 1450 tons of coffee is annually produced in the district (GDOARD (Gimbo District Agriculture and Rural Development Office), 2018).

2.2 Data sources, collection methods, and sampling procedures

The data for this study were collected from both primary and secondary sources. The secondary data source includes different reports, census data, and journal documents, whereas the primary source of data was entirely from sampled respondents of coffee farmers. The data were obtained through a structured questionnaire developed for this study by the researcher. To improve the contents of the questionnaire and increase the precision of the research, the questionnaire was pretested.

This study followed multiple stage sampling procedures. In the first stage, out of 10 Woredas of Kaffa zone, Gimbo Woreda/District was purposively selected on basis of its potential for coffee production and concentration of Fairtrade coffee marketing. The second stage was followed by random selection of three rural *kebele* administrations (the lowest administration organ) from the district. Finally, based on the estimated proportion of coffee farmers in the three *kebeles*, a total sample of 153 respondents (farmers who produced coffee and sold) were selected and data on inputs, output, yield, income, farm practices, socioeconomic characteristics, and prices of the 2017/ 2018 cropping season were collected.

2.3 Data analysis

Descriptive and inferential statistics as well as econometric model results were analyzed with the aid of STATA version 14. Descriptive statistics like mean and standard deviation, were used for compute different farmers' characteristics. As well as t-test was used as an inferential statistic.

Econometric model analysis: In estimating the dependent variable, marketing channel selection had a dichotomous nature as the choice was either Fairtrade or traditional coffee marketing channel. Estimation of this type of relationship requires probit or logit models as a function of the explanatory variables (Gujarati, 2003).

In estimating the effect of Fairtrade coffee channel choice on income of farmers, we may use a regression of income as a function of the various farmer characteristics and a dummy variable, Fairtrade channel choice. However, the difference in income among Fairtrade and traditional coffee marketing users is not necessarily due to their marketing arrangements. There could be a number of unobservable factors (like management skills, entrepreneurial skills, and risk attitude) that might cause a difference; thus, a comparison of the average income of the two groups of farmers could be biased.

To correct for the effects of selection bias, another variant of econometric analysis is applied. Thus, instead of estimating the income using the OLS (Ordinary Least Square) model, the Heckman selection correction model, also known as the treatment effect model,

is used. To check and correct for sample selection bias, the Heckman selection correction model uses the probit model to calculate the inverse Mills ratio in the selection model and includes this ratio as a regressor in the outcome model or income model as applied in this case (Green, 2002; Heckman, 1979). If we observe sample selection bias, we can use the two-step estimate for the regression and selection equations; if there is no evidence of sample selection bias, OLS analysis is consistent and unbiased to be applied (Wooldridge, 2013). In the analysis, the maximum likelihood estimation technique is implemented; in this case, all parameters are estimated instantaneously rather than the conventional Heckman two-step procedure. The technique employed in this study is presented as follows:

$$P_i^* = \gamma\omega_\iota + \varepsilon_i^* \quad (1)$$

$$Y_i = \beta X_i + \delta P_i + \varepsilon_{2i} \quad (2)$$

Where,

P_i^* is a latent (unobservable) variable representing households' discrete decision of farmers whether to select Fairtrade or traditional marketing channel in the first step, which has a dichotomous $P_i$realization that is related to it as P_i= 1 if P_i^*> 0 otherwiseP_i = 0.

P_i= 1 (Fairtrade coffee marketing choice)

P_i = 0 (traditional coffee marketing choice)

ω_i are the variables determining the marketing channel choice in the probit model.

$X_i$are the explanatory variables determining income from coffee.

$\gamma$is an unknown parameter to be estimated in the probit regression model.

β is an unknown parameter to be estimated in the income regression model.

Y_i is the gross income from coffee supply in the second step.

δ is a parameter that shows the effect of channel choice on income.

ε_i^* and ε_{2i} are random error terms for the first and second stages, respectively.

The net impact of the marketing channel choice, δ, is defined as the difference in the expected income earning of farmers in Fairtrade marketing and traditional marketing channels for coffee supply. More formally, this is

$$E[Y_i / X_i, P_i = 1] - E[Y_i / X_i, P_i = 0] \quad (3)$$

Based on recent findings of related studies, the independent variables assumed to affect dependent variables are described and given along with the hypothesized sign in Table 1.

Table 1. Description of variables

Variable	Definition	Expected sign on:	
		Fairtrade	**Income**
Fairtrade	Fairtrade channel choice decision Yes = 1 and No = 0		Positive
Income	Income from coffee in Ethiopian Birr (ETB)		
Exper	Coffee farming experience of farmer (years)	Positive	Positive
Mcoop	Membership of cooperatives: membership=1 and non-membership=0	Positive	
Famsize	Family size (number)	Positive	Negative
Literacy	Literacy status: literate = 1 and illiterate = 0	Positive	Positive
Farsize	Coffee farm size (hectare)	Negative	Positive
Minfo	Accessed to marketing information: yes = 1 and no= 0	Positive	
Remoco	Remoteness of cooperatives engaged in Fairtrade coffee business on foot walk time (minutes)	Negative	Negative
Tpart	Training participation on coffee: yes = 1 and no = 0	Positive	Positive
Acredit	Accessed to credit (dummy): yes = 1 and no = 0	Positive	Positive
Yield	Yield green bean equivalent in kg	Pos/negative	Positive

3 Results and Discussion

3.1 Descriptive results

Table 2 presents the descriptive statistics results of the independent variables (farm households and farm characteristics) involved in the treatment effect model.

Coffee farming experience represents the cumulative duration of time for household head practice in coffee farm management. The results show that the average coffee farming experience of sample household heads was about 12 years with a standard deviation of 5.11. Likewise, the average family size of the sample farm household was 6.43 with a standard deviation of 2.85. Similarly, the mean coffee farm size possessed by sample household heads was 0.57 hectare with a standard deviation of 0.5. This implies that there is a high gap between coffee farm households in terms of coffee farm size they own. Remoteness of coffee farmer from the cooperative stands for the time it takes the farmer from his/her home residence to arrive Fairtrade coffee cooperative center on foot walking time measured in minutes. Accordingly, the results show that the average remoteness of the cooperative was 73.09 minutes with a standard deviation of 14.69. The mean coffee yield (green bean equivalent) in Kg per Ha produced by sample household heads was 434 kilogram per hectare with a standard deviation of 262. This suggests that there is a high gap between coffee farm households in terms of coffee yield they produce. Income from coffee represents the total income that the farm household derives from coffee production measured in Ethiopian Birr (ETB = 0.03506 US). The average coffee income of the farm

household was 14250 ETB with a standard deviation of 20324. This implies that there is a big difference among coffee farm households in terms of income gained from coffee production (Table 2).

Furthermore, the study results show that 29% of the households were members of cooperatives. This implies that the large share of coffee farm households were not members of cooperatives in the study area. Similarly, the results show that 59% of the household heads were literate (at least read and write), while the rest were illiterate (can't read and write). Coffee farm households who accessed market information and credit was 50 and 41%, respectively, (Table 2). Finally, 11% of coffee farm household heads took part in coffee farm management and marketing implying that a large proportion of the sample households did not participate in the training.

Table 2 Farm households and farm characteristics Source: Survey Data, 2018

Continuous variables	Mean	Std. deviation
Coffee farming experience (years)	11.9	5.11
Family size (number)	6.4	2.85
Coffee farm size(hectare)	0.57	0.50
Remoteness of cooperative walking time (minutes)	73	14.69
Coffee yield (green bean equivalent) in Kg per Ha	434	262
Income from coffee (Ethiopian Birr)	14250	20324
Dummy variables	Frequency	Percentage
Membership in cooperatives	45	29
Literacy status (read and write)	90	59
Market information (accessed)	77	50
Training participation of farmer on coffee (participated)	17	11
Credit (accessed)	63	41

3.2 Mean comparisons

The t-test assesses whether the means of the two groups are statistically different from one other. In this case the t-test is employed to compare the mean difference of Fairtrade and traditional coffee marketing channel supplying farmers in terms of different continuous variables. Table 3 presents the mean comparison results of the two groups. The total sampled farm households used in this study are 153 (41 Fairtrade and 112 traditional marketing channel users).

Table 3 Mean comparison of different characters Source: survey data computation, 2018

Characters	Fairtrade (N = 41)	Traditional (N = 112)		
	Mean	Mean	T value	MD
Coffee farming experience (years)	13.9	11.1	2.70***	2.76
Family size (number)	6.8	6.3	1.17	0.58
Coffee farm size(hectare)	0.75	0.50	2.74***	0.25
Remoteness of cooperative (minutes)	62	77	-8.22***	-15.14
Green bean coffee price (Birr/kg)	69	59	2.90***	10
Coffee yield (green bean equivalents) kg/ha	526	400	2.70***	126
Non- farm income (Birr)	1033	1644	-2.03**	-611
Other farm income (Birr)	3245	4273	-2.06**	-1028
Income from coffee (Birr)	27951.69	9235.08	3.53***	18716.60
Total income (Birr)	32230	15152	5.0***	17078

*** and ** indicate statistically significant at 1% and 5% significance level respectively

The results show that the continuous independent variables of coffee farming experience, coffee farm size, remoteness of cooperatives purchasing Fairtrade coffee, green bean equivalents price per kg, and coffee yield (green bean equivalents per ha of coffee) are found to be statistically significant, as their p values are < 1%. On the other hand, non-farm, and other farm income are statistically significant, as their p values are < 5%. Together, this suggests that farming experience, farm size, remoteness, price, yield, non-farm, and other farm income affect coffee farmers' marketing channel choices. Furthermore, the result shows that the mean difference of income from coffee sales is statistically significant at the 1% level of significance. This implies that there exists a considerable income difference obtained from coffee selling among Fairtrade and conventional market outlets supplying coffee farm households. Similarly, total income is found to be statistically significant, as their p values are < 1%. This implies that there exists a considerable total income variance among Fairtrade and traditional market channels supplying coffee farm households. On the other hand, the t-test of family size was insignificant, implying that coffee farmers who supplied their coffee either to the Fairtrade or conventional marketing segments are indifferent in terms of their family size.

3.3 Econometric model results

The econometric analysis seeks to examine the determinants of Fairtrade coffee marketing channel choice and its effect on the income of coffee farmers following a three-step

analytical procedure. Results of the probit, Heckman selection, and OLS regression models are presented in Tables 4, 5, and 6, respectively.

Table 4 shows the results of the probit model on participation in Fairtrade coffee marketing channels. The log-likelihood ratio (LR) chi-square test was found to be significant at a probability of less than 1%, implying that the overall joint significance of the independent variables included in a probit model in explaining the probability of coffee producing-farmers' choice of Fairtrade coffee supply chain. Among the explanatory variables, membership of cooperatives,literacy status, coffee farm size, access to market information, remoteness of cooperatives, and training participation are statistically significant with the expected sign.

The estimated coefficient for membership of cooperatives was positive and significantly determines coffee farmers' marketing channel choice decision in favor of the Fairtrade coffee marketing channel at a 5% level of significance (Table 4). The marginal effect of the variable, 0.208, confirms that all other factors held constant, the probability of those households who were memberships of cooperative membership was about 20.80%higher than those non-members to participate in Fairtrade markets. This is mostly related to the realty that farmers who are members of cooperatives that involved in the Fairtrade coffee business have a better understanding of the benefits associated with Fair trade. Thus, membership of cooperatives enhances the probability of coffee farmers in favor of Fairtrade coffee channel choice. The current result is consistent with the findings of (Wollni & Zeller, 2006) in Costa Rica, which showed that membership in cooperatives increases farmer's probability to participate in specialty and cooperative markets.

The estimated coefficient for literacy status was positive and significantly determines farmers' marketing channel choice decisions towards the Fairtrade coffee marketing channel at the 1% level of significance (Table 4). The marginal effect of literacy status, 0.19 signifies that all other factors held constant, literacy increases the probability that a farmer participates in Fairtrade markets by 19%. This is plausible because literacy improves farmers' information processing and business dealings ability, such as supply arrangements, contracts, and price negotiations. Thus, it increases farmers' likelihood of participation in Fairtrade markets. This finding is in agreement with (Wollni & Zeller, 2006).

The estimated coefficient for farm size was negative and significantly determines farmers' marketing channel choice decisions against the Fairtrade coffee marketing channel at the 1% level of significance (Table 4). The marginal effect of this variable, -0.248, denotes that a hectare increase in farm size leads 24.8% decrease in the possibility of coffee farmers selling their coffee to the Fairtrade coffee marketing channel holding other factors constant. This is due to the fact that farmers with large coffee farms and farmers who produce high-quality coffee may have a better bargaining position when dealing with private buyers. In other words, small-scale farmers are more likely to market their coffee

through cooperative channels (Fairtrade channels). This finding is concurrent with (Mosheim, 2002; Wollni & Zeller, 2006).

The estimated coefficient for access to marketing information was positive and significantly determines farmers' marketing channel choice decisions towards the Fairtrade coffee marketing channel at the 1% level of significance (Table 4). The marginal effect of access to marketing information, 0.1985, signifies that access to marketing information increases the likelihood that a farmer participates in Fairtrade markets by 19.85%, while keeping other factors constant. This is genuine because having marketing information prior to selling their coffee helps the farmers to be aware of Fairtrade buyers' preferences and demand information. The advantage of Fairtrade marketing participation includes premium price payment and other related benefits over traditional marketing counterparts.

Table 4 Probit model estimations for determinants of marketing channel choice. Source: survey data computation, 2018

Variables	Coefficient	z	P>z	Marginal Effect
Coffee farming experience	0.0170	0.45	0.65	0.003
Membership of cooperatives	0.9350**	2.20	0.03	0.208
Family size	-0.0637	-1.04	0.30	-0.011
Literacy status	1.1793***	3.00	0.00	0.189
Coffee farm size	-1.4113***	-3.09	0.00	-0.248
Marketing information	1.0830***	2.77	0.01	0.195
Remoteness of cooperatives	-0.0787***	-3.90	0.00	-0.014
Training participation	0.9173*	1.83	0.07	0.238
Access to credit	-0.2535	-0.74	0.46	-0.043
Yield	-0.0003	-0.33	0.74	0.000
Constant	4.0850	2.39	0.02	
Number of observations =	153			
Prob> chi2 =	0.00			
LR chi2 (10) =	89.77			
Log likelihood =	-44.05			
Pseudo R^2 =	0.5			

*** and** indicate statistically significant at 1% and 5% probability levels, respectively.

The coefficient of remoteness of cooperatives purchasing Fairtrade coffee was negative and significant at the 1% level (Table 4). The marginal effect of the variable, -0.014 imply that if the time it takes the producers to arrive cooperative's purchasing center increases by 1 minute, the probability of farmers selling to the Fairtrade marketing category

(cooperatives) decreases by 1.4%, keeping other variables constant. In other words, it increases the propensity of producer selling to the traditional marketing category (like local collectors). This is plausible because producers want to reduce transportation costs and save time. This finding is in agreement with (Tru, 2009), who conducted research on factors affecting the choices of fresh lychee marketing channels in Vietnam.

The estimated coefficient for training participation was positive and significantly determines farmers' marketing channel choice decisions towards the Fairtrade coffee marketing channel at the 10% level of significance (Table 4). The marginal effect of access to training participation, 0.238, signifies that access to marketing information increases the likelihood that a farmer participates in Fairtrade markets by 23.8%, while keeping other factors constant. This is genuine because training offering on coffee quality is mainly associated with certification and improves information sharing about benefits of Fairtrade marketing over traditional marketing counterparts. This finding is concurrent to Jena, Stellmache, and Grote (2012) who conducted research on the impact of coffee certification on small-scale producers' livelihoods in South-west Ethiopia.

Table 5 presents the Heckman selection model analysis (the effects of market channel choices on coffee farmers' income). The Wald test is highly significant, indicating that a good model fit. On the other hand, the likelihood-ratio test is insignificant, designating that there is no selection bias in the previous specification of the model, eliminating the need to estimate income using the two-step Heckman procedure. Hence, the ordinary least squares (OLS) model is preferred in estimating farmers' income as a function of farm and farmers' characteristics and a dummy variable Fairtrade coffee channel choice.

Table 5 Effects of market channel choices on coffee farmers' income and Fairtrade participation. Source: Survey data computation, 2018

Dependent variable: income	**Coefficient**	**S.E.**	**Z**	**P>Z**
Coffee farming experience	121.99	209.33	0.58	0.56
Family size	88.33	364.30	0.24	0.81
Literacy status	930.50	2239.83	0.42	0.68
Coffee farm size	28,471.02**	2615.29	10.89	0.00
Remoteness of cooperatives	151.85	102.69	1.48	0.14
Training participation	681.92	3679.58	0.19	0.85
Access to credit	-3,880.96*	2028.54	-1.91	0.06
Yield	35.52***	4.42	8.03	0.00
Fairtrade	10,153.85**	4476.05	2.27	0.02
Constant	-32256.64	9905.15	-3.26	0.00
Dependent Variable: Fairtrade				

Coffee farming experience	0.0213	0.0389	0.55	0.58
Membership of cooperatives	0.9267**	0.4280	2.17	0.03
Family size	-0.0644	0.0621	-1.04	0.30
Literacy status	1.1966***	0.4018	2.98	0.00
Coffee farm size	-1.2635***	0.4906	-2.58	0.01
Marketing information	1.0717***	0.3967	2.7	0.01
Remoteness of cooperatives	-0.0803***	0.0209	-3.85	0.00
Training participation	0.8080	0.5136	1.57	0.12
Access to credit	-0.3245	0.3684	-0.88	0.38
Yield	-0.0001	0.0008	-0.13	0.90
Constant	3.9936	1.7362	2.3	0.02
/athrho	-0.19	0.25	-0.75	0.46
/lnsigma	9.34	0.06	160.04	0.00
rho	-0.18	0.24		
sigma	11337.95	661.39		
lambda	-2078.60	2745.50		

*, ** and *** for 10%, 5% and 1%Significance level respectively.
LR test of independent equations (rho = 0): chi2(1) = 0.50, Prob> chi2 = 0.4741
Number of observations = 153Wald chi2(9) = 333.69,
Log likelihood = -1688.736 Prob> chi2 = 0.000

Table 6 presents the OLS analysis (the effects of market channel choices on coffee farmers' income). The F ratio was significant at the 1% probability level, indicating that there is a significant linear relationship between the independent variables taken together and coffee income.

The R-squared of 0.689shows that 68.9 % changes in coffee income are explained by the various independent variables used in the model,and the remaining 30.1% changes are due to other determinants not included in the model. Among the independent variables estimated to affect the income of coffee farmers derived from coffee, farm size, training participation, yield (green bean equivalent), and participation in Fairtade are statistically significant with the expected sign. On the other hand, access to credit is consistent with prior expectation.

The coefficient of coffee farm size, 28022.68, implies that as land size allocated for coffee increases by one hectare, the income of household from coffee increases by Birr 28022.68, keeping other factors constant (Table 6). This is plausible because a large farm size often leads to a larger quantity of produce, which in turn leads to higher income. In addition to this, farmers with larger coffee plots achieve economies of scale in coffee production, which allows them to minimize costs and maximize profits. The findings of this study are in

agreement with the scholar findings of (Zhang et al., 2014)in China, which showed that large farm size leads to higher income derived from apples.

Table 6 Effects of market channel choices on coffee farmers' income.Source: Survey data computation, 2018

Variables	Coefficient	S.E.	t	P>t
Coffee farming experience	142.13	213.99	0.66	0.51
Family size	38.82	369.36	0.11	0.92
Literacy status	1614.66	2111.63	0.76	0.45
Coffee farm size	28022.68***	2625.30	10.67	0.00
Remoteness of cooperatives	113.03	91.65	1.23	0.22
Training participation	1785.54	3481.09	0.51	0.61
Access to credit	-3799.16*	2087.82	-1.82	0.07
Yield	35.83***	4.54	7.89	0.00
Fairtrade	7414.77***	2707.47	2.74	0.01
Constant	-29044.60	9221.66	-3.15	0.00
Number of observations =	153			
F(9, 143) =	35.2			
Prob> F =	0.00			
R-squared =	0.689			
Adj R-squared =	0.6694			

* and *** for 10%, and 1%Significance level respectively

The coefficient of access to credit, -3799.16 imply that access to credit reduces the amount of income earned from coffee by Birr 3799.16 than those farmers who are not accessed to credit, keeping other variables constant (Table 6). The sign of the coefficient seems inconsistent with theoretical considerations, but could be justified as credit received by farmers supports highly other activities (like cattle fattening and small business- petty trading that compete with coffee farm activity), which compete with coffee production rather than enhance the specialization of the farmers in coffee, as was observed during the survey time.

The coefficient of yield, 35.83, implies that as coffee yield (green bean equivalent)increases by one kilogram per hectare, the income of household from coffee increases by Birr 35.83, keeping other factors constant (Table 6). This is credible because productivity often leads to a larger quantity of produce, which in turn leads to higher income. The finding of this study is concurrent to the scholar findings of (Effendy et al., 2019).

The coefficient of Fairtrade coffee channel choice, 7414.77, confirms that coffee marketing through cooperatives (Fairtrade) increases the average income obtained by 7414.77Birr (Table 6) over the traditional market. This result is in agreement with the findings of (Arnould et al., 2009; Kodama, 2009; Mitiku et al., 2017).

4 Conclusion and Policy Implications

The findings of this study ascertain that membership in cooperatives, literacy, access to market information, training participation, and small-scale coffee farm size enhances the probability of farmer's participation in the Fairtrade coffee market. On the other hand, the remoteness of cooperatives engaged in fair trade reduces the likelihood of farmer's participation in the Fairtrade market.

Similarly, the study confirms that income earning increment from the coffee sector seeks for long-period accumulated coffee farming experience, larger coffee farm, higher coffee yield, and participation Fairtrade coffee marketing. Furthermore, the finding designates that participating in the Fairtrade coffee marketing category yields average income earning of Birr 7414.77 over traditional counterparts. On the other hand, access to credit tends to reduce income derived from coffee.

Based on the findings of the study, the following policy implications may be stressed. Farmers' Fairtrade coffee marketing channel choice and income enhancement are linked to capacity building, institutional services, yield, and physical access to market places in Gimbo district. Hence, policy measures that advance the capacity of farmers through training (on coffee farm management and quality control), physical access to market places, market information services, participation cooperatives, yield improvement, and expansion of Fairtrade markets will lead to increase earnings of farmers from the coffee sector.

Abbreviations

CIDIN: Centre for International Development Issues Nijmegen; CSA: Central Statistics Agency; ECX: Ethiopia Commodity Exchange; ETB: Ethiopian Birr; FLO: Fairtrade Labeling Organizations International; GAIN: Global Agricultural Information Network; ICC: International Coffee Council; GDARDO: Gimbo district Agricultural and Rural Development Office; MD: Mean Difference; US: United States dollar.

Declarations

Availability of data

The author would like to declare that he can submit the data and datasets used for this study upon publisher's request.

Competing interests

The author declares that nobody has competing interests.

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Ethical approval and consent to participate
Ethical clearance letters were collected from Wollega University research and community service directorate and Gimbodistrict administrative office to care for both the data collectors and the researcher. Study participants were informed that clients have full rights to discontinue the study if they lose interest. Hence, the overall processes of the survey were completed without any obstacles.

Author's contributions
The author analyzed and interpreted the whole survey date and wrote up the manuscript. The author has read and approved the final manuscript.

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