Determinants of Coffee Market Outlet Choices in Gewata District, Kaffa Zone, Southwest Ethiopia

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Ethiopia has a broad genetic diversity among its coffee varieties. Coffee is one of the cash crop which is highly marketed through world next to petroleum. It has a great contribution in earning foreign currency and it is an income source for around 20 % Ethiopian population either directly or indirectly. Linking small producers to markets are widely recognized as a valuable development route and market outlets choice is one of the most important farm household decisions to sell their produce and has a great impact on household income. Even if the study area has great potential of coffee production, the farmers faced the marketing problem particularly in choice of appropriate coffee market outlets. This study was therefore carried out to analyze determinants of coffee producers’ market outlet choice decisions in Gewata district. Purposive and two stage random sampling technique was used and data was collected from 121 coffee producers. Multivariate probit model (MVP) was used to analyze factors influencing the choice of coffee market outlets choice by coffee producers. The multivariate probit model results indicated that quantity of coffee sold, education level, frequency of extension contacts, household size, years of farming experience, distance to nearest market, off/non-farm income, land under coffee and transport access significantly influenced coffee producers’ choice of market outlet. Therefore, strengthening farmers coffee cooperative and enhancing the financial capacity of cooperative with functional collection center, improving accessibility of transport services and developing infrastructure, improving farmers’ knowledge through adult education as well as their experience sharing with other coffee producing farmers, improving productivity through strengthening supportive institutions (extension service provider).

Keywords: Market Outlet Choice, Multivariate Probit, Coffee, Gewata

INTRODUCTION

Coffee is the second most exported commodity next to oil, and employs over 100 million people worldwide (Petit 2007; Pedegrast 2010; Gray et al., 2013). The production is estimated at around 141.9 million bags in crop year 2014/15, while an initial estimate of world coffee consumption in year 2014 comes to 149.3 million bags, this suggests about the existence of resilient demand for coffee worldwide (ICO, 2015).

Ethiopia is the single largest African producer of coffee with about half of its production going for export. According to the Central Statistical Agency of Ethiopia (2015), the country produced 420 million kilograms of coffee beans and consumed up to about 220 million kilograms (ICO, 2016), that is, more than half of its total production. The country is the world’s fifth largest producer after Brazil, Vietnam, Colombia, and Indonesia, accounting for about 4% of global coffee production. If we consider Arabica alone, Ethiopia is the third largest producer after Brazil and Colombia (ICO, 2015). Despite its high value, it has to be noted that coffee production potential of the country is not yet exploited. In 2014/15, it held only 3.95 percent of Ethiopia’s cultivation area, corresponding to 561,761.82

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hectares and 4,199,801.56 quintals of produce was obtained from these crops with average productivity of 7.48 quintal per hectare in the same agricultural year (CSA, 2015). Overall, it is estimated that there is a potential of 6 million hectares of cultivable land suitable for coffee production (Mekuria et al., 2004).

Smallholder farmers produces coffee on less than two hectares of land and supply Ninety five percent of Ethiopia’s coffee produces, while the remaining five percent grown on modern commercial farms (Taye, 2013 and USAID, 2010). With approximately 95% of coffee production in Ethiopia has been considered as organic, coffee production in the country is categorized into four major systems of production namely forest coffee, semi-forest coffee, garden coffee and plantation coffee (Ministry of Trade, 2012).

Agricultural markets in Ethiopia before 2008 had been characterized by high costs and risks of transacting and little access to market information due to a long-chain supply of coffee with several market intermediaries (ECX, 2011). It was fragmented and not well integrated into a wider market system, which increases transaction costs and reduces farmers’ incentives to produce for the market. Linking small producers to markets are widely recognized as a valuable development route (Alemu and Meijernik, 2010). The government and other stakeholders have focused efforts at linking smallholder farmers with these channels by assisting farmers form groups and organizing forums where farmers and the buyers can link.

Marketing outlet choice is one of the most important farm household decisions to sell their produce in different marketing outlets and has a great impact on household income (Shewaye, 2016). Market outlet choices are a household-specific decision, and several drivers have to be considered as a basis for such decision. Various empirical studies pointed out that smallholder farmers’ decision to choose different market outlets can be affected by household characteristics, resource endowments, and access to different market outlets, prices, and transportation cost (Berhanu et al, 2013; Moti and Berihanu, 2012 and Shewaye, 2016), and they confirm that lack of market knowledge or difficulties in accessing markets that are more rewarding makes smallholder farmers to transact their produce through an outlet offering low price. However, even if such studies were taken by different author in different part of the country in relation to market outlet choice of the of different agricultural commodity in Ethiopia, but no study was not taken in the study area on the market outlet choice of coffee as well as other agricultural commodity except a research conducted by (Kassa et al., 2017) on honey market outlet choice of honey despite to important of market outlet choice decision on household income.

Coffee producers in Gewata district are widely characterized by limited marketing linkage which emanates from limited infrastructure. This results them inability to force local collectors and traders’ price setting and exploitation at farm get level. The market and marketing system of the area is generally dominated by conventional system of marketing and producers are forced to sale directly for conventional transaction root which they do not get premium price for their coffee produce and results low market margins.

Coffee growers in the study area produces coffee for market purpose as well as home consumption. Even if coffee is one of the crucial crop both economically and socially in the study area, the market outlet choice study have not yet been under taken. In order to maximize the benefits that they may earn, farmers have to make appropriate decisions as to where they should sell their product. However, there are various factors that affect households’ decision to select appropriate market outlet for delivering their products to the market. Identifying these factors is very important in terms of investigating possible areas of interventions that may help farmers to maximize benefits out of their coffee production and marketing activities.

METHODOLOGY

Description of the Study Area

Gewata district is located in Southwest of Ethiopia, Kaffa zone. It is located 86km away from Bonga town, 813km from Hawasa and 546km from Addis Ababa. The area lies within 07°25’- 7°50’N Latitude and 35°56’-35°89˚E Longitude. It is bordered in the South by Gimbo and Chena district, in the West by Bitta and Geshia district, in the North by saylem and Oromia region and in the East bordered by Oromia region (GDAO, 2016). The district has a total of 30 kebeles of which 27 are rural based kebele administration areas and 3 are urban kebeles.

According to GDHO (2016), the total population of the district was 91,645 of which male accounts for 44906 (49%) and female accounts 46739 (51%) of the total. Of the total households 97.32% are rural agricultural households. The estimated total area coverage of the districtis 91,500 hectares. Gewata district is well known by high vegetation cover and most of the surrounding area is covered by tropical rain forest comprising a rich mixture of woody species arranged in many stories.

The area is characterized by a long rainy season that extends from March /April to October. The mean annual rainfall ranges from 1800 mm to 2200mm. Over 85% of the total annual rainfall occurs in 8 months rain season, with mean monthly values in the range of 125-250mm occurs in 8 months long rain season. The mean temperature of the district ranges from 16˚C (lowest) and 22˚C highest. The district is dominated by midland agro ecology which is favorable for coffee production. The dominant soil type of
The district is loamy soil. The district was characterized by subsistence mixed farming system in which production of both crops and livestock is common economic activity (GDAO, 2016).

The district is known for its highest production of coffee and other cereal crops. However, coffee production takes the lion share and main source of income generation of the household in the district. Major cereal crops grown in the district are maize, barley, faba bean, chickpea, teff. Moreover, root crop are produced in the district include sweet potato, potato and taro (godere) and fruit product like banana and avocado are produced in the district.

Figure 1: Map of the Study Area

Data Types, Sources and Methods of Data Collection

Both primary and secondary sources data were used for this study. Primary data were collected from smallholder coffee producers randomly selected from four rural kebeles, traders and consumers at different levels.

The primary data were collected from farmers by focusing on factors affecting coffee market supply and market outlet choice, size of output, distance from nearest market, cooperative membership, credit access, access to transport, size of land allocated for coffee, extension service, and demographic characteristics of the household. Moreover, the interview schedule for traders include: buying and selling strategies, capital requirement and capital ownership source of market information, demographic characteristics and finally questionnaire were developed for consumers.

The questionnaires were designed for producers, traders and consumers. The structures of the questionnaire were designed as semi structured questionnaire. Before the data collection, the questionnaire was pre-tested on five farmers to evaluate the appropriateness of the design, clarity and interpretation of the questions, relevance of the questions and to estimate time required for an interview. Subsequently, appropriate modifications and corrections were made on the questionnaire. The questionnaire covered different topics in order to capture relevant information related to the study objectives.

Secondary data were collected by reviewing documents of secondary sources namely: Gewata district office of agriculture, office of trade and industry, district cooperative and marketing office, office of district environmental protection, Ethiopian Commodity Exchange (ECX) and Kaffa Zone of agriculture. Beside to district offices information, websites were visited to generate relevant secondary information focusing on coffee marketing. Furthermore, from these secondary sources data on prices, output, number of licensed coffee traders and data on other socioeconomic variables were taken.

Sampling Procedure and Sample Size Determination

The target populations for this study were the smallholder coffee producers and other actors along the coffee market
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Method of Data analysis

Descriptive statistics and econometric models were used to analyze the data collected from the Households. Descriptive statistics such as mean, percentage, frequency, and standard deviation was used to analyze socio demographic characteristics of household. In the case of econometric analysis different author used different econometric models such as multinomial logit, multivariate probit and other limited dependent variable for market outlet choice without any comparison, even if the models have different properties. Therefore, making comparison between two competing models (multinomial logit and multivariate probit) and choosing the appropriate one would results best outcome of the study finding. Multinomial logit models are appropriate when individuals can choose independent outcome from among set of mutually exclusive alternatives. Multinomial logit models can be used to predict a dependent variable, based on categorical independent variables, where the dependent variable takes more than one forms (Griffiths et al., 2001). In reality there may be several market outlets (such as: private traders, collectors, cooperative and consumers) and farmers have the possibility to select more than two outlets simultaneously to maximize the expected utility. So, using multinomial logit model for such outlet choice study is not viable due to the possibility of simultaneous choices of outlets and the potential correlations among these market outlet choice decisions. Multivariate probit model simultaneously models the influence of a set of explanatory variables on the choice of market outlets, while allowing for the potential correlations between unobserved disturbances, as well as the relationship between the choices of different market outlets (Belderbos et al., 2004). Multivariate probit model is a preferred model because choosing one outlet can be affected by the relative risk of choosing the other (Greene, 2003). In this study, since many farmers were selling coffee outputs to more than one market outlets, Multivariate probit model was used to identify factors affecting market outlet choices of coffee producers. And, the modeled for multivariate probit can be specified as follows:

The observed outcome of market outlet choice can be modeled by the following random utility formulation. Consider the $i^{th}$farm household (i=1, 2...... N), facing a decision problem on whether or not to choose available market outlet. Let $U_i$ represent the benefits to the farmer who chooses private trader, and let $U_k$ represent the benefit of farmer to choose the $k^{th}$ market outlet: where $K$ denotes the number of outlet where, choice of private traders designated by ($X_1$), cooperatives ($X_2$), rural coffee collectors ($X_3$) and consumer ($X_4$). The farmer decides to choose the $k^{th}$ market outlet if $X_{ik}^* = U_k^* - U_O > 0$.

The net benefit ($X_{ik}^*$) that the farmer derives from choosing a market outlet is a latent variable determined by observed explanatory variable ($Z_i$) and the error term ($\varepsilon_i$):

$$X_{ik}^* = Z_i^\beta_k + \varepsilon_i \ K = (X_1, X_2, X_3, X_4) \quad (2)$$

Using the indicator function, the unobserved preferences in the above equation translates into the observed binary outcome equation for each choice as follows:

$$X_{ik} = \begin{cases} 1 & \text{if } X_{ik}^* > 0 \\ 0 & \text{Otherwise} \end{cases} \quad (K = X_1, X_2, X_3, X_4) \quad (3)$$

In multivariate model, where the choice of several market outlets is possible, the error terms jointly follow a multivariate normal distribution (MVN) with zero conditional mean and variance normalized to unity (for identification of the parameters) where \((\mu_{X1}, \mu_{X2}, \mu_{X3}, \mu_{X4} )\) \(MVN \sim (0, \Omega)\) and the symmetric covariance matrix $\Omega$ is given by:
It is a continuous independent variable measured in kilograms and shows the quantity of coffee sold in year 2017. A marginal increase in coffee production has an obvious and significant influence on market supply of coffee. If the market supply of coffee increases, the ability of farmers to choose market outlet may increase. If the quantity of coffee to be sold is low, farmers may not be encouraged to search price and market information. Bezabih et al. (2015) found that large volume of sale motivates household to prioritize the channels and decide to use the best alternative. Thus, in this study, quantity sold is hypothesized to affect channel choice decision of the household.

Household head size: It is a quantitative continuous variable and refers to the total number of members of the household. Household with more members were expected to have man power or family labor in the marketing of coffee, thus positively influences the choice of formal market outlet that provide better prices. Such household are able to transport coffee to the market without having incurring additional external cost. Baltenweck et al. (2006) found that the higher the number of adults in the household, the more likely that private trader channel will be selected than individual customers.

Education level of the household head: It is a continuous variable and measured in years of schooling of the household. It is believed that if a farmer attained formal education of any level there would be a possibility that the farmer would choose formal outlet that provide benefit for them like; cooperatives and private traders. Therefore, education is believed to improve the knowledge of the alternate market outlet choice, because as people learn more and more they become wise in choice of best outlet. Formal education was hypothesized to influence market outlet choice positively. Abraham (2013) found that when vegetable producer is educated, they choose best market outlet.

Frequency of Extension contact: It is a continuous variable measured in number of day that Development Agent (DA) visited farmers. It is expected that agricultural extension service widens household knowledge with regard to use of improved agricultural technologies. Extension services through extension visit is also closely linked to information availability such as access to farming advices and knowledge through extension offices, which is considered as the most crucial source of information for coffee producers. Mekonin (2015) found that farmer’s access to extension service increased the ability of farmers to acquire important market information as well as other related agricultural information which in turn increases farmer’s ability to choose the best market outlets for their product. Therefore, number of extension contact was hypothesized to have an influence on the coffee market outlet choice.

Distance to the nearest local market: It is a continuous variable measured in kilometer that coffee producers are required to travel in order to sell their product in the market. Household which are near an agricultural marketing outlet are likely to make their coffee to that marketing outlet due to low transportation cost. In addition to agricultural marketing distance the condition of both road and market infrastructure have an influence on marketing efficiency. Where the infrastructure is poor or unavailable, farmers are discouraged using it. There by limiting marketing of coffee. The poor states roads which are found in most of the rural area of the district worsen during the rainy season. Consequently, unavailability or limited means of transport to reach the market at such time discourage farmers to choose the channel provide them a reasonable price. Riziki et al. (2015) confirmed that distance to the market is significant determinant in choice of marketing outlet. Therefore, in this study, distance from nearest market was hypothesized to affect market outlet choice.
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Cooperative membership: It is a dummy variable and takes the value 1 if the household is membership of any cooperatives, and 0 otherwise. Thus, cooperatives improve understanding of members about market and strengthen the relationship among the members. According to Berhanu et al. (2013), membership to cooperative positively and significantly affected accessing cooperative milk market outlet as compared with accessing individual consumer milk market outlet. Therefore, cooperative membership is expected to have impact on coffee market outlet choice.

Ownership of means of transportation: It is a dummy variable which took a value of 1 if the household have their own transport and 0 otherwise. Mekonin (2015) indicated that household who have their own transportation facility were able to travel further distances in order to sell coffee to markets that offer higher prices than the private trader outlet. The availability of transportation facility offers greater depth in marketing outlet choices.

Amount of Credit received: This is a continuous variable which represent the amount of credit taken by an individual household for coffee production purposes. Farmers who receive credit had more possibility to choose coffee market outlet that offer better price for their product than those who do not receive credit. According to Mekonin (2015), getting access to formal credit increases the likelihood of the main choice of end consumer outlet compared to private trader outlet. According to his study, a reason for accessing credit is to recruit transportation facility for supply of coffee to the market. The implication is that if farmer receive credit, he or she can easily access transportation facility which assists them to greater depth of choosing better market outlet.

Size of land allocated to coffee production: This variable is a continuous variable measured in terms of number of hectares allocated to coffee production. An increase in size of land by one hectare increases the production proportionally and this would in turn to increase the probability of household to choose the outlet that provide better price for them. Nuri (2016) found that Size of enset landholding influenced the choice of collectors and consumers outlets negatively and significantly. In this study, land allocated to coffee production is expected to influence coffee market outlet choice.

Non/off-farming income: It is a continuous variable measured in birr and shows amount of income obtained from non-farm activities undertaken by the household members. Farmers with off/non-farm income activity want to sell their agricultural products to the nearest marketing outlet with sated prices than searching for other alternative outlet. Hence, income from none farm activity was hypothesized to influence the decision of producers on outlet selection. Abraham (2013) found, income from nonfarm activity decrease the probability to sell to the best market outlet.

Years of farming experience: This is a continuous variable measured in number of years. A household who had been growing coffee for several years are found to be more likely to sell to outlet that are expected to be more profitable than those with less years of farming experience. It means more experienced farmers had better knowledge of cost and benefits associated with various coffee market outlet. Davis (2015) found that number of years that a farmer had been growing mangoes is significantly associated with selling to the export channel relative to brokers. Therefore, years of farming experiences expected to affect market outlet choice.

Weighted average selling price: It continuous variable measured in terms of Ethiopian birr (ETB) paid for a one kg of coffee. The price taken for this study was weighted average because the price of coffee in time of harvesting month was vary from month to and that is weighted average was required during the study. And this price was assumed to be affect the market outlet choice of coffee.

RESULTS AND DISCUSSION

Socio-Demographic Characteristics of coffee Producers

This section begins by discussing demographic characteristics sample respondents with regard to sex of the household head, years of farming experience, household size, and education level of coffee producing households. It further discusses findings of coffee production status and access to service.

As shown in Table 2, out of the total sample respondents, 99(81.82%) were male-headed households and 22(18.18%) were female-headed. Regarding cooperative membership, 67(55.37%) of the sampled households were members of coffee cooperatives and 54(44.63%) were not organized under coffee cooperatives.

Table 2. General Characteristics of sampled households (dummy and categorical variables)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>22</td>
<td>18.18</td>
</tr>
<tr>
<td>Male</td>
<td>99</td>
<td>81.82</td>
</tr>
<tr>
<td>Cooperative membership</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>54</td>
<td>44.63</td>
</tr>
<tr>
<td>Yes</td>
<td>67</td>
<td>55.37</td>
</tr>
<tr>
<td>O/ship of means of transport</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>37</td>
<td>30.58</td>
</tr>
<tr>
<td>Yes</td>
<td>84</td>
<td>69.42</td>
</tr>
</tbody>
</table>

Source: survey result, 2017

With respect to educational level of the sample households the average number of years of schooling completed was 4.25 years with a standard deviation of 3.03. The average household size of respondents was 5.87 with standard
deviation of 2.21. The level of coffee farming experience is taken to be the number of years that an individual was continuously engaged in coffee production activity. The average years of farm experience for sample respondents was found to be 12.041 years with standard deviation of 4.90. Regarding the distance from home to the nearest coffee market place where they sold their product (coffee), sampled coffee producing farmers reported that they have to travel an average of 3.58km (approximately) with corresponding standard deviations of 1.72. The minimum and the maximum distance that sampled coffee producing respondents have to travel to nearest market centers were 0.5 km and 7 km, respectively (Table 3).

Land size and ownership

The average area of land allotted to coffee production per household was 1.27 hectares with standard deviation of 0.77. The minimum and maximum land allocated for coffee production was 0.25 and 3 hectare respectively.

Extension contact: Extension service provision was expected to have direct influence on the production and marketing behavior of the farmers. The mean extension contact frequency provided for coffee producing farmers was found to be 1.82 day/month with standard deviation of 0.84 as mentioned in Table 3.

Access to credit service: Farmers access to credit may reduce the effect of financial constraints and able to buy the necessary inputs which improves their coffee productivity more readily than those with no access to credit. Therefore, it is expected that access to credit can increases the production of agricultural crops in general and coffee in particular. Even if credit services enhance the productivity level of farmers, there is lack of attention to access and availability of credit from formal institution rather than borrowing from informal sources (friends, relatives or village money lenders). Those households who have access to credit receive from their relative and friends in the form of cash or in kind. The mean credit received was found to be 812.19 birr with standard deviation of 2597.58. The amount of credit received ranges from 0 to 14600 birr minimum and maximum respectively.

Table 3. General Characteristics of sampled coffee farm households (Continuous variables)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Observation</th>
<th>Mean</th>
<th>Std. dev</th>
</tr>
</thead>
<tbody>
<tr>
<td>Household size (number)</td>
<td>121</td>
<td>5.87</td>
<td>2.21</td>
</tr>
<tr>
<td>Education (years schooling)</td>
<td>121</td>
<td>4.25</td>
<td>3.03</td>
</tr>
<tr>
<td>Farming experience (years)</td>
<td>121</td>
<td>12.04</td>
<td>4.90</td>
</tr>
<tr>
<td>Distance to market (km)</td>
<td>121</td>
<td>3.58</td>
<td>1.72</td>
</tr>
<tr>
<td>Land under coffee (hectare)</td>
<td>121</td>
<td>1.27</td>
<td>0.77</td>
</tr>
<tr>
<td>Extension contact frequency</td>
<td>121</td>
<td>1.82</td>
<td>0.84</td>
</tr>
<tr>
<td>Amount of credit received</td>
<td>121</td>
<td>812.19</td>
<td>2597.58</td>
</tr>
</tbody>
</table>

Source: survey result, 2017

Econometric analysis

Determinants of market outlet choice

An econometric approach was used to test effects of the different factors on the selection of a particular market outlet. The Wald test ($\chi^2(48) = 129.23$) is significant at the 1% level, which indicates that the subset of coefficients of the model is jointly significant and that the explanatory power of the factors included in the model is satisfactory. Furthermore, results of likelihood ratio test in the model LR $\chi^2(6) = 27.92$, $\chi^2 = 0.0001$ is statistically significant at 1% level, indicating that the independence of the disturbance terms (independence of market outlet choice) is rejected and there are significant joint correlations for two estimated coefficients across the equations in the models. The likelihood ratio test of the null hypothesis of independency between the market outlet decision ($\rho_{21} = \rho_{31} = \rho_{41} = \rho_{32} = \rho_{42} = \rho_{43} = 0$) is significant at 1%. Therefore, the null hypothesis that all the $\rho$ (Rho) values are jointly equal to 0 is rejected, indicating the goodness-of-fit of the model. Hence, there are differences in market selection behavior among farmers, which are reflected in the likelihood ratio statistics. Separately considered, the $\rho$ values ($\rho_{ij}$) indicate the degree of correlation between each pair of dependent variables. The $\rho_{21}$ (correlation between the choice for private trader and cooperative), $\rho_{31}$ (correlation between the choice for rural collector and private trader markets), $\rho_{41}$ (correlation between the choice for private trader and consumer), $\rho_{32}$ (correlation between the choice for rural collector and cooperative markets) are negative and statistically significant at 1% and 10% level respectively and $\rho_{43}$ (correlation between the choice for rural collector and consumer markets) positive and statistically significant at 1% level (Table 15). This finding leads us to the conclusion that farmers delivering to the private trader market are less likely to deliver to cooperative market channel ($\rho_{21}$). Equally, those involved in rural collector market outlet are less likely to send their coffee to the private traders ($\rho_{31}$). The simulation results also indicate that the marginal success probability for each equation (outlet choice decision) is reported below. The likelihood of choosing rural collector outlet is relatively low (29%) as compared to the probability of choosing consumer outlet (48%), cooperative outlet (65%) and private traders’ outlet (68). This is a good evidence to suggest that availability of informal traders’ outlet may not be good and profitable for producers. The joint probabilities of success or failure of choosing four outlets suggest that households are more likely to choose jointly the four outlets. The likelihood of households to jointly choose the four outlets was 5.3% which is relatively higher compared to their failure to jointly choose them was (0.24%).
Quantity of coffee sold: Quantity of coffee sold was positively and significantly influence the likelihood of choosing private traders and cooperative market outlet at 10% and 5% significance level respectively and negatively influenced the likelihood of choosing rural collector outlet at 5% level of significance. Bezabih et al. (2015) indicated that large volume of sale motivates households to prioritize the channels and decide to use the best alternative. Those households with large volume of coffee were more likely to sell to private traders and cooperative and less likely to sell to rural collector outlet. The positive coefficient further implies that large volume of sales motivates households to increase their supply to private traders and cooperatives.

Education Level of Households: Education level of households has positive and significant effect at 5% probability level in choosing private traders’ outlet. The positive relationship between education level and selling to private trader can be explained by the fact that being educated enhances the capability of farmers in making informed decisions with regard to the choice of marketing outlet to sell their farm produce based on the marketing margin and marketing cost. These results concur with the findings of Riziki et al. (2015) Shiferaw et al. (2009) which revealed that education level enhances the capability of farmers in making informed decisions with regard to the choice of marketing outlets to sell their farm produce.

Cooperative membership: Cooperative membership has significant and positive relationship with the likelihood of choosing cooperative outlet at 5% significance level, and negative relationship with the likelihood of choosing rural collector outlet at 1% level of significance. This is because those households belonging to coffee cooperative were easily access information about the price product and beneficiary from profit dividend in the future in addition to actual current price offered by cooperative which is comparable with other market outlet. This result is in line with Berhanu et al. (2013) found that membership to cooperative positively and significantly affected accessing cooperative milk market outlet as compared with accessing individual consumer milk market outlet.

Years of coffee farming experience: The likelihood of choosing cooperatives outlet was positively affected by farming experience at 10% levels of significance. The result showed that those households with many years of experience in coffee production are more likely to choose cooperatives outlet. This could be explained by the fact that more experienced households have better knowledge of cost and benefits associated with various coffee marketing outlet and supplied to better outlet that provide better prices for them. The finding of Berhanu et al. (2013) showed that the number of years a household spent in dairy farming, positively and significantly affected using cooperative milk market outlet as compared to accessing individual consumer milk market outlet.

Land allocated under coffee: The likelihood of choosing private traders and cooperative market outlet was positively and significantly affected by size of land allocated under coffee at 1% and 10% levels of significance, respectively. The survey result indicated that those households who allocate large size of land for coffee would get output and more likely to sell to private trader and cooperative outlet, compared to farmers with small coffee land size. This is in line with Nuri (2016) who found that area of land covered by enset can directly increase the marketable supply of enset products and farmers prefer other channels than collectors and consumers to sale large quantity of bulla.

Access to extension service: Access to extension service is negatively and significantly associated with the likelihood of choosing rural collector outlet at 10% level of significance. Farmer’s access to extension service increased the ability of farmers to acquire important market information as well as other related agricultural information which in turn increases farmer’s ability to choose the best market outlet for their product. This is in line with Abraham (2013) who found negative impact of agricultural extension service on the probability of choosing collector and retailer outlets compared to wholesale outlet in vegetable market outlet choice.

Distance from the nearest market: Distance from nearest market is negatively associated with likelihood of farmers selling to private traders and cooperative outlets at 5% and 1% level of significance, respectively and positively associated with likelihood selling to rural collector outlet at 1% level of significance. The implication is that household located far away from nearest market center faces difficulty in delivering the product to traders and cooperative market rather than selling to locally existing market outlet, because of lack of market price information and poor transport accessibility. This is in line with the finding of Solomon et al. (2016); distance to cooperatives has negative and significant effect on the preference of farmers for cooperatives and has positive and significant impact on preference of farmers for brokers. This result was also supported by the result of Djalaloulet et al. (2015) who found that market distance has positive relationship with rural market and negative relationship with urban markets.

Transportation access: Access to transportation access is positively and significantly related to the choice of cooperative outlet. The positive coefficient depict that having any form of transportation facility increases the likelihood of choosing cooperative outlet at 5% level of significance. This can be attributed to the fact that those who have their own transportation facility were able to travel further distances in order to sell coffee to markets that offer better prices than informal trader and rural collector outlet. The availability of transportation facility offers greater depth in marketing choices. This result is in line with the finding of Mekonin (2015) who found that
owning transportation facility positively related to the choice of end consumer and cooperative outlet in market outlet choice of coffee.

**Off/Non-farm income:** The availability of off/non-farm income has negative and significant relation with the likelihood of choosing private trader outlet at 10% significance level and positive and significant relation with the likelihood of choosing consumer market outlet at 5% significant level. Farmers who have access to off/non-farm income have less likely to choose private trader and more likely to choose consumer market outlet compared to those who have no access to off/non-farm income. The result may reveal that producers who gain more income from off/non-farm activities would likely to choose locally existing outlet rather than in search of other alternatives out.

### Table 4. Multivariate probit estimations for determinates of coffee producers outlet choice

<table>
<thead>
<tr>
<th>Variables</th>
<th>Private Traders</th>
<th>Cooperatives</th>
<th>Rural collector</th>
<th>Consumer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quantity sold</td>
<td>0.426**(0.243)</td>
<td>0.012**(0.005)</td>
<td>-0.002** (0.001)</td>
<td>-0.000(0.000)</td>
</tr>
<tr>
<td>Household size</td>
<td>-0.131(0.089)</td>
<td>0.095(0.092)</td>
<td>-0.631*** (0.236)</td>
<td>-0.114*(0.065)</td>
</tr>
<tr>
<td>Education level</td>
<td>0.189**(0.084)</td>
<td>0.098(0.084)</td>
<td>0.141(0.098)</td>
<td>0.069(0.064)</td>
</tr>
<tr>
<td>Farming experience</td>
<td>0.059(0.062)</td>
<td>0.104*(0.060)</td>
<td>0.066(0.088)</td>
<td>0.0302(0.037)</td>
</tr>
<tr>
<td>Land under coffee</td>
<td>2.037*** (0.764)</td>
<td>0.900*(0.478)</td>
<td>0.395(0.985)</td>
<td>-0.632(0.418)</td>
</tr>
<tr>
<td>Coop membership</td>
<td>-0.941(0.625)</td>
<td>0.977** (0.396)</td>
<td>-2.410*** (0.691)</td>
<td>0.515(0.332)</td>
</tr>
<tr>
<td>Extn contact frq</td>
<td>-0.233(0.253)</td>
<td>0.001(0.231)</td>
<td>-0.733*(0.442)</td>
<td>0.179(0.173)</td>
</tr>
<tr>
<td>Market distance</td>
<td>-0.331** (0.159)</td>
<td>-0.369*** (0.125)</td>
<td>0.910*** (0.323)</td>
<td>0.124(0.093)</td>
</tr>
<tr>
<td>Transport access</td>
<td>0.372(0.447)</td>
<td>1.066** (0.461)</td>
<td>0.206(0.719)</td>
<td>-0.525(0.342)</td>
</tr>
<tr>
<td>Weighted average price</td>
<td>0.0902(0.087)</td>
<td>0.0302(0.047)</td>
<td>-0.031(0.089)</td>
<td>0.088(0.084)</td>
</tr>
<tr>
<td>Of/non-farm income</td>
<td>-0.056*(0.032)</td>
<td>0.011(0.032)</td>
<td>-0.022(0.040)</td>
<td>0.0504*(0.023)</td>
</tr>
<tr>
<td>constant</td>
<td>-14.09*** (6.545)</td>
<td>11.41*** (5.504)</td>
<td>0.371(9.638)</td>
<td>-1.496(3.965)</td>
</tr>
</tbody>
</table>

Prdctd probability 0.68 0.65 0.29 0.48

Joint probability success 0.053
Joint probability of failure 0.0024
Number of draw 5
Observations 121
Log Likelihood -142.81
Wald(chi2(48) 129.23
Prob> chi2 0.000

Estimated correlation matrix

<table>
<thead>
<tr>
<th>ρ₁</th>
<th>1.00</th>
<th>ρ₂</th>
<th>1.00</th>
<th>ρ₃</th>
<th>1.00</th>
<th>ρ₄</th>
<th>1.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>ρ₂</td>
<td>-0.504*** (0.153)</td>
<td>1.00</td>
<td>ρ₃</td>
<td>-0.485*** (0.164)</td>
<td>-0.387* (0.230)</td>
<td>1.00</td>
<td>ρ₄</td>
</tr>
</tbody>
</table>

Likelihood ratio test of ρ₂₁ = ρ₃₁ = ρ₄₁ = ρ₃₂ = ρ₄₂ = ρ₄₃ = 0

χ² (6) = 27.92  Prob> χ² = 0.0001

**Note:** Coefficient and standard errors in parentheses and ***, ** and * indicate statistical significance at 1, 5 and 10%, respectively.

### CONCLUSION AND RECOMMENDATIONS

The study result indicated that the probability of choosing private trader market outlet was significantly affected by quantity of coffee supplied, education level of household, land allocated under coffee, distance to nearest market, and off/non-farm income. The probability of choosing cooperative market outlet was significantly affected by quantity of coffee supplied, years of coffee farming experience, land allocated under coffee, cooperative membership, distance to nearest market and access to transport. The probability of choosing rural collector market outlet was significantly affected by quantity of coffee supplied, household size, cooperative membership, distance to nearest market and frequency of extension contact. Similarly, the probability of choosing consumer market outlet was significantly affected by household size and off/non-farm income.

The correlations between the coffee producers’ choice of private traders and cooperative outlet was negative and statistically significant, correlation between private traders...
and rural collector outlet was negative and significant and the correlation between private traders and consumer outlet was also negative and significant. This shows that in coffee marketing producers used cooperative, rural collector and consumer outlets as substitute for private traders’ outlet and rural collector and consumer outlet are substitute for cooperative outlet.

The econometric finding of multivariate probit suggest that an adjustment in each one of the significant variables can significantly influence the probability of choice of market outlet. Therefore, this study recommends that an improvement of existing road facilities would reduce the time spent to reach the market and lower transportation costs would enhance farmers to sell their produce to the outlet that results higher returns. The study also point that an increasing in quantity of coffee sold and increasing land allocation under coffee for choice of appropriate market outlet was significant determinant of market outlet choice. Hence, increasing quantity sold alone is not enough without getting a reasonable selling price since prices is also one factor that influence in preference of outlet. The need for improvement of the extension services to aware farmers to choose formal markets such as cooperatives and private traders’ outlet with higher returns resulting from quantity sold not from unit price. Furthermore, the concerned authority should be able to increase the awareness of households about the importance of adult education and about the school age at which their children should join the school to choice appropriate market outlet and finally government should increase the number of cooperatives in coffee producing kebeles of the district with functional coffee collection center (CCC) which increases coffee farmers’ income from fair market at minimum marketing cost.

AVAILABILITY OF DATA AND MATERIAL

The data that support the findings of this study can be obtained from the authors based on request.

ACKNOWLEDGEMENTS

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REFERENCES


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