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Analysis of risk attitudes and social capital in pineapple marketing: The case of small-scale farmers in Luwero district, Uganda

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ABSTRACT

Development partners are promoting and encouraging small-scale farmers to venture into horticultural farming as a development tool to enhance their livelihoods. While previous empirical studies provide an indication of how small-scale farmers choose to participate in markets, the role of farmer risk attitudes and social capital in the choice of low or high value market outlets has hardly been analyzed. This study therefore examined the producers' risk attitudes and social capital dimensions that may explain the differences in the choice of market outlets. Data were collected from 272 households in four sub-counties in Luwero district in central Uganda using multi-stage sampling during the period of March through May 2016. The empirical analysis in this study was based on primary data collected in face to face interviews using semi structured questionnaires. Data analysis was done using descriptive statistics and Multinomial Logit regression model. Results indicate that gender, marketing under contract, risk attitudes and trust significantly influenced choice of export market at the one per cent level while education level, farm size, market distance and density of membership influenced it at the five per cent level. Trust, frequency of attending group meetings and density of membership influenced market decision outlet choices and production information flow in market transaction associations which ensure that benefits of social capital are reaped by farmers. Findings showed that choosing high value markets was associated with farmers being risk seekers and having higher trust level for transaction partners. The implication of these findings is that development strategies that target commercialization of small-scale agriculture through high value market access should pay attention to farmers' risk perceptions and trust. The study therefore recommends that to support farmers become more risk takers and increase trust for transaction partners, there is need to create awareness among farmers about how to guard against market risks and benefits of high value market access. This can be achieved by encouraging farmers reduce agricultural risks by building up self-insurance strategies through participation in off-farm activities. Furthermore, social capital stakeholders should encourage development of trust between farmers and transaction partners. This can be through establishing product price floor and ceiling which would reduce price information asymmetry between farmers and traders.

Key words: Market outlets, multinomial Logit, pineapples, risk attitude, social capital, Uganda

RÉSUMÉ

Les partenaires au développement promeuvent et encouragent les petits producteurs à s'aventurer dans la production horticole comme un moyen de développement pour accroître leurs moyens de subsistance. Bien que les études empiriques antérieures indiquent comment les agriculteurs à petite échelle choisissent de participer aux marchés, le rôle des attitudes de prise de risque et du capital social des producteurs dans le choix des débouchés de marché à faible ou haute valeur n'a pas été encore pleinement analysé. Cette étude a donc examiné les attitudes de prise de risques et les dimensions du capital social des producteurs pouvant expliquer les différences dans le choix des débouchés de marché. Les données ont été recueillies auprès de 272 ménages dans quatre sous-comtés du district de Luwero, au centre-ville d'Ouganda, en utilisant un échantillonnage en plusieurs étapes pendant la période de mars à mai 2016. L'analyse empirique de cette étude était basée sur des données primaires recueillies lors des entretiens au moyen de questionnaires semi-structurés. L'analyse des données a été effectuée à l'aide de statistiques descriptives et du modèle de régression Multinomial Logit. Les résultats indiquent que le genre, la commercialisation sous contrat, les attitudes de prise de risque et la confiance ont considérablement influencé le choix du marché d'exportation au seuil de un pour cent, tandis que le niveau d'éducation, la taille de la ferme, la distance au marché et la syndicalisation l'ont influencée au seuil de cinq pour cent. La confiance, la fréquence de participation aux réunions de groupe et la syndicalisation ont influencé les décisions de choix des débouchés de marché et les flux d'informations de production dans les associations de

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transactions sur le marché qui garantissent que les producteurs tirent profit des avantages du capital social. Les résultats montrent que le choix des débouchés de marché de grande valeur était associé aux producteurs qui sont prêts à prendre de risques et qui ont un niveau de confiance plus élevé pour les partenaires à la transaction. L'implication de ces résultats est que les stratégies de développement axées sur la commercialisation de la production à petite échelle grâce à un accès au marché à forte valeur ajoutée devraient tenir compte de la perception des producteurs en matière de risque et de confiance. L'étude recommande donc de soutenir les producteurs à prendre plus de risques et d'accroître la confiance pour les partenaires en transaction. Il est nécessaire de sensibiliser les producteurs à se prémunir contre les risques du marché et les avantages de l'accès aux marchés de grande valeur. Ceci peut être réalisé en encourageant les producteurs à réduire les risques en établissant des stratégies d'auto-assurance à travers la participation à des activités hors ferme. En outre, les acteurs du capital social devraient encourager le développement de la confiance entre les producteurs et les partenaires en transaction. Ceci peut se faire en établissant le plancher et le plafond des prix, ce qui réduirait l'asymétrie des informations sur les prix entre les producteurs et les commerçants.

Mots clés: Débouchés de marché, Logit multinomial, ananas, attitude de prise de risque, capital social, Ouganda

INTRODUCTION

The agriculture sector is a major employer in the Ugandan economy contributing 25.1 per cent of the Ugandan Gross Domestic Product (UBOS, 2015). The sector employs 85 per cent of the labor force (MoFPED, 2015) with over 72 percent of this labor force in the active population (FAO, 2015). Agricultural exports earned the country USD 1.44 billion registering a 7.0 per cent increase from 2014 (UBOS, 2016). However, the total export value of principal agriculture products is estimated at USD 297.3 million only (UBOS, 2016). The sector provides a large proportion of the raw materials used in manufacturing and therefore it is a key determinant of the country's efforts to reduce poverty (MAAIF, 2010).

Despite this, the sector is mostly composed of small-scale producers. These producers are faced with a myriad of constraints such as limited value addition, high energy costs, limited availability of quality inputs, climate change, poor commodity prices, increasing volatility in financial markets, low commercial agricultural levels, lack of linkage between research and farmers, low coverage of irrigation, land fragmentation, lack of agricultural machinery, pests and diseases, and poor transport network (MoFPED, 2016a). As a result, their productivity is low. In a bid to improve this situation, the Government is intensifying promotion of commercial agriculture by supporting stronger linkages between farmers and agro-industries as well as farmers and export markets (MoFPED, 2016b). Additionally, the National Agricultural Sector Development Strategy and Investment Plan (DSIP) was designed to address these constraints through increasing agricultural production and productivity,

increasing access to markets and value addition, creating an enabling environment for the private sector in agriculture and strengthening agricultural institutions (MAAIF, 2010).

Currently, the Ugandan Government is promoting horticultural crop production amongst smallholders by supporting the development of the horticultural value chain (MAAIF, 2010). This is because of the ability of the horticultural subsector to bring quick returns to investment, contribute to exports, growth and poverty reduction and its potential impact to future consumption trends (MAAIF, 2010). In Uganda's fruit farming and trade, the pineapple sub-sector has registered the most developed and established commodity chain (Ssemwanga, 2007). The pineapple sub-sector has gained popularity because of its potential for rural development through increased youth employment, household incomes, poverty reduction and foreign exchange earnings (MoFPED, 2010). Consequently for most small-scale farmers, pineapple farming is considered an important source of income (McCulloch and Ota, 2002).

In spite of the potential of the sub-sector in increasing household livelihoods, pineapple production in Uganda is still low compared to other East African countries such as Kenya and Rwanda (FAOSTAT, 2016). This is attributed to the challenge of commercialization of small-scale pineapple farming with one major constraint being access to pineapple output markets (Poulton *et al.*, 2006). Among these constraints, farmers' risk attitudes that we defined as, the pineapple farmer's willingness to take risk compared to other pineapple farmers and social capital defined by Portes (1998), as the ability of

actors to secure benefits by virtue of membership in social networks or other social structures and playing an important role in farmer market outlet decisions. These factors affect access to agricultural input and output markets, productivity, growth and development (Yu *et al.*, 2014). Therefore, the absence of appropriately harnessed social capital and institutional frameworks linking producers to markets, excludes farmers from making decisions to participating in high value markets (Yusuf, 2008). Farmers' risk attitudes (being either risk averse, neutral and seeker) is also an important factor in shaping farmers' decisions (Yu *et al.*, 2014). According to Liu (2013), risk-averse producers tend to make and adopt agricultural decisions they consider to be less risky although these maybe low paying unlike their risk seeking counterparts. This could be due to imperfect knowledge, information and associated uncertainty about new technologies but also high value markets (Yu *et al.*, 2014). Furthermore risk aversion decreases the use of marketing contracts for producers, who opt for cash sales as a primary marketing technique to minimize transaction costs although these producers are fully exposed to price risks (Franken *et al.*, 2014).

There is currently a growing body of literature analyzing aspects of agricultural market participation in developing countries (Barham, 2007; Jari and Fraser, 2009; Jagwe *et al.*, 2010; Maina *et al.*, 2015). However, while such studies may provide an indication of how small-scale farmers' choose to participate in markets, the role risk attitudes and social capital play in the choice of low or high value pineapple market outlets has not been analyzed. This study therefore attempted to fill this gap.

In as much as farmer risk attitudes and social capital influence market outlet decisions and willingness to choose high value markets, farmers may further fail to participate in highly profitable market outlets due to: costs and risks involved in market access, lack of trust and information about transactions and trade partners. These factors in conjunction with others such as quality input and output products, isolation from high value markets and other structural impediments beyond what this study has been able to assess may also influence market outlet choice. Previous studies (Maina *et al.*, 2015; Muthini, 2015) that assessed how farmers participate in agricultural markets informed this study as they provided insight into the Multinomial Logit regression. This econometric model allows for analysis of decisions

across more than two categories of the dependent variable as was the case in this study.

METHODOLOGY

Study area. Data for this study were collected in Luwero district in central Uganda in the months of March through May 2016. Luwero lies North of Kampala the capital city of Uganda, between latitude 2° North of the Equator and East between 32° to 33°. The district has a comparative advantage in pineapple production and trade because of its fertile soils, equatorial climate and farmers accessing export markets through contract farming. The district has a total area of approximately 2577.49 square kilometers and is divided into ten sub counties of Bamunanika, Kalagala, Kamira, Kikyusa, Zirowe, Makulubita, Nyimbwa, Butuntumula, Katikamu and Luwero. It has mean temperatures ranging between 8°C and 35°C. The rainfall is well distributed throughout the year, with the average annual rainfall being 1,300 mm. People in the district are mainly engaged in agricultural and livestock production. Major horticultural crops grown include tomatoes, pineapples, cabbages and vegetables. Similarly cash crops such as coffee, vanilla and upland rice are grown.

Sampling procedure and sample size. Multi-stage sampling procedure was used in the selection of a representative sample. To begin with, purposive sampling was used to select sub-counties of Kikyusa, Butuntumula, Kamira and Zirowe. This was because the sub-counties had the largest land acreage under pineapple farming. Proportionate to the population of small-scale farmers under subsistence pineapple farming in each sub-county, stratified sampling was used to select small-scale farmers to be sampled from each village. Simple random sampling was further used to select the number of small-scale farmer households to be sampled from each village. A representative sample size of 272 small-scale pineapple farmers to be interviewed was thus obtained. The target population of the study was the small-scale pineapple farmers in Luwero district. The required sample size was determined using the proportionate to size sampling method by Anderson *et al.* (2007).

$$n = \frac{PqZ^2}{E^2} \quad (1)$$

Where n = sample size, p = proportion of the population containing the major interest, q= 1-p, Z = confidence level ($\alpha = 1.96$), E = acceptable error.

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$p = \left(\frac{84,952}{405,900} \right) = 0.23$, $q = 0.77$ and $E = 0.05$. This results into a sample population of 272 respondents that is,

$$n = \left(\frac{0.23 \times 0.77 \times 1.96^2}{0.05^2} \right) = 272 \quad (2)$$

Analytical framework. Multinomial Logit (MNL) model was used to analyze the role of risk attitudes and social capital in the choice of market outlet among small scale pineapple farmers in Luwero district. The model was preferred because it allows the analysis of decisions across more than two categories in the dependent variable; unlike the binary probit or logit models which are limited to a maximum of two choice categories (Wooldridge, 2002). The MNL is the standard method for estimating unordered and multi category dependent variables (Gujarati, 2004). In MNL, a baseline alternative corresponding to the status quo also known as ‘do nothing’ situation was chosen. This is because one of the options had to always be in the respondents’ choice set to be able to interpret the results in standard welfare economic terms (Hanley *et al.*, 2001). The Logistic regression does not assume linear relationship between the dependent variable and independent variables, but requires that the independent variables be linearly related to the logit of the dependent variable (Gujarati, 2004). In this study small scale farmers are faced with three choices of the market outlet to use, which are: selling at the farm gate, local markets and export markets. The decision was based on the alternative which maximized their utility, subject to their risk attitudes and social capital associated with each outlet. The MNL model was expressed as follows:

$$P_{ij} = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_n X_n + \varepsilon_i \quad (3)$$

Where (1,2,3) each takes values representing the choice of marketing outlet (1 = farm gate, 2 = local market and 3 = export market), X are factors affecting choice of a market outlet, β are parameters to be estimated and ε is the error term. With i alternative choices, the probability of choosing outlet j was given by:

$$Prob(Y_i = j) = \frac{e_{z_j}}{\sum_{k=0}^j e_{z_k}} \quad (4)$$

Z_j was a choice and Z_k was the alternative choice that could be chosen (Greene, 2002). The model estimates were used to determine the probability of choice of

a market outlet given j factors that affect the choice X_i . In order for the parameter estimates of the MNL model in Equation 1 to be unbiased and consistent the Independence of Irrelevant Alternatives (IIA) was assumed to hold (Deressa *et al.*, 2008). The IIA assumption requires that the probability of using one marketing outlet by a given pineapple farmer must be independent of the probability of choosing another outlet. The model parameters are estimated by the maximum likelihood estimation (MLE). The dependent variable need not be normally distributed under the maximum likelihood estimation since the estimates remain consistent.

The estimated coefficients give the role of risk attitudes and social capital factors in choice of a market outlet. However, Greene (2002) pointed out that coefficients of multinomial regressions only provide the direction of the effect of the independent variables on the dependent variable. Therefore the estimates represent neither the actual magnitude of change nor the probabilities. As an alternative, the marginal effects are used to measure the expected change in probability of a particular technique being chosen with respect to a unit change in an independent variable from the mean. The marginal effects were computed by differentiating the coefficients at their mean given by:

$$\frac{\partial P_j}{\partial X_k} = Z_j P_j (\beta_{jk} - \varepsilon_{jZ}^{j-N} P_j \beta_{jk}) \quad (5)$$

The empirical specification for examining the effect of explanatory variables as described in Table 1 on choice of market outlet is given as follows:

$$\text{MRKTOUTC} = \beta_0 + \beta_1 \text{Age} + \beta_2 \text{Gender} + \beta_3 \text{Educ} + \beta_4 \text{MrktD} + \beta_5 \text{Output} + \beta_6 \text{RiskA} + \beta_7 \text{Trust} + \beta_8 \text{Mattend} + \beta_9 \text{DGMbr} + \beta_{10} \text{ExtS} + \beta_{11} \text{CMrktg} + \beta_{12} \text{Offarm} + \varepsilon_i \quad (6)$$

Social capital and risk attitude variable definitions. Social capital dimensions of density of membership, frequency of attending group meetings and trust as described by Wambugu *et al.* (2009) were used to measure social capital while farmer risk attitudes were determined using the lottery question as described by Yu *et al.* (2014). Farmers differ in the density of membership and this is captured by the summation of the total number of groups to which each household belongs (membership to groups by individuals in the household is summed up). On the other hand, frequency of attendance to group meetings is measured through a two scale criterion, i.e., “sometimes” and “always; Trust is obtained by asking farmers

if they trusted trade partners to whom they sold pineapples and if yes, then they were asked to rank the level of trust they had for traders “low” or “high”; Risk attitude is obtained by asking, “If you as a farmer were offered a choice between playing a lottery or receive a certain amount of money.” Each time the lottery was the same, but the amount of money was different. If you preferred the money, you would get paid 500,000 Ugshs. If you preferred the lottery, you would play the lottery with a 50% probability that you would win 700,000 Ugshs and a 50 % probability you would receive nothing. Which would you prefer? “Preferred the money”, “preferred neither money nor lottery” and “preferred the lottery”.

RESULTS AND DISCUSSION

Socio-economic attributes. A comparative analysis of the mean of socio-economic variables in different pineapple market outlets showed that there existed significant differences between four variables. These were: education, farm size and contacts with extension at the 1 percent significant level, distance to the nearest market and density of membership at 10 percent level of significance (Table 2).

On average, export pineapple farmers had more years of education and were more likely to supply their produce in high value markets (Table 2). This is because more educated farmers have the capability to

access, interpret and understand market information and requirements better than less educated farmers. This positions these farmers to meet market requirements for standard and quality in the export market better.

Noteworthy differences also existed with respect to farm size and distance to the nearest produce market. Farmers that owned larger pineapple farms had a tendency to travel longer distances to nearest produce markets. This is because such farmers tend to target large virgin farm land to ensure high output production, prevent the use of inorganic fertilizers and minimize effects from pests and diseases. Such quality of land is located in more distant places from markets. Larger farm sizes thus enable farmers meet market requirements of quantity that are more stringent in export markets.

Furthermore, export farmers have considerably low density of group membership. This is because export farmers are likely not looking to benefit from public instituted poverty reduction programmes that require group membership from all beneficiaries. Furthermore, the less number of contacts with extension service providers could be attributed to the fact that export market farmers are more educated thus can access more current production and market information on their own through various Information and Communication Technologies (ICTs) platforms

Table 1. Variables used in the Multinomial Logit

Variable	Description	Measurement	Expected sign
Dependent variable			
MRKTOUTC	Household choice of pineapple marketing outlets	(1=Farm gate, 2=Local market, 3=Export market)	+
Independent variables			
Age	Age of household head in years	In years (Continuous)	+
Gender	Gender of household head	Dummy (1=Male, 0=Female)	+/-
Educ	Education of household head	In years (Continuous)	+
VOwn	Vehicle ownership	Dummy (Yes=1, No=0)	+/-
MrktD	Market distance	Time taken in minutes to walk to the nearest market	+/-
OutputP	Output Price	Ugandan Shillings	+
Offarm	Off-farm activities	Dummy (Yes=1, No=0)	+
RiskA	Risk attitude	Dummy (1=risk seeker, 0= risk -averse)	+/-
Trust	Trust	Dummy (1=Yes, 0= No)	+
Mattend	Number of meeting attended per season	Frequency (Continuous)	+
DGMbr	Number of groups one is a member	Number (Continuous)	+
ExtS	Extension service	Number of contacts with extension	+
CMrktg	Contract Marketing	Dummy (Yes=1, No=0)	+/-

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thus less need to contact extension service providers. Table 3 shows that more export market farmers owned transportation means to access more distant markets. This gives these farmers an advantage by minimizing the travel time to market assembling points and reduced transportation costs as these markets required produce to be delivered promptly while maintaining freshness and wholesomeness of produce supplied. Besides, farmers involved in off-farm activities and risk seekers are more likely to sell their produce in export markets. This is because risk seeking farmers were more willing to bare risks that come with accessing more profitable markets as a result of high transaction costs in efforts to get better prices and profit margins for produce. Moreover, through off-farm activities these farmers get more exposure to wider sources of information which could bring about access to more profitable agricultural markets opportunities for farmers. Involvement in off-farm activities allows farmers to access additional income to purchase farm inputs and pay labor but also reduce and mitigate risks. With respect to frequency of attending meetings and trust between farmers and their trade partners, export market farmers attended group meetings and had high trust for transaction partners. The frequency of attending group meetings positively affects export farmers' performance as through group meetings they gain more knowledge, information and skills about production and market dynamics. This goes a long way in enabling them meet export market requirements for produce quality standards. Likewise, the high level of trust among export market farmers for traders is encouraged by higher product prices these markets offer their participants in addition to the existing contractual agreements between producers and buyers. The agreements provide incentive for market exchange as they reduce transaction costs farmers incur in

accessing market but also provide assurance that trade partners will not breach agreements they make.

Regression results. Multinomial logit model results indicated that 12 out of 16 variables used were statistically significant at 1%, 5% 10% level (Table 4). The Chi-square value of -37.182 showed that likelihood ratio statistics were highly significant ($P < 0.000$) suggesting that predictors included in the model were capable of jointly predicting and explaining choice of market outlet. The pseudo-R square was 0.4925 indicating that explanatory variables explained about 49.25% of the variable of choice of market outlets.

Gender of household head had significant influence on likelihood of choosing farm gate, local and export market at 5%, 1% and 10% significant level, respectively. Male headed households had a higher probability of selling in export and local markets by 2.8% and 12.3%, respectively and a lower probability of selling at farm gate by 15.1%. This could be as a result of differences in agricultural roles played by men and women, social cultural norms and family roles that restrict female mobility thus limiting their participation in off-farm markets. Moreover, the tendency of men being risk takers enables them search for markets in distant and competitive places like export and local markets. Omoto (2004) pointed out that the 'gendered' nature of local knowledge and systems, left differences in resource bases between men and women causing them to experience different sets of social constraints even in market access. As a result, male headed households had a high probability of selling produce in markets beyond the farm gate because of their ability to engage in negotiations, possession of more marketing networks and interaction capabilities with more buyers unlike

Table 2. Socio economic attributes of pineapple farmers

Variable	Market outlet choice			Overall	F/Value
	Farm gate	Local market	Export market		
Age (Years)	39.3	40.4	41.1	39.6	0.390
Education (Years)	8.6	8.7	12.4	8.8	4.786***
Farm size (Acres)	2.08	3.01	7.14	2.46	26.589***
Market distance (km)	10.26	11.42	12.44	7.09	2.424*
Number of contacts with extension officers	1.63	2.24	1.00	1.81	5.489***
Density of membership	1.57	1.39	1.00	1.52	2.865*

***, *: significant at 1% and 10% level, respectively; 1ha =2.2 acres

Source: Survey data (2016)

Table 3. Distribution of categorical variables across different market outlets

Variable	Category	Percentages			χ^2
		Farm Gate	Local market	Export market	
Gender	Male	89.0	95.0	100.0	2.724
	Female	11.0	5.0	0.0	
Transport ownership	Yes	64.9	83.8	85.7	9.932***
	No	35.1	16.2	14.3	
Off-farm activities	Yes	41.9	63.5	71.4	11.479***
	No	58.2	36.5	28.6	
Risk attitudes	Averse	73.3	45.9	42.9	19.117***
	Seeker	26.7	54.1	57.1	
Frequency of attending group meetings	Always	86.0	72.2	100.0	4.852*
	Sometimes	14.0	27.8	0.0	
Trust	Low	65.4	40.5	14.3	18.973***
	High	34.6	59.5	85.7	

***, *: significant at 1% and 10% level, respectively.

Source: Survey data (2016)

Table 4. Multinomial logit regression model marginal effects explaining variation in choice of pineapple market outlets

Variable	Farm gate		Local market		Export market	
	$\delta y/\delta x$	Std error	$\delta y/\delta x$	Std error	$\delta y/\delta x$	Std error
Gender	-0.151**	0.079	0.123*	0.079	0.028***	0.011
Age	-0.002	0.003	0.002	0.003	0.000	0.001
Education level	-0.036	0.042	0.013	0.042	0.023**	0.010
Transport ownership	-0.192***	0.054	0.173***	0.052	0.019	0.018
Off farm activities	-0.187***	0.055	0.163***	0.053	0.024	0.019
Farm size	-0.049***	0.014	0.043***	0.014	0.005**	0.003
Price per head	-0.001***	0.000	0.001***	0.000	4.52e-06	0.000
Market distance	-0.090***	0.035	0.074**	0.034	0.016**	0.007
Extension contact	-0.137***	0.051	0.137***	0.050	-0.011	0.020
Contract marketing	-0.186***	0.075	0.150**	0.073	0.037***	0.014
Risk attitudes	-0.123***	0.028	0.112***	0.027	0.011	0.009
Density of membership	0.061	0.055	-0.024	0.054	-0.037**	0.019
Frequency of meeting attendance	-0.221**	0.097	0.216**	0.907	-0.012	1.611
Trust level	-0.200*	0.011	0.174***	0.045	0.026***	0.046

Number of observations = 102 Wald $\chi^2(26)$: 72.16 Prob> χ^2 = 0.000

Pseudo R^2 = 0.4925 Log likelihood = -37.182292

*, **, ***: significant at 10%, 5% and 1% level, respectively.

Source: Survey data (2016)

women who are restricted by household chores (Jagwe *et al.*, 2010).

In relation to the education level of the household head, a one year increase in the level of education increased the probability of choosing export market by 2.3% and significantly influenced the likelihood of choosing export market at 5% significance level. A probable explanation for this could be that with high level of education, farmers have more knowledge and capacity to interpret market information they acquire to suit their marketing needs. This not only gives them the ability to seek out better marketing opportunities, negotiate for better output prices but also meet market quality standards. Previous studies (Marenya and Barrett, 2007; Jari and Fraser, 2009) argued that, education enhances managerial competencies and successful implementation of improved production, processing and marketing practices. This makes it possible for such farmers to meet quality standard requirements in markets.

Ownership of means of transportation had a significant influence on choice of farm gate and local market outlets at 1% significance level. A unit increase in ownership of transportation means by one vehicle increased the probability of selling in the local market outlet by 17.3 % and decreased the probability of selling in the farm gate market outlet by 19.2%. This could be because ownership of transport ensures availability of produce transportation facilities by households. This reduces the problem of travelling long distance by farmers trying to access markets and reduces transportation cost of output and inputs to and from markets, respectively. Reduced transport costs yields higher farmers' gross margins as it lowers transaction costs. Other researchers (Chalwe, 2011; Panda and Sreekumar, 2012) pointed out that availability of on-farm transport increased the likelihood of farmers transporting goods to the market, as farmers were able to access marketing centers at lower costs and within shorter time periods. Ownership of transport equipment thus lowered transaction costs farmers faced in market access, thereby enhancing their probability for market participation which was often restricted by poor transport (Kabeto, 2014).

Participation in off-farm activities increased the probability of farmers selling in local markets by 16.3% and decreased the probability of them selling at the farm gate by 18.7%. This could be because farmers engaged in off-farm activities were able to

generate more income for investment in farming, such as purchasing transport equipment to send farm output to distant markets. Additionally, farmers involved in off-farm activities are able to access more reliable market information from market operators instead of middlemen. This promotes choosing high value markets to sell output thus disregarding the selling of pineapples at the farm gate. These findings are consistent with those of Tura *et al.* (2016) who argued that farmers who had off farm income were able to finance production and produced more marketed surplus. Therefore, off-farm income provides farming households with insurance against the risks incurred in farming, liquidity for investment and enables them to adopt new technologies (Siziba *et al.*, 2011; Fentie and Rao, 2016).

Farm size influenced the choice of farm gate, local and export market outlet at the 1%, 1% and 5% significance level, respectively. A unit increase in farm size by one acre (0.4 ha) increased the likelihood of choosing to sell in local markets by 4.3% and export markets by 0.5%, with a disregard for the farm gate outlet by 4.9%. This could be so because of economies of scale from reduced transaction costs such as certification and transportation costs incurred in marketing of pineapple output. Previous studies (Martey *et al.*, 2012; Melesse, 2015) pointed out that, households' market participation and volume of crop sold was determined by their access to improved agricultural inputs and farm size as these enabled a household to produce surplus crop for the market which influenced the level of agricultural commercialization.

Price per pineapple head was found to have a significant influence on choice of farm gate and local market outlets at a 1% significance level. A unit increase in price per pineapple head by UGX 1 increased the probability of farmers selling in the local market by 0.1% and decreased the probability of selling at the farm gate by 0.1%. Thus, farmers have an opportunity to earn higher profit margins when they sell in local markets than at the farm gate. Margins earned in local markets as a result of higher prices, allows farmers to make sufficient markup to absorb transaction costs incurred in pineapple production and marketing. According to Mailu *et al.* (2012), farmers opt for markets with high produce prices in comparison to those offering lower produce prices. However, if product prices decreased in these high value markets, farmers then opted to sell their produce in the immediate market to minimize

transaction costs they incurred during market access.

In terms of distance to the nearest market, a unit increase in distance to the market by one kilometer increased the probability of selling in local and export markets by 7.4% and 1.6%, respectively. However, it decreased the probability of selling at the farm gate by 9.0%. This indicates that with increased distance to the market marginal profits earned from selling in high value markets outweighs the opportunity cost of selling output at the farm gate based on transaction costs incurred. High value markets provide high profits which enable farmers to make profits. This finding concurs with Jagwe *et al.* (2010), who observed that more remotely located farming household had greater probability of traveling to markets to sell their commodities, as their urgent need for cash revenue and benefits from market participation outweighed the opportunity cost of transaction costs and time spent during market access. Farmers who live far away from markets are also more likely to have large farms, which exporters prefer because of economies of scale (Muthini, 2015).

In terms of the number of extension contacts, an increase in extension contact by one contact decreased the probability of choosing farm gate outlet by 13.7% but increased the likelihood of choosing to sell in local markets by 13.7%. This implies that information farmers got from extension officers was geared towards commercializing farmer production systems based on poverty eradication efforts in the area. The information gives farmers an edge in negotiating better prices but also facilitates informed market choice decisions by farmers. This finding is consistent with Jaleta *et al.* (2009) who argued that in order to commercialize, access to markets, information and risk reduction were important factors as they could strengthen linkages between farm households and markets, thus increasing technical efficiency advantage and market orientation of households.

For contract farming, having a contractual agreement increased the probability of farmers selling in local and export markets by 15.0% and 3.7%, respectively and decreased the probability of selling at the farm gate by 18.6%. This could be because contracts guaranteed farmers with reliable market, stable produce prices and minimum costs in screening, negotiations, policing, enforcement and bargaining with transaction partners every time a transaction

is to be made. Elupe and Nalukenge (2009) argued that contract marketing provided farmers' market assurance, high prices, inputs and knowledge of new agricultural technologies enabling farmers with contractual agreements sell more pineapple produce. Contract farming is therefore an instrument that can link small-scale farmers to high value domestic and foreign markets (World Bank, 2008).

Risk attitudes had a significant influence on choice of farm gate and local market outlets at the 1% significance level. Being a risk seeker increased the probability of farmers selling in local markets by 15.0% while it decreased the probability of a farmer selling in farm gate markets by 12.3%. This implied that producers who considered themselves more willing to accept risks than their peers were more likely to choose local markets over farm gate. This could be because as farmers' level of taking risks increases, they are more willing to accept the uncertainty and high transaction risks that come with accessing outlets with relatively higher profit margins. For risk seeking farmers the opportunity costs of reliable produce markets, prices and higher marginal returns in local markets outweighed transaction risks surrounding accessing the outlet. Previous studies (Coble *et al.*, 2000; Franken *et al.*, 2014) argued that, risk aversion significantly decrease the proportional use of marketing contracts for producers, as producers who chose cash sales as their primary marketing technique had minimum transaction costs although they were fully exposed to price risks.

Social capital was measured by farmers' density of membership, frequency of attending group meetings and the trust level farmers had for trading partners. Density of membership was found to significantly influence choice of export market outlet negatively at the 5% significance level. Results show that an increase in the number of groups farmers belonged to by one group decreased the probability of selling pineapples in export markets by 3.7%. This could be because as group membership increases, there is increased participation in decision making which may pose difficulty in reaching consensus in decision making. Also decreased commitment to groups' as they increase in number is likely due to high time and resource requirements for active group activity participation. This may dampen group involvement and participation in export markets. Kangogo *et al.* (2013) argued that increased density of membership index was associated with a decrease in loan

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repayment performance because as individuals increased the number of groups in which they had active participation, their commitment to the existing group was compromised, affecting their loan repayment performance.

Regarding frequency of attending meetings, a unit increase in farmer group meeting attendance by one meeting increased the likelihood of selling in local markets by 21.6%, while it decreased the likelihood of selling at the farm gate by 22.1%. This could be due to the fact that farmers who regularly attend group meetings are able to build networks, obtain market information and skills which could enable them access high product demand and priced local markets, but also increase their production efficiency. According to Kangogo *et al.* (2013), farmers that frequently attend group meetings acquire better farming and business skills which lead to their higher productivity as social groups' foster better commitment and trust.

Level of trust farmers had for their transaction partners significantly influenced the probability of selling at farm gate, local and export market outlets at the 10%, 1% and 1% significance level, respectively. Having high trust for transaction partners increased the probability of selling in local and export outlets by 17.4% and 2.6%, respectively. On the other hand, it decreased the probability of selling at the farm gate market by 20.0%. This indicated that trust between transaction partners was an important aspect for farmers to access distant markets. This could be because trust reduces opportunistic behavior between transaction partners and reduces transaction costs farmers incur when accessing markets. Therefore, trust is important for farmers to build strong and reliable personal networks and trustworthy buyer-seller relationships. According to Lu *et al.* (2008), trust reduced transaction costs in vegetable trade because it increased negotiating contractual obligations, facilitated the circulation of reliable information about technology, market opportunities and made the exclusion of unreliable agents easier for farmers.

CONCLUSION AND RECOMMENDATIONS

The study established farm gate outlet as the predominant choice of pineapple market among the small scale pineapple farmers. Most variables used in the model had significant effects on market outlet choice by small scale pineapple farmers. These included gender, education level, transportation

ownership, farm size, per unit price, market distance, risk attitudes, contact with extension and social capital dimensions of trust and density of membership which significantly influenced the choice of market outlet. Risk seeking farmers tended to disregard farm gate market transactions and relied more on high value market transactions. This shows that as farmers risk attitudes tend towards risk seeking, they are willingness to accept higher transaction risks and uncertainties in high value markets as long as it is associated with higher profit margins. However, risk aversion is found to impede choice of lucrative high produce priced markets, as risk-averse producers opt for cash sales marketing techniques to minimize transaction risks and costs. Social capital was found to be an important aspect in influencing output market decisions made by small scale farmers. Through social capital, farmers are able to obtain reliable market demand, supply and pricing information and acquire marketing skills and knowledge through extension training.

Based on the findings the study recommends that stakeholders should develop policies that enable farmers reduce agricultural risks and build up self-insurance strategies through participation in off-farm activities. This helps farmers reduce agricultural risks by diversifying sources of household income and counterbalances variations in product supply, demand and prices in agricultural markets. This will encourage farmers to become more risk seeking and consequently, accessing high value markets. Furthermore, social capital was found to foster trust in seller-buyer transaction relationships in the study. Therefore, the Government should develop strategies that help farmers develop trust for their transaction partners such as establishing pineapple product price floor and ceiling and making this information known to farmers through extension providers and newspapers. This will create market information transparency between small scale farmers and pineapple buyers which in turn would foster the development of trust farmers have for traders and therefore, increasing greater participation in high value markets by small-scale farmers.

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STATEMENT OF NO CONFLICT OF INTEREST

We the authors of this paper hereby declare that there are no competing interests in this publication.

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