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Cassava Market Participation Decisions of Producing Households in Africa

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Summary

Cassava is a basic staple and a major source of farm income for the people of sub-Saharan Africa. Efficiency in cassava marketing therefore becomes a very important determinant of both consumer's living cost and producer's income. At the farmer's level, which is the beginning of the marketing chain, food must produced in reasonable quantity to attract enough market participants that will make for efficient distribution. The use of food price policy to stimulate short-run marketed surplus of producing households has often been questioned. This is because some households are deficit producers who purchase crops they also produce. Increasing producer prices will therefore have adverse distributional effects on food buying, while bypassing autarkic households. An alternative would therefore be to find non-price strategic variables that motivate farm households to participate in commodity markets. This is the objective of this paper. The paper is based on primary data collected within the framework by the collaborative study of cassava in Africa (COSCA). Good market access conditions, improved market information especially on prices, the production of granules instead of dried roots or pastes increased market participation for sellers, while rising grain prices, younger and less educated heads of households encouraged participation for buyers.

Résumé

Participation des producteurs dans la prise de décisions dans la commercialisation de manioc en Afrique

Le manioc est une nourriture de base et une source principale de revenus pour les populations de l'Afrique sub-saharienne. Il faut un bon système de commercialisation pour assurer les revenus des producteurs et un coût de vie raisonnable des consommateurs. Au niveau du cultivateur (qui est au début de la chaîne de commercialisation), il faut qu'il produise assez pour attirer beaucoup de personnes dans la chaîne de commercialisation et pour créer un système efficace de distribution. On a souvent utilisé une politique de prix pour réaliser un surplus de production à court terme pour les producteurs, mais cela est controversé. Ceci est dû au fait qu'il existe des producteurs qui ne produisent pas assez, et doivent aussi acheter ces mêmes produits. L'augmentation des prix aux producteurs posera un grand problème aux achats de nourritures des producteurs déficitaires, et en même temps, exonéra des familles qui ne produisent que ce qu'elles consomment. Une alternative sera de trouver des moyens (qui ne s'attachent pas au prix de manioc) qui motivent les cultivateurs à joindre la chaîne de commercialisation des produits qu'ils produisent. C'est le but de cette étude. Elle est basée sur les données primaires collectées dans le cadre de l'étude participative de manioc en Afrique (COSCA). Des bons accès aux marchés, une amélioration du système d'information (surtout sur les prix), la production des granules au lieu des racines séchées, ou des pâtes, augmentent la participation des vendeurs, tandis que des prix de céréales élevés, des chefs de familles plus jeunes et moins éduqués, encouragent la participation des acheteurs.

Introduction

Cassava is a basic food staple, and a major source of farm income for the people of sub-Saharan Africa. It contributes about 40% of the food calories consumed in Africa (11) and both rich and poor farmers often

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derive more cash income from cassava than from any other crop or income earning activity (3, 14, 22). Hence, efficiency in cassava marketing is an important determinant of both consumers' living cost and producers' income. Moreover, as the process of urbanization progresses in African, an increasing share of national food consumption takes place at locations other than where food is produced. The marketing system must develop well to provide necessary services as producers sell in markets distant from where consumers buy their food (7). Yet, compared with cassava production, cassava marketing has received much less than sufficient attention (7, 21). There is however an inter-acting and mutually reinforcing relationship between increased production and efficient marketing (18). Efficient marketing system stimulates increased production, and the reverse constitutes a constraint to any development effort (17). A malfunctioning marketing chain constitutes an impediment to food security as investment in production becomes both more costly and more risky and may end up being wasted (7). At the farmers' level, which is the beginning of the marketing chain, food must not only be there (produced) to be moved, but must be there in reasonable quantity to attract enough market participants that would make for efficient distribution. Food price policy has often been used as an instrument for raising short-run marketed surplus of producing households. This has, for long, however, been questioned (8). This is because some farm households sell a portion of their output while others are deficit producers who purchase crops they also produce. An increase in official producer prices to stimulate production will have adverse distributional effects on food buying households, who therefore may not in the short run be able to respond to the producer price incentive. Thus, such questions as which factors determine whether or not a household participates in cassava markets? And do buyers and sellers respond in the same way to these factors? Needs to be answered in dealing with the production end of the marketing chain. The objective of this paper is to identify strategic variables affecting cassava market participation decisions of producing households. The paper is based on primary data collected from four countries of Africa (Ivory Coast, Ghana, Nigeria, Tanzania and Uganda), within the framework of the Collaborative Study of Cassava in Africa (COSCA). COSCA was funded by the Rockefeller Foundation and executed by the International Institute of Tropical Agriculture (IITA), Ibadan, Nigeria. Previous study on household food market behaviour in Africa (8) was restricted to only a section of a country in Africa - southeast Senegal and was on coarse grains. The present study not only presents a wider coverage of Africa but deals with cassava.

Method of the study

Climate, human population density, and market access infrastructure formed the basis for sampling. Following Carter and Jones (4), four basic climate zones were defined from temperature and duration of dry periods within the growing season (Table 1).

Information available on all-weather roads, railways and navigable rivers derived from the 1987 Michelin travel maps was used to divide a market access infrastructure map of Africa into good and poor zones according to the density of the roads, railways, or navigable waterways. Human population data from the United States Census Bureau were used to divide a population map of Africa into high demographic pressure zones with 50 or more persons per km^2, and low if less.

The three maps of climate, human population density, and market access infrastructure were overlaid to create zones with homogeneous climate, demographic pressure, and market access conditions. Each climate/population density/market access zone with less than 10,000 ha of cassava in each country was excluded. The remaining areas were divided into grids of cell 12' latitude by 12' longitude to form the sample frame for site selection. Two hundred eleven grid cells, distributed among the climate/population density/market access zones in proportion to the size of the zone and country were randomly selected for the study. These are 40 from Ivory Coast, 30 from Ghana, 65 from Nigeria, 39 from Tanzania and 37 from Uganda. A village was then randomly selected in each grid. This brings the number of villages selected in each country just equal to the numbers listed above. In each selected village, with the assistance of key village informants, a list of farm households was compiled and grouped into 'large', 'medium', and 'small' smallholder farm units. The terms large, medium and small are in parentheses because the target of the study and indeed all the households sampled were

Table 1
Definition of climatic zones

Climatic Zones	Temperature (°C)		Months of dry season
	Daily mean	Range	
Lowland humid	>22	<10	<4
Highland humid	<22	<10	<4
Subhumid	>22	>10	4-6
Non-humid	>22	>10	6-9

smallholder farm units. The grouping was entirely based on the subjective assessment of the key village informant and not on the size of farmland. One farm unit was then randomly selected from each stratum for the study.

Data collection

Leaders in cassava research in the national agricultural research systems in each country administered survey questionnaires to local farmers and took various measurements.

A rapid rural appraisal technique was employed to collect village-level information in the Phase I survey. Farmer groups consisting of men and women of wide age range were constituted and interviewed in each village. A structured questionnaire was used to collect qualitative information on the following aspects among many others: various production practices, cassava processing methods including cassava products processed, cassava marketing including cassava products marketed, village level altitude; mid-altitude refers to all the sampled villages that are more than 800 m above sea level and low altitude refers to all villages less or equal to 800 m above sea level. This survey was conducted in 1989-1991.

Phase II survey was aimed at detailed characterization of the cassava production methods at the field level. The field-level information which was collected from all crop fields of the selected farm units included, field history, inputs applied, cassava root yield along with some agronomic yield components and field size. This information was collected in 1991 from the same villages as in phase I.

Phase III survey was at the household level, also in the same villages. Relevant male and female household members were interviewed with structured questionnaire and relevant measurements taken. The information collected included quantity of cassava products sold or purchased for consumption, access to cassava price information in locations other than where marketed, type of cassava products processed by the household, household cash income and sources of the cash income, household composition and characteristics, etc. This information was collected in 1992.

Conceptual framework

A farm household will choose to participate in the cassava market if the net present value of the expected benefits from participation is greater than the net present value of remaining autarkic – net of costs. Costs here include all transaction costs the household faces in the process of market participation. Past studies suggest that the failure of many households to participate in commodity market is explained by transaction costs (5, 8, 10, 12). In areas with imperfect market and high transaction costs, it is costly to discover trading opportunities. Similarly, poor market access increases a household's cost of observing market prices to make transaction decisions, which reduces the household's leisure time (20).

These costs drive a wedge between the household shadow price and the market price of food products as shown in figure 1. The X-axis of the figure shows the value (shadow price) of cassava products to the households.

The Y-axis shows the market price of cassava products paid or received by a household participating in the market. It transaction costs (ι)= 0, the household

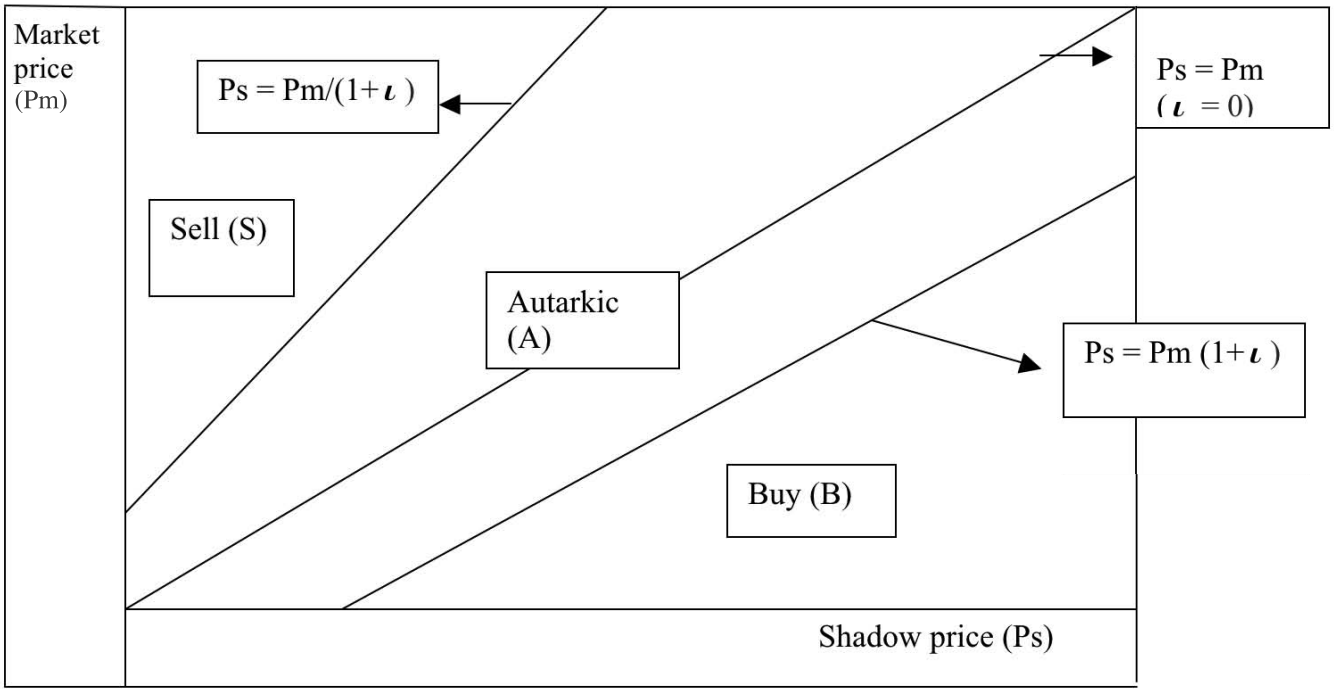

Figure 1: Household cassava market participation decisions with transaction costs (Source: 8).

equates its shadow price with the market price, so that market participation behavior is continuous and not subject to a threshold as the market price varies. For (ι)> 0, however the required level of benefits that will induce participation is higher. So that there exists an autarkic subset of households {A} that cannot equate market and shadow prices over a range. That is, for some finite $\iota > 0$.

$$\exists \{A\}= \{i/ Pmi(1+ \iota_i) < Psi < Pmi (1 + \iota_i) = \emptyset$$

And as $\iota \rightarrow \infty$, there will be no household participating in the commodity market.

Using q_i^{buy}, q_i^{sell}, p_i^{buy} and p_i^{sell} to denote quantity bought, quantity sold, buying price and selling price respectively, the household participation in the cassava market can also be demonstrated thus:

$$q_i^{buy} > 0 \; p_{si} (xi, yi) - p_i^{buy} > 0, \; q_i^{buy} = 0 \text{ otherwise}$$

$$q_i^{sell} > 0 \; \square \; p_{si} (xi, yi) - p_i^{sell} > 0, \; q_i^{sell} = 0 \text{ otherwise}$$

where xi yi denote the none-price and price variables respectively determining the household shadow prices.

The number of farm households participating in the cassava market has an upper limit of 100% when all the households under study are participating and a lower limit of 0% when none of the households is participating. The distribution of this variable shows that a greater number of the households (63%) had a zero participation rate, while a small number (37%) had positive participation (16% buying and 21% selling) rate. The Tobit model is an appropriate framework for modeling a variable so truncated (1, 19, 24).

Following Akinlola and Young (2), the theoretical framework of the Tobit model can be explained by the threshold concept. The decision of the farm household to participate in the cassava market (as a buyer or seller) may be characterized as a dichotomous choice between two mutually exclusive alternatives. This implies that there is a "break point" in the dimension of the explanatory variables below which a stimulus elicits no observable response. Only when the strength of the stimulus exceeds the threshold level does a reaction occur and the second decision of how many kilograms of cassava products to buy or sell is taken.

Let Y denote the decision variable, which is the dependent variable, and X a vector of explanatory variables. Y takes on two values, Y= y* if the decision is to participate in the market, and Y= 0 if the decision is to remain autarkic. At values of X greater than the break point, there is a probability of 1 for market participation; the level of participation (kilograms bought or sold) represented by y* is continuous. At values of X below or equal to the break point, the probability of market participation is zero and the level of participation is zero. The stochastic model of the analysis is as follows:

$$\begin{aligned} Y_i = y_i^* &= X'\beta + \varepsilon_i \quad \text{if } X'\beta + \varepsilon_i > T \\ &= 0 \qquad\quad \text{if } X'\beta + \varepsilon_i < T \\ & \qquad\quad i = 1.2...., N \end{aligned}$$

where N is the number of households, Yi is the level of market participation, Xi is a vector of explanatory variables, β is a vector of parameters to be estimated, T is the threshold point and ε_i is an independently distributed error term assumed N (0, σ^2).

To interpret the dependent variable as the probability of making a choice, some notion of probability is used as the basis of the transformation. The process translates the values of the X_i into a probability, which ranges in value from 0 to 1. For the transformation to maintain the property that increases in X_i are associated with increases (or decreases) in the dependent variable for all values X_i, the standard cumulative normal distribution of $X'\beta$ is used. It is given by:

$$F(X_i'\beta) = \int_{\infty}^{x_i'\beta} \frac{1}{\sqrt{2\prod}} e^{\frac{-s^2}{2}} ds$$

Where s is a random variable, which is normally distributed with mean zero and unit variance. To estimate the parameter β, a maximum likelihood procedure is applied.

Variable definition

Since a household may participate in the cassava market as a buyer or a seller, two models were empirically estimated. The first model uses the quantity (in kilograms) of cassava products sold in the market by a farm household as the dependent variable, while the other uses the quantity of cassava products (in kilograms) bought as the dependent variable.

The decision to participate in the market as a seller or buyer may be related to the characteristics and composition of the household – affecting tastes and leisure, the size of the household farm – affecting the level of production, market access conditions, availability of cassava price information, price of cassava products, type of cassava products made by the household and country dummies; all of which are proxy variables for transaction costs.

The variables specified to capture the effect of composition and characteristics are household size (HHSIZE), dependency ratio (DRATIO), age (AGEHH) and level of formal education (EDUCHH) of the household head. All else equal, size of the household should be negatively related with the household participation as a seller but positively related with its participation as a buyer. The same relationship is expected for dependency ratio. This is because; larger households would most often demand greater food needs. Similarly, household with larger dependency

ratio will be prone to production labor constraints and hence may tend to consume more than it produces. Although it is theoretically expected that age and level of formal education of the household head will affect tastes and leisure preferences of the household, the expected directions of their relationships in this case are ambiguous. It is possible that education will endow the household head with better production managerial skills (6), in which case, it could be positively related with participation as a seller with the reverse as a buyer. It is also possible that education could increase the chances of the household head earning non-farm income (6), perhaps through pension and/or part-time jobs. This could reduce the household's dependency on cassava for cash income and hence reduce its participation as a seller while increasing its participation as a buyer. As for age, it is possible that older and more experienced heads are able to take healthier production decisions and have greater contacts, which allows trading opportunities to be discovered at lower costs than younger ones. In this case, the expected relationship could be positive for sellers and negative for buyers. It is also possible that younger heads are more dynamic with regards to adoption of innovations both in terms of those that would enhance their productivity and those that would enhance their cassava marketing contacts at reduced costs.

Households who have easy road access to markets (ACCESS) have lower transaction costs of market participation, either as seller or as buyers, than households with poor road access to markets. Availability of information (INFO) on prices of cassava products in different locations is likely to enhance the participation of households in cassava markets either as buyers or as sellers because the cost of searching for suitable prices is reduced. The expected relationship of market participation with price of cassava products is obvious – positive for sellers and negative for buyers. In addition, price of grains was specified and expected to have positive relationship with buyers', and negative relationship with sellers' participation in the cassava market. All prices were normalized to one in each country to avoid currency differences. This harmonizes the maximum price in all countries to one.

Different types of cassava products have different characteristics in terms of perishability and moisture content. These are likely to affect their marketing costs. For instance, Hahn (9) observed that cassava fresh roots, which have a moisture content of 70%, are very bulky and therefore much more expensive to transport than processed cassava products. We distinguish, for purposes of this analysis, four major types of cassava products: Granules, Pastes, Driedroots and others. We shall be comparing the dummy for granules with the other three products.

Country dummies (Tanzania, Uganda, Ivory Coast) were then included to capture the effects of geographical differences in costs of marketing (8), with Nigeria as the comparison category.

As a result of interaction between the variables for market access and price of cassava products in the sellers' equation, two specifications were made for sellers; separating market access and price of cassava products. This was not done for the buyers' equation because prices collected for this study were household specific prices, and virtually none of the households were buying and selling. The variables are defined in table 2 below.

Empirical results

The explanatory powers of the specified variables as reflected by Pseudo-R^2 value seem low, but this is not uncommon in cross-sectional analysis (2). Other studies with comparable coefficients of determination include Akinola and Young (2) and Nweke (14). The overall goodness of fit as reflected by Prob> chi^2 is however good. It is less than 0.001 in each of the specifications (Table 3).

The probability of a farm household participating in the cassava market either as a seller or buyer was positively and significantly correlated with price of cassava products. The probability also increased significantly with the price of grains for buyers, but declined though not significantly for the sellers. It was significantly higher for selling households whose access to market is with vehicles or on foot with a distance of within 10 km than for those whose access is on foot with a distance of more than 10 km. The direction of the relationship with the market access variable for buying household was however the reverse situation, although not statistically significant. The probability of market participation increased with the household size, both for buyers and sellers, but the relationship was not significant in either case. While the probability declined for buyers, it increased for sellers, with dependency ratio, though the relationship was also not statistically significant in either case. The probability of market participation increased with the age of the household head for sellers, but declined with age for buyers. The relationship for the buying households was statistically significant. The direction of the relationship of market participation probability with the level of formal education of the household head was negative for both buyers and sellers. The relationship for the buying households was also statistically significant. The probability declined with farm size for sellers but increased with farm size for buyers, but none of these relationships was statistically significant.

The probability of market participation was positively related with availability of information of prices of cassava product both for buyers and sellers (with that of sellers being highly significant). It was higher among households with information on prices of

Table 2
Definition of variables specified in the regression function of market participation behavior of farm households

Variable	Mean (Std deviation)	Unit or Type	Explanation
SELWT*	538.63 (1814.11)	Continuous	Kilograms of cassava product sold
BUYWT*	10.87 (22.78)	Continuous	Kilograms of cassava products bought
Cassava price (sell)	0.44 (0.46)	Continuous	Seller's price of a kilogram of cassava product
Cassava price (buy)	0.31 (0.40)	Continuous	Buyer's price of a kilogram of cassava product
Price of grains	0.30 (0.38)	Continuous	Price of a kilogram of grains
HHSIZE	9.58 (5.86)	Continuous	Size of the household
AGEHH	50.85 (16.48)	Continuous	Age of the household head
EDUCHH	4.21 (4.46)	Continuous	Number of years of formal education of the household head
DRATIO	0.54 (0.18)	Continuous	Percentage of household size whose age is either less of equal to 15 or greater than 65
FMSIZE	1.74 (2.30)	Continuous	Size of the household farm (ha)
INFO	0.10 (0.29)	Binary	I, if household had information on prices of cassava products in locations other than where they sell
ACCESS	0.81 (0.40)	Binary	I, if market access was with vehicle or on foot with a distance of within 10 km; else 0
Granule	0.20 (0.38)	Binary	I, if the major cassava product is granule; else 0
Driedroots	0.45 (0.50)	Binary	I, if the major cassava product is dried roots; else 0
Pastes	0.13 (0.33)	Binary	I, if the major cassava product is pastes; else 0
Others	0.21 (0.41)	Binary	I, if the major cassava product is others; else 0
TANZANIA	0.22 (0.42)	Binary	I, if country is Tanzania; else 0
UGANDA	0.19 (0.40)	Binary	I, if country is Uganda; else 0
IVORY COAST	0.23 (0.42)	Binary	I, if country is Ivory Coast; else 0
NIGERIA	0.35 (0.48)	Binary	I, if Country is Nigeria; else 0

Note: * = Dependent variables

Table 3
Parameter estimates (based on Tobit model) of probabilities of household cassava market participation

	SELWT			BUYWT
Variables	Market Access	Price	Both	
Intercept	-3858.77 (-3.21)***	-3583.74 (2.84)***	-4081.67 (-3.07)***	-16.77 (-0.74)
Price of cassava	_	4682.11 (5.69)***	4568.35 (5.59)***	164.70 (7.25)***
Price of grains	-0.55 (-0.10)	-0.62 (-0.14)	-0.81 (-0.34)	45.85 (2.70)***
ACCESS	857.62 (1.80)*	_	641.17 (1.20)	-2.30 (-0.25)
HHSIZE	16.45 (0.57)	24.39 (0.77)	21.26 (0.67)	0.83 (1.34)
DRATIO	1152.64 (1.15)	1266.00 (1.14)	1215.31 (1.10)	-10.61 (-0.53)
AGEHH	2.40 (0.22)	0.68 (0.06)	0.43 (0.04)	-0.50 (-2.19)**
EDUCHH	-49.87 (-1.01)	-3.12 (-0.06)	-6.68 (-0.13)	-3.31 (-3.41)***
FMSIZE	-35.26 (-0.37)	-76.97 (-0.63)	-69.48 (-0.58)	0.72 (0.55)
INFO	3895.20 (7.75)***	2450.08 (4.84)***	2481.00 (4.92)***	0.88 (1.14)
Driedroots	-933.58 (-2.01)**	-938.57 (-1.81)*	-969.15 (-1.87)*	-0.71 (-0.55)
Pastes	-971.67 (-1.70)*	-667.99 (-1.12)	-611.14 (-1.03)	-4.50 (-0.36)
Others	-486.26 (-1.00)	-608.43 (-1.14)	-572.50 (-1.07)	3.91 (0.35)
TANZANIA	-721.55 (-1.23)	-1898.43 (-2.57)***	-1634.21 (-2.18)**	-24.32 (-2.08)**
UGANDA	-641.87 (-1.07)	-625.49 (-0.97)	-641.89 (-1.00)	12.72 (1.14)
IVORY COAST	988.21 (2.10)**	304.30 (0.61)	376.92 (0.75)	-0.91 (-0.09)
Statistics:				
No. of obs.	433	433	433	433
Chi^2	116.62	159.08	160.58	86.22
Prob> Chi^2	<0.001	<0.001	<0.001	<0.001
Pseudo R^2	0.08	0.11	0.11	0.07

Note: Figures in parentheses are t-ratios; *** denotes P ≤ 0.01; ** denotes 0.01 < P ≤ 0.05, and * denotes 0.05 < P ≤ 0.10

cassava products than in those with no information. Compared with households that produced granules, the probability declined for both buying and selling households that produced dried roots or pastes. The relationship with selling households was also statistically significant. The probability of cassava market participation was lower for selling households in Tanzania and Uganda than for those in Nigeria, with the Tanzania relationship being statistically significant. It was however higher for selling households in Ivory Coast than for Nigeria. Similarly, the probability was lower for buying households in Ivory Coast and Tanzania than for those in Nigeria, also with the Tanzania relationship being significant. The direction of the relationship for buying households in Uganda was positive as compared with Nigeria, though not statistically significant.

Discussion

These results indicate that price of cassava products had important influence on the level of cassava market participation by the farm household. Its positive influence on the selling households' participation is consistent with economic theory that price induces increased supply. But its positive relationship with the buying households' participation seems counter-intuitive. However, a plausible explanation for this phenomenon is that higher prices are interpreted by some households as signals of impending food scarcity, motivating them to stock food (8). The observed positive relationship between market participation and price of grains for buying households is consistent with expectation. Greater grain scarcity forces buying households to rely more on cassava markets. This underscores the role of cassava as a famine-reserve crop.

The positive and important relationship between the market factor and the selling households' market participation is consistent with our hypothesis that households with good road access to markets have lower transaction costs than those with poor access. The direction of the relationship between the market factor and the buying households' participation was because the more removed from the market center a village is, the more undiversified in crop production, and the more concentrated in cassava production the village is (15). Households in remote villages are likely to have restricted food consumption choices and hence likely to consume more of the available staple (which in our case is cassava) than those closer to market centers whose consumption choices are more diversified.

The ambiguity over age of the household head; whether the impact is positive for sellers and negative for buyers owing to increasing productive and marketing experience or negative for sellers and positive for buyers; younger farmers being more innovative was in our case decided in favour of the former alternative. The impact of level of formal education of the household head was negative for both buyers and sellers. Education as we have noted before could endow the household head with the necessary skills to earn non-farm income. Among the educated household heads were people who retired from wage employment and so depended on pension for cash income (14). This could reduce the reliance on cassava for cash income. In addition, educated household heads are likely to be better aware of the need for balanced diet in the household.

Information on prices of cassava products in different locations had a very strong and positive influence on participation for selling households. One of the implicit assumptions of fundamental welfare theorems is that all characteristics of all commodities are observable by all market participants (13). Without this condition, if it is costly to acquire such information, the well known problem of adverse selection arises thereby discouraging market participation (23). Goetz (8) observed that regarding the effects of fixed cost-type variables on market participation, better information plays an important role for sellers but not for buyers of coarse grains in Senegal. The processing techniques of granules are relatively advanced, and they enter the market in ready to serve forms, while those of dried roots or pastes are not so advanced, thus necessitating additional preparation in the home before eating. In addition, granules are more competitive with food grains in the market than dried roots, such that cassava is more frequently processed into granules for sale and into dried roots for home use (15). These suggest a lower transaction cost of marketing granules than dried roots and thus help to explain the negative relationship between production of dried roots and market participation for selling households.

The negative and important relationship between the dummy for Tanzania and market participation for both buyers and sellers as compared with Nigeria could be because of the differences in the condition of road access to markets between the two countries. The percentage distribution of COSCA representative villages with poor road access to markets was four times higher in Tanzania than in Nigeria, and percentage of those with easy road access to markets was also higher in Nigeria than in Tanzania (16). The positive relationship of the dummy for Ivory Coast with participation for sellers is surprising. However, the percentage of COSCA representative villages with good road access to markets was higher in Ivory Coast than in Nigeria.

Conclusion

Good market access conditions, improved market information especially on prices, the production

of granules instead of dried roots or pastes, and Nigerian farm households instead of those in Tanzania increased market participation for sellers, while rising grain prices, younger and less educated heads of households as well as farm households in Nigeria instead of those in Tanzania encouraged participation for buyers. These results suggest that improved market access conditions, better market information especially of prices and type of cassava products made could act as alternative options to output price changes in stimulating cassava marketed surpluses in sub-Saharan Africa. This could be important because, as noted before, higher producer prices would in the short run likely benefit only the sellers while imposing costs on buying, and bypassing autarkic households.

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