# Agricultural Market Liberalisation, Private Trade and Incomes: Implications for Poverty Reduction in Rural Kenya

## By

**Rosemary Atieno**
**Institute for Development Studies**
**University of Nairobi**
**P.O. Box 30197, Nairobi, Kenya**
**E-mail: r.atieno@form-net.com**

***Abstract***

The liberalisation of agricultural markets in Kenya has highlighted the potential role of private traders in the marketing of agricultural commodities and the impact on rural incomes. With the declining ability of both the agricultural and formal sectors to generate additional employment, the participation in the private trade of agricultural commodities provides an important source of employment and incomes especially in the rural areas. This also has implications for rural poverty, which has increased significantly in the recent years. This paper analyses the effect of market liberalisation on the participation of private traders in maize marketing, focusing on the factors, which determine private trader's participation in the advent of market liberalisation.

The paper uses primary data collected through a field survey in Kenya during the period of January to April 2000. Dividing the factors hypothesised to determine participation of private traders in maize marketing into household characteristics and infrastructure related factors, and characterising the trader's decision as a dichotomous choice, the paper uses the probit model to estimate the effect of these factors on the traders' participation in maize marketing. Regression analysis and descriptive statistics like the t-test for the difference between means are also used to show the effects of infrastructure and household characteristics on incomes.

The results show that market liberalisation, entailing the removal of price and movement controls, is not sufficient in increasing the participation of private traders in maze marketing in the country. Other factors including access to infrastructure facilities, transaction costs (consisting of transport, storage and information costs) as well as individual's ability to bear risks are important determinants of private traders participation in a liberalised maize market.

**1.Introduction**

The liberalisation of agricultural markets in Kenya has highlighted the potential role of private traders in the marketing of agricultural commodities and their impact on income generation especially in the rural areas. With the declining ability of both the agricultural and formal sectors to generate additional employment, the development of private trade in agricultural commodities provides an important source of employment and incomes especially in the rural areas. Studies on Micro and Small Scale Enterprises (MSEs) in the country have shown that trade in agricultural commodities is one of the main activities in the sector providing a source of income and livelihoods (Parker and Torres 1994, Daniels et. Al, 1995). This has implications for rural poverty, which has increased significantly in the recent years. Policy measures have also defined an increasing role for the private sector in agricultural marketing (Republic of Kenya 1994, 1996, 1997).

However, although the micro and small scale enterprises of which trade in agricultural commodities are an important part have proved an important source of employment, its ability to provide a sustainable source of income has been questioned (Kenya Human Development Report 2001, forthcoming). Most of these businesses are characterised by small size of operation, few employees and lack of permanent structures among other things (McCormick 1992). This paper analyses the effect of market liberalisation on the participation of private traders in maize marketing, focusing on the factors, which determine private traders' participation. This is important in identifying the potential contribution of private maize trade to rural incomes and hence its role in poverty reduction.

The paper is organised into the following sections: Section two gives the background to agricultural market liberalisation in Kenya. Section three presents the methodology used in terms of the data sources, and the analytical techniques. Section four discusses the results of the different analyses carried out while section five presents the summary and conclusions, focussing on the implications of the results for poverty reduction efforts in Kenya.

**2. Background to agricultural market liberalisation**
Before liberalisation, the restriction in the movement of major scheduled commodities limited the growth of private trade in major commodities like maize. The marketing of the major cereals consisted of the formal and the parallel informal marketing channels operating side by side, and to some extent dependent on each other. The marketing system was based on strict regulation of private trade and direct government participation in the marketing through agricultural marketing boards. The formal market system was mainly dominated by the National Cereals and Produce Board (NCPB), which oversaw the marketing of maize, wheat, plus other legumes and grains. The board acted as the principal purchaser, and distributor of such grains. It was also responsible for both inland and import/export movement of the scheduled commodities. Through a national network of depots, it bought and resold maize to

major millers, wholesalers and consumers. The official restriction in the inter-district movement of maize enforced this role of the board (DAI and IDA 1989).

Since NCPB did not guarantee a secure outlet for all farmers, the informal market thrived parallel to the formal system. This informal marketing system however operated only intensively at the local level serving mainly rural areas within the districts, with less interregional trade. Although this informal private maize trade constituted a vibrant part of the national economy especially by providing employment to a significant section of the population, their performance has however, been described as vigorous but inefficient and costly. This is mainly because most entrepreneurial resources were directed at outmanoeuvring the formal system instead of minimising the handling and transaction costs and maximising turnover. This was largely due to its official illegality (DAI and IDA 1989; Argwings-Kodhek et. al, 1993). This led to the limited exploitation of the regional comparative advantage in the production of maize and did not facilitate market integration and development, particularly private trade.

The main types of actors in the informal market consisted of small-scale market traders, large-scale commodity wholesalers and local millers. The small-scale traders aggregated small supplies from farmers or smaller traders and resold to consumers; the wholesalers, mainly lorry traders transported maize to deficit areas for wholesaling. Other players included agents and millers.

Policy reforms in agricultural sector started in the early 1980s. The first attempts at policy reforms were contained in the 1979/83-development plan, which advocated for gradual price decontrols and the promotion of private trade in agricultural commodities. These reforms initially emphasised liberalisation in grain marketing and the removal of price controls. This was followed by decontrols in import licensing and the removal of obstacles in the marketing and distribution system for both products and inputs. The reforms were mainly aimed at encouraging the private sector to play an important role in the production, processing and marketing of agricultural commodities.

The grain market was temporarily liberalised in 1986/87 when the Cereals Sector Reform Programme (CSRP) was started, with millers being temporarily allowed to purchase directly from farmers. Gradual liberalisation in the marketing of agricultural products was introduced in the late 1980s. This limited the functions of the NCPB, and left a large share of the market to the private traders, millers and co-operatives through the removal of inter-district movement restrictions. The maximum amount of maize transported across districts was raised to ten 90 Kg bags. This was extended to 44 bags in 1991 and to 8 tons in 1992. The maize market was fully liberalised in 1994.

The deregulation of markets, decontrol of prices and trade liberalisation were aimed at encouraging the private sector to play an increased role in the production, marketing and processing of agricultural commodities. The liberalisation of agricultural markets was therefore expected to increase the role of private traders and improve efficiency in the sector. Initially it was expected that the response of private trade to the

liberalisation of the maize market would be most evident among the long distance traders and the large-scale millers as they were the most affected by government regulations. The most significant impact on local maize trade would then involve the scale of transport, as large lorries displaced smaller means of transport. This would further open more opportunities for small-scale traders, thereby raising their incomes. Another important category of traders has been the small-scale mobile and sedentary traders operating in the major market centres. With market liberalisation, the number of these traders has increased and tends to increase most during the harvest time when procurement is easy. While the sedentary traders have permanent operating points, the mobile one travel between different markets trading in maize, and using different transport modes in their activities (Odhiambo 1997).

## 3. Methodology

### Types and Sources of Data Used
The paper uses primary data collected through a field survey in three districts of Kenya during the period of January –April 2000. The districts, namely Nakuru, Kakamega and Kisumu constitute both the surplus and deficit maize production areas of the country. The study unit consisted mainly of market traders operating in major market centres in both urban and rural areas. Both traders engaged in maize trade and those not were interviewed. The choice of this unit was justified by the observation that since the liberalisation of maize trade in the country, the number of small-scale market traders has increased significantly and are therefore assumed to have the highest potential for the development of private maize trade in the country (Odhiambo 1997). A sample size of 480 respondents was targeted, but only 347 traders were successfully interviewed.

### Variable definitions
A number of factors influence traders' decisions to participate in maize trade. In this paper, the factors hypothesised as determining the participation in private trade were broadly categorised into individual household characteristics and infrastructure. These are described below.

*Household/business characteristics*: consisted of the ability to bear risk, household size, business experience, number of owners and education level. Agricultural trade is largely dependent on agricultural commodities whose production is subject to random shocks. Traders are therefore assumed to be risk averse. Ability to bear risks is therefore important in determining the decision to enter into such trade or not. The ability to bear risk is reflected in various household resources like income and assets owned. In this study, income was measured as total income from the business and other non farm sources, while assets were measured as the value of capital stock owned. Other characteristics consisted of ownership size, gender of the trader, business experience as measured by years in the business, education level, household size as measured by number of dependants and access to other forms of information. Because traders' information about the market is not perfect, education, and access to other forms of information were considered important in influencing the demand for

marketing services and their participation in trade. In addition, the traders' previous business experience is important in improving their information about the market. Hence the level of education and business experience were included as variables in the analysis.

*Infrastructure related factors*: are important since traders face transaction and other costs in trade, which are mostly influenced by the state of infrastructure. In this study, infrastructure related factors consisted of the type of road used, distance to the road, distance to the market, type of market facility used, and mode of transport used. These were defined as follows:

*Type of Road Used:* the quality of the road is considered more relevant in determining the time taken by the trader and the cost incurred in handling the commodity. The classification of road types was therefore done according to the road quality as follows: 1=Highway; 2=main tarmac road; 3=all weather murram road; 4=access road.

*Distance to the road:* This was taken as distance from the business premise to the different road categories in kilometres, namely distance to highway, tarmac, all weather road and access roads.

*Mode of Transport:* Different modes of transport are used by traders to transport their goods. These are defined as follows: pickup trucks or lorries; public transport; bicycles; donkeys; handcart and head load.

*Distance to the market centre:* This was taken as the distance in Kilometres to the respective market categories used, namely primary, secondary and tertiary markets. A primary market is defined as a periodic market where buyers and sellers assemble generally once a week to trade agricultural commodities and other consumer goods. A secondary market on the other hand is larger than a secondary market with business housed in permanent structures and business transactions are daily. Wholesaling and stocking of goods are common feature of secondary markets.

**Analytical Framework**
The paper uses the probit model as well as regression analysis and descriptive statistics in the analysis. The probit model is used to estimate the factors influencing traders participation in maize trade, while regression and descriptive statistics, mainly comparison between means, are used to show the effect of specified variables on income.

In an economic setting, an economic unit is assumed to make decisions aimed at maximising its utility. In a liberalised maize market, an individual is assumed to be faced with the alternatives of either participating in private maize trade or not. The decision to participate in the trade can be considered as a dichotomous choice between two mutually exclusive alternatives. The dependent variable therefore involves either participation or non-participation. Predicting and explaining this kind of decision

requires a binary model to identify the relevant economic factors and provide information on the magnitude of their effect.

In specifying a binary decision model, a random variable Y (dependent variable), takes the value 1 if the event occurs and 0 if otherwise. In addition, the probability of an event occurring depends on a vector of independent variables $X_i$ and a vector of unknown parameters $U_i$ (Akinola 1987).

The probit model has several desirable characteristics in analysing such functional relationships. The disturbance term is homoscedastic, unlike in the linear probability model. In addition, the magnitude of the effect of the explanatory factors depends upon the value of the economic unit and the magnitude of the estimated coefficient B. The probit model is derived from the following relationship: The probability of an event occurring depends on an unobserved utility index I, which is determined by a number of independent variables ($X_i$). This can be expressed as:

$$I = \beta_0 + \beta_i X_i \qquad\qquad (1)$$

The unobserved index I, is related to the probability of the event occurring, in this case the decision to participate in informal sector activity, as follows:

Let $Y_i = 1$ if the individual participates in informal employment
$Y_i = 0$ if otherwise.

It is assumed that for each individual, there is a minimum level of I, given as I*, below which the event will not occur. Therefore

$Y_i = 1$ if $I^* \leq I$ and $\qquad\qquad (2)$
$Y_i = =$ if $I^* > I$

Since the only observable data is on $Y_i$ and $X_i$, the coefficient $\beta_i$ can be estimated as follows:

$$I = \beta 0 + \beta_i X_i + U \qquad\qquad (3)$$

Therefore

$Y_i = \beta 0 + \beta_i X_i + U$ if $I \geq I^* \qquad\qquad (4)$
$Y_i = 0$ otherwise

The mathematical model for estimation used is that specified by Maddala (1991, p.221) as follows:

$$Y_i = \beta_i + U \text{ if } \beta_i X_i + U \geq I^* \qquad\qquad (5)$$

$Y_i = 0$ if otherwise

This can be written as $Y_i = \beta 0 + \beta_i X_i + U$           (6)
Where E (U) = 0.

The equation (5) states that the probability that the event $Y_i$ will occur depends on a number of factors represented by $X_i$. $Y_i$ is defined as the individual's decision variable taking the values of 1 and 0. The parameter $\beta_i$ can be estimated using the probit method.

The estimation function becomes:

$$E(Y_i) = \beta 0 + \beta_i X_i + U \qquad (7)$$

With both zero and non-zero values of $Y_i$ used.

$Y_i$ = the decision to participate in maize trade
$Y_i$ =1 if one participates
$Y_i$ = 0 if otherwise
$\beta_i$ =is the parameter to be estimated showing the probability that an individual will participate in informal employment.
$X_i$ = the vector of explanatory variables

Ui is the disturbance term

Assuming that the individual's decision to participate in private maize trade is a function of infrastructure and individual characteristics, the functional form can be specified as follows:

$$P(e) = F (H, I ) \qquad (8)$$

Where:
P(e) is the probability of the event taking place
H is the vector of individual household characteristics
I is the vector of infrastructure related variables

## 4. Results and Discussion

**Household Characteristics of the Sampled Respondents**
The summary statistics for some of the selected variables are given in table 1. From the total sample, 78% of the respondents were found to be females. Upto 98% of the respondents had below 12 years of formal education, showing that most of the participants in this trade are those with secondary level of education as the highest level attained. The mean number of years spent in formal education was eight years.

Most of the businesses (96%) were found to be one person owned with females owning 77% while males owned 23%. A number of reasons were given for joining the business. The major ones were supplementing family income (50%), and starting a new occupation (27%). Other reasons included the need to diversify income sources, and the low start-up capital required for the business. Out of the total respondents, about half (52%) had been engaged in other businesses before joining the maize trade. Business experience, as measured by the number of years that the respondents had been in any form of business showed that over 77% of the sample had over 10 years experience, while the mean number of years in business was found to be 11 years.
Seasonality is likely to affect trade in agricultural commodities. From the sample, 90% of the traders operated throughout the year, with only 10% operating seasonally, which was mainly attributed to seasonal fluctuations in maize production and supply. This may suggest that maize trade is becoming an important source of livelihood for a large proportion of the population.

**Table 1: Summary statistics for selected variables**

| Variable | Mean | Standard error | Maximum |
|---|---|---|---|
| Monthly Income (Kshs) | 11,131 | 3921 | 45,000 |
| Age of respondent | 40 | 1.602 | 70 |
| Number of owners | 1 | .283 | 3 |
| Business experience (years) | 11 | .415 | 12 |
| Education attainment (years) | 8 | .331 | 14 |
| Household size | 5 | .159 | 20 |
| *Distance in (kms) to:* | | | |
| Highway | 6.4 | 0.703 | 40 |
| Main tarmac road | 4.6 | 1.538 | 14 |
| All weather murram road | 5.6 | .539 | 50 |
| Access road | 5.8 | .542 | 50 |
| Primary market | 6.2 | 2.503 | 60 |
| Secondary market | 8.6 | 2.567 | 60 |
| Tertiary market | 14 | 1.022 | 100 |
| *Time taken to:* | | | |
| Primary market (hrs) | 0.5 | 2.357 | 7 |
| Secondary market (hrs) | 0.45 | 2.275 | 7 |
| Transport costs (Kshs) | 1193 | 253 | 60,000 |
| Labour costs (Kshs) | 366 | 102.015 | 6,000 |
| Material costs (Kshs) | 650 | 370 | 45,000 |
| Storage costs (Kshs) | 272 | 26 | 9,467 |

Source: Agricultural Market Survey Data, 2000

**Access to infrastructure facilities**

In this section, we present a descriptive account of the traders' access to the different types of road and market infrastructure facilities. Access to infrastructure was investigated in terms of access to transport facilities like the different road types, market categories and the modes of transport used by the traders.

On average, most traders were found to be located within less than 10 kilometres of the different road types, with the mean distance to highway being six kilometres. Mean distance to the different market categories was found to be six kilometres for primary markets, and nine kilometres for secondary markets. The most common mode of transport used to the different markets was found to be head loading, with 44% using head loading to primary markets and 34% using head loading to secondary markets. A major explanation for the use of head loading can be found in the proximity of traders to the different market categories, although most traders cited its convenience in comparison to other alternatives as the main reason.

Transaction costs were investigated in terms of the major transaction costs incurred by traders, which consisted of labour costs, transport costs, storage costs and materials costs. The mean costs were Kshs 1,193 for transport, Kshs 366 for labour, 650 for materials and 272 for storage. Most traders got their market information through the media, mainly radio and newspapers.

**Results of the Probit Analysis**

The probit analysis shows the determinants of the decision to participate in private maize trade in the country. The results are presented in table 2.

**Table 2: Determinants of traders' participation in private maize trade**

| Variable | Coefficient | z-score | p |
|---|---|---|---|
| Age | 0.047 | 1.194 | .234 |
| Years in formal education | 0.094** | 4.912 | .0000 |
| Household size | -0.0062 | -1.834 | .0672 |
| Number of owners | 0.1171** | 4.728 | .0000 |
| Business experience | -0.005 | -.405 | .6818 |
| Income | 0.0120** | 6.746 | .0000 |
| Business distance to highway | -0.0276* | -2.349 | .0188 |
| Business distance to tarmac road | -0.0043 | -0.636 | .5222 |
| Business distance to all weather road | -0.0231** | -10.193 | .0000 |
| Business distance to access road | -0.0231** | -11.114 | .0000 |
| Business distance to primary market | 0.0011 | 1.241 | .215 |
| Business distance to secondary market | 0.0086 | 0.874 | .3844 |
| Business distance to tertiary market | -0.0021** | -3.158 | .0000 |
| Transport costs | -0.0111** | -4.838 | .0000 |
| Labour costs | 0.0001 | 0.379 | .704 |
| Storage costs | -0.0012 | -.521 | .6030 |
| Material costs | -0.0010** | -3.259 | .0000 |
| Constant | .08283 | 0.03345 | .9760 |

$X^2 = 21986$; P= .000

The results of the probit analysis (table 2) shows that among the variables specified as household characteristics, the level of education as measured by the number of years in formal education, the number of owners and the level of income are statistically significant in determining the decision to participate in private maize trade. The level of income reflects the individual's ability to bear risk, hence the higher the ability, the higher the chances of participation. The higher the number of years spent in formal schooling, the more likely is one to participate in the maize trade. Given that the maximum number of years spent in school was observed as 12 years, this result shows that within this limit, the level of education is significant in determining the decision to participate in the trade. The maize trade therefore provides an important avenue for income generation for those within this level of education.

An increase in the number of owners significantly increases the probability of participating in the trade. This can be explained by the fact that an enterprise owned by more than one person spreads the risks associated with the trade among the owners, reducing individual risks, as opposed to those owned by one person. This minimises individual risks. The level of income is also significant in determining the decision to participate. Higher incomes increase the ability to bear risks associated with the trade, hence those with higher incomes are more likely to participate than those with low incomes. This result can explain the dominance of the maize trade in the country by a few large-scale traders who are able to bear the risks of the trade, as opposed to the

small-scale traders who cannot expand their level of operation. Both incomes and the number of owners can be seen as reflecting individual trader's ability to bear the risks associated with the maize trade. This may call for the formation of marketing cooperatives, which reduce individual risks in maize marketing through risk pooling. This will be important in increasing the participation of small-scale traders who are otherwise discouraged by low incomes and reduce the domination of the market by a few large-scale traders. Risks are an important element of agricultural trade. In Uganda, a study on maize trade found that lack of formal sanctions increased traders' exposure to risk. As a result safety nets against structural and social risks were found to be important in determining the extent to which maize trade can be considered a sustainable source of livelihood for the participants (Sorensen, 2001).

From the infrastructure related variables, business distance to highway, distance to all weather murram road as well as distance to access road are statistically significant in determining participation. Increases in the distance to these road categories significantly reduce the chances of participation in trade. However, distance to both primary and secondary markets was not statistically significant. Only distance to tertiary markets was statistically significant. This can be attributed to the fact that most traders in the sample were located in either primary or secondary markets, hence are not affected by distance to these facilities.

Among the different components of transaction costs, transport costs was statistically significant. Material costs were also statistically significant. Increasing these two components of transaction costs therefore significantly reduces the chances of participation in trade.

A number of factors therefore determine the decision to participate in private maize trade, ranging from household characteristics to infrastructure variables. These factors need to be addressed if liberalisation in the maize market is to attract private traders.


**Regression analysis of the selected variables on income**
Regression analysis was carried out on the effect of selected variables on income. Business profit for both maize and non-maize trade is assumed to be an important determinant of the trader's incomes, and was therefore taken as a proxy for income. It also reflects the enterprise's stability and hence ability to bear risks. In the regression, income was estimated as a function of infrastructure, transaction costs, and business characteristics. The regression results show that the distance of the business to primary and tertiary markets are statistically significant at the 5% level, while distance to highway and secondary markets are significant at the 10% significance level. Distance to the other road categories was not statistically significant (table 3). Longer distance between traders and the highway as well as primary and secondary markets therefore appears to significantly decrease the profitability of trade and incomes from this trade. These results imply that increasing access to the market and road infrastructure are necessary in ensuring that farmers participate profitably in the trade. This is important in increasing rural incomes.

**Table 3: Regression Results for the effect of distance to roads and market facilities on business income**

| Explanatory variable | Estimated coefficient ($\beta_i$) | T-value | Significance |
|---|---|---|---|
| Business distance to highway | -.119384* | -1.656 | .0986 |
| Business distance to tarmac road | -.019241 | -.333 | .7394 |
| Business distance to all weather road | .024618 | .254 | .7994 |
| Business distance to access road | .062334 | .664 | .5069 |
| Business distance to primary market | -.376734** | -2.007 | .0455 |
| Business distance to secondary market | -.371219* | -1.904 | .0577 |
| Business distance to tertiary market | -.190157** | -2.739 | .0065 |
| Constant | 8.580780 | .728 | .4670 |

$R^2 = .16$

F statistic = 1.35327, Significance of F = .0000

**Table 4: Regression results for the effect of transaction costs and household characteristics on income**

| Explanatory variable | Estimated coefficient | T-value | Significance |
|---|---|---|---|
| Age of the trader | -0.01219 | -.225 | .8221 |
| Years of formal schooling | 0.19965 | .175 | .8613 |
| Household size | -0.06276 | -1.155 | .2488 |
| Number of female owners | -.06371 | -.195 | .8453 |
| Number of male owners | .05076 | .144 | .8855 |
| Total number of owners | .12523 | .476 | .6347 |
| Transportation costs | -.03304* | -2.600 | .0548 |
| Labour costs | .15568** | 2.512 | .0125 |
| Storage costs | .10060 | 1.607 | .1090 |
| Material costs | -.03599 | .651 | .5157 |
| Constant | 211.570 | .185 | .8535 |
| | | | |

$R^2 = .25$

F = 2.2591, Significance of F = .0145

Table 4 shows the regression for the effect of transaction costs and household characteristics on income. Among the specified transaction costs, only transportation and labour costs are statistically significant in determining income. Individual household characteristics do not appear to be significant. However, all the coefficients have the expected signs. It is noteworthy that none of the variables under household

characteristics was statistically significant. This may imply that infrastructure facilities in the form of roads and markets are the major factors in determining the profitability of private maize trade in the country. Once individuals enter the trade, their household characteristics are not important in determining the profitability of their business.

In order to verify the significance of the different infrastructure variables on trade volume and profit, these were compared using t-tests between different categories of infrastructure variables. The test variables included the market outlet, type of business premise, and modes of transport in frequent use.

Table 5 gives a comparison of total volume and profits by the type of market outlet used.

**Table 5: Comparison of means for trade volume and profits by main market outlets used**

| Main Market Outlet | Mean quantity sold per day- 90 kg bags | Mean Profits earned Per month (Kshs) |
|---|---|---|
| Open market | 5 | 7,081 |
| Roadside | 3.9 | 9,965 |
| Retail/wholesale store | 21 | 26,044 |
| Bicycle trader | 9 | 4,987 |
| F-statistic | 3.6168 | 1.3010 |
| Level of significance | .0067 | .2693 |

While the mean for the quantity sold differs significantly between the outlets, the profit does not. Hence the type of market outlet is significant in determining the amount sold, but not profitability.

Table 6 gives the comparison of trade volume and profits by type of business premise used by the traders.

**Table 6: Comparison of Trade Volume and profits by type of business Premise**

| Type of business premise | Mean quantity sold per day- 90 kg bags | Mean Profits earned Per month(Kshs) |
|---|---|---|
| Permanent store | 15.3 | 31,359 |
| Temporary stall | 4.2 | 7,308 |
| Designated market place | 4.3 | 4,554 |
| Roadside | 3.5 | 12,385 |
| F-statistic | 11.1561 | 3.1270 |
| Significance of F | .0000 | .0259 |

Both the quantity sold and the profitability differ significantly between the types of business premise.

**Table 7: Comparison of Means for quantity sold and profits by Modes of transport in frequent use**

| Modes of transport used | Mean quantity sold per day- 90 kg bags | Mean monthly Profits earned (Kshs) |
|---|---|---|
| Head load | 2.8 | 6,511 |
| Bicycle | 3.6 | 12,376 |
| Donkey | 6.4 | 10,540 |
| Public transport | 4.5 | 31,725 |
| Pickup | 9 | 6,661 |
| Lorry | 22.6 | 12,630 |
| Handcart | 2.8 | 4,233 |
| F-statistic | 8.9439 | 5.2579 |
| Significance | .0000 | .0000 |

Table 7 gives a comparison of the mean quantity sold and profit by mode of transport used. The results show that both the amount of maize sold and the profits are significantly different between the different modes of transport used by the traders. It therefore appears that both the volume of trade and profitability varies between the traders depending on which mode of transport is used. This can be attributed to the transaction costs, which depend on the mode of transport, and determine how much can be profitably transported and sold. An important observation is that while the quantity sold is highest among the lorry traders, profits are highest among those using public transport.

From the comparisons of means for trade volumes and profits we note that while trade volume differs significantly by all the test variables, namely type of market outlet, business premise, and mode of transport, profits differed significantly only between the type of business premise and the modes of transport used. The type of market outlet is not significant in determining the profitability of trade. What appears important in profitability is the mode of transport and business premise used by traders. Transport mode determines how much can be carried by traders on the different types of roads, and the costs incurred. This will be reflected in the increased economies of scale, reduced unit costs and hence the profitability of the business.

## 5. Summary and Conclusions

This paper has used primary data to analyse the factors that determine the participation of traders in a liberalised maize market in Kenya.

The results show that apart from the removal of price and movement controls, which have been the main elements of market liberalisation in the country, a number of other factors are important in determining private traders' participation in the market. These include household characteristics like education attainment, the number of business owners, and the ability to bear risks. Infrastructure variables like the distance to the roads and market facilities as well as transaction costs like transportation and material costs are also significant in determining the decision to participate. The results further

show that income from trade significantly depends on access to transport and market infrastructure.

These results have important implications for increasing both the participation of the private sector in the liberalised maize market in the country, as well as increasing the benefits from such trade. There is need to address the factors which reduce the risks experienced by traders. One important option is to facilitate risk pooling among traders through facilitating the formation of marketing cooperatives. Access to markets and transportation also need to be improved since these significantly determine the decision to participate and the profitability of trade. This will also be important in reducing the transaction costs, which reduce traders' incomes.

From the results, a number of useful implications can also be drawn for poverty reduction. The magnitude of poverty in Kenya and the measures necessary to address it are well documented (Republic of Kenya 2000). Increasing rural incomes is one of the important options in addressing the ever-increasing rural poverty in the country. The promotion of small and micro-enterprises (MSEs), which offer employment opportunities especially for the rural labour force provides one important avenue for increasing rural incomes and hence addressing the problem of poverty. Trade in agricultural commodities has been found to be one of the major activities of the sector (Parker and Torres 1994).

Although agricultural trade liberalisation offers an important opportunity for employment and hence income generation, a number of factors still stand on the way to a profitable participation in the marketing of agricultural commodities by private traders. These need to be addressed. Policy reforms are not adequate in inducing increased participation.

Despite the fact that small and micro enterprises have become an important source of employment, certain characteristics of the sector raise fundamental questions about its potential in increasing incomes and reducing poverty. The low level of capitalisation, seasonal fluctuations in earnings and the low level of employment are significant indictors that the efficiency of the sector needs to be increased if it has to play its role as a source of income and poverty reduction. This paper shows that ability to bear risks, infrastructure and transaction costs are important factors which need to be addressed to increase the potential of the sector in increasing incomes, and contribution to poverty reduction.

The dominance of women in the trade also has important implications since poverty, both urban and rural affect women most. Improving the efficiency of these enterprises is likely to have greater impact on women by increasing their access to employment and raising their incomes.

The results of the study therefore imply that liberalisation of the markets entailing the removal of price and movement controls alone is not sufficient to induce private sector participation in the trade. Other factors like access to infrastructure facilities, transaction costs as well as individual's ability to bear risks are important determinants

of private traders' participation in a liberalised maize market. More significantly, a number of factors still stand on the way to full participation by the traders.

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