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MARKETING MARGINS AND EFFICIENCY OF COOKING BANANA RETAIL TRADE IN KAMPALA CITY, UGANDA

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ABSTRACT

Cooking bananas like many other food crops in Uganda have experienced consumer price hike threatening poor and urban consumers' dietary diversity and food security. Unfortunately, little research attention has been paid to the demand side of this stapple's supply chain and there is hardly any study that has examined its marketing system performance. Using a sample of 80 representative retail traders, the study examined marketing margins and efficiency of small and big size banana bunches. Results revealed that the banana retail trade was highly inefficient. However, the inefficiency was more felt in trading small size banana bunches than big ones. OLS results on the other hand showed that marketing efficiency was significantly reduced by marketing costs though significantly improved by the scale of operation. The study recommended that provision of policy incentives such as low interest credit to retail traders as way of encouraging business expansion and backward market integration.

KEYWORDS: TVECM, MAAIF, Banana Bunches, Marketing Margins

INTRODUCTION

Background

Bananas especially the cooking type (East African Highland Bananas (AAA-EA group)) are one of the most important staple crops in the East Africa's Great Lakes Region, in which is a major supplier (Spilsbury et al., 2004).They are the primary source of food security for households most of whom are considered poor and live in rural areas. The range of uses of these cooking bananas (locally known as 'Matooke' in Uganda) also extends to provision of household incomes and animal fodder (when chopped and fed to livestock such as cattle and pigs). When exported these bananas attract foreign exchange to the country thereby contributing to alleviation the balance of payment problems. Owing to the role of this crop in the economy, Government of Uganda has earmarked it as a strategic crop for development intervention (Ministry of Agriculture Animal industry and Fisheries; MAAIF, 2010). It features prominently in policy debates as a crop targeted for achievement of food security objectives in the long term. This is partly because it is generally a low input crop yet it commands high consumption rate among the locals.

National Agricultural Research Organization (2009) reported that the annual per capita consumption of bananas stood at 200-300 kg, placing Uganda to be the leading banana-consuming country in the world. However, like many other food crops, in recent past, there has been consumer price hikes for bananas. These prices worsen even more during festive seasons, in effect limiting dietary diversity and food accessibility levels, and in extreme cases excluding low-income urban consumers from this staple. This is largely attributed to both supply and demand factors. Among the supply factors include the declining soil fertility following long periods of cultivation with limited fallowing, pests and diseases; the most notorious ones being the Banana Bacterial Wilt (BBW), nematodes and weevils; and inefficient agricultural extension. Demand and marketing related constraints include bulkiness, high perishability, poorroad infrastructure, limited value

addition opportunities, lack of marketing information, poor stall conditions and long chain of small-scale intermediation.

In response, the research community has commissioned a number of studies in the banana sub-sector. Though, most studies in the sub-sector have mainly focused on the supply side. For instance, Ssali et al. (2010) undertook on-farm participatory evaluation of 18 'Matooke' hybrid varieties in Central Uganda. This study reported that 'Matooke' hybrids 'M2', 'M9', 'M14' and 'M17' (AAA genome) were selected as the most acceptable hybrids because of the attribute combination of high yields and resistance to black Sigatoka. Bagamba et al. (2007) computed gross margins per hectare in Central and Southwest Uganda covering a number of crops. The study led to a conclusion that changes in economic conditions appeared to have shifted income reliance from farm production including bananas to non-farm income. Nakato et al. (2013) assessed the risk of Banana Xanthomonas wilt spread through trade samples of banana fingers and rachis from markets within Kampala, Uganda and at border points of Uganda with DR Congo, Tanzania, Rwanda and Kenya. Besides Nakato et al. study, on the demand side, empirical literature on bananas in Uganda is very scanty. Notably, previous research has neglected examining marketing system performance in the banana sub-sector.

Marketing system performance is concerned with how well the food marketing system performs what society and market participants expect of it. For example, the market system should provide positively and adequately market attributes namely: form, time, space and information. Two theoretical strands have been advanced to explain marketing system performance and these are pricing efficiency and operational efficiency. Pricing efficiency is associated with the ability of a marketing system to efficiently allocate resources and coordinate the entire agricultural production and marketing process in accordance with consumer directives. At marketing level, pricing efficiency declines when prices fail to coordinate the buying and selling activities of market participants including consumers. On the other hand, operational efficiency implies that an economic activity leads to reduced costs of marketing without affecting total output. It also refers to increasing marketable output at the same cost.

Previous studies on marketing system performance have mainly used two approaches namely quantitative estimation of proportions of marketing costs and mark-up at each stage of the marketing chain and econometric estimation of factors affecting this performance. In the former approach, the marketing system is examined using either marketing margins or marketing efficiency (Anyaegbunam and Nto, 2011). Marketing margins can be a useful descriptive statistics if used to show how the consumers' expenditure is divided up among market participants at different levels of the marketing systems (Toure and Wang, 2013). It is defined as the difference between the price the consumer pays and the price that is obtained by producers, or as the price of a collection of marketing services, which is the outcome of the demand for and supply of such services. Such margins give an indication of the performance of a particular industry (Tomek and Robinson, 1990), or an indication of the market structure and efficiency.

The alternative measure of system performance, Marketing efficiency, is defined as percentage ratio of price increase over the total marketing costs at a particularly stage of marketing chain (Anyaegbunam and Nto, 2011). It is computed as the ratio of the value added (profit) at each stage of the marketing system to the total marketing costs. In Uganda, there is hardly any study that has estimated marketing margins and efficiency of cooking bananas marketing system, categorizing such estimates for small and big size bunches. Thus, the current research went ahead to study the marketing system performance of these banana of these bunch sizes in Kampala city markets using marketing margins and efficiency approaches. Empirical studies in agricultural markets carried out on a number of food marketing systems to examine performance employ a wide range of explanatory variables. The variables include handling costs, storage costs, packaging costs, processing costs, and transportation costs (Toure and Wang, 2013; Onu and Iliyasu, 2008), volume traded, seasonality, time trend and lagged margins in case of time series (Ojogho et al., 2012). Since the socio-economic

characteristics of the traders are assumed to affect the market equilibrium, the current study enriches the marketing efficiency literature by integrating marketing margins and efficiency with the variables of age, household size and trading experience in the bananas. Among the studies that are using time series, Chalajour and Feizabadi (2012) who employed the Threshold Vector Error Correction Model () and monthly time series from 1981 to 2006 in studying price transmission in Iranian rice market. Results led to conclusions that changes in the marketing margins can cause asymmetric price transmission between the farm and retail prices in Iran's rice markets.

There are two studies, which are closely related to the current research work. To begin with, Ojogho et al. (2012) used a sample of 120 respondents of beef traders in Benin to determine the major contributing marketing costs to marketing margins. Inferential statistics showed that a unit increase in packaging and handling cost increased marketing margins at wholesale level. On the other hand, retail marketing margins were significantly increased by packaging and transportation. The study also found out that the long-run marketing margin elasticity was 0.976, while the short-run marketing margin elasticity of wholesalers and retailers were 0.906 and 0.911respectively. Toure and Wang (2013) estimated the marketing margin functions among tomato traders in Mali. The authors reported that wholesale margin function was affected by the wholesale price and wholesale cost, while the retail margin function was influenced by the retail price and the retailer cost.

Despite all the parametric work on marketing margins, no study is known to have examined the role of scale of operation in the banana marketing system performance. Particularly, it is not clear whether the scale of operation along with marketing costs and socio-economic characteristics of retail traders have bunch size differential effects on the marketing margins and efficiency of trading cooking banana. The study hypothesized that rental costs and handling costs significantly reduced marketing efficiency while increased scale of operation significantly improved marketing efficiency in trading in both small and big size banana bunches. Knowledge on effect of marketing costs and scale of operation in banana trade is critical in prescription of policy interventions for improvement of marketing system performance in banana sub-sector for sustainable food security for urban consumers.

Theoretical Framework

Economists consider marketing margins as the difference between the retailer's and the producer's price. These marketing margins represent the mark – up of the marketing system and the marketing costs such as transport, storage, processing, wholesaling, retailing, advertising and others. There are several types of marketing margins, based on the market level examined in the marketing chain. The wholesale margin is the difference between the price paid by the wholesale trader and the farm-gate or producer price. The retail margin is the difference between the price the retail trader pays and the retail price he charges to consumers.

The current study applies retail margins approach of examining marketing system performance because most banana traders rely on wholesale traders for supply of stock. Marketing margins are the result of the demand and supply factors, marketing costs, and the degree of the marketing channel competition (Marsh and Gary, 2004). Within the framework of retail marketing margins, the relationships for retail trade price (RP) can be given as follows:

$$\mathrm{RP} = \mathrm{WP} + \mathrm{M} \tag{1}$$

Where RP is the retail price, WP is the wholesale price and M is the marketing margin. The marketing is further expressed as shown below:

$$\mathrm{M} = \delta + \lambda * \mathrm{RP} \tag{2}$$

Where α is the absolute amount representing the costs of marketing and the services in the marketing system and β is the percentage or mark-up of the retail price. In terms of distribution, $\delta \geq 0$ and $0 \leq \lambda < 1$.

METHODOLOGY

Study Area

The study was carried out in cooking banana stall markets in four divisions of Kampala city and was conducted during the month of July 2012. Being the capital city, Kampala is estimated to have a population of 8 million resident inhabitants, implying that potentially it has a high number of food consumers. Principal among the most consumed food staple in Kampala is the cooking banana. Recently, there has been attempts to improve the working conditions of food traders by constructing marketing infrastructures.

However, traders are meant to meet costs of maintenance of these infrastructural developments, rent and security as well as taxes in form of market dues. Though wholesalers transport bananas from rural areas to the retail traders, they still incur costs relating to off-loading and final carriage to the stalls. The concern is how can these various costs be reduced so as to enhance affordable prices for consumers and guarantee urban food security.

Sampling and Data Collection

Four produce markets namely; Kalerwe, Kasubi, Nakasero and Nateete were purposively selected due to their large volumes trade in banana compared to other markets. In order to obtain a representative sample, traders in each market were clustered into three groups: those at the entrance of the market, a category in the middle and the last group at the extreme end of the market. Subsequently, traders in each cluster were subjected to systematic sampling by selecting 'one *trader'* and '*skipping two'* in the row for the interview. Kalerwe market, which has the highest number of traders, 28 traders, were selected for interviewing. This was followed by Kasubi (22 traders), Nakasero (16 respondents) and Nateete (16 respondents). This process yielded a sample of 82 respondents. However, two respondents' data had gaps and therefore dropped from analysis, reducing the sample for final analysis to 80.

A pre-tested questionnaire with both open-ended and close-ended questions was then administered to the sampled retail traders. The questionnaire covered aspects of socio-economic and demographic characteristics of the traders, marketing activities and sources of marketing information. Open-ended questions demanded responses whose units of measurement were stated for the respondent and other responses where they could freely express themselves. Close-ended question offered respondents options from which they made choices on situations which best described such traders. In case where, none of the offered choices described the trader, an additional option of *'other, please specify'* was provided.

Analytical Methods

Determining Marketing Margins and Efficiency

Gross retail marketing margins (GMM) calculated as shown in the relationship below:

$$GMM_{i,j} = \frac{\sum_{i=1}^{i=n}\left[\frac{RP_j - WP_j}{RP_j}\right]}{n} \quad (3)$$

Where RP, WP, n represent the retail price, purchase price (wholesale price) and total number of observations in the sample respectively. i is the i^{th} retail trader in the sample and j is either small size or big size banana bunches.

Marketing efficiency $(M.E)$ was computed following the methodology used by Anyaegbunam and Nto, 2011, Ozougwu (2002) and Olukosi and Isitor (1990) as follows:

$$M.E_{i,j} = \frac{\sum_{i=1}^{i=n}\left[\frac{VA_j}{TMC_j}\right]*100}{n} \quad (4)$$

Where $M.E$ is marketing efficiency, VA_1 is value – added or profit obtained by i^{th} retail trader and TMC_i is total marketing costs for the i^{th} retail trader and j is as explained in (3). The relationship in equation (4) is interpreted as the percentage ratio of price increase over the total marketing costs at retail level of the marketing chain. The decision rule in (4) above is that if marketing efficiency is 100% (unity), it shows that the market is perfectly efficient because price increment is just high enough to cover the cost of marketing cooking bananas. Whereas marketing efficiency that is greater than 100% indicates excess profit for retail traders. However, if marketing efficiency is less than 100%, it is assumed that inefficiency exists in the marketing system (Anyaegbunam and Nto, 2011; Scarborough and Kydd, 1992).

Factors Affecting Marketing Margins and Efficiency

Economic literature has shown that marketing margins and efficiency in market equilibrium are a function of supply and demand factors. Toure and Wang (2013) observed that the explanatory variables used to explain the variations in the marketing margins among others include marketing costs, total volume traded (as proxy for scale of operation), time trend, seasonality and lagged margin. The current study modifies the above variants and introduces age, household size, and trading experience. Besides, it estimates empirical models for small and large size bunches of cooking bananas separately for both marketing margins and efficiency in order to achieve a comparative analysis as shown in equation (5):

$$\ln MM_{i,j} = \alpha_0 + \alpha_1 \ln Rent\_cost_{i,j} + \alpha_2 \ln Hand\_Cost_{i,j} + \alpha_3 \ln Trad\_Vol_{i,j} + \alpha_4 \ln HH\_Age_i + \alpha_5 \ln HH\_Size_i + \alpha_6 \ln Mat\_Exp_i + \varepsilon \quad (5)$$

Where $MM, Rent\_Cost, Hand\_Cost$ and $Trad\_Vol$ represent percentage marketing margins, rental costs, handling costs (loading and offloading costs) and trade volume all in Uganda shillings respectively. The socio-economic variables of the traders; $HH\_Age, HH\_Size, Mat\_Exp, \varepsilon$ are age of household head (years), household size (number of members), trading experience in banana (years) and error term respectively. $\alpha_{1,2....6}$, i are the various parameters to be estimated, i^{th} retail trader in the sample and j is either small size or big size banana bunches.

The above empirical framework was estimated using Ordinary Least Squares (OLS) method and apriori sign expectations is $\alpha_1, \alpha_2, \alpha_3, \alpha_6 > 0$ while $\alpha_{4,}\alpha_5 > \text{or} < 0$.

The marketing efficiency empirical model specification is as shown in equation (6) with all explanatory variables retained as explained in equation (5):

$$\ln MEff_{i,j} = \beta_0 + \beta_1 \ln Rent\_cost_{i,j} + \beta_2 \ln Hand\_Cost_{i,j} + \beta_3 \ln Trad\_Vol_{i,j} + \beta_4 \ln HH\_Age_i + \beta_5 \ln HH\_Size_i + \beta_6 \ln Mat\_Exp_i + \varepsilon \quad (6)$$

Where $MEff$ - marketing efficiency is as explained in equation (4) and coefficient sign expectations are as

follows: $\beta_1, \beta_2 < 0$; $\beta_3, \beta_6 > 0$ while $\beta_4, \beta_6 >$ or < 0 .

RESULTS AND DISCUSSIONS

Marketing Margins and Efficiency

Results of marketing margins and efficiency **(Table 1)** revealed that retail trade in cooking bananas in Kampala city in all bunch sizes was grossly inefficient. In the two categories of bunches considered in the study, the marketing efficiency values were below 100%.

Table 1: Banana Bunch Size Marketing Margins and Efficiency Differentials

Variable	Mean (N = 80)	
	Small Size Bunches	Big Size Bunches
Retail Price (UGX)	13,950	16,862.5
Wholesale Price (UGX)	10,575	12,150
Marketing Margins (UGX)	3,375	4,713
Unit Storage/ Stall costs (UGX)	134.83	149.1
Unit Loading costs (UGX)	397.5	397.5
Total Marketing Costs (UGX)	11,107	12,697
Retail Profit (UGX)	2,843	4,166
Percentage Retail Profit	20.4	24.7
Percentage Marketing costs	79.6	75.3
Percentage Marketing Margins	24.2	27.9
Marketing Efficiency (%)	25.6	32.8

UGX = Uganda Shillings and N= Sample Size

Trading in small bunches (25.6%) was less efficient compared to trading in big bunches (32.8%). This efficiency difference arises from reduced per unit marketing costs (75.3%) for big bunches compared to 79.6% for small bunches. Yet again, unit retail profit for small bunches (20.4%) was lower than that of big bunches (24.7%). Therefore, it is worthwhile to infer that per unit cost of doing business declines while retail profit increases with banana bunch size, contributing to enhanced marketing efficiency as the bunch size increases. Percentage marketing margins differentials for the two bunch categories matched findings from marketing efficiency, meaning that the two indicators can be used analogously to measure marketing system performance. Marketing margins for small bunches were 24.2% whereas those of big bunches were 27.9%.These high values were far higher than the acceptable 5 – 10% (Anyaegbunam and Nto, 2011; Scarborough and Kydd, 1992) showing inefficiency in retail market. Overall, the cost of bunches (wholesale price) constituted the biggest portion of marketing costs and margins in both bunch categories. Onu and Iliyasu (2008) report closely related results on food grain marketing in Nigeria were small size trade was associated with less efficient marketing.

Determinants of Marketing and Efficiency

Empirical results of estimation of factors affecting retail-marketing margins for small and big size bunches of cooking bananas are presented in **Table 2**.The results show that the variables of rental costs, handling costs and trade volume for both small and big size bunches models were bearing positive signs, conforming to theoretical expectations.

Table 2: OLS Estimates of Factors Affecting Retail Marketing Margins

	Small Size Bunches		Big Size Bunches	
Dependent Variables	lnMM_Small		lnMM_Large	
Explanatory Variables	Co-Efficient	t-Value	Co-Efficient	t-Value
lnRent_Costs	0.05 (0.06)	0.81	0.02 (0.06)	0.41
lnHand_Costs	0.02 (0.07)	0.27	0.20 (0.08)**	2.62
lnTrade_Volume	0.32 (0.06)***	5.31	0.23 (0.06)***	3.95
lnHH_Age	0.45 (0.22)**	2.04	-0.13 (0.23)	-0.56
lnHH_Size	-0.13 (0.12)	-1.14	-0.32 (0.12)**	-2.26

Table 2: Contd.,

lnMat_Exp	-0.002 (0.06)	-0.00	0.15(0.07)**	2.24
F (6, 73)	5.85		5.17	
Prob > F	0.000		0.000	
R-Square	0.32		0.30	

All figures in parentheses are standard error values; ***, ** represent significance at 1% and 5% levels respectively

On the other hand, the co-efficient for household size in either regression was consistently bearing a negative sign. However, experience in trading in cooking bananas as well as age of household head had mixed signs for the two bunch sizes considered in the study. The model with big size bunches yielded better results with four variables being statistically significant namely loading and offloading costs, trade volume, household size and trading experience. For the small size bunches, it was only trade volume and age that were significant. Overall, the two models were highly significant (Prob > F = 0.000).In the alternative models having marketing efficiency as the dependent variable, the findings were even more interesting. The two drivers of marketing costs namely rental costs, and handling costs carried the expected negative signs and were statistically significant **(Table 3)** in both small and big size bunches.

Table 3: OLS Estimates of Determinants of Retail Marketing Efficiency

	Small Size Bunches		**Big Size Bunches**	
Dependent Variable	**lnMEff_Small**		**lnMEff_Large**	
Explanatory Variables	**Co-Efficient**	**t-Vale**	**Co-Efficient**	**t-Value**
lnRent_Costs	-0.15 (0.06)**	-2.27	-0.22 (0.05)***	-4.01
lnHand_Costs	-0.82 (0.08)***	-9.67	-0.62 (0.07)***	-8.40
lnTrade_Volume	0.31 (0.07)***	4.48	0.24 (0.05)***	4.30
lnHH_Age	0.66 (0.25)**	2.58	-0.03 (0.22)	-0.15
lnHH_Size	-0.17 (0.13)	-1.29	-0.25 (0.11)**	2.20
lnMat_Exp	-0.02 (0.07)	-0.31	0.15 (0.06)**	2.44
F (6, 73)	22.88		20.87	
Prob > F	0.000		0.000	
R-Square	0.65		0.63	

All figures in parentheses are standard error values; ***, ** represent significance at 1% and 5% levels respectively

Equally interesting is that trade volume as a proxy for scale of operation in either bunch category was positive and significant as theoretically expected. Like in the marketing margins regressions, household size was negative in either bunch category while age and trading experience had mixed findings on signs of the co-efficient. The finding of positive association between the handling and rental costs were in agreement with results reported by Toure and Wang (2013). In comparison, the quality of results under marketing efficiency model estimations was much better than that of marketing margins' empirical frameworks. Consequently, the rest of the discussion concentrated on marketing efficiency models.

In either model of marketing efficiency determinants, the measure of goodness of fit (Prob >F) was 0.000 indicating high level of statistical significance. The co-efficient of determination (R^2) also demonstrated statistical significance in terms of high level of explanatory power in both bunch category regressions. The R^2 was 0.65 and 0.63 for small and big size bunches' models implying that the two model specifications were explaining 65% and 63% of the total variations in the dependent variables respectively. On the strength of the models' significance, the null hypothesis that rental costs and handling costs significantly reduced marketing efficiency while increased scale of operation significantly improved marketing efficiency could not be rejected. Therefore, this study stands to conclude that the marketing costs and the scale of operation were among the major factors affecting marketing efficiency in retail trading in both small and big size banana bunches.

The above results also present policy analysis relevance. Based on the statistical and economic significance of the two cost drivers and trade volume, it is possible to influence improved marketing efficiency in the banana retail business through policy interventions that reduce marketing costs while enhancing the scale of operation. Generally, the magnitudes of elasticities under small size bunches were bigger than those of big size bunches. This should not be misinterpreted to mean that dealing in small bunches yields better economic benefits but rather a higher degree of responsiveness of marketing efficiency to explanatory variables under small bunches. This could be attributed to the fact that at current economic conditions, resultant marketing efficiency for small bunches is lower than that of big bunches, suggesting that in case of any policy interventions in the variables studied, higher percentage economic gains would be realized in the former bunches category than in later category. However, the model for big size bunches yielded more variables that were significant. Thus, the foregoing analysis preferred the big size bunches regression.

The elasticity of rental and handling costs were -0.22 and -0.62 respectively. This means that a 1% increase in any of these costs was associated with 0.22% and 0.62% downward pressure on retail marketing efficiency of cooking bananas ceteris paribus. The value of elasticity of scale of operation was 0.24. Literally, the finding means that holding all other factors constant, a 1% increase in the level of scale of operation of individual retail traders would lead to 0.24% improvement in marketing efficiency. Like trade volume, experience in trading in bananas (0.15) implied that all else constant, a 1% increase in year of banana trading experience would improve individual traders' marketing efficiency by 0.15%.Therefore, retail traders stand to benefit more through increasing scale of operation which also lead to a decline in the per unit marketing costs.

CONCLUSIONS AND POLICY RECOMMENDATIONS

Conclusions

In the study, marketing costs, margins, efficiency at retail level were separately estimated for small and big size bunches. Findings revealed that marketing system performance for retail cooking bananas businesses in Kampala city was highly inefficient. The level of inefficiency was more felt in trading small size bunches compared to big bunches. The main sources of improved efficiency for big bunches was more reduced per unit marketing costs and higher retail profit margin in comparison with small bunches. Furthermore, factors affecting both marketing margins and efficiency were determined. It was found out that rental and handling cost significantly widened marketing margins for big bunches.

Although these costs were not important in the case of small bunches, they gave an indication that they were major determinants of consumer prices. The same cost drivers significantly reduced marketing efficiency though the traders' scale of operation significantly improved it. Based on the significance of the findings, it is possible to influence improved marketing efficiency through policy interventions that reduce marketing costs while enhancing the traders' scale of operation.

Policy Recommendations

Wholesale price was found to constitute the biggest portion of the marketing costs and margins, a precondition for inefficient marketing. In achieving reduced cost of doing business, retail traders should strive to integrate backward other than relying on a long chain of small-scale intermediaries, which accentuates marketing costs. Policy incentives can play a key role in achieving this. First, by encouraging acquisition of credits, having low interest rates, which help retail traders expand their business and be able to integrate vertically marketing activities. Retail backward linkages can also help transmit price-based incentives to producers. In effect, the producers would be encouraged in investing farm production for higher yields; bigger size banana bunches and hence enhanced marketing efficiency.

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