

Full Length Research

# Analysis of the Characteristics, Behaviour, and Outcomes of Dry Maize Marketing in Ibadan, Oyo State, Nigeria

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This study examined the characteristics, behaviour, and outcomes of dry maize marketing in Ibadan, Oyo State, Nigeria. A two-stage sampling method was used to select 200 dry maize sellers, proportionate to size of the four big markets (Bodija, Orita-merin, Oje and Omi-Adio Markets) in Ibadan, which are known for their prominence in dry maize marketing. Primary data were collected using a structured questionnaire and analysed using descriptive statistics, the Gini Coefficient, Profit Margins, and Marketing Efficiency. A Gini coefficient of 0.5472 indicates a significant level of income inequality among sellers and high degree of market concentration. Most respondents (70%) obtained market information from their colleagues, 83% indicated that the selling price was determined through negotiation with buyers, and 96.6% were members of a Traders' Association. On average, sellers had a monthly market margin of ₦47,827.50, gross margin of ₦17,636.00, net margin of ₦13,040.77, and an efficiency level of 167%, showing that the dry maize marketing in the study area is efficient and profitable. While dry maize marketing can be a lucrative venture, it is faced with challenges such as limited access to credit, inadequate road infrastructure, price instability, and low profit margins. To encourage competition and improved access to credit, government should implement policies that will reduce the concentration of market power among sellers.

**Keywords:** Market Concentration, Competition, Market Margins, Dry Maize, Marketing outcomes

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## INTRODUCTION

Marketing consists of all business activities involved in the flow of goods and services from the point of production until they get to the ultimate consumer (Nwankwo *et al.*, 2023). It is only when consumers' needs are properly identified and satisfied that marketing takes place. Marketing provides job opportunities for millions of people in Nigeria today. This is because about half of the country's population makes a living by carrying out retailing, wholesaling, advertising, personal selling, public relations, transportation and storage activities (Abah *et al.*, 2015). They are also involved in building or maintaining such marketing infrastructure as roads, airports, seaports, haulage trucks, warehouses and telecommunication network, among others. The number of jobs being created by marketing has been increasing very fast in the country as the Nigeria economy develops (Chima *et al.*, 2022).

Akinniran *et al.* (2018) explained that there are different types of markets. These include producer–consumer market where the farmer or producer has the opportunity to sell directly to consumers and obtain the full consumer prices for their produce; local assembly markets which are usually organized and supervised by local government authority, and much of these market activities may be conducted on or near the farm. There are central wholesale markets which are found in cities or other concentration points and are usually for perishable produce (fruits, vegetables, meat, fish, potatoes, and *et cetera*) and also for grains (Nwankwo *et al.*, 2023). Other types of markets include retail market, commodity exchange market, future market, and so on.

Rustam (2020), explained that marketing of agricultural produce consists primarily of moving the produce from production sites to points of final consumption. Agricultural marketing encompasses all goods and services related to agriculture. Most producers do not sell their goods directly to the final users; between them stands a set of intermediaries performing a variety of functions. These intermediaries constitute a marketing channel or distributing channel (Ozor *et al.*, 2018). According to Nwankwo *et al.* (2023) marketing channels are the pathways a product or service follows after production, culminating in purchase and consumption by the final users.

Thus, a marketing channel ensures that farm produce/products are made available to the consumers in the right form, time, and place, and at an affordable price, and thus provides form, time, place and possession utilities required to meet the consumers' welfare. Agricultural and food marketing system performs three sets of functions; exchange, physical and facilitating functions. Exchange functions include buying, selling and storage; physical functions involve assembling, transportation, sorting, processing and standardization; and facilitating functions involve financing, risk bearing and market intelligence. Each of these functions adds value to the product and they require inputs, so the marketers incur costs (Rustam, 2020).

The characteristics of a market determine the structure of the market which can be defined as the prevailing nature of competition in a market. These characteristics include the number of buyers and sellers, their size distribution, degree of product differentiation and the ease of entry of new marketing participants (Bain, 2018). Also, the behaviour and practice of firms within an industry refer to market conduct. These include price policies and other policies pursued by sellers. For example, firms that are price takers behave differently from firms that are price makers (Bain, 2018). The behaviour (conduct) of firms/marketers in a market is influenced by the characteristics of such market. Behaviour of firms can be analysed in terms of volume of sales and marketing practices, including prices, sources of marketing information, sources of product procurement, and *et cetera* (Dennis *et al.*, 2020). Therefore, the outcomes of marketing activities give indications of performance in terms of commodity prices, marketing efficiency, level of profit earned, as well as cost. All these factors interact to determine the free flow of market information on prices, which invariably affects the marketing margin (an outcome) of traders.

Maize is one of the food crops that have several uses, whether as food for man or as animal feed, due to its high nutrition value. According to Jimoh *et al.* (2021), maize contains 80percent carbohydrate, 10percent protein, 3.5percent fibre and 2percent mineral. Iron and Vitamin B are also present in maize. Maize is used as raw material for brewing beer and for producing starch (Jimoh *et al.*, 2021). Food and Agriculture Organization (FAO, 2020) stated that the total maize harvest in Africa was estimated at 40 million hectares, with Nigeria being the top producer (60%), followed by Tanzania.

According to Sahel Reports (2017), in Nigeria, the largest volumes of maize are produced in the Northern region, particularly in Kaduna, Borno, Niger, and Taraba states, and in the Southwestern states including Ogun, Ondo and Oyo. Maize in Nigeria is mainly produced by smallholder farmers, each cultivating an average of 0.65ha (Sahel Reports, 2017). Production of grains is very popular in Nigeria among crop farmers because of its high socio-economic value and importance in tackling food insecurity and poverty (Ahmed, 2020). Despite the economic importance of maize (dry maize) to the teeming populace in Nigeria, it has not been produced enough to meet the level of food and industrial needs of the country and given that the demand for maize in the country is estimated to increase by 3.2 percent per year due to urbanization and population growth (Jimoh *et al.*, 2021). This means the demand for maize (dry maize) will keep increasing as a result of competition for maize by both man and livestock.

There might be a number of reasons for this scenario as to why demand in the market for dry maize is greater than the supply. For example, the reason may be that there are few firms in the industry and these few firms may collude and sell their products at a high price which may result in an uncompetitive market. Another reason could be that the cost of trading in dry maize is very high and prohibitive, resulting in barriers for new entrants into the market. Ozor *et al.* (2018) noted that in many markets in Nigeria, price of dry maize is rising due to the high utilization of the product; thereby widening the demand-supply gap. This widening demand-supply gap can also be as a result of the existence of inefficiency in the marketing system due to marketing problems such as poor market information, poor market structure, high cost of transportation, lack of capital, poor storage facilities, limited markets, and large number of intermediaries (Rustam, 2020).

## Research Questions

The following research questions were answered in this paper:

- i. What are the characteristics of dry maize market in Ibadan?
- ii. What are the behaviour of dry maize buyers and sellers in Ibadan?
- iii. What are the outcomes of dry maize marketing in Ibadan?
- iv. What are the constraints to dry maize marketing in Ibadan?

## Objectives of the Study

The broad objective of this paper is to examine the characteristics, behaviour, and outcomes of dry maize marketing in Ibadan, Oyo State, Nigeria. To achieve the overall objective, the specific objectives are to:

- i. Analyse the characteristics of dry maize market.
- ii. Examine the behaviour of sellers and buyers of dry maize.
- iii. Assess the outcomes of dry maize marketing.
- iv. Identify the constraints to dry maize marketing.

## Literature Review

### Review of Empirical Literature

The organization and financial performance of the wholesale marketing of cocoyam in Southeast Nigeria were examined by Nwankwo *et al.* in 2023. Multistage sampling procedure was used to choose 216 wholesale cocoyam traders in 18 markets in the states of Anambra, Enugu, and Imo. Structured questionnaire was administered to collect pertinent data. Descriptive statistics, the Gini Coefficient, and enterprise budgeting analysis were utilized to analyze profitability. The Herfindahl Index (HI) and Gini Coefficient (GC) were employed to identify market structure. The results showed that the Gini Coefficient value of 0.5642 indicated an oligopolistic market structure, which means that the market's revenue is concentrated in the hands of a small number of wholesale marketers.

Nwankwo *et al.* (2023) got HHI value of 0.14 also suggested a low degree of inequality among wholesale marketers. Additionally, it was found that marketers' bargaining strength (61.1%) was what ultimately decided cocoyam prices. The differences in selling prices across the marketers suggested that they have some control over the prices of their goods, even though associations have an impact on pricing decisions in some places. A productive business initiative is one that has a net return on investment of 35 kobo for every naira invested, as shown by wholesale cocoyam marketing.

Muhammad and Abdulzeez (2021) examined groundnut marketing in the Song local government area of Adamawa State, Nigeria. Primary data were sourced from 39 wholesalers and 101 retailers in the Song, Dumne, Golantabal, Loko, and Murke (Bariki) markets using random sampling techniques. Data were analyzed utilizing descriptive statistics, evaluations of the gross and marketing margins, and marketing effectiveness. Results showed that groundnut marketing is profitable, with gross margins for retailers and wholesalers of ₦25,427.58 and ₦550,817.94 per week, respectively. Retailers and wholesalers had marketing margins of 18.28% and 15.97% of sales, respectively, while their corresponding marketing efficiencies were 114.5% and 115.5%, which is a sign of efficient market performance. Lack of credit options (77%), and high transportation costs (71%), are critical obstacles for groundnut marketers.

Wardhono *et al.* (2020) described the chili commodity marketing chain in Banyuwangi Regency by analyzing the determinants of the structure, conduct, and performance of the chili commodity market. The study used both primary and secondary data. Primary data were sourced with the aid of a structured questionnaire from stratified groups of farmers and sellers. Data were analyzed using the autoregressive integral moving average (ARIMA) and structure conduct performance (SCP) models. The results of the study show that price determination was based on market mechanisms and collective agreements for farmers who partner with collectors and food processing industries. The emergence of asymmetrical information from chili business and the growth of new traders that dominates the chili trade are the results of a lack of price and knowledge information in market analysis and projections of price movements, the absence of special institutions that deal with chili governance, and the limited use of technology. In Banyuwangi Regency, there is limited competition among chili sellers due to the oligopsony-like nature of the market structure, its power to affect market pricing, and its concentration.

Abera *et al.* (2020) evaluated the market margins for key maize marketing channels in Alefa District, Central Gondar Zone of Amhara Regional State. Both secondary and primary data were sourced from a total of 198 producers and 34 traders of maize. Primary data were collected through personal interviews. The data were analyzed using descriptive

statistics. The findings showed that, with 44.00% and 36.35% of total purchases, wholesalers and rural assemblers are the two largest buyers of maize from farmers. The research area's maize market can be described as oligopolistic based on the market concentration ratio, which is 74.07%. Also, 18.03 quintals of maize were produced on average per household, and 34.37 quintals of maize were yielded per hectare.

Additionally, Abera *et al.* (2020) discovered that the main obstacles to household production and marketing of maize in the study area were the high cost of fertilizers, the untimely availability of improved seeds, the prevalence of unlicensed traders in the markets, the effects of climate change (such as the occurrence of droughts and pest/disease outbreaks), the unavailability of credit, and the opaque taxation system. The opportunities include the potential for farmers' cooperatives to supply improved maize seeds, fertilizer, other farm inputs, and reliable and timely market information sourced from government agencies; the potential for the production of maize in the region; improved trends in maize quality; and the ability to generate demand for other crops.

The structure, behaviour, and performance of maize markets were evaluated during the main harvest and lean seasons of 2018-19 in Malawi by Dennis *et al.* (2020). In addition to conducting 28 focus group discussions (FGD) with a total of 480 farmers and interviewing 749 traders from 74 markets throughout 8 districts, this study also examined daily and weekly price data from 13 regional markets. The structure of maize markets was investigated by assessing marketing channels, entrance obstacles, and the level of competition at various points in the marketing chain. The examination of market conduct involved looking at differences in sales revenues, seasonal changes in trader types, standardization of weights and quality, and trader behaviour and performance. These were evaluated by assessing trader costs and margins as well as the spatial and temporal integration of maize markets.

Dennis *et al.* (2020) discovered that the maize market in Malawi has a pyramidal structure, and it is extremely competitive at lower levels of trade, but it is oligopolistic at higher levels. With changes in trader types and occurrences of rural-urban trade reversals, the market channels change with the seasons. Despite existing organizations, there is a pervasive absence of structured trading and an inequality in sales income among traders with comparable capacities. It is possible that there are marketing inefficiencies due to the high cost-to-revenue ratio, the extremely seasonal nature of maize prices, their greater volatility compared to adjacent nations, the inadequate spatial integration of markets, and the slow rate at which prices adjust to long-run equilibrium levels.

Jimoh *et al.* (2021) evaluated the structure, conduct, and performance of maize marketing in Irewole Local Government Area of Osun State by determining the marketing margin, marketing cost, markup, operational efficiency, and constraints faced by the maize marketers in the area. Using a standardized questionnaire, a total of 120 respondents from three purposefully chosen large maize markets-40 maize wholesalers and 80 retailers were contacted for the study's data. Analytical methods used include descriptive statistics, concentration ratio, Gini coefficient, and operational efficiency model. Using ₦900 and ₦1,200 per 100kg bag for wholesalers and retailers, respectively, the findings showed that maize marketing was effective and profitable. Additionally, different marketing costs, margins, profits, and markups were obtained for the wholesale and retail maize sellers. Gini coefficients of 0.319 and 0.312, respectively, for wholesalers and retailers show a high level of industry competitiveness. Price ambiguity, the high perishability of maize, and the seasonal character of maize are the main issues that both wholesalers and retailers face. For wholesalers, insecurity and a high capital requirement are, however, seen as serious obstacles.

In the centre of Indonesia's vegetable production in Central Java, Pujiharto and Sri (2021) investigated potato trading using structure conduct performance (SCP) model. As respondents, 82 potato farmers, 45 traders who specialize in collecting, 10 traders who specialize in wholesaling, and 14 persons who specialize in retailing were all randomly selected. The market structure was examined by using market share, the Herfindahl-Hirschman Index (HHI), and the Concentration Ratio for the Biggest Four (CR4). The analysis of market behaviour focused on the existence or absence of collusive practices in setting prices, the process of selling and buying, the creation of equilibrium pricing, payment methods (cash, credit), and collaboration with other trading organizations. Farmers' share and marketing margins were used to analyze market performance. Findings show that oligopolies dominate the potato market. Farmers' (producers') direct interactions with collectors have a greater impact on how prices behave at the farmers' level. The majority of collectors' sales are to wholesalers, who either pay in cash or on account. Additionally, collectors and wholesalers engage in collusive behaviour, particularly when it comes to the extension of capital or credit.

Southeast Nigerian beef marketing was examined in detail by Ejike *et al.* (2022), analysing the market structure, practices, and results. In order to choose retail beef marketplaces and beef merchants for the study, a multistage sampling technique was used. Structure questionnaire were administered to 270 merchants chosen from 30 geographically distinct retail beef markets. The following methods were utilized to analyze the data; descriptive statistics, marketing margin analysis, Herfindahl index, and marketing efficiency index. The findings indicated that men (76.3%) dominated the beef marketing industry, having an average trade history of about 9 years. The Herfindahl Index for the beef marketing system was 0.37, indicating that the retail beef marketing system had a competitive environment that was comparatively ideal. The findings of a marketing margin and marketing efficiency of 30.32% and 34.05%, respectively, imply that retail beef marketing is a profitable business, and the traders were generally effective in carrying

out trading activities in the beef marketing system.

The organization, operation, and effectiveness of the cities of Palembang and Pagar Alam's coffee processing sector were examined by Syamsurijal *et al.* (2019). The study's key data sources were coffee processing companies in Palembang and Pagar Alam. Structure-Conduct-Performance (SCP) analysis was employed. The findings showed the monopolistic competition market structure of the coffee processing sector in Palembang and Pagar Alam cities, with a CR4 value of 32.43 percent in Palembang City and 37.65 percent in Pagar Alam City. If the market share is less than 5.83 percent, there may be room for new businesses to enter the sector. Product, price, and promotion tactics are employed in the coffee processing sector, according to the analysis of its behavior.

In six villages in the Bangladeshi Chuadanga Area, Biswas *et al.* (2023) examined the profitability and input-use efficiency of maize farming. Data were gathered from the purposefully chosen 80 respondents using an interview plan. Following data analysis, it was found that for marginal, small, and medium-sized maize production, respectively, the total cost of production was Tk 124,495, Tk 134,335, and Tk 140,579. Gross return on investment (ROI) per hectare was Tk. 213,997, Tk. 204,972, and Tk. 197,163, while gross margin (GM) per hectare was Tk. 120,478, Tk. 104,748, and Tk. 92,516. The gross costs were Tk. 89,502, Tk. 70,637, and Tk. 56,584, and were used to compute the net return. For marginal, small, and medium maize output, the benefit-cost ratio was 1.72, 1.53, and 1.40, respectively. For marginal, small, and medium-sized maize production

### **Theoretical Framework**

The theories that are relevant and appropriate to this study are as follows:

#### **Dynamic or Frictional Profit Theory**

J.B. Clark introduced the Dynamic or Frictional Theory of Profits in 1900 (Rajib, 2019). This theory holds that there is a normal rate of profit, which is a return on capital that must be paid to the owners of capital as a reward for saving and investing their funds rather than hoarding them. According to the frictional theory of profit, shocks or disturbances occasionally happen in an economy as a result of unanticipated changes in product demand or cost conditions that lead to out-of-equilibrium conditions. For certain businesses, these situations of disequilibrium are what create positive or negative economic profits. As a result, according to the notion of frictional forces, economic profits continue for a while since these forces impede the system from instantly adapting to the changing circumstances. When economic profits are made in the near term, more traders will enter the market in the long term, driving down all economic profits until they are zero (that is, sellers will only be making regular returns or profits on sales).

#### **Risk and uncertainty theory of profits**

The Risk and Uncertainty Bearing Theory of Profit was introduced by Hawley F.B. in 1893 (Rajib, 2019). According to the theory, a businessman must earn profits as payment for taking on risk and ambiguity in a dynamic economic environment. Entrepreneurs are forced to carry out manufacturing under uncertain circumstances since profits result from future uncertainty. Entrepreneurs must anticipate future demands for their products as well as other elements that may affect expenses and price. Entrepreneurs invest a significant amount of time in the process of creating and selling the product because they recognize the worth of the output created by the hired factors after it has been produced and sold in the market.

However, between contracts and the sale of output, many changes may take place, which may upset anticipations for good or for worse and thereby give rise to positive or negative profits. Entrepreneurs who correctly predict the future or whose expectations turn out to be accurate reap positive earnings. Entrepreneurs who have made predictions that turn out to be false will gain or suffer losses. Entrepreneurs must make guesses about the cost and demand conditions in order to make all of these decisions and bear the constant risk of suffering financial setbacks as a result of their business decisions.

#### **Structure, Conduct, and Performance Theory**

The Structure, Conduct, and Performance Theory (SCP) was first initiated in 1933 by Edward Chamberlin and Joan Robinson and later developed by Joe S. Bain in 1959 (Panhans, 2023). The SCP model serves as an analytical framework for analyzing the major elements of the market. According to this concept, market structure and conduct play a significant role in determining how well a market performs. These factors are significant because they have an impact on both buyers' and sellers' behaviour in the market. As mentioned by Panhans (2023), these factors are market structure, conduct, and performance, which are covered in the following paragraphs:

**Market structure:** A market's structure relates to its development, composition, and construction as well as its operating environment. The extent to which supply and demand are concentrated, the degree of product differentiation, the product's characteristics, the available technology, and entry obstacles all play a role in how markets fail to follow ideal competition conditions.

**Market conduct:** This refers to the way buyers and sellers behave or comport themselves in relation to a market's structural framework. Additionally, it describes how buyers and sellers communicate with one another and act in the market.

**Market performance:** This is the achievement or accomplishment of a certain market or industry, or its outcomes. Product quantity, product quality, and manufacturing efficiency are performance factors taken into account in the market.

## **RESEARCH METHODOLOGY**

### **Study Area**

The study was carried out in Ibadan, the Capital city of Oyo State, Southwest Nigeria. Ibadan is a regional commercial hub for both agricultural and industrial goods from different parts of the country. The area is an amalgamation of urban and rural structures characterized by year-round booming commercial and social activities.

### **Data Sources**

Primary data were used for the study. The data were collected from dry maize sellers using a structured questionnaire. The questionnaire sought information on purchase practices, marketing information, marketing services and constraints to dry maize marketing in Ibadan.

### **Sampling Procedure**

Two-stage sampling method was used to select the respondents for this study. The first stage involved a purposive selection of big markets in Ibadan; (Bodija, Orita-merin, Oje and Omi-Adio Markets). The markets were chosen based on their prominence in dry maize marketing. The second stage involved random selection of 75 dry maize sellers in Bodija market, 80 dry maize sellers in Orita-merin market, 20 dry maize sellers in Oje market and 25 dry maize sellers in Omi-Adio market, proportionate to the size of each market and the responses from the respondents. This gives a total sample size of 200 dry maize sellers used for this study.

### **Methods of Data Analysis**

Data were analyzed using descriptive statistics, Gini coefficient and Lorenz curve, Gross margin, Net margin and Market margin analyses, and Marketing efficiency.

### **Descriptive Statistics**

Descriptive statistics were used to examine the behaviour of sellers and buyers of dry maize (Objective 2) and to identify the constraints to dry maize marketing (objective 4). The descriptive statistics include frequency, percentages, mean and cross tabulation. The results are presented in frequency distribution tables.

### **Gini coefficient and Lorenz curve**

Gini coefficient and Lorenz curve were used to analyse the characteristics of dry maize market (Objective 1). Gini coefficient was adopted to measure the relative degree of income inequality among maize sellers.

The model specification is as follows:

$$\text{Gini coefficient} = 1 - \sum XY$$

Where

X = the percentage of sellers, Y = the cumulative percentage of total sales,

$\sum XY$  = the summation of XY.

The Gini coefficient ranges from 0 to 1, where 0 implies perfect equality in the distribution. The closer the Gini coefficient is to zero, the greater the degree of equality, the lower the level of concentration and the more competitive the market. On the other hand, the closer the Gini coefficient is to one, the greater the degree of inequality, the higher the concentration and the more imperfect the market (Abah *et al.*, 2015).

Lorenz Curve, according to Abah *et al.* (2015) is a graphical representation of income distribution. It tells which proportion of total income is in the hands of a given percentage of population by relating the cumulative proportion of income to the cumulative proportion of individuals. The X-axis records the cumulative proportion of population ranked by income level. It ranges from 0 to 1. The Y-axis records the cumulative proportion of income for a given proportion of population, that is, the income share calculated by taking the cumulated income of a given share of population divided by the total income. According to Sitthiyot and Holasut (2021), Lorenz curve is used in economics to describe inequality in income or wealth. If all individuals are the same size, the Lorenz Curve is a straight diagonal line (45°), called the line of equality, if there is any inequality in size, then the Lorenz Curve falls below the line of equality (45°).

### Gross Margin, Market Margin, Net margin and Market Efficiency

Gross margin, market margin, net margin and market efficiency were used to assess the outcomes of dry maize marketing (Objective 3).

Gross Margin:  $GM = TR - TVC$ .

Where GM = Gross Margin, TR = Total Revenue, TVC = Total Variable Cost

Market margin:  $MM = SP - PP$ .

Where MM = Market Margin, SP = Selling price, PP = Purchase price.

Net margin:  $NM = TR - TC$ .

Where NM = Net Margin, TR = Total Revenue, TC = Total Cost

Market efficiency:  $ME = \frac{MM}{MC} \times 100$

Where ME = Market Efficiency, MM = Market Margin, MC = Marketing Cost

**Decision Rule:** If Marketing efficiency is equal to or greater than 100% ( $ME \geq 100\%$ ), the market is efficient. But if marketing efficiency is less than 100% ( $ME < 100\%$ ), the market is not efficient (Egbeadumah *et al.*, 2016).

## RESULTS AND DISCUSSIONS

### Characteristics of Dry Maize Marketing in Ibadan

Table 1 shows the distribution of dry maize sellers by monthly sales range. The total sales per month by dry maize sellers were ₦133,504,500. From the results, Gini coefficient for the dry maize sellers in Ibadan is 0.5472. This implies a high level of inequality in the sellers' income and high degree of market concentration. Abah *et al.* (2015) emphasized that values of Gini coefficient greater than 0.35 are high, indicating that there is inequitable distribution of sales income. Thus, dry maize market in Ibadan is imperfect. The inequality in the sellers' income is as a result of difference in the amount of capital put into the dry maize business by some sellers who chose to increase their level of investment in order to increase their earnings and make more profit.

This contradicts the findings of Jimoh *et al.* (2021) that there exists high level of competition among maize marketers in Irewole local government area, Osun state. The inequality in earning is a partial reflection of difference in the ability to bear risk of investment. People differ in their risk preference and this affects their earnings. Those with a higher propensity to take risk tend to choose riskier ventures and consequently, could have larger earnings and make more profits. Conversely, people with a relatively high degree of risk aversion seem to prefer less risky and less profitable investment and consequently, obtain lower earning.

**Table 1:** Computation of Gini Coefficient for Dry Maize Marketing in Ibadan.

Monthly Sales Range (₦)	No. of Sellers (Freq)	% of Sellers (X)	Cum % of Sellers	Cum Freq	Total Sales /Month (₦)	% of Total Sales	Cum % of Total Sales	XY
≤ 500,000	79	39.50	39.50	79	26,834,000	20.12	20.12	0.0795
500,001 - 600,000	15	7.50	47.00	94	7,950,000	5.95	26.07	0.0195

**Table 1: continuation**

600,001 - 700,000	31	15.50	62.50	125	19,044,000	14.26	40.33	0.0625
700,001 - 800,000	28	14.00	76.50	153	21,472,750	16.08	56.41	0.0789
800,001 - 900,000	0	0.00	76.50	153	0	0	56.41	0.0000
900,001 - 1000000	13	6.50	83.00	166	11,800,000	8.84	65.25	0.0424
>1,000,000	34	17.00	100.00	200	46,403,750	34.75	100	0.1700
Total	200	100			133,504,500	100		0.4528

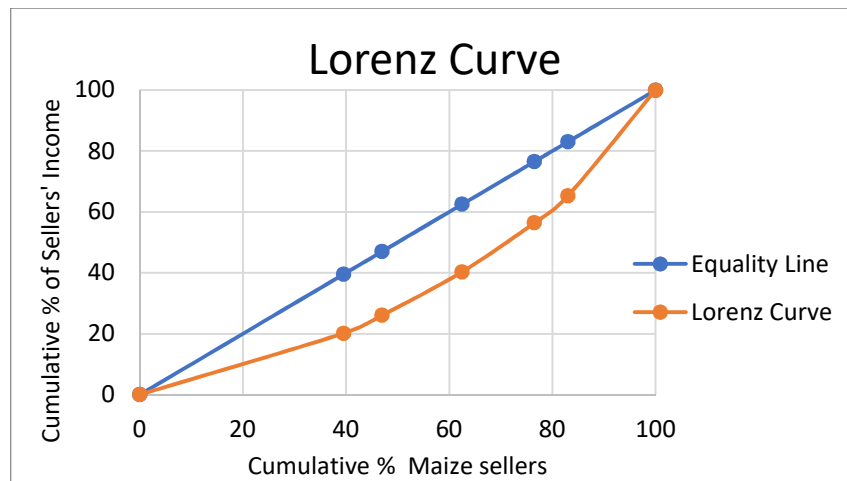
**Source: Data Analysis, 2023**

*Cum – Cumulative, Freq - Frequency*

**Note:** The Mean Value of Sales = ₦667,522,50, Gini Coefficient =  $1 - 0.4528 = 0.5472$

### Lorenz Curve

The Lorenz curve in Figure 1 shows the income distribution of dry maize sellers in Ibadan. The large gap between the line of absolute equality (blue) and the Lorenz curve (red) representing maize traders, indicates the existence of a considerable level of inequality in sales income of the sellers in the dry maize market. Careful observation of the Lorenz curve shows that the Lorenz curve is convex, which indicates inequality in the sellers' income distribution with high market concentration, meaning that some sellers seem to earn far much more than their counterparts. This indicates inequality in income distribution.



**Figure 1:** Lorenz Curve Showing Sales Income Distribution of Dry Maize Marketers in Ibadan

**Source:** Data Analysis, 2023

### Behaviour of Dry Maize Marketers in Ibadan

The behaviour of sellers in the market such as market information which include sellers' purchase price information, pricing strategy, source of start-up capital, membership of association, sales of other commodities, and advertising strategies were examined. Results are presented in Table 2.

### Marketing Information

Marketing information play an important role for sellers because they determine the quantity of the purchase stocks, purchase and selling prices, as well as time of sales. Results in Table 2 show that majority (70%) of the respondents got market information from their colleagues in the market, 28% got market information from both their colleagues in the market and from market traders' association while 2% got market information from market traders' association only. This shows that there is free flow of market information in the dry maize market in the study area. The results of this study



agree with the finding of Asogwa and Okwoche (2012) that there is free flow of marketing information in sorghum market in Benue State.

### Pricing Strategy

Uniform measurements were used in each market. From the results in Table 2, majority (83%) of the respondents reported that their selling price was set by bargaining/negotiation between them and the buyers while 17% of the respondents said that selling price was set by market forces, that is, interaction of supply and demand in dry maize market.

### Start-up Capital and its Source

The amount of start-up capital serves as an indicator to potential entrants as to know whether to venture into dry maize marketing or not. Results in Table 2 show that all respondents agreed that, with minimum amount of ₦500,000, someone can venture into dry maize marketing business in Ibadan. On the source of start-up capital, majority (71%) of the respondents sourced start-up capital from personal savings, 2% from loan while 27% got from both personal savings and loan.

### Membership of Association

Dry maize trader association exists in the markets. They registered as members of association due to certain benefits they derive. Benefits such as access to credit, market information, purchase and sales coordination, and monthly saving contribution called *Ajo* in Yoruba language, to support their business. Results show that majority (96.5%) of the respondents belong to dry maize traders' association.

### Sales of other Commodities

It is shown on Table 2 that 46.5% of the respondents were fully engaged in dry maize marketing while 53.5% sold other produce such as wheat, sorghum, millet, and so on.

### Advertising Strategy

All the respondents (100%) used open display, persuasive efforts and mobile phone to reach out to buyers and their customers. They use mobile phone to advertise and alert their regular customers, mostly the livestock farmers, who were their biggest customers. This finding agrees with Eronmwon *et al.* (2014) who found that most of the respondents used open display and persuasive efforts to attract customers in plantain marketing in Edo State.

**Table 2:** Behaviour of Dry Maize Marketers in Ibadan

Activity/Behaviour	Strategies	Frequency	Percentage
Market information	Traders Market Association	4	2.0
	Colleagues in the Market	140	70.0
	Both	56	28.0
Pricing Strategy	Negotiation/bargaining	166	83.0
	Market forces (demand and supply)	34	17.0
Start-up Capital	Minimum ₦500,000	200	100.0
Start-up Capital source	Personal Saving	142	71.0
	Loan	4	2.0
	Both	54	27.0
Membership of Market Association	Member	103	96.5
	Non-member	7	3.5
Sales of other Commodities	Yes	107	53.5
	No	93	46.5
Advertising Strategy	Open Display	200	100.0
	Persuasive efforts	200	100.0
	Mobile Phone	200	100.0

**Source:** Field Survey, 2023

### Outcomes of Dry Maize Marketing in Ibadan

In this section, the outcomes of dry maize marketing are presented in Table 3. Results show that average purchase cost (APC) accounted for 94.68% of total cost while average marketing cost (AMC) such as transportation cost and loading/offloading cost accounted 4.61% of total cost. The gross margin and marketing margin results show that the average total variable cost (ATVC) and average total fixed cost (ATFC) incurred for selling dry maize in a month were ₦649,885.90 and ₦4,595.83 respectively, accounting for 99.29% and 0.71% of total cost respectively. Also, the seller realised average total revenue (ATR) of ₦667,522.5 per month. This suggests that an average seller earned ₦17,636.6 as gross margin, ₦47,827.5 as marketing margin, and net margin of ₦13,040.77 per month.

The gross margin, market margin and net margin constituted 2.64%, 7.16% and 1.99% of total sales, respectively. Gross margin of 2.64% implies that every ₦1.00 invested on a bag of dry maize by the sellers is accompanied by 2.64k gross profit obtained. Market margin of 7.16% implies that dry maize seller realised 7.16k of every naira of the selling price paid by the consumer. This agrees with the findings of Omoare (2018) that the gross margin of greater than zero is profitable and such business is worth undertaking. Further results recorded net margin on investment of 1.99%, meaning that dry maize sellers realised 1.99k on every ₦1.00 invested. Also, marketing efficiency result was 167.17%, indicating that dry maize marketing in Ibadan is efficient and desirable to venture into because the higher the value, the better the business.

**Table 3:** Outcomes of Dry Maize Marketing in Ibadan

Costs	Values (₦)	% of Total Cost	% of Total Sales
<b>Average Variable Cost (a)</b>			
Purchased Cost (PC)	619,695.0	94.68	92.84
Transportation	20,539.40	3.14	3.07
Loading/Off loading	9,651.50	1.47	1.45
Total Variable Cost (TVC)	649,885.90	99.29	97.36
<b>Average Fixed Cost (b)</b>			
Rent on Shop/Security	4,595.83		
Total Fixed Cost (TFC)	4,595.83	0.71	0.68
Total Cost (TC)	654,481.73	100	
<b>Average Return</b>			
Total Revenue (TR)	667,522.50		
Marketing Margin (SP - PP)	47,827.50		7.16
Gross Margin (TR - TVC)	17,636.60		2.64
Net Margin (TR - TC)	13,040.77		1.99
Marketing Efficiency ( $\frac{MM}{MC}$ ) = 167.17%			

Source: Data Analysis, 2023

Note: SP = TR, PP = PC, MM = Market margin, MC = Marketing cost  
MC = transportation + Loading/offloading costs

### Constraints to Dry Maize Marketing in Ibadan

In this section, the challenges that are faced by dry maize sellers in Ibadan are presented. Challenges such as poor access to credit, poor road infrastructure, price instability, and low trade margin, were ranked from number one to number five in their order of severity, starting with the most severe.

Results in Table 4 show that more than half (52.5%) of the respondents complained of poor access to credit as the most severe. This is followed by poor road infrastructure (26.5%), price instability (25.5%), low trade margin (17.5%) and insufficient market information (14.5%). This suggests that sellers in the study area are faced with constraints that limit maize marketing and reduce their income. In agreement with the findings of this study, Muhammad and Abdulazeez (2021), Jimoh *et al.*, (2021) and Abera *et al.*, (2020) reported the main problems of produce marketing as inadequate capital, poor transportation network, low market performance, and inadequate access to market information.

**Table 4:** Constraints to Dry Maize Marketing in Ibadan

Constraints	Frequency	Percentage	Rank
Poor access to credit	105	52.5%	1 <sup>st</sup>
Poor road infrastructure	53	26.5%	2 <sup>nd</sup>
Price instability	51	25.5%	3 <sup>rd</sup>
Low trade margin	35	17.5%	4 <sup>th</sup>
Insufficient market information	29	14.5%	5 <sup>th</sup>

**Source:** Field Survey, 2023

## CONCLUSIONS

Dry maize market in Ibadan is imperfectly competitive; highly concentrated with high level of inequality in earnings of sellers. Market structure of dry maize in the study area was found to tilt towards oligopolistic competition because the market power concentration is in the hands of few sellers. All the sellers are dependent on each other; they are not free to establish their own marketing and pricing policies because activities of one seller would have effect on others. However, there is ease of entry and exit as well as freedom for buying and selling. The selling price was mainly set by bargaining/negotiation between the sellers and buyers and all the respondents used open display, persuasive efforts and mobile phone to reach out to buyers and their customers. Dry maize marketing business in Ibadan is efficient and profitable. To encourage competition and improve access to credit, government should implement policies that will reduce the concentration of market power among sellers.

## RECOMMENDATIONS

To eliminate the constraints encountered by traders in maize marketing businesses in Ibadan, the following recommendations are suggested:

- i. Lending bodies should provide more credit facilities to maize traders at a friendly interest rate.
- ii. Governments and non-governmental organizations should provide necessary transportation facilities
- iii. The marketers should work towards competitive market structure and encourage demand driven price setting mechanism.
- iv. Traders should be encouraged through subsidies to procure storage infrastructures as this will encourage fair trade margin and price stability
- v. Market information should be properly disseminated through mass media.

## Suggestions for Further Studies

This study examined the characteristics, behaviour, and outcomes of dry maize marketing in Ibadan, Oyo State, Nigeria. It can be extended to the geopolitical zone level to be able to assess what geopolitical factors influence the market characteristics or market performance of maize. Grains are important staples in Nigeria. This study can be carried out on other forms of grains like sorghum, millet, wheat, guinea corn, etcetera to determine the market nature of each product and the particular product with the highest market performance.

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