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SOCIO-ECONOMIC AND PROFITABILITY ANALYSIS OF RETAILING FROZEN FISH IN RIVERS STATE NIGERIA

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Abstract. This study was designed to investigate the socio-economic and profitability of the frozen fish retailing business in Rivers State, Nigeria from March to August 2021. During the study period, a total of 80 frozen fish retailers were selected randomly for this study. Descriptive statistics, budgetary analysis, and multiple regression analysis were used for the analysis. The result of the findings revealed that most (62.5%) of the respondents were within the age range of 31–50 years. A majority (79.5%) of the respondents had acceptable levels of formal education. Results also revealed that fish marketing in the area is dominated by females, with most (70%) of the respondents being married. Most of the respondents had enough experience in fish marketing. The estimate of cost and return analysis shows a net income (NI) of N106, 837.56 per annum. The profitability index was 0.56, indicating that out of every Naira earned, about 56 kobo was returned to the frozen fish retailers as net income. The rate of return on variable cost was estimated to be 29.55%, which means that every Naira spent on variable inputs generates about N30 on a monthly basis, implying improved enterprise profitability. The operating ratio was 0.29, indicating greater total revenue over total variable costs, which is very good for the business, while education and fish quantity sold were positive and significant at 5 percent.

Keywords: Profitability index, Net income, Rate of return, Operating ratio.

Abstrak. Penelitian ini dirancang untuk menyelidiki sosio-ekonomi dan profitabilitas bisnis ritel ikan beku di Rivers State, Nigeria dari Maret hingga Agustus 2021. Selama masa penelitian, total 80 pengecer ikan beku dipilih secara acak untuk penelitian ini. Statistik deskriptif, analisis anggaran, dan analisis regresi berganda digunakan untuk analisis. Hasil temuan menunjukkan bahwa sebagian besar (62,5%) responden berada dalam rentang usia 31-50 tahun. Mayoritas (79,5%) responden memiliki tingkat pendidikan formal yang dapat diterima. Hasil penelitian juga mengungkapkan bahwa pemasaran ikan di daerah tersebut didominasi oleh perempuan, dengan sebagian besar (70%) responden sudah menikah. Sebagian besar responden memiliki pengalaman yang cukup dalam pemasaran ikan. Perkiraan biaya dan analisis pengembalian menunjukkan laba bersih (NI) sebesar N106, 837,56 per tahun. Indeks profitabilitas adalah 0,56, menunjukkan bahwa dari setiap Naira yang diperoleh, sekitar 56 kobo dikembalikan ke pengecer ikan beku sebagai pendapatan bersih. Tingkat pengembalian biaya variabel diperkirakan 29,55%, yang berarti bahwa setiap Naira yang dikeluarkan untuk input variabel menghasilkan sekitar N30 setiap bulan, yang menyiratkan peningkatan profitabilitas perusahaan. Rasio operasi adalah 0,29, menunjukkan total pendapatan lebih besar dari total biaya variabel, yang sangat baik untuk bisnis, sementara pendidikan dan kuantitas ikan yang dijual positif dan signifikan pada 5 persen.

Kata Kunci: Profitability index, Net income, Rate of return, Operating ratio.

INTRODUCTION

Fish is regarded as one of the most traded food items globally (FAO, 2016). According to the 2016 Nigeria Fisheries Statistics report, our annual fish demand is estimated at 3.32 million metric tonnes an unsurprisingly high number considering Nigeria's teeming population of about 186 million people. Domestic production produces only about 1.12 million metric tonnes. This large deficit has left Nigeria with the option of importing an estimated 1.9 million metric tonnes of fish valued at over N125 billion per annum (Agbo, 2015). This leaves a deficit of 2.2 million metric tonnes, which is largely supplied through fish importation. Nigeria imports about 0.72 million tonnes of frozen fish that

was valued at over \$US 500 million annually, this ranked Nigeria as the highest importer of seafood in Africa (Atanda, 2012). Nigeria is the fourth largest importer of fish in the world, following China, Japan and the United States (Kikiope 2018). Nigeria imports primarily saltwater fish. Since 2001, Nigeria has imported over 600,000 t of fish annually; in 2018, the figure was closer to 750,000 t (Igoni-Egweke, 2018).

Despite the importation of frozen fish, the fish supply gap in Nigeria persists as the human population grows and eating patterns change. According to FAO (2018) fish consumption in Nigeria measured at 13.3 kg/capita/year is low compared with the world's average of 20.3 kg/capita/year. Fish consumption in Nigeria is characterized by a long-standing cultural preference for fresh fish, however due to dwindling fisheries resources in most Nigerian lake bodies, frozen fish is gradually replacing fresh fish. Frozen fish has some advantages over fresh fish. First, while growing demand for fish is driving up prices (Jiang, 2010), frozen fish enables consumption to be generalized at a lower price. Generally speaking, on average, fresh fish is priced higher in the market than frozen fish (Trondsen, 1997). Many consumers perceive that fresh fish is superior to frozen fish in terms of taste, freshness, and nutritional value. However, the high quality of the freezing-at-sea process employed by the frozen fish industry often means that frozen fish is the equivalent of fresh, if not better (CBI, 1996). Similarly, as a result of the processing and preparation techniques used, nutrient preservation over time is often greater in frozen fish than in fresh (CBI, 1996). Most of the time, the frozen natural products may contain more vitamins and minerals than freshly chilled because they are frozen on board recently caught at the moment of higher nutritional value.

Marketing is an integral aspect of fish production because it is only when the fish gets to the consumers that production is said to be complete. Fish marketing is the one of post-harvest activities, which is an avenue of improvement of family income (Babalola, 1976). The availability of fish to consumers at the right time and at the right place requires effective marketing system. Currently, people involved in marketing of fish are on the increase, this might be as a result of the profitability of the venture or increase in population (Ali et al., 2014).

The level of efficiency and profitability of the market and marketing functions are very important for sustainable marketing of agricultural products like fish (Umoinyang, 2014). Effective and efficient marketing systems the one that will induce the production of those products and quantities which when sold to the consumer will result in maximum returns after the deduction of minimum marketing charges and farm production costs (Muhammed, 2011). Economic analysis is necessary in assessing the profitability and viability of enterprises. Therefore, this study was conducted to determine the socio-economic status of frozen fish retailers and the profitability of frozen fish retailing in Port Harcourt metropolis.

METHODS

Study Area

Port-Harcourt is the capital of Rivers State, Nigeria. Port Harcourt lies between longitudes 6°55' and 7°10' east of the Greenwich meridian and latitudes 4°40' and 4°55' north of the equator. It occupies an area of 369 km2 (142 sq m2) metropolis, 360 km2 (140 sq m2) land, 9 km2 (3 sq mi) water, 158 km2 (61 sq mi) urban, 1,900 km2 (700 sq mi) metro. The metropolis of Port Harcourt spans seven local government areas that includes Port Harcourt, Okrika, Obio-akpor, Emuoha, Etche, Ikwerre and Eleme.

Data Collection

A multi-stage sampling technique was used in the selection of respondents for this study. In the first stage, purposive sampling was used in the selection of three local government areas in the Port Harcourt metropolis, namely Obio-akpor, Ikwerre, and Eleme Local Government Areas (LGA), because of their high population of frozen fish marketers. The second stage was to select major frozen fish markets in the three LGA. The third stage was the random selection of ten respondents each from eight major markets in the three selected local government areas in Port Harcourt metropolis. The data for this analysis was collected using a well-structured questionnaire that was given to frozen fish retailers in different markets. The questionnaires were administered to randomly selected retailers of frozen fish retailers (80 respondents) in the eight markets.

Data Analyses

Descriptive statistics analysis such as percentage, frequencies were used to describe the socioeconomic characteristics of the respondents, common frozen fish species retailing in the study area using Statistical Package for Social Science (SPSS) 16.0 windows SPSS software package.

Cost and Returns Analysis

This analysis was used to determine the profitability of froze fish Retailing. The profitability analyses employed were fixed cost (FC), variable cost (VC), total cost (TC), total revenue (TR), gross margin (GM), and profit (Adebayo and Daramola 2013).

Total Cost =Total Variable Cost + Total Fixed Cost. Total Revenue = P X Q (P = Price and Q = Total output (kg))=TR –TVC where: GM = Gross margin GM = Total revenue TR TVC = Total variable cost Profit = GM - TFCWhere: GM = Gross margin TFC = Total fixed cost.Profitability index or return on sale (PI) = NI/TRThe ratio of return on investment (% RRI) = NI/TR x 100 Where: NI =Net Income Rate of return on Variable Cost (% RRVC) =TR-TFC/ TVC x100 Operating Ratio (OR) = TVC/TR

Regression Analysis

The regression analysis was carried out to examine the factors affecting the market profit of frozen fish retailers. The dependent variable is profit obtained by sellers in the market, while the exogenous variables are the factors affecting the level of profit, such as age, marital status, marketing experience, level of education, the quantity of fish sold, fish species and membership of cooperative). Four functional forms were fitted, these were linear, semi-log, double log, and exponential. The model with the best fit was then chosen as the lead equation.

RESULT AND DISCUSSION

Socio- economic characteristics of frozen fish retailers

Some important socio-economic characteristics of frozen fish retailers are summarized in Table 1. The table shows that most of the respondents were within the age range of 31–50 years old, constituting 62.5% of the total respondents. This implies that most of the frozen fish retailers were in their productive years, which is an important factor in marketing activities. It implies that they are still in their economically active age, which could have a positive effect on production. All the respondents were female in the study area, indicating that frozen fish retail is gender-sensitive. Women engage mainly in post-harvest activities (processing, selling, marketing of fisheries resources) resulting in some empowerment. Women have tendency to be more labour efficient than males (Onubuogu et al., 2014).

Majority of the respondents (70%) were married, while 30.0% of the respondents were single. Studies have shown that healthy marriages increase business profitability by about twenty percent (Ahituv and Lerman, 2005) and this suggests that marriage will improve employment, efficiency, and profitability. The findings of this study reveal that the majority of the frozen fish retailers were educated, with about 57.5% of the frozen fish sellers having a secondary school education and 5.0% only having a non-formal education. This indicated that the majority of the respondents were literate, which was expected because managing the frozen fish business requires the ability to complete certain documentation. Pala (1976) reported that formal education is an important factor in the performance and management of fish marketing and fishery sector in general. According to the survey, thirty-five

percent of frozen fish retailers have been in business for over 15 years. 32.5% of the respondents had between 1 and 5 years of experience, 20% had experience of 11–15 years, and 12.5% had 5–10 years of experience in the sale of frozen fish. The high level of experience had the tendency to improve the efficiency and profitability of frozen fish marketing in the study area. According to Ojo (2003), experience has the tendency to improve both the productivity and profitability of a business enterprise.

Table 1. Socio- economic characteristics of frozen fish retailers				
Socio-economic characteristics of respondents	Frequency	Percent		
Age (Years)				
>20 years	2	2.5		
21-30 years	20	25		
31-40 years	26	32.5		
41-50 years	24	30		
51-60 years	8	10		
Sex				
Male	0	0		
Female	80	100		
Marital Status				
Single	24	30		
Married	56	70		
Educational Level				
No formal education	4	5		
Primary education	14	17.5		
Secondary education	46	57.5		
Post-secondary education	16	20		
Work Experience				
Less than 5 years	26	32.5		
5-10 years	10	12.5		
11-15 years	12	20		
Above 15 years	28	35		
Motivational factors into frozen fish retail				
Unemployment	15	18.75		
Financial benefits	45	56.25		
Flexible work schedules	8	10		
Family business	12	15		
Other business-related options				
Sale of other fish type	17	21.25		
Sales of food items	36	40		
Sale of other agricultural produces	23	28.75		
Membership of fish market co- operative society association	-	- · · ·		
Co-operators	32	40		
Non- Co-operators	48	60		
Acquiring of sales point				
Rent	66	82.5		
Free	14	17.5		
Source of capital	- •			
Family/Friend	30	37.5		
Money lender	12	15.0		
Personal saving	24	30.0		
Credits	14	17.5		

Source: Primer Data

The motivating factors reported by the respondents were unemployment, financial benefits, flexible work schedules, and family business. As revealed in the study, financial benefits were reported by the respondents to be the most motivating factor, with about 56.25%, followed by unemployment (18.75%) and family business (15%), while the least motivating factor was flexible work schedules (2.5%). Data collected also revealed that the other small-scale related options for respondents included the sale of other fish types, sales of food items, and the sale of other agricultural

produces. Results also revealed that most of the respondents (82.5%) paid to acquire sale points, while the remaining 17.5% of the respondents did not pay to acquire the sale points. Further results in Table 1 indicate the sources of capital for the business. About 37.5% of the respondents got their capital from family /friends, while another 30% got capital from their personal savings. 17.5% started their business on credit, while the remaining 15% got capital from money lenders. The findings of this study show that most of the money used in starting up frozen fish businesses by most marketers comes from family/friends. Adequate financial resources are essential to a successful business, and the ability to acquire sufficient capital is a key factor (FAO, 2017). Table 1 indicates that most of the respondents (60%) belong to one co-operative society, while the remaining 40% of the respondents do not belong to any co-operative society.

Frozen fish species retailing in Port-Harcourt Metropolis

Table 2 reveals the common frozen fish species sold in the study area. Three fish species, including Pseudotolithus enlongatus (Croaker), Oreochromis niloticus (Red Tilapia) and Trachurus spp (kote Scumbia), were classified as the most expensive fish species by the respondents. This finding is similar to that of Agom et. al., (2012).

Table 2. Fish species retailing in in Port-Harcourt Metropolis			
Most expensive fish species sold	Frequency	Percentage	
Pseudotolithus enlongatus (Croaker)	75	93.75	
Oreochromis niloticus (Red tilapia)	60	75.0	
Trachurus spp (kote scumbia)	51	63.75	
Pollachius virens (saithe)	17	21.25	
Scomber japoncius (Mackerel)	17	21.25	

Source: Primer Data

Multiple response

Daily quantity of frozen fish sales in Port Harcourt metropolis

The study, as shown in table 3, revealed that 40% of frozen fish retailers sold between half a carton and one carton of fish daily, and about 20% of the respondents sold between one and one-half cartons of fish every day, while the remaining 40% of the respondents sold two cartons or above. A parallel relationship between the quantity of fish sold and business capital exists: if the amount of capital of the retailers is small, the amount of fish sold is also small, and vice versa.

Table 3. Daily frozen fish sales in Port Harcourt metropolis			
Daily quantity of fish sales	Frequency	Percent	
A half-carton to a full-carton	32	40	
1 and a half cartons	16	20.0	
Two cartons	14	17.5	
Above two cartons	18	22.5	
Total	80	100.0	
Correct Driver Date			

Source: Primer Data

Cost and Return Analysis of Frozen fish Marketing in Port-Harcourt Metropolis

Estimates of cost and return analysis were made from the frozen fish business using average cost (fixed and variable) and yield data generated by each of the sampled frozen fish retailers. The cost and return analysis in Table 4 reveals that the variable cost accounted for the largest proportion of N54, 632.575.00 of the total cost of frozen fish in the study area. Also, the result shows that an average total cost (TC) of N83, 330.83 per annum was incurred by the respondents while a total revenue (TR) of N190, 168.39 per annum was realized with a returning gross margin (GM) of N135, 535.81 per annum and a net income (NI) of N106, 837.56 per annum. This indicates that frozen fish sales in the study area were profitable. The implication of the findings is that when efficiently, effectively, and carefully managed, frozen fish marketing is capable of producing good marketing margins as well as a reasonable net return over time. Okeoghene (2013) measured the profits or losses of the marketers in the fish marketing channels of frozen fish in Edo state using Gross Margin analysis and he found that the business was profitable.

Item	Minimum	Maximum	Mean	Std. Deviation
Nylon	250.00	300.00	298.75	7.90
Fish cost	25,000.00	102,500.00	54,333.83	22019.73
Total Variable Cost	25,300.00	102,800.00	54,632.56	22020.19
Table	2,000.00	9,000.00	6,665.00	1348.04
Knife	500.00	800.00	513.75	60.96
Chop board	400.00	600.00	453.75	26.28
Apron	300.00	500.00	352.50	25.19
Umbrella	7,000.00	9,000.00	7,950.00	1011.47
Cooler	2,000.00	4,000.00	3,475.00	251.92
Tray	1,500.00	2,000.00	1,512.50	79.06
Scale remover	400.00	500.00	450.00	11.32
Scale brush	280.00	350.00	300.75	8.59
Bowl	4,500.00	5,000.00	4,512.50	79.06
Iron stool	2,500.00	3,000.00	2,512.50	79.05
Total Fixed Cost	23,550.00	3,2150.00	28,698.25	1710.63
Total cost	53,350.00	130,850.00	83,330.82	21970.45
Total Revenue	87,500.00	358,750.00	190,168.38	77069.05
Gross Margin	62,200.00	255,950.00	135,535.81	55048.86
Net Income	32150.00	232400.00	106,837.56	55191.36

Table 4.	Cost and Retur	n Analysis of	f Frozen fish	Marketing in	n Port-Harcourt	Metropolis
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Source: Primer Data

Profitability Analysis of Frozen Fish Retailing in Port-Harcourt Metropolis

The profitability ratio in frozen fish retail was calculated to determine the profitability level of the enterprise. Table 5 reveals that the profitability index was 0.56 indicating that out of every Naira earned, about 56 kobo returned to the frozen fish retailers as net income. In addition, frozen fish retailer earns 56 Kobo profit on every naira spent on frozen fish marketing. The rate of return to variable cost was estimated as 29.55% that is on monthly basis, every one Naira cost incurred on the variable inputs generates about N30 which implies that improving profitability in the enterprise. The operating ratio of 0.29 indicates greater total revenue over total variable costs, which is very good for the business. The results of the profitability analysis of frozen fish show that the frozen fish business is a profitable business. This is in line with the findings of Okeoghene (2013), who reported a positive gross margin for frozen fish marketing in Edo State.

Table 5. Profitability Analysis of Frozen Fish Retailing in Port-Harcourt Metropolis			
Profitability Analysis of Frozen Fish Retailing	Values		
Profitability index (P.I)	0.56		
Rate of Return on Investment (%) RRI	56.18%		
Rate of Return on Variable Cost (%) RRVC	29.55%		
Operating Ratio (OR)	0.29		

Source: Primer Data

Linear Regression Analysis of profit margin determinant

The regression analysis was used to predict the influence of the hypothesized explanatory variables on the marketing margin (profitability indicator). The results of the regression output are presented in Table 6. The adjusted coefficient of determination (R-2) is 0.896, indicating that 89.6% of the variation in the marketing margin is explained by the variations in the specified independent variables. Table 6 indicates that, six out of the eight variables in the model have significant coefficients. These include education, years of experience, fish type, fish quantity sold and seasons. The coefficients of years of experience, fish type, and seasons were all positive, accounting for 10% of the total. According to Ali et al., (2008), marketing experience is important in determining the level of profitability obtained by a marketer.

At 5%, education and fish quantity sold were both positive and significant. Education had a positive coefficient on the profit margin of the marketers. Marketers with formal education have a greater ability to adopt new technology, ideas, information, and marketing strategies to maximize

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profit. It is expected that the higher level of education will contribute significantly to the decision making of the fish frozen sellers. Esiobu et al., (2014) asserted that exposure to a high level of education is an added advantage in terms of achieving a huge profit margin, efficient marketing, and sustainable marketing enterprise production. Age, on the other hand, had a 1% negative impact.

Table 6 Linear Regression Analysis of profit margin determinant			
Variables	Co-efficient	t-value	
(Constant)		0.830	
Age	-0.088***	-3.418	
Marital status	-0.076	-0.448	
Education	0.089**	2.474	
Years of experience	0.241*	1.959	
Fish species	0.476*	1.979	
Fish quantity sold	0.066**	2.328	
Membership of cooperative	0.436*	1.947	
F-value		29.208	
R Square		0.904	
Adjusted R Square		0.896	

NOTE: *** sig at 1%, ** sig at 5%, * sig at 10%

- Sign signify inverse relationship between the variables and the profit margin i.e increase in the variable will lead to decrease in the profit margin.

+ Sign signify direct relationship between the variables and the profit margin i.e increase in the variable will lead to increase in the profit margin.

Source: Primer Data

CONCLUSION

The study showed that frozen fish marketing is a lucrative enterprise in the study area. The net income was positive at N106,837.5625 and the profitability index, rate of return on investment, rate of return, variable cost, and operating ratio were estimated as 0.56, 56.18%, 29.55%, and 0.29%, respectively, all of which imply that the business is profitable. Variables like education, years of experience, fish type, and fish quantity sold, and seasons are socio-economic factors that had significant influence on the profitability indicator.

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