# Financial Performance of Some Classes of Trawling Vessels in Nigeria: A Comparative Analysis

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***Abstract***
*The study compared financial performance between different classes of trawling vessels. Data was collected from a cross section of 30 small and large vessels, 30 fishing and shrimping vessels and also 30 foreign owned and Nigerian owned vessels. Comparison was done according these paired groupings. Financial performance was assessed using Return on Investment (ROI) while comparison of financial performance between different classes of vessels was facilitated using t-test statistics for paired samples. Results from the study revealed a significant difference in the mean value of financial performance for small and large vessels showing that investment in large vessels is more viable than their small vessel counterparts. Smaller vessels encounter high cash outflows with relatively lower revenue resulting from lower fishing power in contrast with their larger counterparts who in addition to incurring high cash outflows earn higher revenue in view of their higher fishing power. The study also showed that the financial performance for shrimping vessels were significantly higher than that of fishing vessels at the 5 per cent level ($p<0.05$). This is attributed to the fact that products of shrimping vessels (shrimps) are mainly for export and commands high value in international market relative to products of fishing vessels (fish) which are for domestic market with attendant lower prices. The financial performance of foreign owned and operated vessels was approximately 20% higher than their Nigerian owned counterparts and is statistically significant at the 5 per cent level of probability. This is premised on the fact that foreign owned vessels are newer and equipped with sophisticated technology for fish detection and capture relative to Nigerian owned vessels which are as old as 20 years and which attracts higher repair and maintenance costs. This accounts for domination of marine capture fisheries by foreigners. The study recommends urgent implementation of the Cabotage vessel fund to enable Nigerians buy new and sophisticated vessels at minimal interest rates. While financial performance indices point to relative profitability of large and shrimping vessels, caution should be exercised in maintaining reasonable investment in fishing vessels for domestic fish production and consumption.*

***Keywords:*** *Vessels, Trawling, Performance, Investment, Fishing, Shrimping, Financial*

## Introduction

In an attempt to diversify the Nigerian economy in the light of dwindling oil revenue, investment in trawling vessels is perceived as a viable option in view of its capability to contribute to food security, employment and income generation, foreign exchange as well as

raw materials for livestock and feed industry (Effiong et al, 2016a). Trawling vessels are specialized ships designed for fish capture. Before the advent of trawlers, the exploitation of marine fish stocks was carried out by artisanal fishermen in dugout canoes. This method of fishing was characterized by drudgery, low volumes of catch per man, sea accidents and limitation of fishing distance. Trawling therefore emerged as a technologically efficient method in the exploitation of the marine fishery resource relative to artisanal fisheries (Effiong et al, 2016b). The emergence of trawling has helped in no small way in increasing domestic fish production in Nigeria. The extent to which a trawling vessel is able to make profit could go a long way in determining the level of investment in the sub-sector. According to NBS (2005) Nigeria is still unable to produce at least 60% of her annual fish demand. The country is at present producing about only one third of the quantity of fish she requires for domestic consumption. The shortfall in domestic fish production is augmented through importation. Effiong et al (2016c) in a study on the performance of trawling vessels observed that shrimping vessels enjoys higher returns because its products which are for export commands high value in international market. The fact buttressed here is that the stakes are high for investors in trawl fisheries. This is coupled with increased surveillance of our territorial waters which has seriously reduced the incidence of piracy and sea robberies.
This study aims at comparing the financial performance of some classes of trawling vessels. Results of the study is expected to serve as a signal for facilitating meaningful policy and investment decisions as well as provide insight on measures to improve financial performance. A success in this direction is expected to stimulate increased investment in the industrial fishery sub-sector and hence make possible the realization of the objective of national fisheries policy.

**Literature Review**

Tietze (2005), Lery, Prado and Tietze (1999) and Anon (1999) stressed that the financial performance of fishing operations is generally analyzed with the help of return on investments (ROI). This ratio shows how much money needs to be invested in fishing enterprise in order to generate a certain net profit.
Financial performance of trawling operations is affected by various factors including fluctuations in revenue, falling yield, catch per unit of effort, unforeseen increase in the cost of key inputs and catch and effort restrictions.

Theory suggests that in an open access unregulated fishery, the fishery will eventually end up producing at the point where total revenue equals total cost (Garca, 1997; Cheson and Clayton, 1998). In a study by the Food and Agricultural Organization (FAO) fisheries department in 1995 to 2000 of selected countries in Africa, Asia, Europe and Latin America, it was discovered that inspite of heavily exploited fisheries resources, marine capture fisheries are generally still a financially viable undertaking. In most cases , it generates sufficient revenue to cover the cost of depreciation, the opportunity cost of capital and this generates sufficient funds for re-investment in addition to generating employment income and foreign exchange earnings (Farmer and Garca, 2000). Of the 108 fishing vessels studied in the survey, 105 or 97% had a positive gross cash flow and fully recovered their operational costs. When considering cost of capital i.e. the cost of depreciation and interest, 92 out of the 108 vessels or 85% showed a net profit after deducting the cost of depreciation and interest. Those categories of fishing units with operational losses at the time of the study are located at the extreme ends of the scale of fishing operations i.e. the very small scale as well as in the very large scale sector of the industry (Sumaila, Lin and Tyedmers, 2002).
In the former case, over exploitation of inshore fisheries resources and competition from more efficient fish capture technologies such as purse seiners and coastal trawlers seem to be

responsible for the negative financial performance. In the latter case, excess capture capacity and related excessive costs of operation and investment vis-à-vis limited fishing grounds and fisheries resources seem to be the important factors.

A change in average profitability of a vessel is an imperfect indicator of change in overcapacity as it is also affected by changes in prices and costs. These in turn may be influenced by factors outside of the fishery- for example, exchange rate changes, fuel cost changes, price changes due to changes in the supply of farmed fish. These factors may either increase or decrease profitability independent of the state of the stocks. Hence further analysis of data is required to determine the cause of any change in profitability.
As far as financial performance and cost of fishing operations are concerned, some trends can be observed. In trawl fisheries, for example, noticeable differences can be observed between developed and developing countries regarding financial performance and productivity. While productivity, measured as value of production per crew member, was found to be generally higher in developed countries, the rate of return on investment was found to be generally higher in developing countries. The higher degree of productivity in developed countries studied can be probably attributed to a higher degree of mechanization and sophistication of equipment for fish detection, capture and on on-board handling of fish. Their lower cost of operation in relation to gross earnings and their lower cost investment/higher depreciation because of the use of older fishing vessels explain the higher profitability of trawl fisheries in the developing countries studied. As the cost of labour increases in developing countries in the course of overall economic development and as old fishing vessels are being replaced through newly built ones, it can be expected that the difference in profitability of fishing operations as compared to developing countries might gradually disappear.
In the case of small scale fishing vessels, the differences between productivity on the one hand and financial performance on the other are even much more pronounced. While productivity is again higher in developed countries, the financial performance of the small scale fishing units studied in developing countries is significantly better than those in developed countries because of lower cost of investments and lower cost of production (Tietze, 2005).

**Methodology**

A multi-stage sampling procedure was used in selecting the sample for the study. First, the list of licensed vessels operating in Nigeria was obtained from the Federal Department of Fisheries (FDF) from which 60 vessels were randomly selected. The second stage involved the use of stratified sampling where the vessels were classified into large and small vessels. The third stage involved the random selection of 30 large and 30 small vessels. The size of large vessels in this study is taken as 18m length overall (LOA) and above while that of small vessels is taken as 10-17 LOA. The fourth stage involved stratified sampling where the large and small vessels were further classified into fishing and shrimping vessels. The fifth stage involved the random selection of 15 fishing as well as 15 shrimping vessels from among the large vessels and 15 fishing as well as 15 shrimping vessels from among the small vessels. This brings to 30 each of the total number of fishing and shrimping vessels. In the sixth stage 15 Nigerian owned as well as 15 foreign owned vessels were purposively selected from among the large vessels while 15 Nigerian owned as well as 15 foreign owned vessels were equally purposively selected from among the small vessels. This brings to 30 each of the total number of Nigerian and foreign owned vessels. A total of 60 copies of questionnaire were administered to captains of the trawling vessels using the above criteria. Hence n = 60.
This study made use of both primary and secondary sources for data collection. Relevant information for this study was gathered through a combination of personal informal

interviews, discussions and interview with a questionnaire. The structuring of the questionnaire allowed for both fixed alternative and open-ended questions for increased efficiency in data collection. The questionnaire was designed to obtain original information, which involved a direct field study of the trawlers. Secondary data for the study was obtained from Federal Department of Fisheries (FDF), Nigerian Trawlers Owners Association (NITOA), Nigerian Maritime Administration and Safety Agency (NIMASA).

Performance according to Effiong et al (2016c) is an appraisal of the financial result emanating from industrial trawl fisheries. Measures of performance adopted in this study are based on the following parameters. (i) Level of earnings. (ii) Level of investments. (iii) Level of operational costs. Comparison between different classes of vessels allows for effective evaluation of the activities of trawling vessels.

Financial performance was assessed with the help of the Return on Investment.

$$ROI = \left[ \frac{\text{Average Profit}}{\text{Average Investment Outlay (expressed as a percentage)}} \right]$$

Where

ROI = Return on Investment

Average Profit = Profit after Tax and Depreciation

Average Investment Outlay = Initial Investment Cost plus other subsequent cash outflow divided by 2

Comparison of financial performance between different classes of vessels will be facilitated using t-test statistics for independent samples. In using the t-test, financial performance of trawlers will be compared following this grouping: large and small vessels, fishing and shrimping vessels, foreign and Nigerian vessels,

$$t = \frac{X_1 - X_2}{\sqrt{SE^2_1 + SE^2_2}}$$

Where:

$\bar{X}$ = Means of 2 independent samples

$SE^2$ = Standard errors

$S^2$ = Sample Variance

**Results and Discussion**

**Table 1: Test of Significance of the difference between the mean of Financial Performance of different Classes of Trawling Vessels**

| Class of Vessel | Mean | Std. Deviation | Std. Error Mean | D.F. | t-Statistic |
|---|---|---|---|---|---|
| Small Versus Large Vessels | 23.39<br>29.57 | 1.3735<br>2.4090562 | .2508<br>.4398315 | 29 | -11.714** |
| [a] Lv - Sv | 6.18 | 2.8865841 | .5270157 | | |
| Fishing Versus Shrimping Vessels | 39.10<br>49.83 | 2.8556639<br>2.0670 | .5213705<br>.3774 | 29 | -16.942** |
| [a] Sv - Fv | 10.73 | 3.4678756 | .6331446 | | |
| Foreign Versus Nigerian Vessels | 50.37<br>30.82 | 2.9388<br>7.4618293 | .5366<br>1.3623374 | 29 | 12.111** |
| [a] Frv- Nv | 19.55 | 8.8415067 | 1.614309 | | |

** Means significant at the 5 per cent level. [a] represents paired sample differences

**Small versus Large Vessels**

The results reveal that on the average, the financial performance of large vessels was higher than that of small vessels. The mean value of financial performance of small and large vessels was approximately 23.4 and 29.6 respectively. There was a significant difference (t=-11.714) in the mean value of financial performance for small and large vessels. The mean value of financial performance was higher for large vessels than for small vessels. This means that investment in large vessels is more viable than small vessels as larger vessels earn an average of 29.57 per cent of their investment capital as average profit while smaller vessels earn an average of 23.39 per cent of their investment fund as average profit. This can be attributed to high cash outflows to earnings ratio. Smaller vessels encounter high cash outflows with relatively lower revenue resulting from lower fishing power in contrast with their larger counterparts who in addition to incurring high cash outflows earn higher revenue in view of their higher fishing power. This result is consistent with Sumaila et al (2002) and Effiong et al (2016c).

**Fishing versus Shrimping Vessels**

The mean value of financial performance is 39.10 for fishing vessels and 49.83 for shrimping vessels. This implies that shrimping vessels earn 10.73 per cent higher returns from investment capital than fishing vessels hence it is more profitable to invest in shrimping. The difference is statistically significant at 5 per cent level of probability ($P<0.05$). This may have informed the higher number of shrimping vessels operating in Nigeria relative to fishing vessels. As at 2007, there were 161 registered shrimping vessels as against 28 registered fishing vessels operating in Nigeria (FDF, 2008). Effiong et al (2016c) attributes this to the fact that the products of shrimping vessels (Shrimps) are mainly for export and commands high value in the international market while that of fishing vessels are mainly for domestic market and attracts relatively lower prices. Shrimping vessels generate foreign exchange from export of shrimps to the European Union and the United States of America and other countries. This may have in part accounted for higher profitability relative to their fishing vessel counterparts. According to Olawuyi (1992), this may be responsible for a gradual shift from fishing to shrimping. There was a 90.6 per cent increase of shrimping vessels purchased between 2001 to 2005 (FDF,2008).

**Foreign Versus Nigerian Vessels**

The mean index of financial performance for foreign owned and Nigerian owned vessels was 50.37 and 30.82 respectively. This shows that foreign owned vessels earn approximately 20% higher returns from their invested capital than Nigerian owned vessels. This difference is statistically significant at the 5 per cent level. The reason for the wide difference between the financial performance of foreign owned vessels and their Nigerian owned counterparts could be attributed to the following:

(i) Foreign vessels are equipped with more sophisticated technology for fish detection and capture hence superior fishing power
(ii) Employ highly trained and skilled personnel as crew.
(iii) Most of the foreign vessels are distant water vessels as such go to fish in other countries where Nigeria has bilateral agreement.
(iv) Most of the Nigerian vessels are old. Some are as old as 20 years or more hence attract higher repair and maintenance costs and may not be used for long fishing journeys.

With this type of scenario, the industrial fishery sub-sector will continue to be dominated by foreign firms. This may have informed the passing into law of the Cabotage Act in 2005 which is an attempt by government to encourage greater participation by Nigerians in fishery and maritime business. The Act stipulates that:

(i) Where Nigerians go into a joint venture with foreigners; Nigerians should own not less than 60 per cent equity share.
(ii) All crew members of fishing vessels should be Nigerians. Violation attracts fines.
(iii) All fishing vessels operating in Nigeria's waters should be made in Nigeria.

**Conclusion and Recommendations**

To prevent domination of the industrial fishery sub-sector by foreign firms, there is need for urgent implementation of the Cabotage Vessel Fund to enable Nigerians buy new and sophisticated vessels at minimal interest rate and thus be able to compete favourably with foreign vessels. While financial performance indices point to relative profitability of large and shrimping vessels, care should be exercised in maintaining reasonable investment in fishing vessels for domestic fish production and consumption. The study also underscores the need for training institutions within Nigeria for maritime training of highly skilled personnel that can compete favourably with their foreign trained counterparts in manning trawling vessels.

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