Comparative Analysis of Net Returns of Small and Medium Agro-Based Enterprises in Enugu State, Nigeria

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ABSTRACT

The study analysed the returns to agro-based small and medium enterprises in Enugu State, Nigeria. It specifically estimated and compared the returns to both categories of enterprises and also determined the factors that affected returns to each category. Ninety agro-based SMEs comprising 60 small scale and 30 medium scale agro-based enterprises were randomly sampled from the three zones of the State. Data were generated through the use of structured questionnaire. Results showed that small scale agro-based enterprises earned on the average a total revenue of ₦1,006,470 ($6,099.82 at an exchange rate of $1 = ₦165) per annum while the medium scale agro-based enterprises total revenue was ₦2,065,375 ($12,517.42) per annum. The results yielded a net return of ₦199,070 ($1,206.48) and ₦433,332 ($2,626.25) with an average rate of return of 24.66% and 26.55% for the small and medium scale agro-based enterprises respectively. This implies a high rate of return. Net returns to small and medium scale agro-based enterprises were significantly affected by age of operators, education, employment generation, linkage effect, experience and category of enterprise. It is recommended that policies which will encourage continuous education of entrepreneurs in business skills either through workshops or seminars should be highly advocated.
Key words: Net returns, agro-based, small scale, medium scale, enterprises

INTRODUCTION

Agriculture is the mainstay of the Nigerian economy, in which over 80% of the population is engaged in subsistence farming. The growth and development of any economy, depends on the growth and development of the agricultural sector (Eze, 2007). The sector gave employment to about 65 million persons and contributed about 41% of the Gross Domestic Product (GDP) of the country (NBS, 2007).

Given the potential inherent in the economy with regards to stable food crops, arable and cash crops and virgin land, setting up agro-based industries with backward linkages to the farm would to a considerable extent alleviate poverty if properly financed. In addition, it would provide a ready market for the rural dwellers that depend on agriculture for their livelihood. It can also supply the base or by-products for industry; satellite industries can develop from the parent body and a continuous supply of utilities is guaranteed over time.

The controversy between agricultural development and industrial development as alternative development strategy will be resolved by integrating agriculture into industry through agro-based small and medium scale enterprises (SMEs). Industrialization is a veritable tool for a faster economic growth. It involves a technical arrangement that moves an economy from the traditional method of production to a more complex system of mass manufacture of a variety of goods and services involving technology and management techniques (Anyanwu, 1996).

The small and medium scale enterprises are the engine of growth of economies around the globe. Industry sources have established that an average of 70% of business operations in world economy is accounted for by SMEs (Egugozie, 2007). Various authors report that SMEs account for 40% of the Gross Domestic Product (GDP), provide about 70% work force and promote indigenous technology (Osuala, 1995; Eze, 1992). Other elements of growth which SMEs contribute include more economic use of resources, more employment creation per unit of capital investment, mobilization of domestic saving for investment, development of domestic entrepreneurship, personnel development and more equitable income distribution (Anyanwu, 1996).

In a recent study by Ike *et al* (2014) on financing of small and medium scale agro-based enterprises in Enugu State, it was reported that despite the success recorded by SMEs in the state in terms of job creation and poverty alleviation; they are still faced with numerous challenges amongst which is low access to capital when viewed against the high cost of doing business in Nigeria. The issue of provision of power is a costly factor of production and its inadequacy has affected the survival of most small and medium enterprises in the country.

In spite of all these challenges, it is well known that SMEs are established as private enterprises by the operators with the primary objective of profit maximization. The different conditions for categorization of business enterprises into small or medium scale are well documented in literature (Ike and Chidebelu, 2003). The level of returns to each of these categories of business enterprises need to be examined. This is based on the fact that despite the classification of these agro-based business enterprises together by government agencies and development partners, there are still differences in both capital and labour requirement for the establishment of

each category. To this end, there arises the need to estimate and compare the net returns to small and medium scale agro-based enterprises as well as determine the factors that affect the returns to these categories of enterprises in the state.

METHODOLOGY
Study Area
Enugu State is one of the thirty six states of Nigeria. The state was carved out from the old Anambra State in August 27, 1991. The state is bounded northwards by Abia and Benue states. Other states that share common boundaries with Enugu state include Ebonyi, Imo, Kogi, and Anambra states. The State is crisscrossed by numerous streams and rivulets of which the major ones are the Adada, Oji, Ekulu and Ajalli Rivers.

The state is composed of seventeen local government areas divided into three agricultural zones of Nsukka, Enugu and Awgu zones and has a population of 3.26 million made up of 1.62 and 1.63 million males and females respectively (NPC, 2006). The state's population density is two and a half times the national average. Enugu state has a rich agricultural land as a result of its location within the tropical forest and savanna belts. A large percentage of the state's rural population are farmers growing food crops such as rice, cassava, maize, yams, cocoyam, banana and a variety of fruits and vegetables. Cash crops such as oil palm and cashew are produced in large quantities while animals as goat, sheep, pig, poultry and cattle are also domesticated mainly at small scale level.

Sampling Procedure/ Data Collection and Analysis
The study population included all registered small and medium scale agro-based enterprises in the three agro-ecological zones of Enugu State. Twenty small scale and 10 medium scale enterprises were randomly selected in each of the three zones to give a total of 60 and 30 small and medium scale agro-based enterprises respectively.

Data for the study were obtained from the owner-operators of the enterprises the use of structured questionnaire. Questionnaire items included age of entrepreneurs, level of educational attainment of the owner-operators, number of employees, number of years operated, the nature of products, prices of products, inputs/costs, other variable/fixed costs amongst others. The data generated were analyzed through the use of inferential statistics. The inferential statistical tools employed are Net Income Analysis and Ordinary Least Square (OLS) Regression Analysis.

The Net Returns as well as Returns on Investment (ROI) were calculated for each of the separate agro-based enterprise. The Return on Investment measured as Net Income divided by Total cost was established for the two categories of agro-based enterprises to compare which amongst them generates more naira per unit of investment.

The Net Return model is specified as follows:

$$NR = \sum_{j=1}^{n} P_j Q_j - \sum \left(\sum_{j=1}^{m} P_k X_k^n + \sum_{l=i} P_l F_l^z \right)$$

Where;

e	=	1 for small scale enterprises and 2 for medium scale enterprises
j	=	the jth enterprise
n	=	number of entrepreneurs
P_j	=	Price of the jth enterprises output
O_j	=	Output of the jth enterprises
P_k	=	price of the kth variable
X_k	=	variable inputs
m	=	number of variables inputs
P_i	=	Price of the ith fixed input
F_i	=	Fixed inputs
z	=	number of fixed inputs

Ordinary Least Square (OLS) Multiple Regression
The Ordinary Least Square (OLS) Multiple Regression was used to establish the factors that affect the returns to small and medium agro-based enterprises. Four functional forms of the multiple regressions were fitted. This includes linear, semi-log, double log and exponential functions. The lead equation was chosen based on *a priori* theoretical expectations, magnitude of the multiple regressions co-efficient (R^2) and statistical significance of the coefficients.

The multiple regression model was implicitly specified as:

$$Y = f(X_1, X_2 \ldots X_n, e)$$

The model is explicitly specified as follows;

1) Linear form

$$Y = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + \ldots b_6X_6 + e$$

2) Semi-log form

$$Y = b_0 + b_1\log X_1 + b_2\log X_2 + b_3\log X_3 + \ldots b_6\log X_6 + e$$

3) Double log form

$$\log Y = \log b_0 + b_1\log X_1 + b_2\log X_2 + b_3\log X_3 + \ldots b_6\log X_6 + e$$

4) Exponential form

$$\log Y = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + \ldots b_6X_6 + e$$

Where:

Y =   Net return

X_1=   Age of entrepreneurs in years

X_2 =   Number of years spent in formal education

X_3 =   Employment

X_4 =   Linkage effect

X_5 =   Category of enterprise

X_6 =   Experience of the entrepreneurs in years

e =   Stochastic error term

It is expected *apirori* that the coefficients for X_1, X_2, X_3, X_5 and $X_6 > 0$ while $X_4 < 0$

RESULTS AND DISCUSSIONS

The net return of small and medium agro-based enterprises was estimated using the net returns model. The results of analysis of net returns per annum shows that the small scale agro-based enterprises earned a total revenue of ₦1,006,470 ($6,099.82 at the rate of $1 = ₦165) per annum while the medium scale agro-based enterprises total revenue was ₦2,065,376 ($12,517.43) within the same period (Table 1). The average annual total variable cost of the small scale agro-based enterprises was ₦713,500 ($4,324.24) and the total fixed cost was ₦93,900 ($563.64). This gave a total cost of ₦807,400 ($4,893.33). Likewise, the average annual total variable cost and total fixed cost of medium scale agro-based enterprises were ₦1,470,453 ($8,911.84) and ₦161,591($979.34) respectively.

These results yielded a net return of ₦1 99,0709 ($1,206.48) and ₦433,332 ($2,626.25) per annum for small and medium scale agro-based enterprises respectively. The average rates of return on investment were 24.55% for small scale enterprises and 26.55% for medium scale enterprises. The results imply that medium scale agro-based enterprises have a higher rate of return than small scale agro-based enterprises in the study area. This rate of return obtained by respondents in this study compares favorably with those reported by Ike and Chdebelu (2003) on their study, Analysis of the influence of socioeconomic variables on economic performance of women small scale business enterprises in Nigeria: The case of the restaurant industry in Enugu State.

Factors that affect the net returns of small scale agro-based enterprises

Ordinary least square multiple regression was used to analyse the data so as to ascertain the factors that affect the net returns to small scale agro-based enterprises in the study area. Four functional forms of the model were tried and the results of analysis are presented in Table 2.

The results show that the double-log function produced the highest value of the coefficient of multiple determination (R^2), the highest number of significant variables and conformed to *a priori* expectations. The test of significance of the R^2 produced an f-value of 12.05 which was significant at 1%, implying that the double log function gave a good fit to the data. The double log function was therefore chosen as the lead equation and used for discussion.

The coefficient of multiple determination was found to be 0.810, implying that about 81% of the variations in net returns of small scale agro-based enterprises were jointly accounted for by the independent variables investigated in the regression model. The coefficients for education and employment generation were significant at the 0.05 level. This implies that a more educated entrepreneur, all things being equal will make more returns in business than the less educated counterpart. This is understandable since education will avail an entrepreneur the opportunity to be in tune with the current happenings in the form of information gathering and innovations in the business than a less educated person. In the same vein, the number of employees is a demonstration of the size of the enterprise. To a great extent, firms that have higher number of employees enjoy the benefit of economies of scale and hence will make more returns. Linkage effect (dummy), which is measure of backward linkage to primary agricultural products, was significant at the 0.01 level. This implies that agro-based firms that have all the raw materials available within their vicinity, all things being equal will generate more returns. It can also be further interpreted that an increase in the volume of purchases increases the net

returns of the enterprise. As more labour is employed, the small scale agro-based enterprises purchase more input, thereby adding value to the host community through linkage effect. This implies that the enterprises add value to other sectors of the economy.

Also, the number of years of experience in the business was significant at the 0.1 level implying that a more experienced entrepreneur knows the terrain of the business more than new comers and hence will make more returns than new entrants.

Factors that affect the net returns of medium scale agro-based enterprises

For the factors determining the net returns to the medium scale agro-based enterprises in the study area, four functional forms of the ordinary least square multiple regression model were also tried and the results of analysis are presented in Table 2.

The result shows that the linear function produced the highest value of the coefficient of multiple determination (R^2), the highest number of significant variables and conformed to *a priori* expectations. The test of significance of the R^2 produced an f-value of 152.62 which was significant at 1%, implying that the linear function gave a good fit to the data. The linear function was therefore taken as the lead equation and used for discussion.

The coefficient of multiple determination was found to be 0.982, implying that about 98.2% of the variations in net returns of medium scale agro-based enterprises were jointly accounted for by the independent variables investigated in the regression model. The coefficients for age, employment generation, linkage effect and category of enterprise were all significant at the 1% level, implying that these variables are important factors influencing the net returns of medium scale agro-based enterprises in the study area.

The coefficient for age (X_1) was significant at 1% and positively related to the net turns. This shows that age has a direct relationship to net returns, indicating that older entrepreneurs are more experienced in managing agro-based enterprises. They also know better investment opportunities that yield returns than their younger counter parts that are new in the field.

The coefficient of employment generation (X_3) was significant at 1% and had a positive sign. This implies that an increase in number of employed labour as denoted by wage paid increases the net returns of the medium scale agro-based enterprises. When employed labour is increased; the medium scale agro-based enterprises also increase production and hence their profit.

The coefficient of linkage effect (X_4) was significant at 1%, and had a positive sign. This implies that an increase in the volume of purchases increases the net returns of the enterprise. As more labour is employed, the medium scale agro-based enterprises purchase more input, thereby adding value to the host community through linkage affect. This implies that the enterprises add value to other sectors of the economy, particularly; the communities where they are domiciled.

The coefficient for category of enterprise (X_5) was also significant at 1% and negatively related. This implies that livestock based medium scale enterprises have a higher net return than crop based medium scale enterprises.

CONCLUSION

The small and medium scale enterprises are the engine of growth of economies around the globe. Industry sources have established that an average of 70% of business operations in world economy is accounted for by SMEs (Egugozie, 2007). The result of the analysis of the net returns of the agro-based SMES shows that small scale agro-based enterprises earned on the average a total revenue of ₦1,006,470 per annum while the medium scale agro-based enterprises total revenue was ₦2,065,375 per annum. The results yielded a net return of ₦199,070 and ₦433,332 with an average rate of return on investment of 24.66% and 26.55% for the small and medium scale agro-based enterprises respectively. This implies a high rate of return. The multiple regression coefficients for age, education, employment generation, linkage effect, experience and category of enterprise were all significant in affecting the net returns of small and medium scale agro-based enterprises in the study area.

It is therefore the recommendation of the study that relevant policy that will encourage education of entrepreneurs in business skills either through workshops or seminars is highly advocated. Also, the basic infrastructure such as power and good roads will help in reducing the cost of doing business by these categories of enterprises which will ultimately translate to increased returns.

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Table 1: Computations of Net Returns of Small and Medium Scale Agro-based Enterprises

Item	Small Scale	Medium Scale
Total revenue (TR)	1,006,470	2,065,376
Variable Costs		
Purchase of raw Materials	520,000	988300
Labour cost	103000	260200
Transportation	64000	96800
Utilities	19000	85655
Other costs	7500	39498
Total variable cost	713,500	1470453
Fixed Cost		
Land rent 23950	23950	29450
Interest on loan	37800	50656
Depreciation on equipment items	32150	81485
Total fixed cost	93900	161591
Total Cost	807400	1631044
Net Return	**199,070**	**433,332**
Rate of return	**24.66**	**26.55**

Table 2:   Result of Multiple Regression Analysis of Factors that affect Net Returns of Small Scale Agro-based Enterprises

Explanatory variables	Functional Forms			
	Linear	Semi-log	Double log	Exponential
Age (X₁)	0.130341	-1.64478	0.00829	0.02118
	(0.40080)	(-0.7564)	(0.08328)	(1.3319)
Education (X₂)	-0.01073	-10.9007	0.57555)	-0.00058
	(-1.5606)	(-2.0138)	(2.3298)**	(-1.7394)
Employment (X₃)	1.71198	(2.259507	0.131479	0.09295
	(2.6335)	(2.08890)	(2.6557)**	(2.9356)
Linkage effect (X₄)	0.00024	9.552436	0.49787	1.25E-05
	(5.2307)	(4.30879)	(4.9067)***	(5.5988)
Category of enterprise (X₅)	-0.6710	-0.34735	-0.01501	-0.03205
	(-1.0475)	(-0.51634)	(-0.4874)	(-1.0260)
Experience (X₆)	0.13097	2.293179	-0.15051	0.008176
	(1.35065)	(1.310414)	(1.8793)*	(1.72929)
Constant	12.2059	-12.3921	1.02794	2.41497
R²	0.737	0.754	0.810	0.769
F-value	7.9317	8.6644	12.059	9.4483

Figures in parenthesis are t-ratios *** = significant at 1%, ** = significant at 5% *Sig. at 10%

Table 3: Result of Multiple Regression on Factors that affect Net Returns of Medium Scale Agro-based Enterprises

Explanatory variables	Functional Forms			
	Linear	Semi-log	Double log	Exponential
Age (X₁)	1.44887	-327629	-2.11227	1.45E-05
	(6.346)***	(-3.8012)	(-2.6416)	(1.65122)
Education (X₂)	0.540387	68158.66	0.050477	-0.00018
	(0.2994)	(2.28319)	(0.182636)	(-2.5468)
Employment (X₃)	791.0466	30792.5	2.901915	0.00706
	(16.368)***	(4.62679)	(4.71005)	(3.81462)
Linkage effect (X₄)	4007.797	50771.17	1.21963	0.075808
	(3.4855)***	(0.927274)	(2.40596)	(1.71755)
Category of enterprise (X₅)	-1.86872	-56746.6	-0.08522	1.24E-05
	(-5.569)***	(-2.21476)	(-0.3597)	(0.96529)
Experience (X₆)	6.200085	3154.589	-0.24217	-5.5E-05
	(1.1104)	(0.101305)	(-0.8399)	(-0.2565)
Constant	-45121.5	1.927864	17.5269	7.14241
R²	0.982	0.762	0.859	0.815
F-value	152.62	9.059	17.27	12.11

Figures in parenthesis are t-ratios *** = significant at 1%, ** = significant at 5% *Sig. at 10%