IOSR Journal of Agriculture and Veterinary Science (IOSR-JAVS)
e-ISSN: 2319-2380, p-ISSN: 2319-2372. Volume 7, Issue 5 Ver. III (May. 2014), PP 43-50
www.iosrjournals.org

Stock Size and Relative Efficiency in Broiler Production in South-Western Nigeria: A Normalized Profit Function Approach.

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Abstract: *The study examined the relative economic efficiency of large and small poultry farms in southwestern Nigeria. Results from the profit function without a dummy showed that the coefficient of labour wage rate, feeds and drugs are negative while for fixed cost and farm size turned up to be positive. The profit function and all the explanatory variables significantly affected the profit level. The test of relative economic efficiency between the groups is in favour of the large farms. The elasticities of production showed that the sum of the elasticities is less than one, thus characterized by decreasing returns to scale.*

Keywords: *Relative efficiency, profit function, poultry farms, southwestern, Nigeria.*

I. Introduction

The importance of food in the socio-economic development of any country cannot be over-emphasized. Increased domestic food supply has been the major food policy objective of successive Nigerian Governments since the 1970s. Such policy objective has been translated into many agricultural programmes and projects (see Idachaba, 2000). The emphasis on increased domestic food production capability can be justified in view of the poor performance of the food sub-sector of the Nigerian economy. The consequences of food demand – supply gap are declining per capita production, high and rising food prices, increasing food import and a growing deterioration in the nutritional status of the average Nigerian (Falusi, 1995).

Nigeria's poultry industry has its root in the initiatives of regional governments from the 1960s when, for example the Western Regional Government entered into joint pilot poultry production schemes with some foreign partners, notably the Israeli government (Adene and Oguntade, 2006). Commercial poultry egg production started in Nigeria in the early 1960s. It has assumed a relatively important position in the Nation's livestock economy (Binuomote et al, 2008).

The Structural Adjustment Programme (SAP, 1986) resulted in some unintended counter-productive effects on the poultry industry. The performance of the industry in this scenario was dictated by its conspicuous dependence on imported inputs like Grand Parent Stock (GPS) and Parent Stock (PS), grains, feed stuff, drugs, vaccines and others (FAO, 2006). The ban on the importation or restriction on many of these inputs led to the collapse of the industry.

.Only about 20 percent of the more than 5,000 commercial poultry farmers existing pre-SAP survived into the mid 1990s. The commercial poultry stock declined to an all time low of about 9 million. The attendant deficit in animal protein supply became a source of concern to the government (Adene and Oguntade, 2006). These negative development in commercial poultry challenged successive governments between the late 1990s to date (FAO, 2006). The governments realized the need to rejuvenate and redress the situation through policy incentives.

It is well-known that Nigeria's per capita intake of high quality animal protein is too low (Edusogie 1971; Olayide et al, 1972; Oyenuga, 1974; FAO, 1990). The health hazards of protein malnutrition have been well documented (FAO, 1965). According to Awosanmi, (1999); there is an increasing evidence of high infant mortality, low resistance to diseases, poor growth and development, mental retardation which comes as a result of inadequate protein in the diets of most Nigerian. According to FAO (1990), the diets of the people of the tropical zone and Nigeria (Tewe, 1993) are usually protein poor.

Apart from fishes, other sources of animal protein in Nigeria are cattle, poultry, piggery, sheep and goats. Hence, livestock industry of which poultry is a subset provides protein for the populace (Okubanjo and Adeneye, 1993). However, cattle, sheep and goats are poor candidates for rapid short-term increases in number. This is due to their low fecundity, long gestation and long generation interval. Very rapid increases can be achieved with respect to piggery and poultry within a short-time (Famoyin, 2000). Unlike pork that has no national spread due to religious beliefs, there are virtually no taboos that hinder the consumption of poultry broilers (Ikeobi et al, 1999). Hence, poultry production has long been recognized as one of the quickest ways for a rapid increase in protein supply in the short-run. To satisfy the need to meet animal protein requirements by Nigerians from domestic sources, demands intensification of production of meat and broilers, derived from prolific animals like poultry birds. Poultry has a shorter life-cycle and is much more prolific than larger livestock.

Available information shows that the scale of operation can range from stocks of a few units of a variety of poultry bird in the household to tens of thousands in commercial poultry. FAO (2006) identified four operational types: Industrial Integrated System with high bio-security system, Commercial Poultry Production System with moderate to high bio-security systems, Commercial Poultry Production System with low to minimal bio-security Systems, and the Village or backyard Production with its minimal bio-security. The focus of this study is on the third type. The Commercial Production System is capital and labour intensive; as well as inputs and technology demanding.

II. The Problem Statement

Poultry farming units are the most common type of livestock production in Nigeria, (Famoyin, 2000). Before now, most of the poultry raised in the country was from the indigenous breeds. In recent years, commercial poultry farms using modern techniques and inputs such as improved breeds, better feeding methods and management practices have been established (Sonaiya, 1990). Today, the poultry industry in Nigeria is suffering from being largely import dependent (Adegbola, 1990). It is believed that the rate of expansion of this sub sector of the economy has been substantially reduced (Afolami, 1998). This is due to, among other factors, high feed cost; arising largely from increasing prices of ingredients, poor quality food and inefficiencies, in production and distribution (Adekojo, 2000).

The success of a poultry enterprise, irrespective of the size, largely depends on the kind of care and attention the flock receives (Alaka, 2000). This is reflected in the choice of source of birds, the choice of feed/feed materials and the operational diseases control programmes. These factors inter-play to determine the total well-being or health status of the flock and the enterprise. It has long been established that profitability in the poultry industry depends largely on the biological efficiency of the birds, efficiency of feed consumption and viability. The economic efficiency of chicken meat production depends on the growth rate of the birds as well as the feeding cost and finishing time. Efficiency measurement has received considerable attention from both theoretical and applied economist (Bravo-Ureta and Rieger, 1991). Little of this research effort has been directed to the poultry industry and to the relative importance of the various components of poultry firms` efficiency.

In the past ten years, many large scale operators in the industry have been forced out of the business. This was due to various problems ranging from shortage and high cost of feed, high cost and inadequate veterinary services and drugs, poor quality of equipment and other inputs.

Lack of proper management in terms of feeding, housing, health care, etc among other factors is responsible for the inefficiency in the industry. The problem is in quantifying the relative economic efficiency of the existing broiler farms in terms of meat production and by scale of operation

In addition to this, there is the methodological problem of simultaneity bias in the use of production function methods to test for allocative and economic efficiency in production. This is because input levels are endogenously determined. This problem can be avoided by estimating profit or cost functions (Quisumbing, 1994).

The use of the duality theory side-steps the problems of solving first order conditions. It does this by directly specifying suitable minimum cost functions or maximum profit functions rather than production or transformation functions. The single equation normalized profit function is more appropriate in a situation like this. This study is justified by the novelty of applying the duality theory to the broiler sub sector of the poultry industry.

2.1 Research Questions

The following research questions guide the execution of this study:
What are the major determinants of broiler production?
What is the relative economic efficiency of the farms?
What are the directions and magnitudes of the production parameters?
What is the nature of returns to scale in production?

2.2 Research Objectives

The general objective is to apply the duality theory between normalized profit function and production function broiler production in Nigeria. Specifically, the study aims at the:

- identification of the major determinants of the normalized profit level of the farms,
- quantification of the relative economic efficiency between large and small broiler farms,.
- examination of the effects of production inputs on poultry meat production,
- -, determination of the returns to scale and elasticity of production for the farms, and
- making policy recommendations based on the findings of the study.

2.3 Theoretical framework for the Profit Function

Consider a broiler farm with a production function with the usual neoclassical properties

Q = f (X1, . . . , Xm; Z1, . . . , Zn) (1)

Where Q is output, Xi represents variable inputs, and Zi represents fixed inputs of production. Profit (defined as current revenues less current total variable costs) can be written

∏ = p. f (X1, . . . , Xm; Z1, . . . , Zn) $-\sum_{i=1}^{m} c_i^{'} X_i$ (2)

Where ∏ is profit, p is the unit price of output, and $c_i^{'}$ is the unit price of the ith variable input. The fixed costs are ignored since, as it is well known, they do not affect the optimal combination of the variable inputs.
Assume that a firm maximizes profits given the levels of its technical efficiency and fixed inputs. The marginal productivity conditions for such a firm are

p. ∂f(X,Z)/∂X= C i Ci = 1, . . . , m (3)

By using the price of the output as numeraire we may define Ci1 = Ci/p as the normalized price of the ith input. We can then write (3) as

∂f/∂X = Ci1 i = 1, . . . , m (4)

The deflation of equation (2) by the price of the output results in equation (5) where ∏ is the "Unit – Output – Price" profit (or UOP profit)

∏* = ∏/ p = F(X1, . . . , Xm; Z1, . . . , Zn) $-\sum_{i=1}^{m} c_i^{'} X_i$ (5)

Equation (4) may be solved for the optimal quantities of variable inputs denoted by $X_i^* s$, as functions of the normalized prices of the variable inputs and of the quantities of the fixed inputs,

$X_i^* = f_i(c, Z),$ I = 1, . . . , m (6)

c are the vectors of normalized input prices and Z are the vectors of quantities of fixed inputs. The substitution of (6) into (2) we get the profit function

∏ = p[F (X1, X2,…,Xm; Z1, Z2, …, Zn) - ∑c1Xi] (7)

But, ∏ = G(p, $c_1^*, \ldots, c_m^{'}; Z_1, \ldots, Z_n$)

The profit function gives the maximized value of the profit for each set of values ($p;\ c_i^{'}, \ldots, c_m^{'}; Z_1, \ldots, Z_n$). Observe that the term within square brackets on the right-hand side of (7) is a function only of c and Z. Hence we can write

∏ = pG*(c1,…,cm; Z1,…,Zn) (8)

The UOP profit function is therefore given by

∏* = ∏/ p = G*(c1,…,cm; Z1,…,Zn) (9)

It should be noted that maximization of profit in (2) is equivalent to maximization of UOP profit in (5). The two equations yield identical values for the optimal$X_i^* s$. Hence II* in (9) indeed gives the maximized value of UOP profit in (5). The UOP profit function II* is used here. This is because it is easier to work with than the ordinary II. It is evident that given ∏* one can always find Π and vice versa. On the basis of a priori theoretical considerations we know that the UOP profit function is decreasing and convex in the normalized prices of variable inputs and increasing in quantities of fixed inputs. It follows also that the UOP profit function is increasing in the price of the output. A set of dual transformation relations connects the production and the profit functions.

III. Methodology

3.1 Area of the study

The study area is South Western geopolitical zone of Nigeria and this comprises of six (6) states namely: Lagos, Ogun, Oyo, Osun, Ondo and Ekiti states. The region is situated mainly in the tropical Rainforest zone. It lies between latitudes 5 and 9 degree North and longitudes 2 and 8 degree East. It is bounded by the Atlantic Ocean in the South, Kwara and Kogi States in the North Edo state in the south and Republic of Benin in the west. It has a land area of about 114, 270/km2. This represents 12 percent of the country's total arable land. Some 65 percent of commercial poultry production in Nigeria is carried out in this area (PAN 2008, Okoruwa and Obayelu 2004). This justifies the choice of the area for this study

3.2 Method of Data Collection

Primary and secondary data were used in this study. The list of poultry farms operating in the zones was obtained from the Poultry Association of Nigeria (PAN). The data were collected by means of structured questionnaire. This was done with the assistance of extension agents from Agricultural Development Projects of the states. Data on the socio-economic characteristics of the respondents, cost of inputs, and value of outputs, were collected. In addition, secondary data from published journals and magazines were also be used.

A multistage sampling technique, involving purposive, stratified sampling and simple random sampling, was used in the selection of respondents. Oyo, Ogun and Osun states were purposively selected from the southwest geo-political zone. This selection was guided by the intensity of poultry production as reported by PAN in each state (PAN 2009).

Secondly, three PAN zones with the highest number of poultry farms were purposefully chosen. This was followed by random selection of three sub zones from each zone. The sub zones were stratified based on the production systems adopted by the farmers. Each stratum was further stratified based on scale of operation. Finally simple random sampling was used to select three respondents from each stratum.

3.3 Methods of Data Analysis: Analytical Tools

3.3.1 Multiple Regression Analysis Model Specification

Given that Q = f(X1, X2, X3, Z1, Z2; a, θ) and is characterized by a Cobb Douglas technology as,

$Q = AX_1^{a1}X_2^{a2}X_3^{a3}Z_1^{\theta 1}Z_2^{\theta 2}$, the log-linearized production function becomes

$\ln Q = \ln A + a1\ln X1 + a2\ln X2 + a3\ln X3 + \theta 1\ln Z1 + \theta 2\ln Z2$

Where Qi = Output of broiler in kg, X1 = labour inputs in hours; X2 = feeds in Kg; and X3 = cost of drugs. Cost is used here for drugs because it is more amenable to the theory of production and economic interpretation than doses, their unit of measurement. The fixed \cost of production= Z1, while Z2 = number of broiler birds is used as a proxy for farm size. Different birds such as Abor acre, Hybro, Ross and Anak are used in production in that order. The emphasis in this study is on the weight of the birds given the same inputs. This accounts for why the output is measured in kilograms.

The corresponding normalized function is represented as

$\ln\prod^* = \ln K + b1\ln r1 + b2\ln r2 + b3\ln r3 + \beta 1\ln Z1 + \beta 2\ln Z2$

3.3.2 The neoclassical production and the normalized profit functions

The duality theory that exists between the neoclassical production and the normalized profit function defines the relationships between them. The production function relates inputs to output. The profit function relates the relative prices of the inputs, and the fixed factors of production to the normalized profit. However, the parameters of the two functions are inter-related as the production function is a mirror image of the profit function and vice versa.

i. The parameters of the profit function are b1, b2, b3, β1, β2
ii. The transform of the parameters of the profit function a1, a2, a3, θ1 and θ2 are those of the production function in that order.
iii. The parameters of the estimated profit function can be used to obtain the indirect eleasticity of production. These are denoted by the ai's

The different relationships between and among the parameters of the functions are presented below:

$U_N = \sum_i b_i$, Where UN , is the summation of the parameters of the relative or normalized prices in the estimated profit function.

The following relationships should also be noted

a1	=	-b1(1 – UN) -1
a2	=	-b2(1 – UN) -1
a3	=	-b3(1 – UN) -1
θ1	=	β1(1 – UN) -1
θ2	=	β2(1 – UN) -1

In this way, the parameters of the production function are derivable from those of the profit function. To meaningfully uphold this self-dual relationship, the underlying production technology is assumed to be Cobb-Douglas function. Since (1 – UN) > 0, by local strong concavity and UN > 0 by monotocity, the value (1 – UN) lies strictly between zero and one. It follows that the value of (1 – UN) must be strictly greater than one or that UN must be strictly negative.

The relationship between K from the production function and A from the profit function is represented as

K = (1 – UN) $A^{(1-U_N)^{-1}}$ a1-a1(1-UN)-1 a2-a2(1-UN)-1 a3-a3(1-UN)-1

This implies that once one of the unknowns is obtained from a specific function, the other can be calculated. The complete model comprising of the normalized profit function and the share equations are to be estimated. However, only the no restriction normalized profit function is used in the subsequent analysis. In addition to this, the estimators of such a normalized profit function are more efficient than the single-equation ordinary least square estimators. The normalized profit function is thus presented as

$$\prod^* \quad = A r_1^{b1} r_2^{b2} r_3^{b3} Z_1^{\beta 1} Z_2^{\beta 2} e\delta d$$

$$\ln \prod^* \quad = \ln A + b1\ln r1 + b2\ln r2 + b3\ln r3 + \beta 1\ln Z1 + \beta 2\ln Z2 + \delta d.$$

The normalized labour wage rate= r1, normalized the price of feeds = r2 and the normalized price of drugs=. r3 The fixed \cost of production= Z1and the number of broilers representing the size of the farm= Z2. A dummy variable (d) classifying the forms as large or small scale farm is included in the model. The variable d = 1, if large scale and otherwise = 0. This is based on the threshold farm size used to dichotomize the farms into the groups.

3.3.3 Estimation of the Indirect Elasticities

The indirect estimates of the elasticity are derived from the following equations

$$a_1^* \equiv -a_i(1-U_N)^{-1}; \qquad i = 1, 2, 3$$

$$\beta_j^* \equiv -\beta_j(1-U_N)^{-1}; \qquad j = 1, 2$$

The asterisked letters represent the indirect estimates of input elasticities of the production function.

3.3.4 Returns to Scale

This is the long run returns to scale and it is the summation of the parameters of all the inputs (variable and fixed) used in production.

RTS = b1 + b2 + b3 + β1 + β2

3.3.5 Constant Returns to Scale

This is the summation of the coefficients of fixed factors of production which must be equal to one. It is represented by, β1 + β2 = 1

If greater than 1, it implies increasing returns to scale while if less than 1 it means decreasing returns to scale in the production of broilers

3.3.6 Theoretical Expectations

-The estimated parameters are expected to be statistically significant and with the expected signs.
-Negative signs are the expectation for the parameters of the relative prices of the variable factors.
-Positive signs are expected for the parameters of the fixed factors of production
-The production elasticities are expected to be smaller in magnitude than the corresponding profit elasticities with respect to the normalized prices and the fixed inputs.

However, evidence abounds in the literature indicating that some of these expectations may not be met. Generally the parameters of the relative prices of the variable inputs are expected to be less than one. Those of the fixed factors of production can be greater than one (see Lau and Yotopolous, 1971; Yotopolous and . Lau, 1973).

IV. Results and Discussion.

The results of the estimated models are presented and discussed in this section

4.1 Estimated Normalized Profit Function without Group Dummy

Table 1: Results of the Estimated Normalized Profit Function without Group Dummy

Ln π	Coeff	Std Err.	t-value
Lnr1	-0.6569***	0.0740	-8.8770
Lnr2	-0.5197***	0.1191	-4.3636
Lnr3	-0.2634***	0.0692	-3.8064
Lnz21	0.7310***	0.0922	7.9284
Lnz22	0.2939***	0.0807	3.6419
-Cons.	2.8623	0.5403	5.472976

Source: Data Analysis, 2013 *** significant at 1%.

F(5,324) = 183.73
Prob>F = 0.00
R-squared = 0.7115
Adj R-squared = 0.7071 N =330

Table 1 presents the results of the estimated normalized profit function in which the dummy variable for the two groups is not included. The aim behind using this procedure is to examine the effects of the explanatory variables on the dependent variable. This approach was deemed necessary and important to test the hypothesis of the coefficients of the explanatory variables of being zero or not.

Table 1 therefore indicates that with a R2 value of 0.7111, the explanatory variables explained about 74% of the variation in the dependent variable. The estimated model thus displayed a good-fit with the data set. The calculated F-value of 183.73 is far greater than the tabulated values of F (5,324) = 3.02 at 1% and 2.21 at 5% levels of significance. The null hypothesis that all the coefficients of the inputs (variable and fixed) are zeros is rejected. The alternative hypothesis that they are significantly different from zero is accepted.

The coefficients of labour wage rate, feeds and drugs are negative as expected. These results tend to imply that the profit function is a decreasing function of the prices of labour, feeds and drugs. The results for the coefficients of the fixed factors of production are also as expected. The coefficient for the fixed cost of production and the number of broilers that represent the size of the farm as expected came up positive in support of economic theory. All the explanatory variables significantly influence the dependent variable.

This result sets the stage for examining the effect of the dummy variable on the model. A dummy variable capturing the large scale and small scale dichotomy of the farms is included. Large farms are those with more than 2000 birds while small farms have 2000 or less birds.

4.2 Estimated Normalized Profit Function with Group Dummy

Table 2 :Results of the Estimated Normalized Profit Function with Dummy

lnΠ	Coeff	Std Err.	t-value	p>t
lnr1	-0.6364***	0.0729	-8.7298	0.000
lnr2	-0.4859***	0.1190	-4.0832	0.000
lnr3	-0.2315***	0.0683	-3.3895	0.000
lnz1	0.7191***	0.1079	6.6645	0.000
lnz2	0.1905***	0.0451	4.2240	0.000
d	0.3053***	.01125	2.7138	0.000
Cons	-3.1107	0.5337	-5.8286	0.000

Source: Data Analysis, 2010 *** significant at 1%.
F (6,323) = 155.92
Prob > F = 0.0000
R-squared = 0.7161
Adj R-squared = 0.7108 N = 330

The results of the estimated normalized profit function with a dummy variable are presented in Table 2. The R2 value of 0.7161 means that, the explanatory variables explained about 72% of the variation in the dependent variable. This constitutes an improvement over the first results. The estimated equation thus displayed evidence of good-fit by this result. The calculated F-value of 155.92 is far greater than the F-tabulated of F (6,323) = 2.80 at 1% and 2.10 at 5% levels of significance. This F-test indicates that the null hypothesis that all coefficients, of the dummy, the variable and fixed inputs, are zeros should be rejected. The alternative hypothesis is thereby accepted that the coefficients as defined are collectively significantly different from zero. Hence, all the explanatory variables significantly affect the dependent variable.

The coefficients of labour wage rate, feeds and drugs are negative. These results are in accord with a-priori economic theory or the theoretical expectation. The profit function is decreasing in the price of labour, feeds and the price of drugs. The coefficients of fixed cost and the number of broilers are as expected

4.3 Derived Production Function Parameters from the Estimated Normalized Profit Function

The derived production function is represented by

$$\ln Q = 3.2745 + 0.2704\ln X1 + 0.2064\ln X2 + 0.0984\ln X3 + 0.3056\ln Z1 - 0.0809\ln Z2 - 0.3053d$$

To determine the effects of the production factors on broiler output the identities that linked the self dual profit function and the primal production function were used (Adesina and Djato. 1996; 1997). Using the pooled data, the elasticities for the variable inputs and fixed factors were calculated. The result shows production elasticity is highest with respect to labour, followed by feeds, and drugs in that order. An increase of 10% in labour will increase output by 2.70. Similarly, a 10% increase in feeds is expected to lead to about

2.06% increase in broiler output. However, a 10% increase in drug use will lead to a 0.98% decrease in broiler production.

The fixed factors are highly inelastic in production. These results show that labour is the most limiting input in production in this study. This finding tends to suggest that technologies that will enhance labour productivity are likely to achieve significant positive effects on output.

4.4 **Indirect Estimates of Input Elasticities of the Production Function**

Table 3: Results of the Indirect Estimates of Input Elasticities of the Production Function

Parameters	Estimates
a1	-0.2704
a2	-0.2064
a3	-0.0984
β1	0.3056
β2	0.0809
(a1 + a2 + a3 + β1 + β2)	0.9617
(β1 + β2)	0.3865

Source: Data Analysis, 2010

Table 3 presents the estimates of the input elasticities of the production function. The elasticities appear reasonable by comparison with other available estimates of Cobb-Douglas agricultural production functions in other parts of the world.

The sum of the elasticities obtained is less than one in absolute terms. This result tends to imply that the production function is characterized by decreasing returns to scale.

The null hypothesis of relative economic efficiency between the groups tested as the coefficient of the dummy variable being not significantly different from zero is rejected. The acceptance of the alternative hypothesis implies the rejection of the assertion of equal efficiency between the two groups. The positive sign of the dummy variable indicates that large farms, with 2,000 or more birds, are more profitable. They are thus more efficient at all observed prices of the variable inputs, given the distribution of the fixed factors of production. In this Cobb-Douglas formulation or methodology, the comparison of relative economic efficiency of two groups of farms is simply made by examining the coefficient of the group dummy variable.

The conclusion of the test of relative economic efficiency is in favour of large farms. Within the context of this study, this finding means that the large farms attained higher levels of price efficiency (optional price behavior) and/or they operated at higher levels of technical efficiency. This may imply that in broiler production, the supervisory role of the owner-manager of a farm may be crucial for attaining high levels of economic efficiency.

V. Summary, Conclusions and Policy Recommendations

5.1 Summary of Major Findings

The profit model without dummy variable showed that the coefficient of labour wage rate, feeds and drugs are negative as expected. The results tend to imply that the profit function a decreasing function of the relative prices of labour, feeds and drugs. The results for the coefficient of the fixed factors are as expected. The coefficients for fixed cost and farm size turned up positive in support of expectation. All the explanatory variables significantly affected the profit level.

The results from the profit function equation with a dummy variable for the groups yielded a similar result. The test of relative economic efficiency between the groups is in favour of the large farms. This means that the large farms attained higher levels of profit than the large farms. This may imply that in broiler production, the supervisory role of the owners of large farms may be crucial in outcomes in production. The elasticities of production obtained appear to be reasonable. The sum of these elasticities is slightly less than. The production system can thus be characterized as one of decreasing returns to scale.

5.2 Conclusion

The results of the study have been presented and discussed. It is hoped that they will constitute a baseline or bench mark information for other researchers in this field. It is also hoped that this will instigate other researchers to examine different aspects of poultry production within and outside the zone of study for comparative purposes. The reasons for the decreasing returns obtained in this study call for additional studies to either confirm or reject this finding. This also applies to the difference or lack of equality in the relative economic efficiency of the groups of farms.

5.3 Policy Recommendations

Based on the findings in this study, the following recommendations are proffered

Government should provide subsidies on the key imported inputs in poultry production if it is hoped for the industry to be self-sustaining. Government should encourage and stimulate the exportation of broilers to avoid glut in the market. More small scale poultry farms should be encouraged by the government especially for graduates of agriculture through a micro-financing arrangement as a source of employment generation. These small farms need small initial capital outlay and they tend to be more relatively efficient than large farms. Government should monitor and support feed mills that can produce feeds of the required quality for the industry and at reduced cost. This will have the effect of quick turn-over rates in production in the industry.

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