


Is Debt Financing a Burden or a Boost to the Growth of Small Scale Poultry Farms? Evidence From Nigeria


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Abstract

The growth of poultry industry is very relevant to the economy of Nigeria. Poultry farm growth may respond to debt financing positively over time up to a threshold, beyond which it becomes a burden to the business. The debt threshold of poultry farms is still not significantly understood by stakeholders in the industry. Therefore this study derives its significance by examining the asymmetric relationship between debt financing and the growth of small scale poultry farms in Nigeria. Multi-stage procedure for selection of sample was employed to involve two hundred and forty (240) poultry farmers in the survey. Primary data collected with structured questionnaire were analyzed using descriptive statistical tools (mean, percentage, standard deviation). Inferential statistical formula (Ordinary Least Square technique of multiple regression model) was employed for data analysis. Result indicates that 6% of total asset was financed by debt while 94% was financed by owner's equity (personal fund). This indicates that debt threshold of 50% was neither attained nor exceeded. Further result shows that the growth indicators namely stock size, revenue and poultry owners' equity responded positively to debt financing status but to a small extent. Significant determinants of debt financing status of poultry farms identified in the study were: farm age, farm size, terms of loan, loan duration, loan sources and owners' equity. Debt financing positively impacted poultry farm growth. This implies that surveyed poultry farms are in the tolerable debt level where owners equity is higher than total debt owed. The study has established a positive causal relationship between debt financing and the growth of poultry farms in Delta State, Nigeria. The study has further accentuated the centrality of credit financing as a catalyst in the growth and development of the poultry industry. There is sufficient evidence to advocate for more loans to support the growth of small scale poultry farms. More access to external debt financing is recommended to boost small scale poultry farms' growth in Nigeria. A more efficient credit market will serve as an incentive to the credit seeking behaviour of borrowers (small scale poultry farmers) in Nigeria.

Keywords: Debt financing, Asymmetric relationship, Burden, Boost, Poultry farms' growth

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1. Introduction

Globally, poultry agribusiness is important economically being a source of income, food, employment and self-sufficiency and animal protein (Bosnjak and Rodic, 2008; Hodges, 2009). According to Achoja and Chukwuji (2013), the poultry sub-sector in Nigeria is believed to have asset base of up to ₦2 trillion with employment capacity of about 30 million people in Nigeria. However, supply-demand gap of chicken eggs and meat in Nigeria is still wide. Some persons in Nigeria depend on poultry industry for their livelihood. Poultry industry is one of the dominant sectors of Nigerian economy. It contributes to the national GDP, generates employment opportunities to a good percentage of Nigerians enhances food security and alleviates poverty.

The small scale poultry farmers therefore deserve external financing through loan. Obtaining loan is an important tool for farmers to obtain the working capital used in order to improve their productivity and income. Obtaining loan therefore through agricultural credit is important in the strategy of developing the agricultural farm productivity. Achoja (2012) has established the multiplier effects of credit utilization in poultry development. Loan can be classified into productive and unproductive loans. The former is a loan that is expected to create assets which will yield income sufficient to repay the principal and interest on the loan. The unproductive loan is a loan that is used for other purposes at the expense of farm asset or wealth creation. It is usually raised for protection against disasters. It does not directly affect productivity of the farm. All loans are debt, but not all debts are loan. Sources of debts in poultry farms include: loans (cash credits) from financial and non-financial institutions, debt owed inputs (feeds, drugs etc) suppliers.

The decline in poultry production over the years in Nigeria can be associated with inadequate finance (credit facilities) for the adoption of improved production technologies. This could hinder optimal production of poultry birds (Akanni, 2007). This has led various agencies to lend to the poultry sub-sector sector. The availability of these loans is an incentive for farms to shift sources of farm financing away from equity towards debt. The repayment may however not be smooth due to loan delinquency by poultry farmers.

Good agricultural (Poultry) business practices is capital intensive. It has been determined that the agricultural enterprises that make Good Agricultural Practices (GAP) have increased their market share and economic efficiency (Söyler and Atli, 2018). Although Özpınar and Çay (2018) emphasized the contribution of farm mechanization in farming system, including poultry production system, a mechanized poultry farming is capital intensive and thus requires credit financing. In the light of this, different governments in the world offer different types of loans, guarantees and other supporting measures to facilitate these small scale agribusinesses access to capital. Evidence from previous studies shows that debt financing of poultry agribusinesses is associated with short duration to guarantee pay-off (Abereijo and Fayomi, 2005). Furthermore, banks in many developing countries prefer to lend to other sectors to the detriment of poultry firms expected return and risk (Levitsky, 1996). Reinhart and Rogoff (2012) earlier hypothesized a non-linear effect of debt financing on firms. They associated high debt profile of firms with persistent stagnation and low growth rate. Some authors expressed contrary view that reasonable levels of debt could improve growth in output and profit through capital accumulation (Hameed et al., 2008; Wang, 2009).

This research work was therefore conceived to examine the asymmetric effects of debt, if any, on the growth of poultry farms in Nigeria. Accordingly, the argument raised in this study was underpinned by Financing Gap Theory, Debt 'Laffer Curve', debt overhang theory and debt threshold theory.

Financing gap theory underscores the importance of borrowing from external sources only to close up internal financial gap (short falls) up to a certain threshold (Pattillo, et al. 2004). The debt overhang theory emphasized that high level of indebtedness beyond a threshold, could be burdensome and adversely affect firm's growth (Ali and Mustafa, 2012).

The Debt Laffer curve is a clarification of the debt overhang hypothesis, and it theorizes that a curve indicates the optimal level for a business debt. These theories have not been applied to analyse debt situation of poultry farms in Nigeria before now.

The main thrust of this study was to analyze the asymmetric effects of debt status on the growth of poultry farms in Nigeria. The specific objectives were to:

- i. examine the debt status of poultry farms.
- ii. determine the proportion of poultry farmers that operated within the debt threshold value.
- iii. evaluate the effect of debt status on growth of poultry farms.
- iv. Investigate the determinants of debt status in poultry farms.

The hypotheses tested in the study were:

H₀₁: There is no significant gap between the debt threshold and debt status of poultry agribusiness.

H₀₂: Significant relationship does not exist between credit financing (debt) status and the growth of poultry agribusiness.

H₀₃: The selected factors do not have significant joint and individual effects on the debt status of poultry agribusiness.

2. Materials and Methods

2.1. Study Area, Sampling Procedure and Data Collection Techniques

This study was carried out in Delta State, Nigeria. Delta State, Nigeria was chosen for the study due to the presence of many poultry farms in it. Delta state enjoys tropical climate with rainy season (March-November) and dry season (December-March). Annual rainfall is about 256.5mm to 190mm in the North. The temperature varies between 20^oc and 34^oc. The state is suitable for crop production and livestock farming such as piggery, goats, aquaculture and poultry production. Multi-stage sampling procedure was applied to select the respondents. The first stage involved the random selection of two local government areas from each of the three agricultural zones. This gave a total of six local government areas. Stage two (2) involved the random selection of four communities in each of the six selected local government areas. This gave a total of twenty four (24) communities. Stage three (3) involved a random selection of ten poultry farms. This gave a total of 240 respondents. The study was based mainly on cross-sectional and 3 year-time series data. The instrument for data collection from the respondents was structured questionnaire. The instrument was subjected to the validity and reliability tests. The questionnaire was designed to capture information on the farm financial statements (balance sheet and income statement). Copies of the questionnaire was personally administered and retrieved from respondents by the researcher. The questionnaire was subdivided into the sections according to the specific objectives of the study.

2.2. Methods of data analysis.

- i. The debt status as stated in objective ii was analyzed by employing the formula stated in equation 1:

$$\text{Debt status} = \frac{\text{amount borrowed} - \text{amount repaid}}{\text{Amount borrowed}} \times 100 \quad (\text{Eq.1})$$

- ii. Debt threshold was determined by the equation for debt – equity ratio according to Helfert (2008) in equation 2.

$$\text{It is stated as debt – equity ratio (DER)} = \frac{\text{debt (₦)}}{\text{Equity (₦)}} \times 100 \quad (\text{Eq.2})$$

According to Helfert (2008) debt equity ratio is an attempt to show the relative proportion of owner’s claims and of lenders claims. It is used as a measure of debt exposure. It is expressed either as a percentage or as a proportion. For debt to be sustainable, the debt to income ratio must be constant or declining as depicted by equation 3:

$$\text{SDB} = \frac{D}{v} \quad (\text{Eq.3})$$

SDB = Sustainable Debt

D = Debt

v= Income

Theoretically, the highest point at the Laffer curve represents the stage obtaining more credit.

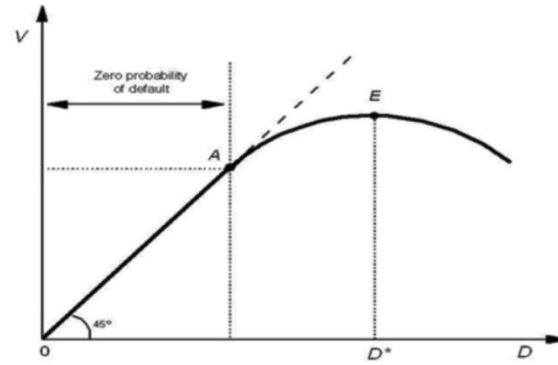


Figure. 1 Debt laffer curve, adapted from Krugman(1989).

A poultry farm that has debt that is below the threshold (below 50%) is not at risk and can borrow more. For a farm that has debt above the threshold (above 50% or 0.5), the farm can no longer borrow, the farm is in distress and needs a bailout.

iv. Debt status gap was analyzed using the equation 4

$$DB_{gap} = \beta_0 + \beta_1 (DT - DER) + \mu \quad (Eq.4)$$

Where:

DB_{gap} = debt status gap

DT = debt threshold

DER = debt – equity ratio

β_0 = constant

β_1 = coefficient of debt gap

μ = error term

Ordinary least square technique of multiple regression was used to analyze the relationship between debt status and poultry farm growth.

Determinants of debt status was evaluated using ordinary least square technique of multiple regression as shown in equation 5, equation 6 and equation 7.

$$DB = \beta_0 + \beta_1 LS + \beta_2 INT + \beta_3 LCD + \beta_4 LDU + \beta_5 FMSZ + \beta_6 FAGE + \beta_7 LNFRQ + \beta_8 CRWT + \beta_9 EQT + \mu \quad (Eq.5)$$

2.3. Model Specification

2.3.1. Determinants of debt status

The model for the determinants of debt status is implicitly specified as:

$$DB = f(LS + INT + LCD + LDU + FMSZ + FAGE + LNFRQ + CRWT + EQT + \mu) \quad (Eq.6)$$

The explicit form of the model is specified as:

Linear model

$$DB = \beta_0 + \beta_1 LS + \beta_2 INT + \beta_3 LCD + \beta_4 LDU + \beta_5 FMSZ + \beta_6 FAGE + \beta_7 LNFRQ + \beta_8 CRWT + \beta_9 EQT + \mu \quad (Eq.7)$$

3. Results and Discussion

Table 1 and 2 present the result on the distribution of loan borrowed by poultry farmers in the study area. It shows that a large number of farmers 97.5% borrowed loans less than ₦ 500,000 while very few farmers 1.3% borrowed loans between ₦ 500,100 to ₦ 10,000,000. Also some farmers 1.3% borrowed loans between 15,000,100 to 20,000,000. This implies that most of the farmers did not borrow so much loans because they were small scale farmers.

Table 1. Distribution of sources of loans among surveyed poultry farmers

Debt sources		Amount
1.	Long term loan	Nil
2.	Short term loan	48654000
3.	Suppliers credit	5406000
Total debt		54060000
Equity		898833900

Table 2. Distribution of loan borrowed by poultry farmers

Class of amount borrowed (₺)	Frequency	Percent	Mean/Mode
<5.000,000	234	97.5	
5.000,100-10.000,000	3	1.3	
10.000,100-15.000,000	0	0	<500,000
15.000,100-20.000,000	3	1.3	
Total	240	100	

3.1. Debt Status of poultry farms

The result in *Table 3* implies that the debt servicing tends to accelerate the growth of poultry farms by providing financial capital that serves as working capital for firm growth. Although high debt servicing could be cumbersome and traumatic to poultry farm managers, these farmers are not in the distressed debt level. The overall debt status of poultry farmers in the study area is 6%. This means that the poultry farmers are still operating in the tolerable level and are advised to borrow more as debt in form of loan will cause an increase in poultry farm growth. The finding also collaborates the hypothesis of Reinhart et al (2012) that firms with high debt are liable to slow growth and stagnation and low debt will not cause slow growth rather speed up growth.

Table 3. Distribution of debt status of poultry farms

Default rate {%}	Number of farmers	Percentage Distribution	Cumulative frequency	
1 – 10	87	36.25	36.25	Tolerable debt
11 – 20	73	30.42	66.67	
21 – 30	27	11.25	77.92	
31 – 40	28	11.67	89.59	
41 – 50	17	7.08	96.67	
51 – 60	4	1.67	98.34	*Debt threshold
61 – 70	2	0.83	99.17	Distressed debt
71 – 80	0	0	99.17	
81 – 90	2	0.83	100	
91 – 100	0	0	100	
Total	240	100	100	

* Default rate of 50% is the debt threshold of poultry farms

3.2. Debt- Equity Ratio of Poultry Farms

Debt equity ratio is a financial ratio and is used as a standard for judging the financial standing of a firm. It is also known as the financial leverage. It is a measure of the firm's ability to repay its obligations. When examining the health of a firm, it is critical to pay attention to the debt equity ratio. If the ratio is increasing, the firm is being financed by creditors rather than its own revenue. Optimal debt equity ratio is considered to be about 1 but it differs from firm to firm and also from country to country. For most countries, the maximum acceptable debt to equity ratio is 1.5 – 2. Debt equity ratio gives an indication of the equity strength of a farm at a point in time. According to Helfert (2008) debt equity ratio is an attempt to show the relative proportion of owns claims and of lenders

claims. It is used as a measure of debt exposure. It is expressed either as a percentage or as a proportion. In general, a high debt to equity ratio indicates that a firm may not be able to generate enough cash to pay its debt obligations.

$$\text{Equation 8 depicts debt – equity ratio: } DER = \frac{\text{debt (₦)}}{\text{Equity (₦)}} \times 100/1 \quad (\text{Eq.8})$$

If the quotient comes to 0.5 (50%) or less, it means debt is half of the equity. The numerator is the debt, while the denominator is the owners' equity (net worth).

Debt equity ratio for poultry farms in Delta state, Nigeria is reported in equation 9:

$$\frac{₦54,060,000}{₦ 896,705,000} = 0.06 \text{ or } (6.0\%) \quad (\text{Eq.9})$$

This result implies that poultry farms are capitalized with 6.0% debt financing and 94% owners' equity. Poultry farms' debt status is far below the 50% debt threshold. Therefore, small scale poultry farms can seek and obtain additional loan to increase productivity and revenue. Reinhart et al. (2012) stated that debt has a non-linear relationship with firm growth. This implies that low debt can lead to growth of poultry farm firm, but it debt increases beyond the threshold value, it impacts negative effects on growth.

The result of the present study indicates that the co-efficient of debt status is positive, this means that most of the farmers are still within the tolerable threshold region and at this level, it is encouraged to borrow more. The positive sign although insignificant is a signal that farmers can still borrow more signal that farmers can still borrow more loans.

3.3. Relationship between debt status and poultry farm growth parameters

Table 4, Table 5 and equation 9 present the result on the relationship between debt status and poultry growth parameters. The finding reveals that there is positive and significant relationship ($p < 0.01$) between debt status and all the poultry growth parameters that were captured in the study. This result implies that an increase in the amount of debt obtained for the farm will lead to an increase in all the growth parameters (revenue, equity and stock size). The finding in equation 9 implies that a 1% increase will translate to 0.51% in poultry farm growth all other things being equal.

Table 4. Relationship between debt status, loan diversion and poultry farm growth parameters (revenue, equity and stock size)

n = 240		debt status	Stock size	Equity	Revenue
debt status	Pearson Correlation	1			
	Sig. (2-tailed)				
Stock size	Pearson Correlation	0.054	1		
	Sig. (2-tailed)	0.407			
equity	Pearson Correlation	0.035	0.997**	1	
	Sig. (2-tailed)	0.594	0.000		
Revenue	Pearson Correlation	0.054	0.993**	0.988**	1
	Sig. (2-tailed)	0.402	0.000	0.000	
	N	240	240	240	240

Table 5. Relationship between debt status and poultry farm growth

variable	coefficient	std. error	t-stat.	prob.
Constant	362816.83	53545.38	6.77**	9.63E-11
Debt Status	0.51	0.091	5.53**	8.38E-08
R Square	0.1138		F-statistic	30.58738
Adjusted R Square	0.1101		F-statistic	8.38E-08
Durbin-Watson stat	1.520			

** = significant at 1%.

This finding could be attributed to the fact that as more loans are obtained and spent on the operation of the farm, it will increase the capacity of the farm, create wealth and increase the assets base of the farm. This will lead to an upward move of the farms revenue and the growth parameters. This result is in agreement with the finding of Odoemenem and Obinne (2010) who reported that growth of a farm is hindered by their limited access to loan which means growth is enhanced as farmers have more access to loans.

3.4. Determinants of debt status of poultry farms

Table 6 shows that the R^2 of the regression is 0.29 or 20.92% this means that the variables used in the equation only explain 20.92% of the explained variable (dependent) while 79.08% of the dependent variable are explained by variables not captured in the study. However the P-value of the F-statistic is significant ($P < 0.05$) this means that the model is fit and the result can be relied upon to make inference with regards to the dependent variable.

Creditworthiness has a positive but insignificant relationship ($P < 0.05$) with debt status. Most farms that are creditworthy will then borrow more, if not monitored will lead to a huge debt. Equity has a positive and significant relationship with debt status ($p < 0.05$). The more the equity base of the farm, the more the farm can acquire loan. Therefore farms should always borrow in line with their equity. A farm with low equity should obtain low loans. Farm age has a negative but significant relationship ($P < 0.05$) with debt status this means that an increase in farm age will result in a 4.72% reduction in debt status. This finding agrees with Lewis (1954) who theorized that older firms could depend on internally generated revenue for the financing of its expansion or growth process. The older a poultry gets the more financially stable it becomes and the less it relies on loans and external financing. Farm size also has a negative and significant relationship ($P < 0.05$). This agrees with Oni et al (2005) that noted that an increase in the stock size will result in a decrease in debt status. Smaller firms seek private debt sooner than larger firms do when growth opportunities increase.

Table 6. Distribution of determinants of debt status in poultry farms

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Constant	23.47664	5.768529	4.069780	0.0001
Creditworthiness	3.307279	3.924287	0.842772	0.4002
Equity	9.49E-06	2.38E-06	3.995539	0.0001**
Farm age	-4.724139	1.726501	-2.736250	0.0067**
Farm size	-0.063282	0.015864	-3.989044	0.0001**
Interest	0.116474	0.498639	0.233583	0.8155
Loan condition	6.293070	2.879024	2.185834	0.0299*
Loan duration	0.563955	0.152177	3.705921	0.0003**
Loan frequency	0.299530	0.160203	1.869691	0.0628
Loan sources	-7.042216	2.758092	-2.553293	0.0113**
Loan Diversion	9.03E-06	2.24E-06	4.028411	0.0001**
R-squared	0.209269	F-statistic		5.437417
Adjusted R-squared	0.170782	Prob(F-statistic)		0.000000
Durbin-Watson stat	1.709228			

Dependent variable: Debt Status

**significant at 1%

*significant at 5%

Interest rate has a positive but insignificant relationship ($P < 0.05$) with debt status. The more the interest on loan the more cumbersome it is to payback. Loan duration is positive and significantly ($P < 0.05$) related to debt status. The shorter the duration of loan the more loan repayment default. Poultry farmers are encouraged to obtain loan with longer loan duration. Loan condition is positive and significantly ($P < 0.05$) related to debt status. Farmers are encouraged to get loan with favourable loan conditions. This will reduce the loan repayment default. Loan frequency has a positive and insignificant relationship with debt status. Favourable loan terms and transactions of loan sources has a negative significant relationship with debt status ($P < 0.05$).

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