Determinants of Capital Structure among Poultry and Piggery Enterpreneurs in Abia State, Nigeria

Chima, A. A. and Timothy, C.

Department of Agribusiness and Management,
Michael Okpara University of Agriculture Umudike, Abia State, Nigeria
Corresponding Author's email: chimaamarachi68@gmail.com

Abstract
This study analysed the determinants of capital structure in poultry and piggery enterprises in Abia State, Nigeria. A multi-stage random sampling technique was used in choosing the sample. Primary data collected from 83 livestock enterprises comprising of 50 poultry enterprises and 33 piggery enterprises were used for the study. Data collected were analyzed using Maximum Likelihood Stochastic (MLS) regression model. Findings showed that expected total expenditure requirement of the business, profitability of the enterprise, size of the enterprise, growth of enterprise, business environment, liquidity, the total assets' turnover, owner's collateral and age of the enterprise significantly determined the capital structure of the poultry enterprise in Abia State whereas, expected total expenditure requirement of the business, profitability of the enterprise, size of the enterprise, growth of enterprise, liquidity, total assets' turnover and age of the enterprise significantly determined the capital structure of the piggery enterprise in Abia State. The study recommends that efforts should be made by both government and other investors in agriculture to first consider the various factors identified by this study that influenced the capital structure of poultry and piggery enterprises in Abia State to make a profitable investment that will provide employment opportunity to the masses, make chicken and pork meat supplies more available as well as generate more funds to run the affairs of the State.

Keywords: Capital, structure, poultry, piggery, enterprises, Abia State.

Introduction
Livestock production has remained a vital sub-sector in Nigeria today and enhancing the performance through appropriate capital structure is one major need in the country. Livestock production in Nigeria is achieved mostly through 'nomadic or rural households' production of sheep, cattle, goat, pigs, poultry (ducks, guinea fowl and chicken) and rabbit etc. at subsistence level. Gross Domestic Products (GDP) from agriculture averaged N3,771,185.70 Million from 2010 until 2017, and reach an all-time high value of N5,189,365.99 Million in the third quarter of 2017 with livestock production accounting for only 38.7% of GDP from agriculture (Nwankwo, Nnamerenwa, and Elechi, 2018). No meaningful growth can occur in the economy without the profitability of agro-based firms which livestock production is included (Kira, 2013). As a result of livestock enormous contribution to the growth and development of several economies, livestock are aptly referred to as the engine of growth and catalyst of socioeconomic transformation of any country (Onwumere, 2008). Livestock production is an asset as well as source of income for many Nigerians, creating

employment opportunities, source of revenue to the government (tax and export), source of food and meat that partly satisfy the animal protein requirement, provides animal manure for crop production and provides power and transport options (Rahman and Yakubu, 2006). The importance of livestock production is considered in the role they play in the general society. Livestock production provides food, income and other useful product to the people. They contribute substantially to the livelihood of many rural households (Duru, 2006). Capital structure according to Kennon (2010) refers to the percentage of capital (money) at work in a business by type. Capital structure refers to the kinds of securities and the proportionate amounts that make up capitalization. It is the mix of different sources of long-term sources such as equity shares, preference shares, debentures, long-term loans and retained earnings. The term capital structure refers to the relationship between the various long-term sources financing such as equity capital, preference share capital and debt capital. According to Paramasivan and Subramanian (2009), deciding the suitable capital structure to employ is an important decision a livestock

enterprise owner makes since it influences the value (performance) of the enterprise.

Capital structure is one of the most important effective parameters on the valuation and direction of economic enterprises in the capital markets. Livestock enterprise owners are keen to profit maximization and how best to earn more returns by determining the best combination of financial resources for their enterprises. Debt financing is a situation whereby credit or loans are borrowed either from formal or informal financial institution for investment purpose whereas, equity financing is a situation in which personal saving and earnings accruing from an investment is solely utilized in financing a business. Financing decisions are some of the most critical decisions for livestock enterprise owners because they have direct impact on capital structure and performance of the livestock enterprise (Brigham and Ehrhardt, 2004). Usually livestock enterprises owners prefer internal funds over debt, growth-oriented firms use more debt to fund their growth and higher educated firm owners use less debt (Lucey and Voronkova, 2008). Researches on livestock sector have attracted attention from researchers, policy makers, and practitioners due to their contributions to economic growth (Kira, 2013). There has been a wide acclamation that most rural livestock enterprise operators rely more on their personal saving to finance their business. Such situations can be found in Abia state. According to Duru (2006) majority of the livestock production activities are carried out in the rural and peri-urban areas. Capital structure of a livestock enterprise should be high enough as such to enhance the profitability (performance) of the enterprise. A livestock entrepreneur will have to make decisions on the appropriate capital structure that suits his/her business plan. The capital structure that suits a particular livestock enterprise may not be suitable for another. Differences are bound to exist in the real effect of capital structure on the investment and performance of different livestock enterprises. An enterprise that utilizes both debt and equity financing mix may probably be better off than an enterprise financed with either debt or equity. This is hypothetical and the true nature of this, in Abia state this can be ascertained by determining the factors that influence the capital structure in poultry and piggery enterprises. This is the thrust of this study which focus on estimating the determinants of capital structure in poultry and piggery enterprises in Abia state, Nigeria.

This study promotes and improves the livestock production and ensures increased returns to the farmers to sustain their living standard. A result from studies like this is of immense relevance to livestock farmers, government and other stakeholders in the agricultural industry. The result of this study is expected to stimulate far reaching concern and draw attention to the need of ensuring appropriate capital structure for livestock farming as an economically relevant strategy for improving the performance and relevance of the poultry and piggery enterprises. The result of the study acts as a reference to the government, farmers and investors in agriculture, non-governmental organization, research institutes, government agencies and other corporate bodies in their dealing with capital structure and performance of investment in such livestock enterprises as poultry and piggery enterprises in Abia State.

Empirical studies on the determinants of capital structure of an enterprise. Michaelas *et al*. (1999), the key reference of this thesis, the main determinants that have the effect on both short term and long-term debt in the SMEs are size, age, profitability, growth and future growth opportunities, asset structure net debaters, stock turnover and operating risk. Moreover, they suggested that the industry where the SMEs operates in and time have an impact on maturity structure of debt in SMEs. Economic condition has also impact on the level of debt. For instance, the average short-term debt ratio in small and medium size company happen to be increasing while the economy is in recession, and it will decrease when economic condition improved. To be able to analyse the impact of the determinants on capital structure, according to the work of Michaelas *et al*. (1999), two independent variables were selected. The independent variables are short-term debt to total assets and long-term debt to total assets. The main reason for not choosing total debt to total asset ratio is the work of Van der Wijst and Thurik (1993) and Chittenden *et al*. (1996). They have shown in their papers that the impact of the explanatory variables on total debt is a net effect of the opposite effect on both long- and short-term debt. Therefore, it would not possible to analyse the impact of a determinant (dependent variables) on a decomposed leverage level.

Methodology
The comparative survey research design was adopted in the study. The study was conducted in Abia State, Nigeria. Abia State was carved out of the former Imo state in 27th August, 1991. The name "Abia" was coined from the first letters of the name of the geographical (political group that made up the state namely; Aba, Bende, Isiukwuato and Afikpo though Afikpo joined Ebonyi State in 1996. Abia State is one of the 36 states of the Federal Republic of Nigeria. The state is located in the south east geo-political zone of Nigeria. It lies between longitude $7^0 23'$ and $8^0 02''$ E and latitude 50 47' and 60^0 12N. The State covers an area of about 5,243.7sq.km which is approximately 5.8% of the total land area of Nigeria. Nigerian Galleria. com (2017) Report. The estimated population statistics puts the state at a population of 4,533,911 (NPC, 2017). Abia state is bounded by the North and Northeast by the states of Anambra, Enugu and Ebonyi. Imo State to the West and by the south east is Cross River State and Akwa-Ibom State and to the South is River State. The Southern part of the State lies within the river line part of the country. The state is low lying with a heavy rainfall of about 2,400mm which is evenly distributed between months of April through October. The rest of the state is moderately high plain. The most important rivers in the state are Imo and Aba rivers which flow into the Atlantic Ocean through the Niger Delta. The State is located

within the forest belt of Nigeria and the temperature ranges between 20°C and 36°C (Onwumere,2008).The state comprises of seventeen (17) Local Government Areas, three (3) Agricultural Zones namely: Aba, Umuahia and Ohafia.

The population of the study consist of all the poultry and piggery enterprises in Abia State. The total population of registered poultry and piggery enterprises in Abia State are 63 and 42 respectively as documented by the Ministry of Commerce and Industry of Abia State. This gave a total population of 105 registered livestock enterprises (poultry and piggery enterprise) considered in the study. Multi-stage sampling technique was employed in the selection of poultry and piggery enterprises in the study. Firstly, two out of the three agricultural zones in the state were selected for the study. The agricultural zones that were selected are Umuahia and Aba agricultural zones; this was based on the fact that there were good numbers of poultry and piggery enterprises in these selected Agricultural zones. Secondly, two Local Government Areas were selected from each of the two agricultural zones. Finally, the selected ones were accumulated at the Local Government Area (LGA) level, because they were too few in the different communities and villages. Fifty (50) poultry enterprises as well as thirty-three (33) piggery enterprises were randomly selected from the entire four (4) LGAs used for the study. Thirteen (13) poultry enterprises were selected from each of the four (4) selected Local Government Areas, whereas nine (9) piggery enterprises were selected from reach of the four (4) selected Local Government Areas. In this study, primary data was used. The information that was used in this study was gathered through the administration of questionnaire and oral interview. The researcher also assisted respondents who found it difficult to answer some questions in the questionnaire especially where they could not understand. A total of fifty (50) copies of questionnaire were administered to the poultry enterprise owners whereas thirty-three (33) copies of questionnaire were distributed to the piggery enterprise owners in the State. Each respondent was allowed a maximum of two days to study the questionnaire and respond accordingly. At the end of the period, the researcher and the two research assistants that were hired for the study went back and retrieved the questionnaire from the respondents. Prior to the administration of the questionnaire, the instrument was validated and also ensured that the item statements addressed the research objectives, questions and the adequacy of the constructs used in the questionnaire. Data collected for the study were analysed using appropriate statistical tools. The determinants of capital structure in poultry and piggery enterprises in the study area was analysed using the Maximum Likelihood Stochastic (MLS) regression approach.

Model Specification
The Maximum Likelihood Stochastic (MLS) regression model was used to estimate the determinants of capital structure of poultry and piggery enterprises in the study area.

The determinants of capital structure of poultry enterprise in the study area is specified explicitlythus;

$$CS_{PO} = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \beta_5X_5 + \beta_6X_6 + \beta_7X_7 + \beta_8X_8 + \beta_9X_9 + \beta_{10}X_{10} + \beta_{11}X_{11} + \beta_{12}X_{12} + Vi ....(1)$$

Where,
CS_{PO} = Capital structure measured as debt-equity ratio of investment in poultry enterprise
X_1 = Expected total expenditure requirement of the business (naira)
X_2 = Profitability of the enterprise (measured as operating income/total assets)
X_3 = Size of the enterprise (measured by stock size).
X_4 = Tangibility of assets (measured as average total fixed assets/total assets).
X_5 = Growth of enterprise (measured as a percent change in sales).
X_6 = Business environment (Internal and external =1; Otherwise =0)
X_7 = Effective taxation (measured as the ratio of tax to gross profit)
X_8 = Liquidity (measured as Current Assets - Current Liabilities)/Revenues
X_9 = Total assets' turnover (measured as total sales/total assets). This is an indicator of efficiency which reflects how many times the capital invested in the total assets rotates in order to achieve the company's turnover
X_{10} = Closely held ownership of enterprise (Yes =1; Otherwise =0)
X_{11} = Owner's collateral (measured as percentage of debt secured by personal assets of firm owner)
X_{12} = Age of the poultry enterprise as at the time of the survey (Years)
V_i = Error term
$\beta_0 - \beta_{12}$ = Parameters to be estimated.

The determinants of capital structure of piggery enterprise in the study area is specified explicitly as:

$$CS_{PG} = \beta_0 + \beta_1Q_1 + \beta_2Q_2 + \beta_3Q_3 + \beta_4Q_4 + \beta_5Q_5 + \beta_6Q_6 + \beta_7Q_7 + \beta_8Q_8 + \beta_9Q_9 + \beta_{10}Q_{10} + \beta_{11}Q_{11} + \beta_{12}Q_{12} + Vi .... (2)$$

Where,
CS_{PG} = Capital structure of piggery enterprise (measured as debt-equity ratio).
Q_1 = Expected total expenditure requirement of the business (naira)
Q_2 = Profitability of the enterprise (measured as operating income/total assets)
Q_3 = Size of the enterprise (measured by stock size).
Q_4 = Tangibility of assets (measured as average total fixed assets/total assets).
Q_5 = Growth of the enterprise (measured as a percent change in sales).
Q_6 = Business environment (Internal and External =1; Otherwise =0)
Q_7 = Effective taxation (measured as the ratio of tax to gross profit)
Q_8 = Liquidity (measured as Current Assets - Current

Liabilities)/Revenues

Q_9 = Total assets' turnover (measured as total sales/total assets). This is an indicator of efficiency which reflects how many times the capital invested in the total assets rotates in order to achieve the company's turnover;

Q_{10} = Closely held ownership of the enterprise (Yes =1; Otherwise =0)

Q_{11} = Owner's collateral (measured as percentage of debt secured by personal assets of firm owner)

Q_{12} = Age of the piggery enterprise as at the time of the survey (Years)

V_i = Error term

$\beta_0 - \beta_{12}$ = parameters to be estimated.

Results and Discussion

The Maximum Likelihood Stochastic (MLS) regression model that was used to estimate the determinants of capital structure of poultry enterprise in the study area is presented in Table 1. The gamma and sigma were significant at one percent alpha level implying goodness of fit and correctness of the specified assumption of the composite error distribution according to Okoye and Onyenweaku (2007) and Kadurumba *et al.* (2009). The gamma value also indicates that 90.8% of the variability in the capital structure of poultry enterprise in the study area was accounted for by the factors included in the model. Table 1 shows that for the poultry enterprise, the coefficients of total expenditure requirement of the business, profitability of the enterprise, size of the enterprise, growth of enterprise, business environment, liquidity, the total assets' turnover, owner's collateral and age of the enterprise were significant factors that determined the capital structure of the poultry enterprise in Abia State. The coefficient of the total expenditure requirement of the business was significant at one percent and negatively related to the capital structure (debt-to-equity ratio) of poultry enterprise in Abia state. This agrees with *a priori* expectation and implies that the higher the total expenditure requirement of a business, the less the ratio of equity to debt capital of the enterprise. The negative sign shows that the enterprise uses more debt financing than equity financing. A business enterprise will borrow more funds to meet up with the expected total expenditure requirement of the business where equity financing is inadequate to cover such capital requirement. This result also agrees with Mashenene and Rumanyika (2014) and Siro (2013) who noted that expenditure of a business enterprise influences is capital structure. The coefficient of profitability of the enterprise was significant at one percent and positively related to the capital structure (debt-to-equity ratio) of poultry enterprise in Abia State. The positive sign here shows that the enterprises use more equity financing than debt financing. This implies that the higher the profitability of the enterprise, the more the ratio of equity to debt capital financing of the enterprise. This is because profitability will increase the equity financing of the business and decrease the extent of use of debt financing. This result also agrees with Mashenene and Rumanyika (2014) who noted that profitability of a business enterprise reduces the extent of use of debt to finance a business outfit. The coefficient

of size of the enterprise was significant at five percent and positively related to the capital structure (debt-to-equity ratio) of poultry enterprise in Abia state. This implies that the higher the size of the enterprise, the more the ratio of equity to debt capital financing of the enterprise. The larger the size of an enterprise (measured by log of sales) the more is its income. This will increase the equity financing of the business and decrease the extent of use of debt financing. The coefficient of growth of the enterprise was significant at five percent and positively related to the capital structure (debt-to-equity ratio) of poultry enterprise in Abia State. This implies that the higher the growth of the enterprise, the more the ratio of equity to debt capital financing of the enterprise. Growth of an enterprise (measured as percentage changes in sales) implies that an enterprise is self-sustaining. This will decrease the extent of use of debt in financing the business. This finding supports the study of Abdul (2012) who noted that financially self-sustaining firms do not seek for more debt capital to finance their business as this reduces the profit that accrues to the business in terms of loan repayment with interest charges. The coefficient of business environment was significant at one percent and positively related to the capital structure (debt-to-equity ratio) of poultry enterprise in Abia state. This implies that business environment that discourages lending of loans to business enterprises will force business enterprises, to rely more on their equity than debt in financing their business. The coefficient liquidity of the enterprise was significant at one percent and negatively related to the capital structure (debt-to-equity ratio) of poultry enterprise in Abia state. This implies that the less liquid a poultry enterprise is, the less is the ratio of its equity to debt capital in financing the enterprise. The value of liquidity when positive shows that current assets exceeds current liabilities of a firm and indicates a strong liquidity position hence the ability of an enterprise to meet up with their short-term financial obligations as they come due. On this condition, many enterprises will be more able to use its working capital to generate sales and reduce the extent of borrowing funds. The coefficient of the total assets' turnover was significant at one percent and positively related to the capital structure (debt-to-equity ratio) of poultry enterprise in Abia state. This implies that the higher the total assets' turnover, the more is the ratio of its equity to debt capital in financing the enterprise. Total assets' turnover is an indicator of efficiency which reflects how many times the capital invested in the total assets rotates in order to achieve the company's turnover. The more times the capital invested in the total assets rotates, the more capital the enterprise makes. The more will be the equity position of the enterprise. This finding supports the finding of Chepkemoi (2013) who noted that firms with high assets turnover have positive capital structure. The coefficient of owner's collateral was significant at five percent and negatively related to the capital structure (debt-to-equity ratio) of poultry enterprise in Abia state. This implies that owner's collateral increases the use of debt in financing poultry business in the study area. Collateral makes borrowing of funds easier than

when there is no collateral. Thus, business enterprise owners will be eager to seek for debt capital to finance their business when they have valued collateral than when they do not have any. The finding of the study is in line with Hashemi (2013) who asserted that financial institutions offers loans more to business firms with exchangeable valued collateral than to firms with no valued collateral as a security to their funds. The coefficient of age of the enterprise was significant at five percent and positively related to the capital structure (debt-to-equity ratio) of poultry enterprise in Abia state. This implies that poultry enterprise with several years of existence to rely more on their equity than debt in financing their business. This is because as the years of existence increases, the enterprise is able to payback its loans and hence rely more on the business's equity for its future investment obligations. According to pecking order theory, older firms have enough time to collect internally generated funds; hence they do not in a great need of external finance. The positive sign on age coefficient also proved the idea that the older poultry enterprises are not in a great need of external finance and are more likely to use internal funds. This finding agrees with Jumanne (2015) who noted that newly established business enterprises tends to depend more on debt financing than older enterprises who have broken even and can fund their business from their net-worth (equity).

The Maximum Likelihood Stochastic (MLS) regression model that was used to estimate the determinants of capital structure of piggery enterprise in the study area is presented in Table 2 below. The gamma and sigma were significant at one percent alpha level implying goodness of fit and correctness of the specified assumption of the composite error distribution according to Okoye and Onyenweaku (2007) and Kadurumba et al. (2009). The gamma value also indicates that 82.3% of the variability in the capital structure of piggery enterprise in the study area was accounted for by the factors included in the model. Table 2 also shows that for the piggery enterprise, the coefficients of expected total expenditure requirement of the business, profitability of the enterprise, size of the enterprise, growth of enterprise, liquidity, the total assets' turnover and age of the enterprise were significant factors that determined the capital structure of the piggery enterprise in Abia state. The coefficient of the expected total expenditure requirement of the business was significant at five percent and negatively related to the capital structure (debt-to-equity ratio) of piggery enterprise in Abia State. This agrees with a priori expectation and implies that the higher the expected total expenditure requirement of a business, the less the ratio of equity to debt capital of the enterprise. The coefficient of profitability of the enterprise was significant at one percent and positively related to the capital structure (debt-to-equity ratio) of piggery enterprise in Abia State. This implies that the higher the profitability of the enterprise, the more the ratio of equity to debt capital financing of the enterprise. The coefficient of size of the enterprise was significant at one percent and positively

related to the capital structure (debt-to-equity ratio) of piggery enterprise in Abia state. This implies that the higher the size of the enterprise, the more the ratio of equity to debt capital financing of the enterprise. The coefficient of growth of the enterprise was significant at five percent and positively related to the capital structure (debt-to-equity ratio) of piggery enterprise in Abia State. This implies that the higher the growth of the enterprise, the more the ratio of equity to debt capital financing of the enterprise. The coefficient liquidity of the enterprise was significant at one percent and negatively related to the capital structure (debt-to-equity ratio) of piggery enterprise in Abia state. This implies that the less liquid a piggery enterprise is, the less is the ratio of its equity to debt capital in financing the enterprise. The coefficient of the total assets' turnover was significant at one percent and negatively related to the capital structure (debt-to-equity ratio) of piggery enterprise in Abia State. This implies that the lower the total assets' turnover, the less is the ratio of its equity to debt capital in financing the enterprise. The coefficient of age of the enterprise was significant at five percent and positively related to the capital structure (debt-to-equity ratio) of piggery enterprise in Abia State. This implies that piggery enterprise with several years of existence to rely more on their equity than debt in financing their business.

Conclusion
The capital structure decision is critical for any business enterprise because it affects the organization's performance. The decision is significant due to the need to maximize returns on investment in poultry or piggery enterprises in the study area. The result of the study has shown that expected total expenditure requirement of the business, profitability of the enterprise, size of the enterprise, growth of enterprise, business environment, liquidity, the total assets' turnover, owner's collateral and age of the enterprise significantly determined the capital structure of the poultry enterprise in Abia State whereas, expected total expenditure requirement of the business, profitability of the enterprise, size of the enterprise, growth of enterprise, liquidity, the total assets' turnover and age of the enterprise significantly determined the capital structure of the piggery enterprise in Abia State. Any policy aimed at dealing with the capital structure of poultry and piggery enterprises in should prioritize factors such as the expected total expenditure requirement of the business, profitability of the business, size of the business, growth of the business, business environment, liquidity, total assets turnover, owner's collateral, and the age of the business, among others, which have a significant influence on the capital structure of poultry and piggery enterprises.

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Table 1: Maximum Likelihood Stochastic (MLS) regression estimate of the determinants of capital structure of poultry enterprise in the study area

Variable	Poultry enterprise
Constant	0.395(5.439)***
Expected total expenditure requirement of the business	-0.123(-2.996)***
Profitability of the enterprise	0.520 (4.317)***
Size of the enterprise	0.281(2.487)**
Tangibility of assets	0.010(-0.818)
Growth of enterprise	0.509(2.293)**
Business environment	0.213 (3.264)***
Effective taxation	0.019(1.168)
Liquidity position of the business	-0.591(-3.182)***
The total assets' turnover	0.424 (2.219)**
Closely held ownership of enterprise	0.003 (1.348)
Owner's collateral	-0.361(-5.643)***
Age of the enterprise	0.319(2.082)**
Diagnostic statistics	
Sigma-square (δ^2)	1.727(6.775)***
Gamma (λ)	0.908(27.658)***
Log-Likelihood	96.862
LR Test	60.277

Source: computed by the author from Field Survey data, 2018
*Note: Asterisk *** and ** represent 5% significance levels respectively. Figures in parenthesis are t- value*

Table 2: Maximum Likelihood Stochastic (MLS) regression estimate of the determinants of capital structure of piggery enterprise in the study area

Variable	Piggery enterprise
Constant	0.5132 (2.278)**
Expected total expenditure requirement of the business	-0.117(-2.649)**
Profitability of the enterprise	0.441(5.439)***
Size of the enterprise	0.317(3.154)***
Tangibility of assets	0.658(1.193)
Growth of enterprise	0.833 (2.230)**
Business environment	0.073(1.485)
Effective taxation	0.124(0.149)
Liquidity position of the business	-0.289(-2.984)***
The total assets' turnover	-0.025(-6.977)***
Closely held ownership of enterprise	-0.093(-0.810)
Owner's collateral	0.006(1.405)
Age of the enterprise	0.135(2.217)**
Diagnostic statistics	
Sigma-square (δ^2)	1.556(6.329)***
Gamma (λ)	0.823(23.789)***
Log-Likelihood	94.269
LR Test	58.827

Source: computed by the author from Field Survey data, 2018
*Note: Asterisk *** and ** represent 5% significance levels respectively. Figures in parenthesis are t- value*