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IMPACT OF DEBT THRESHOLD LEVEL ON FINANCIAL PERFORMANCE OF LISTED FIRMS ON GHANA STOCK EXCHANGE

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ABSTRACT

This study is to investigate the relationship between debt and financial performance. The study employed the Panel Threshold Regression model introduced by Hansen (1999). The study used panel data covering a period of fifteen-years from 2005 to 2019 for twenty-five listed companies on the Ghana Stock Exchange. Financial performance was measured by return on assets. The study finds the threshold level of debt at 43.85%. The result of the study, however, indicates that the debt threshold level is positive in both low and high debt regimes but the degree of debt impact on both regimes is not comparable. It has also indicated that debt has a significant potential impact on financial performance in low debt regime and a slightly lower impact in high debt regime. The findings suggest that more debts have been contracted by the companies in low debt regime than high debt regime. The results of explanatory variables used in the study such, as inflation rates reveal an insignificant negative relationship with financial performance, and foreign exchange rate and interest rates also produce an insignificant negative relationship with financial performance. The findings of this study will help the management of the listed companies on the Ghana Stock Exchange to inform their decision on what percentage of debt should form part of the company's capital structure because the more the value of the debt themore it would impact on the financial performance. However, it would be advisable that management of all the listed companies both local or foreign should keep their debt portfolio below the 43.85% estimated threshold level to improve the performance of the company.

Keyword: Debt, Financial Performance, Threshold, Ghana Stock Exchange.

1. INTRODUCTION

1.1 Background of the Study

Financial Performance from a more extensive perspective alludes to how many monetary goals being or have been cultivated and is a significant part of money related danger the executives. It is the way toward estimating the aftereffects of a company's arrangements and tasks in financial terms. It is utilized to quantify a company's general monetary wellbeing throughout a given timeframe and can likewise be utilized to think about comparative firms over a similar industry or to look at enterprises or areas in conglomeration. There are numerous approaches to quantify money related execution, however, all measures ought to be taken in detail. Details, for example,

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income from activities, working pay, or income from tasks can be utilized, just as complete unit deals. Besides, the investigator or speculator may wish to look further into financial reports and search out edge development rates or any declining obligation.

In this paper, the financial performance is measured by return on assets. Return on assets is a profitability ratio that provides how much profit a company can generate from its assets. In other words, return on assets (ROA) measures how efficient a company's management is in generating earnings from its economic resources or assets on its balance sheet. ROA is shown as a percentage, and the higher the number, the more efficient a company's management is at managing its balance sheet to generate profits. On a wider horizon, financial indicators are classified as liquidity, operational, profitability, debt, and market indicators. However, the overall profitability indicator has already become of interest, as it cannot provide the real scene of the company's financial stance. Shareholder's focus mainly concentrated on the indicators of how the company is working for covering their investments. Especially return on assets gains inherent importance in investor evaluation (Avlokulov,2018)

The long – term trajectory of ROA is the best-financial related scorecard of an organization's wellbeing and a marker of how its choices play out. Understanding the direction gives an establishment of taking a more drawn-out term viewpoint that can assist organizations with molding winning systems (Hagel et al, 2013). Regardless of a ton of monetary adequacy markers, return on resources portrays the guide for dynamic in the venture and the board measures. Return mirrors the valid and the most dependable position and situation of the budgetary soundness of the organization by covering two key monetary strength markers: resources and benefit. Resource structure gives an establishment and essential to the presence of an organization, while the benefit level shows how much the organization is working. Blend of both soundness reflecting pointers how the organization is functioning out the contributed capital by bearing benefit. According to Avlokulov (2018), it has been revealed by classical business finance theories that return on asset (ROA) is thought to be the most effective instrument of measuring monitoring the financial status of companies.He further conducted an OLS test and found that the total operating cost and asset structure had a negative influence on ROA, while revenues from sale supported the financial stability of the companies.

The aim of this study is to investigate the relationship between debt and financial performance. Debt is a measure of cash acquired by one gathering from another. Debt is utilized by numerous companies and individuals as a strategy for making enormous buys that they couldn't bear under typical conditions. An obligation game plan gives the getting party authorization to get cash under the condition that it is to be repaid sometime in the not-too-distant future, normally with a premium.

According to Thompson in Managers Tool kit, First Edition (2019), there are two types of debt, firstly "Good Debt Cash-flow" and secondly "Bad Debt Cash-flow" He further indicates that Good Debt Cash-flow can be defined as "any debt including bank loans that can be leveraged and cash-flow as an investment in performing asset, asset-based equity capital gain, and smart investment strategies, above the cost of managing the existing debt financial portfolio." Whiles

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Bad Cash-flow is, "any debt, including Bank Loans which is leveraged to purchase liabilities instead of building investment portfolios, in performing asset markets, asset-based equity capital gain and smart investment strategies.", "Bad Debt is any debt that does not pay you and forces you to use personal earnings to settle the existing debt." Debt, in general, enables firms that are in financial distress to reduce their financial stress. But the question needs to ask ii what percentage of debt to part of the capital structure and how it impacts the profitability of firms.

2. LITERATURE REVIEW

Theoretically literature generally recommended that the public debt negatively affects GDP growth yet numerous investigations found, a negative yet insignificant outcome between the factors. The authors find no significant connection between public debt and GDP development of 44 modern countries (Schclarek, 2004; Okeke and Idike,2016). Reinhart and Rogoff used 44 countries over a time of 200 years and found a positive effect on growth on the low degree of public debt and a negative impact on growth on the significant level of public debt. Then again, these investigations couldn't find a significant result on debt evenon the high debt level (Reinhart and Rogoff, 2010; Lof and Malien, 2014). Ismihan andOzkanb, 2012 and Kumar Woo, 2015 also find a contrary connection between the variables. Another examination broke down the connection between debt and GDP growth of 118 advances, emerging and developing countries. The study found no threshold level over the period of all countries (Tešić et la,2014; andEberhardt and Presbitero, 2015). Finally, Alam (2019) investigates the relationship between debt threshold and GDP per capita growth by usingpanel threshold regression for 7 advanced countries for a period of twenty-one years. The study found the debtthreshold level of62.47 for G7 (Advance Countries).

Exchange Rate

The exchange rate is defined as the price at which a country's currency can be exchanged for another country's currency. Exchange rate movement affects output levels of firms and also the trade balance of an economy. Share price movements on the stock market also affect aggregate demand through wealth, liquidity effects, and indirectly the exchange rate. Specifically, a reduction in stock prices reduces the wealth of local investors and further reduces liquidity in the economy. Bailey and Chung (1995) conducted a study on Exchange Rate Fluctuations, Political Risk, and Stock Returns at the Mexican stock market and the results proved there is a positive relationship between exchange rate fluctuation and stock market return. However, other studies that found a positive relationship between exchange rate fluctuations and stock return volatility include, Smith (1992), Solnik (1987), Aggarwal (1981), Phylaktis and Ravazzolo (2000), and Apte (2001).Benita and Lauterbach (2004) found that exchange rate volatility has real economic costs that affect price stability, firm profitability and a country's stability.

Interest Rate

The interest rate can be defined as the annual price charged by a lender to a borrower for the borrower to obtain a loan. This is usually expressed as a percentage of the total amount loaned. Traditional theories define interest rate as the price of savings determined by demand and supply of loanable funds. Ngugi and Kabubo (1998) state that the primary role of the interest rate is to help mobilize financial resources and ensure the efficient utilization of resources in the

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promotion of economic growth and development. hen *et al* (1986) indicated that interest rate had a positive impact on stock return. Chen *et al* (2005) again found that the interest rate was not significant for Taiwan hotel stock return. Nguyen (2007) found interest rate spreads had a significant effect on the riskiness of capital-intensive industries. Chiang *et al* (2009) realized the interest rate was negative toward Singapore hotel stock return. Specifically, besides, Kandir (2008) studied the Turkish market and found a positive relationship between interest rates and stock return. According to Barnor (2014), a rise in interest rate influences investing decisions, thus investors make changes in their investment structure, generally from the capital market to fixed income securities. OburaandAnyango (2016) also defined interest rate as the price of savings determined by demand and supply of loanable funds

Inflation Rate

The inflation rate is the rate of increase of a price index (for example, a consumer price index). It is the percentage rate of change in the price level over time. The rate of decrease in the purchasing power of money is approximately equal (Mishni, 2004). A research study has also been conducted to determine the effects of inflation on the stock market. Most scholars used the consumer price index (CPI) to substitute inflation. CPI was often used to reflect the products and prices of the general public. Most studies reveal inflation had a negative impaction on stock return. Liljeblom*et al* (1997) also found the Finnish data of the stock market was affected by inflation. In the industry analysis, Kavussanos*et al* (2002) found that there were a few industries that have a negative influence, such as electronic sectors. etc, in predictability, the inflation is limited. (Rapach*et al*,2005), (Chen *et al*,1986). On the contrary, they considered inflation had no ability in predicting stock return. (Chan,1998), (Chen,2005). Based on the above findings, we predict that the variable of inflation has a negative impact on stock returns. Chinzara (2011) in his study on macroeconomic uncertainty and stock market volatility for South Africa found out that stock market volatility is significantly affected by macroeconomic uncertainty, that financial crises raise stock market volatility, and that volatilities in exchange rates and short-term interest rates are the most influential variables in affecting stock market volatility whereas volatilities in oil prices, gold prices, and inflation play minor roles in affecting stock market volatility.

However, there are so many studies that have been carried in the past indicating that public debt is growing improving means by numerous nations generally for developed and developing nations. In any case, the connection between debt and GDP growth is a long way from indisputable. Some experimental examinations show a critical positive relationship while different investigations recommended a negative relationship. Then again, not many investigations featured that there is no significant connection between it. Evening though there has been a study on debt impact only a few are the threshold level investigation and no studies have been conducted on the impact of debt threshold level on financial performance. This current study is to investigate the level of debt that could impact the financial performance of listed firms on the Ghana Stock Exchange.

3. RESEARCH METHODOLOGY

3.1. Data and Estimation

The study consists of the balanced panel data of twenty-five (25) listed companies on the Ghana

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Stock Exchange for fifteen years period from 2005 to 2019 by using estimation of a threshold by likelihood ratio test by Hansen (1999). The data of this study are collected from the Bank of Ghana and Ghana Stock Exchange database.

3.2. Population and Sample

The study consists of twenty-five (25) listed companies on the Ghana Stock Exchange. This is subject to the data availability of the financial statement of the listed companies for the period under study. Financial performance is measured using a return on assets (ROA) and inflation, exchange, and interest rate are explanatory variables used for the period under study.

3.3. Summary of the Variables

Table 1Variables Summary

Variables	Sources
Return on assets (ROA)	Ghana Stock Exchange dataset
Inflation rate	Bank of Ghana dataset
Foreign exchange rate	Bank of Ghana dataset
Interest rate	Bank of Ghana dataset

3.4. Panel Threshold Regression Model

The panel threshold regression model is alluring among other regression models as they consider regression of parting the observations with threshold esteems. The author proposed a threshold strategy for assessment of the threshold level by the likelihood ratio test. Panel Threshold regression model is better than another model utilizing nonlinear functionand it is introduced by Hansen (1999).

The equation of the interest is given below;

$$Y_{it} = \beta_1^{'} \times_{it} h(qit \leq y) + \beta_2^{'} \times_t h(qit < y) + \mu i + \varepsilon_{it} \qquad (1)$$

Where γ_{it} is the dependent variable, $\times_{it}$ is a 1 x k vector of covariates possibly containing lagged values ofγ_{it}, β_1' is a k x 1 vector of regime-invariant parameters, $\varepsilon_{it}$is an iid error with mean 0 and variance σ^2, h is a vector of exogenous variables with regime-specific coefficient vectors β_1' and β_2', and q_t is a threshold variable that may also be one of the variables in $\times_{it}$. Regime 1 is defined as the subset of observations in which the value of being q_{it} is less than the threshold γ. Similarly, Regime 2 is defined as the subset of observations in which the value of q_{it} is greater than γ. The equation one can be rewritten as,

$$\gamma_{it}=\beta_1^{'} \times_{it} h+ \varepsilon_{it} \text{if} q_{it} \leq \gamma (2)$$

$$\gamma_{it}=\beta_2^{'} \times_{it} h+\varepsilon_{it} \text{if} q_{it} > \gamma \qquad (3)$$

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Where q_{it} signifies the threshold variable, dividing all the observed values into two groups or "regimes". Term γ_{it} signifies the variable to be explained, whereas $\times_{it}$ is a matrix that, denotes the explanatory variable. The error term $\varepsilon_{it}$is white-noise iid, and γ represents the threshold value, which is unknown, but can be estimated. The model implies that when the threshold variable is smaller than the threshold parameter, the regression Equation (2) is applicable. Let $h_t(\gamma) = \{q_{it} \leq \gamma\}$, and {.} as an indicator function with h =1 if $q_{it} \leq \gamma$ occurs, or h = 0 otherwise. In addition, when $\times_{it}(\gamma) = \times_{it} h_t(\gamma)$, the equations (2) and (3) revised as follows.

$$\gamma_{it} = \theta' x_t + \rho' x_t(\gamma) + e_{t,} e_t \sim iid(0, \sigma_t^2). \quad (4)$$

Therein, $\theta = \theta_2$, $\rho = \theta_1 - \theta_2$, $e_t = [e_{1t} e_{2t}]'\theta, \rho,$ and γ are the parameters to be estimated. The equation (4) allows all the regression coefficients to differ between sample groups. The resulting sum of squared error as a result of estimating these parameters $\theta, \rho,$ and γ can be expressed as follows

$$S_1(\gamma) = \hat{e}(\gamma)'\hat{e}(\gamma) \quad (5)$$

The least-squares method for estimating γ was introduced by Hansen in (1996). This can be achieved by minimizing the sum of squared errors in (5). The estimated threshold value is given as:

$$\hat{\gamma} = \text{argmin} S_1(\gamma) \quad (6)$$

And the variance of the residual is expressed as:

$$\hat{\sigma^2} = \frac{1}{n} \hat{e}_t(\gamma)' \hat{e}_t(\gamma) = \frac{1}{n} s_1(\gamma) \quad (7)$$

Once $\hat{\gamma}$ is obtained, the vector of parameter estimates is $\hat{\theta} = \hat{\theta}(\hat{\gamma})$ and $\hat{\rho} = \hat{\rho}(\hat{\gamma})$. led using a Lagrange Multiplier (*LM*) bootstrap technique. For γ isn't distinguished under the invalid speculation of the no-threshold impact, the p-values are registered by a fixed bootstrap technique. To analyze by testing whether the coefficients in the two regimes are the equivalent or not, the null hypothesis of no threshold impact to Equation is.

$$H_0 = \beta_{1i} = \beta_{2i} i = 0 \ldots \ldots 5(8)$$

Let S_0 and S_1 be the residual sum of squares under the null hypothesis and alternative of (8). As such, the *F*-test is based on:

$$F_1 = \frac{S_0 - S_1(\gamma)}{\sigma^2} \quad (9)$$

Once the threshold effect exists, the next question is whether or not the threshold value can be

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known. The null hypothesis of the threshold value is $H_0: \gamma = \gamma_0$, and the likelihood ratio statistics is:

$$LR_1(\gamma) = \frac{s_1(\gamma) - s_1(\gamma)}{\sigma^2} \quad (10)$$

Where S_1 (γ) and S_1 (γ) are the residual sum of squares from Equation (7) given the true and estimated value, respectively. The asymptotic distribution ofLR_1 (γ_0)can be used to form a valid asymptotic confidence interval about the estimated threshold values. The statistics of LR_1 $(\gamma_0)$are not normally distributed and Hansen（2000）computedtheir no-rejection region, c (α), α is a given asymptotic level. That is, ifLR_1 $(\gamma_0) \leq c$ (α), where c (α) = -2In $(1 - \sqrt{1-\alpha})$, the null hypothesis of $H_0: \gamma = \gamma_0$ cannot be rejected.Aside from testing the existence of one threshold value, to further investigate whether there are two or more threshold values that exist, we first employ the F_1 test to assess the null hypothesis of no threshold. If this null hypothesis is rejected, then at least one threshold value is ensured. We next proceed to test the null of one threshold against the two thresholds. We assume a known estimated $\hat{\gamma_1}$ and proceed to search the second threshold, γ_2. In this case, we obtain the following:

$$S_2^r(\gamma_2) = S(\hat{\gamma_1}, \gamma_2) if \hat{\gamma_1} > \gamma_2 \quad (11)$$

$$S(\gamma_2, \hat{\gamma_1}) if \gamma_2 > \hat{\gamma_1} \quad (12)$$

Thethresholdvalue,thenull hypothesis,andthe$F$-testarerespectivelystatedasfollows:

$$\hat{\gamma_2^r} = \arg\min S_2^r(\gamma_2), \quad (13)$$

$$H_0 = \text{only one threshold} \quad (14)$$

$$F_2 = \frac{S_1(\hat{\gamma_1}) - S_2^r(\hat{\gamma_2^r})}{\hat{\sigma_2^2}} \quad (15)$$

Where$S_1(\hat{\gamma_1})$ is referred to as the sum of squared errors acquired from the previous threshold estimation. The residual variance is given as follows:

$$\hat{\sigma_2^2} = \frac{1}{T} S_2^r(\hat{\gamma_2^r}) \quad (16)$$

The significance F_2 implies the rejection of the null of one threshold and two thresholds is expected. If the two thresholds cannot be rejected, then the confidence interval for two thresholds (γ_1, γ_2) can be constructed in the same way. The procedures are carried out until the null in (7) can no longer be rejected.

4. RESULTS AND DISCUSSION

4.1. Introduction

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This section focuses on the empirical estimation, presentation, and economic interpretation of the regression results carried out using the methodology highlighted in the previous section. Table 2. below shows some descriptive statistics of the dependent and explanatory variables that were used in the study for the period of fifteen years from 2005 to 2019. In the table below foreign exchange rate is highest at 5.25% as compared with the other explanatory variables such as debt, interest rate andinflation rate whose rate is at 2.22%, 0.26% and 0.19% respectively. The average foreign exchange rate shows in table 1 below is 2.45% which is still at the high side as compared with the other explanatory variables.

Table 2. Descriptive Statistics

	ROA	INFR	EXCHR	INTR	DEBT
Mean	0.042092	0.129980	2.450561	0.172806	0.680064
Median	0.035500	0.116900	1.836333	0.160000	0.753900
Maximum	0.524100	0.192900	5.250683	0.259167	2.216100
Minimum	-0.517600	0.086800	0.905492	0.126667	0.000000
Std. Dev.	0.106015	0.034386	1.485173	0.037075	0.284569
Skewness	0.360942	0.345787	0.558316	0.920422	-0.139931
Kurtosis	8.309261	1.700947	1.760608	2.931301	5.304761
Jarque-Bera	448.5840	43.48376	43.48376	53.02233	84.22256
Probability	0.000000	0.000000	0.000000	0.000000	0.000000
Observations	375	375	375	375	375

4.2 Panel Threshold Regression Model

This study implies the panel threshold regression model proposed by author to determine the number of threshold and its effect on dependent variable by Hansen (1999). Result of inflation threshold and its impact on return on assets is presented as follows and the presentation of the result of this is in line with the presentation of Alam (2019).

4.2.1. Threshold Estimator in Single Threshold Model

To further analyze the impact of inflation on the return on assets, the study finds the threshold number in the model. The null hypothesis H_0: $\beta_1' = \beta_2'$ (No threshold effect) and the alternative hypothesis is H_1: $\beta_1' \neq \beta_2'$ (Threshold effect exists). The estimated result indicates a single threshold model at 43.85% with a 95% confident interval (0.4319, 0.4419)

Table 3. Threshold Effect

Threshold estimates	
γ	43.85%

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4.2.2. Threshold Significance Threshold Model

The significance level of the single threshold model in table 4 shows a p. value of 0.220. As the result has indicated above, the null hypothesis is accepted. This implies that a linear relationship between inflation and return on assets is realized and it has been revealed that the threshold effect does not exist.

Table 4. Significance of Threshold Effect.

F. Statistics	*P. Value*	*Critical Value (%)*
8.24	0.220	

4.2.3. Impact of Inflation on Return on Assets (ROA)

Table 5 below shows the estimated result of an inflation effect on financial performance and financial performance has been measured with return on assets. In the table, the result shows the effect of inflation on ROA. The result is divided into two regimes denoted by β'_1 and β'_2. In regime, one where inflation $\leq$ 43.85% the coefficient value (0.179) which is more than the threshold value indicates a positive significant relationship between debt and the ROA that one percent increase in debt would result in a reduction in the ROA by .0.179 percent. While in regime two, where inflation >43.85% the coefficient value (0.023) which shows a positive insignificant relationship between debt and ROA and that a percentage increase in debt would result in a reduction in the value of ROA. The impact of the debt on the financial performance in the in regime two, though positive but the result is insignificant and less than threshold level estimated.

Table 5. Impact of Inflation on ROA

Impact of Inflation on Return on Assets	ROA
$\square'_1$	0.179***
	(0.066)
$\square'_1$	0.023
	(0.813)

4.2.4. Explanatory Variables and Return on Assets

In table 6 below, the estimated result revealed a negative effect of the inflation rate on ROA with the coefficient value (-0.148) the result does not produce a significant result between the inflation rate and return on assets (ROA). This implies that when the inflation rate reduces by one percent, the financial performance of the listed companies would improve by the same percentage. It has also been indicated that the foreign exchange rate has an insignificant negative effect on ROA with the coefficient value (-0.002) which means that a percentage decrease in the foreign exchange would enhance the financial performance of the listed companies. The interest

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rate is an insignificant negative effect on return on assets. The coefficient value (-0.133) indicates that a one percent decrease in interest causes an increase in the return on assets.

Table 6. Impact of Explanatory Variables on Return on Assets

Impact of Explanatory Variables	ROA
INFR	-0.148
	(0.278)
EXCHR	-0.002
	(0.006)
INTR	-0.133
	(0.325)
CONS	0.067***
	(0.271)

F test that all u_i = 0: F (24, 345) = 6.04 Prob>F = 0.0000 Note: t-statistics are given in parenthesis and ***/ **/ * denotes the variables are statistically significant at 1 percent, 5 percent & 10 percent respectively.

This paper investigates the relationship between debt and financial performance of listed companies on the Ghana Stock Exchange and the financial performance is measured by return on assets (ROA). The study utilizes the fixed panel threshold regression model introduced by Hansen (1999). The paper used fifteen years period from 2005 to 2019 for twenty-five (25) listed companies. In order to estimate a threshold level, the study used debt to assets as a threshold variable in the model. The study finds the threshold level of debt is 43.85%. The result of the study has been divided into two regimes and the estimated result, however, indicates that the debt threshold level is positive in both low and high debt regimes but the degree of debt impact on both regimes is not comparable. It has also indicated that debt has a significant potential impact on financial performance in regime 1 and a slightly lower impact in regime 1 implies that more debts have been collected by the companies in regime 1 than regime two.

The results of explanatory variables used in the study such, as inflation rates reveal an insignificant negative relationship with financial performance, and foreign exchange rate and interest rates also produce an insignificant negative relationship with financial performance. Debt is good to be part of the capital structure but at what quantum would be kept so that it will not have any impact on the performance of the companies. The findings of this study will help the management of the listed companies on the Ghana Stock Exchange to inform their decision on what percentage of debt should form part of the company's capital structure because the more the value of the debt the more it would impact on the financial performance. However, it would be advisable that all the companies both local or overseas should keep their debt portfolio below the 43.85% threshold level to improve the performance of the company.

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