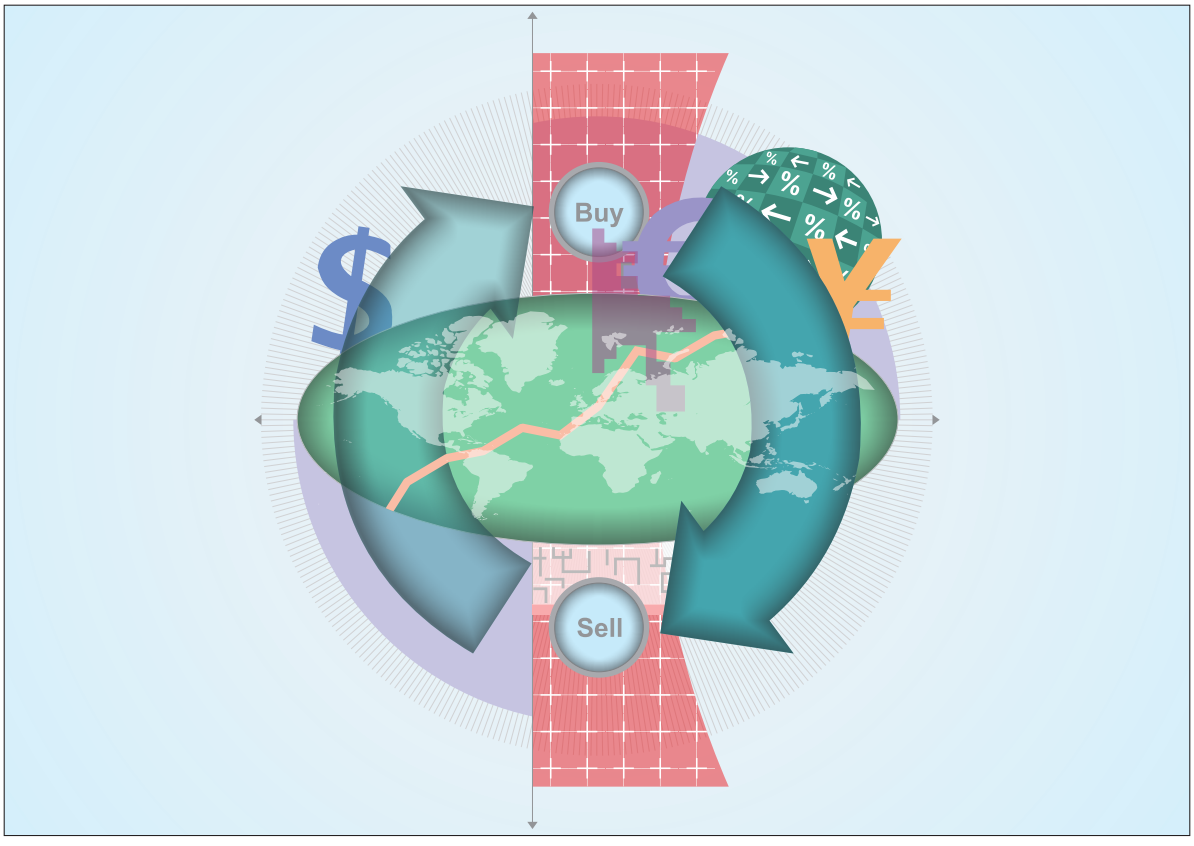

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Capital Structure and Stock Returns in Nigeria: A Panel Co-integration Approach

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ABSTRACT

Capital structure and stock return play a significant role in the performance of firms. This study explored the relationship between capital structure and stock return of Nigeria-listed companies. Firm level panel data for this study were collected from 85 firms listed on the Nigeria stock exchange for the period 2000-2010. A panel co-integration approach was employed to examine the existence of long run relationship between the two variables. Results from Pedroni co-integration test indicate there is a long run relationship between capital structure and stock return; they will not drift away from each other. This finding suggest that, for financial stability to exist, attention needs to be paid to the two variables simultaneously since evidence suggest that the two variables will not wander away from each other.

Key words: Capital structure, stock return, panel data, leverage, Pedroni co-integration

INTRODUCTION

The relationship between capital structure and stock return is an important aspect of financial management studies. The relevance of capital structure and stock return is rooted in their characteristics as factors of business success or failure (Fama and French, 2002). Capital structure composition can also be used to exert some influence on a firm's value and affect its risk and return characteristic and this provide some tools for evaluating the impacts of alternative capital structure on the stock returns (Welch, 2004). The optimal capital structure strikes a balance between the risk and returns which maximizes the price of the stock (Groth and Anderson, 1997).

Theories suggest that a change in the capital structure implies a change of the firm value which should consequently impact on stock returns (Koch and Shenoy, 1999). Capital structure theories suggest a change in leverage ratio will either move the capital structure closer to or further away from the optimal capital structure which will be affected in the equity market (Kayhan and Titman, 2007). If the dynamic pecking order theory holds, increase in leverage may result in a decrease in the contemporaneous stock returns since increase in leverage reduces firm's safe debt capacity and have increase the possibility of foregoing positive net present value projects in the future. This is especially true for firms that already have high debt level (Cai and Zhang, 2006). On the other hand, according to trade-off theory a deviation from the optimal capital structure (either increase or decrease) would result in a lower stock returns.

The capital structure is a significant managerial decision which influences the (shareholder's return) stock return, also the market value of firm may be affected by the capital structure decision (Baker and Wurgler, 2002). The company will have to plan its capital structure

initially at the time of its promotion. Thereafter, whenever funds have to be raised to finance investment a capital structure decision is involved. This decision will involve an analysis of the existing capital structure, desired debt-equity mix, payment policy and other factors which govern the decision of the firm. The stock return decision is, in a way, a financing decision (Hovakimian *et al*., 2001). The firm's policy to retain or distribute earnings affects the owners' claims. Shareholders' equity position is strengthened by retentions of earnings. Thus, the stock return decision has a bearing on the capital structure of a company. The debt-equity mix has implication for the shareholders' stock return and risk, which in turn will affect the cost of capital and the market value of the firm.

In spite of the relevance of capital structure and stock return to the performance of firms, there is dearth of literature on causal relationship between the two especially in the presence of panel data. Therefore an attempt will be made in this study to investigate the relationship between firm capital structure and stock returns. A few empirical studies combine these two major topics in the financial management arena. Existing empirical evidence is based mainly on data from developed countries. Thus, there is a conspicuous gap in the empirical research on capital structure and stock return of corporate firms in developing countries. Even in the developed countries, most available literature focused more on capital structure without due consideration of the interrelationship between the capital structure and stock return.

The financial management of firms in developing countries and in particular Nigeria is altogether an ignored area of research. Keeping this in view and the recognition of the potential contribution of the quoted companies to the economy of developing countries, this study will no-doubt contributes significantly to knowledge in the field of financial management. It will also shed light on the nexus of relationship between capital structures and stock return of quoted companies in Nigeria. Finally, this study will directly relate the capital structure with empirical assets pricing literature which will help to better understand the dynamics of equity market.

The objective of this study, therefore, was to determine long run relationship between capital structure and stock return using panel econometric approach with a view to providing a conceptual backdrop necessary to guide the financial manager in capital structure planning and decision in order to increase the shareholders wealth.

MATERIALS AND METHODS

Secondary data were used for this study and covered period of 2000 through 2010. The data were sourced from the Annual reports and Accounts of the sampled companies and annual publications of the Nigeria Stock Exchange. A sample of 85 non-financial quoted companies listed on the Nigeria Stock Exchange (NSE) was randomly selected for analysis. Panel unit root and co-integration tests were applied to the capital structure and stock return variables. On the unit root tests, Im, Pesaran and Shin (IPS), which is based on the well-known Dickey-Fuller is considered. IPS proposed a test for the presence of unit roots in panels that combines information from the time series dimension with that from the cross section dimension, such that fewer time observations are required for the test to have power. IPS test has been found to have superior test power by researchers in economics to analyze long-run relationships in panel data. IPS begins by specifying a separate ADF regression for each cross-section with individual effects and no time trend:

$$\Delta y_{it} = \alpha i + \rho_i y_{i,t1} + \sum_{j=1}^{pi} \beta_{ij} \Delta y_{i,t\,j} + \varepsilon_{it} \quad (1)$$

where, i = 1, . . ., N and t = 1,...,T.

IPS use separate unit root tests for the N cross-section units. Their test is based on the Augmented Dickey-fuller (ADF) statistics averaged across groups. After estimating the separate ADF regressions, the average of the t-statistics for p_1 from the individual ADF regressions, t_{iTi} (p_i):

$$\bar{t}_{NT} = \frac{1}{N} \sum_{i=1}^{N} t_{iT} (p_i \beta_i) \quad (2)$$

The t-bar statistic is standardized and converges to standard normal distribution as N and T→∞.

Panel cointegration tests: The procedures proposed by Pedroni make use of estimated residual from the hypothesized long-run regression of the following form:

$$y_{i,t} = \alpha_i + \delta_i t + \beta_{1i} x_{1i,t} + \beta_{2i}\, x_{2i,t} + ... + \beta_{Mi} xM_{i.t} + e_{i,t} \qquad \text{for } t = 1,....., T,\ i = 1,...., N,\ m = 1, ..., M \quad (3)$$

where, T is the number of observations over time, N number of cross-sectional units in the panel and M number of regressors. In this set up, α_i is the member specific intercept or fixed effects parameter which varies across individual cross-sectional units. The same is true of the slope coefficients and member specific time effects, $\delta_i t$.

Pedroni (1999, 2004) proposes the heterogeneous panel and heterogeneous group mean panel test statistics to test for panel cointegration. He defines two sets of statistics. The first set of three statistics $Z_{v,N,T}$, $Z_{pN,T}$ and $Z_{tN,T}$ is based on pooling the residuals along the within dimension of the panel. The statistics are as follows:

$$Z_{\hat{v},N,T} = T_2 N_{3/2} \sum_{i=1}^{N} \sum_{t=1}^{T} \hat{L}_{\,2\,1li}\, \hat{e}_{\,i,t\,1}^{\,2} \quad (4)$$

$$Z_{\hat{p}N,T1} = T\sqrt{N} \sum_{i=1}^{N} \sum_{t=1}^{T} \hat{L}_{\,2\,1li}\, \hat{e}_{\,i,t1}^{\,2} \Big/ \sum_{i=1}^{N} \sum_{t=1}^{T} \hat{L}_{\,1li}^{\,2} (\hat{e}_{i,t\ 1} \Delta \hat{e}_{i,t}\ \hat{\lambda}_i) \quad (5)$$

$$Z_{tN,T1} = \tilde{\sigma}_{N,T}^{\,2} \sum_{1=1}^{N} \sum_{T=1}^{T} \hat{L}_{\,2\,1li}\, \hat{e}_{\,i,t1}^{\,2} \Big/ \sum_{i=1}^{N} \sum_{t=1}^{T} \hat{L}_{\,2\,1li}\, \hat{e}_{\,2\,1li} (\hat{e}_{i,t\ 1} \Delta \hat{e}_{i,t}\ \hat{\lambda}_i) \quad (6)$$

where, $\hat{e}_{i,t\,1}$ is the residual vector of the OLS estimation of the above equation and where the other terms are properly defined by Pedroni (1999, 2004).

The second set of statistics is based on pooling the residuals along the between dimension of the panel. It allows for a heterogeneous autocorrelation parameter across members. The statistics are as follows:

$$\tilde{Z}_{\hat{p}N,T\,1} = \sum_{1=1}^{N} \sum_{T=1}^{T} \hat{e}_{\,i,t\,1}^{\,2} \Big/ \sum_{t=1}^{T} (\hat{e}_{i,t\ 1} \Delta \hat{e}_{i,t}\ \hat{\lambda}_i) \quad (7)$$

$$\tilde{Z}_{lN,T\ 1}=\sum_{1=1}^{N}\sum_{T=1}^{T}\hat{e}_{1,t\ 1}^{2}\ ^{1/2}\sum_{t=1}^{T}(\hat{e}_{i,t\ 1}\Delta\hat{e}_{i,t}\ \hat{\lambda}_{i}) \tag{8}$$

These statistics compute the group mean of the individual conventional time series statistics. The asymptotic distribution of each of those five statistics can be expressed in the following form:

$$\frac{X_{N,T}\ \mu\sqrt{N}}{\sqrt{v}}\Rightarrow N(0,1) \tag{9}$$

where, $X_{N,T}$ is the corresponding from of the test statistics, while μ and v are the mean and variance of each test, respectively. Under the alternative hypothesis, Panel v statistics diverges to positive infinity. Therefore, it is a one sided test were large positive values reject the null of no co integration. The remaining statistics diverge to negative infinity, which means that large negative values reject the null.

RESULTS AND DISCUSSION

In order to do any meaningful policy analysis with the results, it is important to distinguish between correlation from a share trend and one associated with an underlying causal relationship. To achieve this, the data on capital structure and stock returns were tested for a unit root (non-stationary) by using panel unit root approach consisting of IPS (lm, peasaran and Shin W-stat) since our data is balanced. The results (Table 1) show that all the two variables are integrated of order one, I (1). Having established that all the variables are I (1), panel co integration test was applied to investigate whether long-run steady state or cointegration exist among the variables. The result of the test is presented in Table 2.

Results of Pedroni co-integration test (Table 2) indicate that at constant level, 5 out of 7 statistics reject null hypothesis of no co-integration at the 5 percent level of significance for the panel rho -statistics, panel pp-statistics, adf-statistic, group PP-Statistic and the group-adf statistics. The results of the panel co-integration tests in the model with constant level show that capital structure and stock return variables are co-integrated in the long run for the sampled firms under study for the sampled period 2000-2010. In the panel co-integration test for the model with constant plus trend level, the results indicate that 3 out of 7 statistics reject the null hypothesis of no co-integration at 5% level of significance. It is shown that capital structure and stock returns variables are co-integration in the long run for the sampled quoted firms. However, since the statistics conclude in favour of co-integration and this, combined with the fact that the according to Pedroni (1999) the panel non-parametric (t-statistic) and parametric (ADF-statistic) statistics are more reliable in constant plus time trend, we conclude that there is a long run co-integration among the two variables.

Table 1: Result of the panel unit root test

	Leverage		Stock return	
Method	Level	First difference	Level	First difference
Levin lin and chin t	0.03894	-2.877*	-0.38050	-09.93571*
Lm, Pesaran and shin N-start				
ADF-Fisher chi-square	133.06400*	104.186*	37.9337	169.38800*
PP-Fisher chi-square	163.39600*	269.776*	50.7768	422.23200*

*Significant at 5%

Table 2: Pedroni panel co-integration test

	Constant		Constant+trend	
Test	Statistics	Probability	Statistics	Probability
Panel v-statistic	-1.689206	0.9529	-3.784099	0.9995
Panel ρ-statistic	-1.847400*	0.0323	1.088929	0.8619
Panel t-statistic: (non-parametric)	-6.508000*	0.0007	-5.495553**	0.0000
Panel t-statistic (adf): (parametric)	-5.060600*	0.0000	-3.163413**	0.0008
Group ρ-statistic	0.616800	0.7313	2.423569	0.9923
Group t-statistic: (non-parametric)	-6.915800*	0.0000	-5.725933**	0.1101
Group t-statistic (adf): (parametric)	-4.045000*	0.0000	-1.226231	0.1101

All statistics are from Pedroni (1999) where the adjusted values can be compared to the N (0,1) distribution. The Pedroni (2004) statistics are one-sided tests with a critical value of -1.64 (k<-1.64 implies rejection of the null), except the v-statistic that has a critical value of 1.64 (k>1.64 suggests rejection of the null), ***Rejection of the null hypothesis of no-co-integration at 1 and 5%, levels of significance, respectively

CONCLUSION

The long run relationship between capital structure and stock return has been examined. The panel co integration approach employed for this study indicates that the two variables are correlated implying that, for any stable economic activities to exist in developing countries, attention needs to be paid to the two variables simultaneously since evidence suggests that the two variables will not drift away from each other. The finding of this study may also imply a need to assess the effect of determinants of each of these two macroeconomic variables simultaneously on capital structure and stock return using appropriate methodology. This will ensure the correctness of several policies formulated to stabilise financial base of firms based on either capital structure or stock return.

REFERENCES

Baker, M. and J. Wurgler, 2002. Market timing and capital structure. J. Finance, 57: 1-32.

Cai, J. and Z. Zhang, 2006. Capital structure dynamics and stock returns. http://papers.ssrn.com/sol3/papers.cfm?abstract_id=685462

Fama, E. and K.R. French, 2002. Testing trade-off and pecking order predictions about dividends and debt. Rev. Fin. Stud., 15: 1-33.

Groth, J.C. and R.C. Anderson, 1997. Capital structure: perspectives for managers. Manage. Decis., 35: 552-561.

Hovakimian, A., T. Opler and S. Titman, 2001. The debt-equity choice. J. Fin. Quant. Anal., 36: 1-24.

Kayhan, A. and S. Titman, 2007. Firms histories and their capital structures. J. Fin. Econ., 83: 1-32.

Koch, P.D. and C. Shenoy, 1999. The information content of dividend and capital structure policies. Financial Manag., 28: 16-35.

Pedroni, P., 1999. Critical values for cointegration tests in heterogeneous panels with multiple regressors. Oxf. Bull. Econ. Stat., 61: 653-670.

Pedroni, P., 2004. Panel cointegration, asymptotic and finite sample properties of pooled time series tests with an application to the PPP hypothesis. Econometric Theory, 20: 597-625.

Welch, I., 2004. Capital structure and stock returns. J. Pol. Econ., 112: 106-131.