Financial Risk and Value Relevance of Accounting Information: Evidence from Nigeria Quoted Insurance Firms

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Abstract
This paper examined the effect of financial risk on the value relevance of accounting information of quoted insurance firms in Nigeria. The objective is to investigate whether there is a dynamic long run relationship between various financial risk and value relevance of accounting information, time series data was sourced from financial statement of quoted insurance firms and Central Bank of Nigeria statistical bulletin from 1990-2016. Value relevance of accounting information was proxy by aggregate stock prices of the quoted insurance firms while financial risk was proxy by debt to total capital ratio, capital to expenditure ratio, liquidity risk, volatility of earnings from general insurance business, volatility of earnings from life insurance business, exchange rate risk. The study adopted the Ordinary Least Square as data analysis method. The β coefficient of the independent variables shows that expenditure ratio and variation on earnings from general insurance have negative relationship with value relevance of accounting information while debt equity ratio, exchange rate risk, liquidity risk, variation of earnings from life insurance have positive impact on value relevance of accounting information. We recommend that policy should be formulated to manage financial risk of the insurance firms.

Keywords: *Financial Risk, Value Relevance Of Accounting Information, Quoted Insurance Firms.*

Introduction

The concept of value relevance refers to the strength of relationship between accounting variables and market value of equity of a firm. Value Relevance studies belong to the broader field called Capital-Market-Based Accounting (CMBAR), that starts with the pioneering studies of Ball and Brown (1968) and Beaver (1968). Value relevance is one of the basic attributes of accounting quality (Francis et al. 2004). High quality accounting information is a pre-requisite for well functioning capital markets and economy as a whole and as such should be of importance to investors, companies and accounting standard setters. Value relevance is being defined as the ability of information disclosed by financial statements to capture and summarize firm value. Value relevance can be measured through the statistical relations between information presented by financial statements and stock market values or returns. The business environment is very risky, this is because to the uncertainties that characterized the operating environment. Some of the risks emanate from the business known as systemic

risk while others emanate from the external environment known as unsystematic risk. The cost of bearing risk is a crucial concept for any corporation most of financial policy decision whether capital structure, dividend policy, investment or capital budgeting and hedging policies revolves around the benefits and cost of corporation holding risks (Daunfeldt, and Hartwig, 2012).

The main premise in finance is that there is a connection between risk and return. Higher risk is assumed to lead to higher return on stocks with rationale pricing of stocks, highly profitable firms are riskier than average (Fama and French, 2015). Finance theories suggest that there is a positive connection between risk and returns. However, it is also possible that high risk leads to financial distress which can result in lower future profitability. Conceptually risk is the probability of loss or failure. In finance the concept of risk relate to variability of earnings. Risk is inherent in every business, but organization that has the right risk management strategies into business planning and performance management are more likely to achieve their strategies and operational objectives. It comprises financial risk and operating risk. Financial risk emerges from the financing of corporate entities such as leverage. Debt-to-capital ratio measures the proportion of debt used, given the total capital structure of a company. A high proportion of debt indicates a risky investment. The capital expenditure ratio, divides cash flow from operations by capital expenditures to know how much money a company will have left to keep the business running after it services its debt.

Value relevance of accounting information has well been documented in literature, Ibadin (2015) and Collins, Maydew and Weiss 1997) assert that the common belief that traditional financial statements have lost their relevance, is adduced to the transition from industrialized economy to high-tech, service-oriented economy. Again, there exists a contradiction on the direction of change in relevance and its source. Collins, Maydew, and Weiss (1997), Francis & Schipper (1999) demonstrate an increasing trend in value relevance. Lev and Zarowin (1999), Core, Guay and Buskirk (2003) find evidence of declining value relevance of accounting information. The above divergences attract further research most especially in the developing economies like Nigeria. Empirical studies on the effect of risk on performance or value relevance do not usually focus on the risks mentioned above, but more often on either bankruptcy or credit risk, that are more interesting for investors and debtors. From the above, this study intends to examine the relationship between financial risk and value relevance of accounting information among quoted insurance companies in Nigeria. Section two focuses on both theoretical and empirical review of related literature, section three deals with the research methodology. Section four deals with the data analysis and presentation and the fifth section contain the conclusion and recommendations from the findings.

Literature Review

Financial Risk

In finance risk is a technical matter of unpredictability in expected outcomes, both negative and positive. In other businesses and political settings, risk is closely associated with the spirit of enterprise and value creation (Power, 2007). Financial risks are market-wide risks that can affect the financial performance of companies in the whole economy. However, in finance literature risk usually also has an upside. Volatility of returns/income is a common measure of this. Malkiel (1982) sums the reasoning behind this measure of risk, for an investor risk is the disappointment of not earning the expected return. Financing risk comprises of financial leverage risk and borrowing cost risk. Financial leverage means the ratio of debt to equity. If this ratio gets too high, the company has no buffer to withstand potential losses and is in effect on the brink of bankruptcy, the borrowing cost as an absolute

figure is not relevant, but the spread between borrowing cost and return on assets. If the company is creating high returns on its operating assets, it can in turn afford to pay high interest rates. However, if the average interest rate surpasses return on assets, every dollar of debt generates losses for the company. Companies indeed balance their total risk level by choosing the amount of financial leverage on the basis of their cost structure. Financial leverage determines what is left in the bottom line of earnings variability. As a product of different factors, it has both systematic components that result from market factors, and company specific factors. Scott (1981) argues that theoretically a company goes bankrupt if, debt payments are larger than EBIT plus present value of future dividends and-if payable liabilities are larger than market value of assets.

Value Relevance

The value relevance of a particular accounting standard can also be evaluated, because stakeholders assume that accounting standard do affect the quantum and presentation of accounting numbers (Amir, Harris and Venuti, 1993; Ayers 1998; and Cheng, Liu and Schaeffer 1996). In context of a specific accounting standard, the higher the association between accounting number deriving from it and a measure of market value, the higher the value relevance of that standard. This is of interest to policy makers and standard setters, in assessing the effect of changes in accounting standard, under local conditions. The concept of value relevance refers to the strength of relationship between accounting variables and market value of equity of a firm. This is indicated by R-square from regression analysis and the earnings response coefficient of each accounting variable in the equation. The regression result can be used to measure another important concept of financial information, its timeliness. Timeliness means having information available to decision makers before it loses its capacity to influence decisions. The value relevance of financial information can also be affected by how timely that information is (Kothariand, 1992; Alford Jone, Leftwich and Zmijewiski, 1993; Colins et al 1997; Lev, 1999). The coefficient of regression of market value on accounting numbers also indicates the timeliness of that accounting number.

The concept of value relevance may be defined in a number of ways. Francis and Schipper (1999) discuss four different interpretations of value relevance. Consistent with their fourth interpretation, value relevance is the ability of financial information to capture or summarize information that determines firm value. Therefore value relevance is measured as the degree of statistical association between accounting information and market values or returns. Barth, Beaver and Landsman (2001) simply state that value relevance research examine the association between accounting amounts and equity market values. In a more thorough discussion of the construct, Francis and Shipper (1999) offer four interpretations of value relevance. Interpretation one is that financial statement information influences stock prices by capturing intrinsic share values toward which stock prices drift. Under interpretation two, Francis and Schipper (1999) state that financial information is value relevant if it contains the variables used in a valuation model or assists in predicting those variables, while interpretation three and four are based on value relevance as indicated by a statistical association between financial information and prices or returns. Value relevance research does not focus on how accounting information is used in valuation.

Theoretical Framework

Theory of Value Relevance

The first tests of value relevance were, of course, based on capital market theories prevalent at the time. For example, Ball and Brown assumed that the Efficient Market Hypothesis is maintained (Brown, 1989). This allowed them to calculate information value of accounting

earnings (an approach which was not followed upon). They were probably aware of the Modigliani-Miller propositions, which explicitly connect firm value with its expected income (Modigliani & Miller, 1958). It is thus apparent that the return on a share of stock will be equal to the return on assets less interest expense. Notice however, that Modigliani-Miller propositions use expected return, not actual return. Return, which is reported in financial statements, influences stock return only indirectly through its impact on expected earnings. Market efficiency, the attribute of Modigliani-Miller's ideal world, is a significant concern in capital market studies. In emerging and transition economies market institutions are not well developed, which often entails market inefficiency. The question is, whether market efficiency is necessary for value relevance studies to produce reliable results. Aboody *et al.* (2002) argue that semi-strong market efficiency is necessary, if economic inferences are to be unbiased. However, in emerging country studies the goal is only to determine if accounting earnings are at all relevant. Even if a market is not efficient, investors and their decisions can be significantly affected by earnings information.

Efficient Market Hypothesis notwithstanding, testing value relevance requires a market where investors are free in making their decisions and where investors' decisions affect prices. Otherwise, even if accounting numbers are of highest quality, they will not have an impact on stock returns. In other words, stock prices must reflect the preferences of market participants (Abdel-Khalik, Kie Ann Wong, & Wu, 1999). Thus, the stock market must be free from manipulation by the authorities, or other people of power. Moreover, restrictions on trading must not be too strict or subject to authorities' discretion. Examples of such restrictions include setting a narrow limit on daily price fluctuations and freezing trading. In an inefficient market preferences of investors are not reflected in prices, so accounting numbers which influence these decisions are not relevant for stock value. However, the existence of an efficient market does not necessarily imply value relevance. Accounting earnings may still be of doubtful quality: accounting methods may not be well defined; manipulation may be commonplace, internal and external controls non-existent. In such a case, rational investors will not base their decisions on accounting information.

Stakeholder Theory

Stakeholder theory focuses explicitly on equilibrium of stakeholder interests as the main determinant of corporate policy. In certain industries, particularly high-tech and services, consumer trust in the company being able to continue offering its services in the future can substantially contribute to company value. However, the value of these implicit claims is highly sensitive to expected costs of financial distress and bankruptcy. Since corporate risk management practices lead to a decrease in these expected costs, a company values raise (Klimczak, 2005).Therefore stakeholder theory provides a new insight into possible rationale for risk management. However, it has not yet been tested directly. Firms can reduce the likelihood of financial distress by hedging variability in earnings by managing financial risk.

Financial Economic Theory

The theory of financial economic theory states that corporate risk management is appropriate to increase firm value in the presence of capital market imperfections such as bankruptcy costs, a convex tax schedule, or underinvestment problems. Carter et al. (2006) noted that risk management can increase shareholder value by harmonizing financing and investment policies. A credible risk management can mitigate underinvestment costs by reducing the volatility of firm value. As the underinvestment problem which includes financial risk management is likely to be more severe for firms with significant growth and investment opportunities, various measures such as the market-to-book ratio, research and development

to sales ratio, capital expenditure to sales, net assets from acquisitions to size which are indicators of financial performance are used for testing the underinvestment hypothesis.

Empirical Literature

Jorion (1990) investigated exposure of U.S multinational firms to foreign currency risk. It also focuses on determinants of exchange rate exposure. There exist direct relationship between foreign involvement and exchange rate. It found that most of multinationals firms with foreign involvement belong to oil industry where foreign sales accounts for 53 % of sales of U.S oil industry and 41 % sales belong to computer industry.

Hassan and Nasir (2008) explored causal relationship of macroeconomic variables and equity return during period of 1998-2008. The long term effect of interest rate, money supply and exchange rate on equity return is found significant. The negative relationship between interest rate and equity return is statistically significant. There is positive relationship between money supply and equity return which implies that increased money supply leads to increased liquidity and hence value of share increases. Kalyanaraman and Tuwajri (2014) examined the long run dynamics of macroeconomics variables and global stock prices. The study employed Johansen co-integration approach to investigate the long term effect of macroeconomic variables on stock prices.

Joseph (2002) investigated the effect of interest rate as well as exchange rate fluctuations on the U.K market. The author reports an inverse relation between industry stock return and interest rate risk. The results suggest that only 34% firm‘s shows significant exposure for interest rate changes and 28% firms for exchange rate changes. The financial performance of the firms has been affected by the fluctuations in financial risk.

Chang (2002) explored effect of exchange rate changes on industry level by using stock returns of Taiwan. The firms are less exposed to exchanges rate risk exposure as compare to smaller firms. Amihud (2002) investigated exchange exposure US exporting firm‘s stock returns. The study concludes that no significant exchange rate exposure has been observed for US exporting firms.

Abugri (2008) examined that fluctuations in interest rate negatively affects stock returns in Chile, Brazil and Argentina and this affect is significant whereas insignificant relationship between interest rate changes and Mexican stock return has been observed. Jecheche (2011) examine arbitrage pricing theory in Zimbabwe stock market by employing time series data for the period of 1980 to 2005. The study use co integrating technique and vector autoregressive model. The weekly data for the period of 1999-2006 has been analyzed. The Granger causality test has been used to check the lead and lag relationship. The test suggests that stock price leads foreign exchange rate and a non-linear causality has been observed from foreign exchange rate toward stock returns. The study observed unidirectional relation of CPI to stock return both in long run and short run. Therefore predictions for exchange rate are important so that stock return can also be predicted.

Samsudheen and Shanmugasundram (2013) examined the sensitivity of corporate firm‘s value to the fluctuations of foreign exchange rates by using Jorion‘s (1990) model. This study employ the ordinary least square regression methodology to estimate the foreign exchange rate exposure of selected samples as against bilateral exchange rate of Indian Rupee against US Dollar for a period of 2010 to 2012. The results indicate that on an average, Indian firms benefit from an appreciation of the home currency and may lose from a depreciation of home

currency.

Hassan and Javed (2009) explored causal relationship of monetary factors and equity return during period of 1998-2008. Monthly data has been used. The result suggests that there is long run link among monetary variables and equity returns. Insignificant relationship has been observed for the inflation on stock returns. The negative correlation between interest rate and stock return is statistically significant. This implies that interest rate increase is linked with increased discount rate and consequently which lead to decline in present value of future cash flows.

Ayed and Abaoub (2006) examined the value relevance of accounting earnings and components in the Tunisia Stock Exchange. Employing a sample of 262 firm-years, over the period 1997 to 2004, in which the new accounting system of companies was introduced, but before the introduction of the standard of consolidation in 2005, they tested three hypotheses. First, that operating earnings before taxes are more value relevant than bottom line earnings in explaining returns; second, that earnings components are more value relevant in explaining returns, and, third ,that cash flow from operations is not value relevant and have no incremental information content beyond earnings.

Ng, Gul and Mensah (2007) examined the effect on value relevance of accounting earnings after the coming of Sarbanes-Oxley Act in 2002 and managerial entrenchment characteristics. They found that the value relevance of earnings is significantly different for three sub-periods in which the sample of observations was partitioned. Employing the existence of anti-managerial entrenchment mechanism, as a measure of good corporate governance, they observe that these measures have a positive impact on value relevance of accounting earnings in the period of Enron Scandal.

Ben Naceur and Nachi (2007) examined the impact of the accounting reforms on the value relevance of financial information in the Tunisian Stock Exchange (TSE). It found that value relevance of accounting information has significantly improved after the 1997 accounting reforms; and that the factors of firm size and branch of activity have not improved the value relevance of accounting information in TSE following the accounting reforms.

Pourheydari, Aflatooni and Nikbakat (2008) compared the combined value relevance of dividends and book value with the value relevance of earnings and book value and their relationship with market value of shares in Tehran Stock Exchange from 1996 to 2004. Their results found a positive relationship between dividends, book value and earnings with stock market value. They also find that dividends have information content. The information content of dividends, combination of book values and earnings and combination of book values and dividends are approximately equal.

Habib and Elhamaney (2009) adopted the Pope and Wang's (2004) residual income specification instead of the commonly used Ohlson model to ascertain the value relevance of accounting information in Egyptian equity market. Their result found positive correlation between cash flow and equity market values in Egypt. Kirkulak and Balsari (2009) analyzed the effect of inflation adjusted data on explaining the market value of equity and stock returns in Turkey. They find that both historical cost-based book value and earnings information and inflation adjusted information are value relevant and they complement each other.

Oyerinde (2009) investigated the value relevance of accounting data in the Nigerian Stock

Market, with the objective of establishing the relationship between accounting numbers and share prices in the Nigerian Stock Market. Results shows a number of serious limitations: the time scope for this study was narrow, such that conclusions from this study could not be compared to studies done in more matured markets. It also did not take into cognizance the factor of scale as well as the effects of heteroscedasticity.

Pereia and Thrikawala (2010) analyzed the published financial statements of commercial banks listed in the Colombo Stock Exchange over the period 2005 -2009. Their result shows that the earnings per share and earnings yield and return on equity have not declined in value relevance. Keener (2011) examined the differences in the value relevance of earnings and book values across industries. He presented evidence that joint value relevance of earnings and book values had not declined, even though the incremental value relevance of earnings increased; while the vale relevance of the book values was unchanged for the period.

Glezakos, Mylonakis and Kafuoros (2012) examined the impact of earnings and book values on share prices; they find that the explanatory power of earnings and book values in share prices had increased over time. They also provide evidence that in the last year earnings played an increasingly declining role in the determination of share prices relative to book values. Halonen, Parlovic and Pearson (2012) employed a simplified Ohlson's (1995) model; investigated value relevance of financial reporting in Sweden after the introduction of the International Financial Reporting Standard in 2005. They found that value relevance of book values had increased but the value relevance of earnings had decreased over the period. Olga and Veltri (2012) investigated the incremental value relevance of aggregate comprehensive income compared to net income, surveying empirical literature on value relevance tests, value relevance approach and other comprehensive income measure. They found that majority of studies did not support the incremental value relevance of other income over net income.

Melissa (2013) addressed the relationship between share price and bottom line accounting information as dividends, earnings and book value in the Nairobi Stock Exchange. The study shows that earnings and book values are significantly associated with share values though book value was found to be least significant of the three variables. Ayzer and Cema (2013) examined the value relevance of financial statement information in Turkish Stock Markets during the period 1997-2011, using the Ohlson (1995) mode. Their result showed that combined book values and earnings are significantly value relevant in explaining stock prices in the Turkish Stock Markets. Book values and earnings were individually significantly value relevant, with book values having higher explanatory power than earnings.

Sibil (2013) investigated the value relevance of accounting information in pre and post financial periods of IFRS adoption for Turkish listed firms. Market value per share is related to book value per share and earnings per share by using the Ohlson model (1995). Overall book value is value relevant in determining market value or stock prices. The result shows that value relevance of accounting information has improved in the post IFRS period considering book values while no improvement has been observed in value relevance of earnings.

Adaramola and Oyerinde (2014) examined the trend in value relevance of accounting information, using a sample of sixty six listed companies in the Nigerian Stock Exchange. The study found that value relevance of accounting information did not follow any trend, but it was lower in the period of military dictatorship and global economic crisis.
Vijltha and Nimalathasan (2014) studied the value relevance of accounting information in the

Colombo Stock Exchange. The study find significant association of Earnings Per Share, Net Asset Value Per Share and Return On Equity, with share prices of listed firms on the Exchange Chen et al (1999) provide empirical evidence as to perception of usefulness by domestic investors in the Chinese stock market of accounting information produced under Chinese GAAP using a sample of all firms listed in Shanghai and Shenzhen Stock Exchanges from 1991 to 1997. They obtained evidence of value relevance of accounting information in China based on a return and price model. They documented that accounting information is value relevant in the Chinese Market from either the pooled cross-section or time series regressions or the year by year regressions. They showed that the factors of positive versus negative earnings, firms size, earnings persistence and percentage of public holding impact on value relevance of accounting information.

Mingyi, (2000) compared the value relevance of book value and dividends versus book value and earnings. They justified the modeling price in terms of book value and dividends, using the Modigliani and Miller (1959) argument and they derived a model of price in terms of book value and dividends from basic analytical relationships. They reported three sets of findings. First is that book values and dividends have about the same explanatory power as book value and reported earnings. Dividends have greater explanatory power than earnings for firms with transitory earnings. When earning is transitory, book value is a poor indicator of value.

Babalyan (2001) focused on the relative explanatory power and earnings responses coefficient in regressions of reported accounting numbers on market returns of firms listed in the Swiss Stock Exchange, but preparing financial statements under different accounting regimes. He showed that earning numbers from International Accounting Standards (IAS) compliant firms are not more value relevant than earnings from firms reporting under Swiss standards, after controlling for firm size, foreign market listing, audit quality and sensitivity to some variable specifications. He also provided evidence that firms reporting under US GAAP provide more informative earnings numbers, though this result must be put in the context of the small sample of firms and high presence of US GAAP firms on foreign stock markets.

Gaston, Fernadez, Harne and Gadea (2003) employed a sample of 50 local firms listed on national stock markets during the period 1995-1999 in 36 countries, undertook a comparative study of relevance of earnings and their components. Their results showed that disaggregation of earnings into components parts of income statement provides the investors with incremental information regarding market value of companies. Their results are consistent with earlier studies providing evidence of value relevance of earnings for valuation purposes irrespective of the market analyzed, though the potency of this differ between counties.

Wulandri and Rahman (2004) addressed the effect of three accounting institutional environment parameters, accounting standard quality, acceptability of accounting standards and enforceability of accounting standards on value relevance of accounting earnings. Using a sample from 35 countries, they found a positive association between value relevance of earnings and quality of accounting standards acceptability of standards and punitive enforcement of the standards. They also found that accounting institutional environment has a stronger positive association with value relevance of accounting earnings than legal environment. They also found that for code law and emerging market countries, the association between accounting institutional environment and value relevance is positive and

stronger than that of common law developed countries.

Ndubizu and Sanchez (2004) examined the valuation properties of US GAAP and IAS in Chile and Peru. They used the accounting regimes to formulate contracts and to represent the contracts in the financial statement to minimize the likelihood of assessment noise. They found that US GAAP and IAS earnings and book value are value relevant in both countries. Ragab and Omran (2006) examined empirically whether national and international investors in the Egyptian stock market perceive accounting information based on Egyptian Accounting standards to be useful in stock valuation. Using a sample all available listed firms in the emerging market data based from 1998 to 2002, evidence of value relevance of accounting information in Egypt was obtained based on both return and price models. They found that stock prices in Egypt are less information about the future value of the firm than accounting information.

Mao (2006) demonstrated that measurement error bias is a major factor driving the results of previous studies of value relevance of earnings information decline over time. Using the variance of measure error in earnings change as proxy for unexpected earnings, and after controlling for impact of measurement error, trends of Earnings Responses Coefficient (ERC) and R^2 estimated using the latent variable model are not significantly different from zero. Mao provided explanation for the low magnitude of OLS ERC observed in previous studies by showing substantial measurement error in using either earnings change or analyst forecast to calculate unexpected earnings.

Ortega (2006) reinvestigated the changes in value relevance of earnings book values and cash flows in security prices over time, employing data from 1961 to 2005extracted from Compustat primary, secondary and tertiary full coverage and research annual industrial files. Firstly, he found that cash flow provides incremental information content beyond earnings and book values in security prices. Secondly, that combined relevance of earnings, book value and cash flow has not declined over time. Thirdly, when firms have negative earnings and onetime items, the value relevance of earnings shift to book values and cash flows.

Aleksanyan (2007) using data obtained from Excel Financial Company Analysis over the period 1988 to 2005, covering firms listed in the London stock Exchange found that firms that trade at a premium to book value relevance of two fundamental financial statement value driver- earnings and book value is negatively related to the level of sophistication of the firm's information environment, which is proxy by capitalized value of the firm. But for firms trading at a discount to book value, value relevance of the financial statement drivers is not affected by the level of sophistication of the information environment.
The empirical studies above fail to establish the exact relationship that exists between financial risk and value relevance of accounting information. The present study intends to establish valid relationship between various measures of financial risk and value relevance of accounting information.

Research Methodology
The main tool of analysis is the Ordinary Least Squares (OLS) using the multiple regression method for a period of 26 years, annual data covering 1990– 2016. The objective of the study is to examine the effects of financial risk on value relevance of accounting information among quoted insurance companies in Nigeria. Moreover, in order to undertake a statistical evaluation of our analytical model, so as to determine the reliability of the result obtained and the coefficient of correlation (r) of the regression, the coefficient of determination (r^2), the

student T-test and F-test where employed. The multiple regression models are specified as follows:

ASPI = f(DCR, CER, LIQR, VEGI, VELI, EXR) 1

Transferring equ (1) into a testable form, we obtain the following regression equation;

$ASPI = \beta_0 + \beta_1 DCR + \beta_2 CER + \beta_3 LIQR + \beta_4 VEGI + \beta_5 VELI + \beta_6 EXR + \mu$ 2

Where

ASPI = Aggregate stock prices of quoted insurance firms
DCR = Debt to total capital ratio of quoted insurance firms
CER = Capital to Expenditure Ratio of quoted insurance firms
LIQR = Liquidity Risk Measure as Variability of Cash Holdings of Quoted Insurance Firms
VEGI = Volatility of Earnings from General Insurance Business
VELI = Volatility of Earnings from Life Insurance Business
EXR = Exchange Rate Risk
μ = Error Term
β_0 = Regression Intercept
$\beta_{1-}\ \beta_6$ = Coefficient of the Independent Variables to the dependent variable

Data Analysis Procedure

Stationarity (Unit Root) Tests

The study investigates the stationarity properties of the time series data using the Augmented Dickey Fuller (ADF) test. According to Nelson and Plosser (1982), Chowdhury (1994) there exist a unit root in most macroeconomic time series. If a time series is stationary, it means that its variable and auto-covariance (at various lags/gaps/distances) remain the same (constant over time) no matter at what point we measure them (they: are time invariant). Non stationary time series will have a time varying mean or a time- varying variance or both. If a time series is non stationary, we can study its behaviour only for the time period under consideration, and cannot generalize it to other time periods, and hence remain of little practical value if we intend to forecast (Gujarati, 2003). Thus, test for stationarity is also called test for integration. It is also called unit root test. Stationarity denotes the non-existence of unit root. We shall therefore subject all the variables to unit root test using the augmented Dickey Fuller (ADF) test specified in Gujarati (2004) as follows.

$$\Delta y_t = \beta_1 + \beta_2 + \delta y_{t-1} + \alpha i \sum_{i-1}^{m} \Delta y_{t-1} + Et \qquad 3$$

Where:

Δy_t = change time t

Δy_{t-1} = the lagged value of the dependent variables

Σ_t = White noise error term

If in the above δ =0, then we conclude that there is a unit root. Otherwise there is no unit root, meaning that it is stationary. The choice of lag will be determined by Akaike information criteria.

Decision Rule

t-ADF (absolute value) > t-ADF (critical value) : Reject H_o (otherwise accept H_1)

Note that each variable will have its own ADF test value. If the variables are stationary at level, then they are integrated of order zero i.e 1(0). The unit root problem earlier mentioned can be explained using the model:

$Y = Y_{t-1} + \mu_I$ 4

Where Yt is the variable in question; μ_i is stochastic error term. Equation (a) is termed first order regression because we regress the value Y at time "t" on its value at time (t- 1). If the coefficient of Y_{t-i} is equal to 1, then we have a unit root problem (non stationary situation). This means that if the regression.

$Y = Y_{t-1} + \mu_I$ 5

Is run and L is found to be equal to 1 then the variable Yt has a unit root (random work in time series econometrics).

If a time series has a unit root, the first difference of such time series are usually stationary. Therefore to salve the problem, take the first difference of the time series. The first difference operation is shown in the following model:

$\Delta Y = (L-1)\, Y_{t-1} + \mu_I$ 6

$\delta Y_{t-1} + \mu_I$ 7

(Note: $\delta = 1-1 = 0$; where $L = 1$; $\Delta Yt = Yt - Y_{t-i}$) 8

Integrated of order 1 or I(I)

Given that the original (random walk) series is differenced once and the differenced series becomes stationary, then the original series is said to be integrated of order I or I (1).

Integrated of order 2 or I (2)

Given that the original series is differenced twice before it becomes stationary (the first difference of the first difference), then the original series is integrated of order 2 or 1(2).

Therefore, given a time series has to be differenced Q times before becoming stationary it said to be integrated of order Q or I (q). Hence, non stationary time series are those that are integrated of order 1 or greater.

The null hypothesis for the unit root is: Ho: a = 1; 9

The alternative hypothesis is Hi: a <1. 10

We shall test the stationarity of our data using the ADF test.

Co-integration Test (The Johansen' Test)

It has already been warned that the regression of a non stationary time series on another non stationary time series may lead to a spurious regression. The important contribution of the concept of unit root, co-integration, etc is to force us to find out if the regression residual are stationary. Thus, a test for co-integration enables us to avoid spurious regression situation, the study employ Johansen Multivariate Co-integration Test to ascertain if there is the existence of a long run equilibrium relationship among time series variables. Johansen (1988, 1991) pointed out that a linear combination of two or more non stationary time series may be stationary, if such a stationary linear combination of two or more non-stationary time series exists, the non-stationary time series are said to be co-integrated and may be interpreted as long-run relationship among the variables. If the residual is found to be stationary at level, we conclude that the variables are co-integrated and as such as long-run relation sip exists among them.

$$TA_t = w_O + \sum_{i=1}^{i} \vartheta_t TA_{t-i} + \sum_{i=1}^{j} \varpi_i TA_{jt-i} + \mu_{1t} \quad 11$$

In the equation above, therefore, in this study, we will carry out a stationarity test between an independent variables value relevance of accounting information and the dependent variable financial risk from 1990-2016.

Granger Causality Test

Thus, Granger causality test helps in adequate specification of model. In Granger causality, test, the null hypothesis is that no causality between two variables. The null hypotheses is rejected if the probability of F* statistics given in the Granger causality result is less than 0.05. Therefore, in this study, we will carry out granger causality between an independent variables financial risk and the value relevance of accounting information.

The pair-wise granger causality test is mathematically expressed as:

$$Y_t \pi_o + \sum_{i=1}^{n} x_1^{\,y} \; Y_{t-1} \sum_{i=1}^{n} \pi_1^{\,x} \, x_{t-1} + u_1 \qquad 12$$

and

$$x_t dp_o + \sum_{i=1}^{n} dp_1^y \, Yt-1 \sum_{i=1}^{n} dp1^x x_{y-1} + V_1 \qquad 13$$

Where x_t and y_t are the variables to be tested white u_t and v_t are the white noise disturbance terms. The null hypothesis $\pi_1^y = dp_1^y = 0$, for all I's is tested against the alternative hypothesis $\pi_1^x \neq 0$ and $dp_1^y \neq 0.$ if the co-efficient of π_1^x are statistically significant but that of $dp1y$ are not, then x causes y. If the reverse is true then y causes x. however, where both co-efficient of π_1^x and dp_1^y are significant then causality is bi –directional

Vector Error Correction (VEC) Technique

The study investigates the direction of causality for the hypotheses using Vector Error Correction (VEC) model based causality technique. The presence of co-integrating relationship forms the basis of the use of Vector Error Correction Model. E-views econometric software used for data analysis, implement vector Auto-regression (VAR) based co-integration tests using the methodology developed by Johansen (1991, 1995). The non-standard critical values are taken from Osterward Lenun (1992).

Presentation and Discussion of Results

Table 1: Level Series OLS multiple Regression

VARIABLE	COEFFICIENT	STD ERRS.	T-STATISTICS	PROB.
DCR	2.943063	4.361042	0.674853	0.5075
CER	-0.057364	2.864122	-0.020029	0.9842
LIQR	2.293340	0.314128	7.300648	0.0000
VEGI	-0.612366	2.249505	-0.272222	0.7882
VELI	1.553223	0.920250	1.687827	0.1070
EXR	0.368252	0.799079	0.460846	0.6499
C	238.6545	67.02519	3.560670	0.0020
R^2	0.828809			
Adj R^2	0.777452			
F-STATISTICS	16.13812			
F-PROB	0.000001			
Durbin-Watson stat	1.055264			

Source: Extracts from E-view

The objective of this study is to establish the relationship between various measures of financial risk and value relevance of accounting information. Value relevance in this study is

proxy by aggregate stock prices of quoted insurance companies. An analysis from the table above shows that financial risk as measured in this study can explain 82.8% and 77.7% variation on aggregate stock prices of the insurance companies. The F-statistics and the probability justifies that the model is significant. The Durbin Watson statistics is greater than 1.00 but less than 1.5 this implies the absence of serial auto correlation among the variables in the time series. The β coefficient shows that expenditure ratio and variation on earnings from general insurance have negative relationship with value relevance of accounting information while debt equity ratio, exchange rate risk, liquidity risk, variation of earnings from life insurance have positive impact on value relevance of accounting information. The T-statistics and probability shows that liquidity risk is statistically significant while other variables are statistically not significant. Based on theory and management objective to minimize risk, we conclude that the positive impact of risk on the value relevance of accounting information is contrary to expectation and could be traced to effective management strategies to minimize risk and enhance corporate return on investment.

Table 2: Unit Root Test

VARIABLE	ADF STATISTICS	MACKINNON 1%	5%	10%	PROB.	ORDER OF INTR.
LEVEL SERIES						
ASPI	1.359586	-3.752946	-2.998064	2.638752	0.9981	1(0)
DCR	-4.181513	-3.711457	-2.981038	-2.629906	0.0033	1(1)
CER	-3.597588	-3.711457	-2.981038	-2.629906	0.0130	1(1)
LIQR	-0.491342	-3.711457	-2.981038	-2.629906	0.8778	1(0)
VEGI	-1.757860	-3.737853	-2.991878	-2.635542	0.3911	1(0)
VELI	-3.998872	-3.752946	-2.998064	-2.638752	0.0057	1(1)
EXR	-1.650485	-3.752946	-2.998064	-2.638752	0.4419	1(0)
FIRST DIFFERENCE						
ASPI	-5.022451	-3.752946	-2.998064	-2.638752	0.0005	1(1)
DCR	-7.363148	-3.724070	-2.986225	-2.632604	0.0000	1(1)
CER	-5.670519	-3.737853	-2.991878	-2.635542	0.0001	1(1)
LIQR	-5.451178	-3.724070	-2.986225	-2.632604	0.0002	1(1)
VEGI	-7.493069	-3.752946	-2.998064	-2.638752	0.0000	1(1)
VELI	-4.464667	-3.788030	-3.012363	-2.646119	0.0023	1(1)
EXR	-5.309037	-3.752946	-2.998064	2.638752	0.0003	1(1)

Source: Extracts from E-view

Theoretically, if time series variables are non -stationary, all regression results with these time series will differ from the conventional theory of regression with stationary series. That is, regression coefficients with non-stationary variables will be spurious and deceptive. To get over this problem, we test for stationarity of the time series. In order to test for stationarity of the data used in this study, the Augmented – Dickey Fuller (ADF) test will be used. The first step is to test for stationarity at level, if the variables are non – stationary, then the next step is to difference and test for the stationarity of differenced variables. If the variables become stationary after first difference then it is concluded that the variables are integrated of order one i.e. I (1). The result of the unit root test is presented above. From the table, the variables are not stationary at level but stationary at first difference except expenditure risk, liquidity risk and variation of earnings of life insurance which are stationary as both level and first difference, we therefore conclude that the variables are integrated in order of 1(1). This enables us to test for long-run relationship of the variables.

Table 3: Johansen Co-Integration Test Results

Hypothesized No. of CE(s)	Eigen value	Maximum-Eigen	0.05 Critical Value	Prob.**	Decision
None *	0.963734	184.1717	125.6154	0.0000	Reject H0
At most 1 *	0.819883	101.2500	95.75366	0.0198	Reject H0
At most 2	0.607398	58.39637	69.81889	0.2879	Accept H0
At most 3	0.518428	35.02243	47.85613	0.4468	Accept H0
At most 4	0.378001	16.75494	29.79707	0.6581	Accept H0
At most 5	0.169132	4.884536	15.49471	0.8210	Accept H0
At most 6	0.010046	0.252425	3.841466	0.6154	Accept H0
TRACE STATISTICS					
None *	0.963734	82.92168	46.23142	0.0000	Reject H0
At most 1 *	0.819883	42.85366	40.07757	0.0237	Reject H0
At most 2	0.607398	23.37395	33.87687	0.5021	Accept H0
At most 3	0.518428	18.26749	27.58434	0.4730	Accept H0
At most 4	0.378001	11.87040	21.13162	0.5605	Accept H0
At most 5	0.169132	4.632111	14.26460	0.7873	Accept H0
At most 6	0.010046	0.252425	3.841466	0.6154	Accept H0

Source: Extracts from E-view

Since the unit root test shows that the variables are stationary at level 1(0) and first order difference 1(1), we therefore test for co-integration among these variables by employing the Johansen co-integration test. The result of the test is shown in table above. The result shows that there exist one (1) co-integrating equations at 5% level of significance. This is because the likelihood ratio is greater than critical values at 5%. This shows that there is long run relationship between financial risk and all the explanatory variables. The result indicates that, in the long run; the dependent variables can be efficiently predicted using the specified independent variables. However, the above result failed to indicate the direction of long-run relationship. Therefore, we test the normalized cointegrating equation.

Table 4: Presentation of Normalized Cointegrating Equation

ASPI	DCR	CER	LIQR	VEGI	VELI	EXR
1.000000	-190.7566	41.28543	-11.45039	89.29651	-21.80081	-33.86109
	(11.4109)	(6.20830)	(0.72622)	(5.17992)	(2.32793)	(2.15684)

Source: Extracts from E-view

The above table shows that in the long-run debt equity ratio, liquidity ratio, variation of earnings from life insurance and exchange rate risk have negative long-run relationship while expenditure risk and variation of earnings from general insurance have positive long-run relationship. Hence, error correction model can be estimated.

Table 6 Parsimonious Error Correction Results

VARIABLE	COEFFICIENT	STD ERRS.	T-STATISTICS	PROB.
C	29.50191	18.43066	1.600697	0.1535
D(ASPI(-1))	-0.126837	0.305422	-0.415285	0.6904
D(DCR(-1))	-4.142668	5.035683	-0.822663	0.4378
D(DCR(-2))	-1.221109	4.843743	-0.252100	0.8082
D(DCR(-3))	-5.587229	5.444964	-1.026128	0.3390
D(CER(-1))	2.181200	2.196248	0.993148	0.3537
D(CER(-3))	1.703125	3.336234	0.510493	0.6254
D(LIQR(-1))	-0.612951	1.261693	-0.485817	0.6419
D(LIQR(-2))	-0.131912	1.467775	-0.089872	0.9309
D(LIQR(-3))	-1.135556	1.193857	-0.951166	0.3732
D(VEGI(-1))	-0.138521	2.232996	-0.062034	0.9523
D(VEGI(-2))	-3.529929	2.139505	-1.649881	0.1430
D(VELI(-1))	-0.233021	1.155916	-0.201590	0.8460
D(EXR(-1))	-1.509620	1.203859	-1.253984	0.2501
D(EXR(-2))	0.895526	0.886129	1.010604	0.3459
ECM(-1)	-0.469325	0.325571	-1.441543	0.1926
R^2	0.663454			
Adj R^2	0.457716			
F- Stat	10.91996			
F-Prob	0.000007			
DW	1.568005			

Source: Extracts from E-view

The parsimonious error correction result indicates a good fit with an F-ratio of 10.91996, an R^2 of 66.3% and an adjusted R^2 of 45.7% meaning that the model explains approximately 66.3% of the variations in Aggregate stock prices of the quoted insurance firms. The D-Watson statistic of 1.568005 suggests absence of any autocorrelation. The error correction term of -0.469325, has the appropriate negative sign is significant and shows that approximately 46.9% of the deviation from long run equilibrium in can be corrected annually using the annual time series data.

Table 7: Presentation of Granger Causality Test

Null Hypothesis:	Obs	F-Statistics	Prob.	Remark	Decision
DCR does not Granger Cause ASPI	25	0.29298	0.7492	Not Sig	Accept H0
ASPI does not Granger Cause DCR		1.10791	0.3497	Not Sig	Accept H0
CER does not Granger Cause ASPI	25	0.62841	0.5436	Not Sig	Accept H0
ASPI does not Granger Cause CER		1.05507	0.3668	Not Sig	Accept H0
LIQR does not Granger Cause ASPI	25	0.67936	0.5183	Not Sig	Accept H0
ASPI does not Granger Cause LIQR		2.74585	0.0884	Not Sig	Accept H0
VEGI does not Granger Cause ASPI	25	0.00110	0.9989	Not Sig	Accept H0
ASPI does not Granger Cause VEGI		1.92350	0.1722	Not Sig	Accept H0
VELI does not Granger Cause ASPI	25	0.28086	0.7581	Not Sig	Accept H0
ASPI does not Granger Cause VELI		1.64809	0.2175	Not Sig	Accept H0
EXR does not Granger Cause ASPI	25	0.56057	0.5796	Not Sig	Accept H0
ASPI does not Granger Cause EXR		0.87173	0.4335	Not Sig	Accept H0

Source: Extracts from E-view

The results above show causality between financial risk and value relevance of accounting information as well as their independent variables as used in this study. The null hypothesis in case of the variables is accepted. As stated in the methodology, null hypothesis is rejected if Fcal>Ftab; accept otherwise. At 5% level of significance, from result presented we say likewise, that there is no causal relationship between the independent to the dependent variables and other wise.

Conclusion and Recommendations

This study examines the relationship between financial risk and value relevance of accounting information of quoted insurance companies in Nigeria from 1990-2016. Data were collected from financial report of the insurance companies and Central Bank of Nigeria statistical Bulletin. The study modeled aggregate stock prices of the insurance industry as the function of variation on debt and equity, variation on expenditure, liquidity risk, variation of earnings from general and life insurance and exchange rate risk. Findings reveals that expenditure ratio and variation of earnings in general insurance have negative relationship while debt equity ratio, liquidity risk, variation of earnings from life insurance have positive relationship with aggregate stock prices of the insurance firms. The independent variables can explain 82.8% and 77.7% variation on aggregate stock prices of the quoted insurance companies. We conclude that financial risk has significant relationship with value relevance of accounting information of the quoted insurance firms. We therefore make the following recommendations:

Corporate strategies should be formulated to manage financial risk among the quoted insurance companies and the insurance firms should ensure optimal capital structure that will enhance the value relevance of its accounting information. Policies should be formulated to manage the operating environment of the insurance firms to leverage its effects on the value relevance of accounting information.

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