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### Determinants of Domestic Corporate Bonds Yield Spread in Nigeria

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#### ABSTRACT

Theoretically, the coupon on corporate bonds is simply seen as the risk-free rate plus a spread. In reality, however, the empirical analysis of the determinants of the spreads is highly demanding. Unmasking the determinants of corporate bond yield spreads has remained an important research issue, especially in the third world economies. In Nigeria, and most third world economies, there seems to be dearth of research in the area of corporate bonds yield spreads due to insufficient bond data, especially secondary market data on corporate bonds. Even in the advanced economies where studies have been carried out, there seems to be no universally accepted determinants of corporate bonds yield spread: different variables and proxies, and measurements of the variables are used in different studies. This study investigates the extent to which bond-specific, firm-specific, macroeconomic and institutional factors affect corporate bonds yield spread in Nigeria. It applies the generalised methods of moment (GMM) estimation method on an unbalanced firm-level panel data and macroeconomic and institutional time series data from 2000 to 2014 to examine the determinants of domestic corporate bonds yield spread in Nigeria. The bond-specific and firm-specific data were sourced from the prospectuses of the bonds and annual reports of the respective firms that are quoted on the floor of the Nigerian Stock Exchange. We find that domestic corporate bonds yield spread responded to both bond-specific, firm-specific and macroeconomic factors in Nigeria. The outcome of the study is consistent with most of the studies conducted with secondary market data on corporate bonds in the advanced economies, and therefore justifies our use of inflation-adjusted coupons on bonds as the yield on corporate bonds. We therefore recommend that researchers should use inflation-adjusted coupons as proxy for corporate bonds yield spread. Profitable and well managed firms should take advantage of their profitability and efficient management and raise debts at lower margins to enhance their enterprise value and size.

**Keywords:** Corporate bond yield, firm-specific, macroeconomic, institutional variables.

## 1. INTRODUCTION

The importance of the domestic corporate bonds market as an alternative source of financing for corporations was once again brought to the front burner by the Asian financial crisis of June 1997 to January 1998. This importance of the domestic corporate bonds market has also been accentuated by the global financial crisis of 2007-2009 which led to a bailout of many financial institutions in different countries across the world. Following these crises, managers of national economies are revisiting the corporate bond market, particularly the domestic corporate bonds market, with more intensity than ever before. The renewed recourse to the domestic corporate bonds market is aimed at addressing its well-deserved position in the mobilization of long-term investible funds agenda and in the cushioning of the domestic economy from contagion effects of foreign financial crisis.

Economic literature is rich with works on the factors that determine corporate bonds yield spread. Most of these works, however, are concentrated on the advanced economies of the world with little attention being paid to the emerging economies. In Nigerian where the corporate bonds market seems to be developing gradually, not much is understood in terms of the causes of corporate bond yield spreads changes. Again, despite a seeming consensus on factors that can influence corporate bonds yield spread, to the best of our knowledge, there seem to be no known empirical studies in Nigeria that have addressed the issue of what causes the changes in domestic corporate bonds yield spreads. Min (1998) argues that lack of research in this area is common to most emerging markets in the world due to the unavailability of accurate and sufficient data. Ameer (2007) supported this argument by observing that there were an extremely limited number of empirical evidences concerning relationship between macroeconomic variables and bond markets in Asian economies; and indeed in the emerging market economies as a whole.

Nigeria is the largest economy in Africa and 26th in the world with GDP of US\$568.51 billion as at October 2015 (Tradingeconomics, 2015). Despite the size of the economy, and position of Nigeria in the world economic ranking, the dearth of infrastructural facilities in Nigeria has remained a problem, with the Gross Fixed Capital Formation standing at US\$14.042 million; against South Africa's US\$44.905 million (Tradingeconomics, 2015). It is estimated that Nigeria still needs about US\$25 billion annually for the next twenty years to ramp up her infrastructural base to support her population (Nwankwo, 2015). This dearth of infrastructural development finance has necessitated a renewed search for alternatives to the traditional sources of finance. The attainment of optimum performance in Nigeria's economy will most probably serve as the springboard from which all other economies in Sub-Saharan Africa can take off.

In order to come out of the recession of 2008 – 2009, corporate bonds issuance in the United States between 2008 and 2012, increased by 300 percent. This translated into the aggregate size of bonds issued increasing from US\$600 billion in 2007 to US\$1.8 trillion in 2012. The huge increase in corporate bonds issuance occasioned by the lessons of the global financial meltdown was not peculiar to the United States of America. In Europe, the realisation that the crisis- and after-crisis times are characterised by illiquidity and tough credit forced smaller and mid-cap businesses to look to the corporate bond market for financing. According to Hillion (2013), in Europe, growth in corporate bond issuance was particularly pronounced in Germany, where net issuance swung from a relatively flat growth in 2007/2008 to an annualised growth rate of 17 percent between 2008 and 2012. In the whole of the European Union (EU), corporate bond

issuance increased from US\$200 billion in 2007 to over US\$400 billion in 2012; an increase of over 100% (ICMA, 2013). The trend is the same in Asia. For instance in China, according to Johnson (2013), between 2011 and 2012, 572 small and medium enterprises (SMEs) borrowed a total of about 315 billion yuan (about US\$50.4 billion) from the bond market. This figure was almost four times the amount they raised in the three years between 2008 and 2010.

In Nigeria, the trend of the developments in the bond market is quite different. According to the records of the Securities and Exchange Commission of Nigeria (SEC), in the year 2007, no corporate bond was issued in Nigeria. In the year 2008, only two corporate bonds with an aggregate size of N5.3 billion (equivalent of about US\$44.7 million at N/\$ 120) were issued. In 2009, the number of issuances was still two but the aggregate bond size increased to N15.4 billion. There was a substantial increase in the number of issuances in year 2010 to six, with aggregate size of N83 billion (about US\$554 million at N/\$ 150). This trend was repeated in year 2011 with nine issuances but with lower aggregate size of N64.5 billion (about US\$430 million at N/\$ 150). In 2012, however, the number tumbled to two, as well as the aggregate bond size which went down to N12.94 billion (about US\$80.9 million at N/\$ 160).

The year 2012 data needs further mention: only one of the two issuances can actually be said to be a corporate bond. The only corporate bond, in the strict sense and definition, was issued by C&I Leasing, with a bond size of N940 million (about US\$5.9 million at N/\$ 160). The second issuance was by the International Finance Corporation (IFC) with a size of N12 billion. The issuance by the IFC, being a supranational bond, has its rating and circumstances determined beyond Nigeria even though it is listed by SEC under corporate bonds. In view of this, therefore, one can conclude that the number of corporate bond issuances in Nigeria in year 2012 declined both in number and value. The performance of the corporate bonds market in Nigeria could, at best, be said to be sub-optimal.

The concerns about the sub-optimal performance of the corporate bonds market in Nigeria stems from the expectation of future growth of the market which was predicated on the nation's dire need for new and revamped infrastructure. In fact, the Transformation Agenda of the Goodluck Jonathan's administration projected an investment programme of N25.7 trillion for the period 2011 to 2015. Of this amount, the private sector was expected to mobilise N11.1 trillion; constituting about 43.19% of the total sum (FGN, 2013). On the part of corporate bonds, growth expectations were predicated on the privatisation of the power assets which requires huge investments from the power assets investors. Other reasons for the growth expectation included the expected privatisation of the refineries, the railways and a whole lot of other sectors of the economy that require financing. Obviously, the financial requirement of these projects is beyond the financial capacity of the Federal and State Governments.

The expectations on the private sector are clear enough, but to meet the expectations, there is a need to revisit the factors that influence corporate bond yield spreads; especially in view of the financial meltdown which may have impacted on the spread. Economic literature is rich with works on the factors that determine corporate bonds yield spread. Most of these works, however, are concentrated on the advanced economies of the world with little attention being paid to the emerging economies. Although the Nigerian corporate bond market seems to be developing gradually, not much is understood in terms of the causes of corporate bond yield spreads changes. Despite a seeming consensus on factors that can influence corporate bonds yield spread, to the best of our knowledge there seem to be no known

empirical studies in Nigeria that have addressed the issue of what causes the changes in bond yield spreads. Min (1998) argues that lack of research in this area is common to most emerging markets in the world due to the unavailability of accurate and sufficient data. Ameer (2007) supported this argument by observing that there were an extremely limited number of empirical evidences concerning relationship between macroeconomic variables and bond markets in Asian economies; and indeed in the emerging market economies as a whole.

In theory, the calculation of the interest on corporate bonds seems as simplistic as the risk-free rate plus a risk premium, but in reality, the empirical analysis of the determinants of the spreads has turned out to be more demanding than it appears on the surface (Krainer, 2004). According to Huang and Huang (2003) in an earlier study, and Christensen (2008), the challenges of determining the factors that influence the corporate bond yield spread has remained a puzzle. In fact, Jones, Mason and Rosenfeld (1984) had, in an earlier study, opined that some fundamental determinants of corporate credit spreads continue to be indefinable. Expectedly, the unravelling of the puzzle has elicited several researches from many scholars, including Jones *et al.* (1984), Collin-Dufresne *et al.* (2001), Elton *et al.* (2001) and Huang and Huang (2003), among others.

Most of the existing studies (Fama and French, (1993); Min, (1998); Elton, *et al.* (2001); Mussa and Kihongo (2011); and Mayberger (2014) have empirically examined the influence of macroeconomic variables on corporate bond yield spreads in the advanced economies. Some other literature (Ameer, (2007); Norliza *et al.* (2009) have examined the changes in corporate bond yields as a function of macroeconomic and solvency variables in emerging economies, particularly in Asian economies. Standard macroeconomic variables such as the real GDP growth, inflation rates, the real exchange rate, industrial production, exports, imports, foreign reserves and other trade figures have all been investigated. Most of them were found to be significant in explaining corporate bond yield spreads. However, some variables at times yield different results in different studies based on different economies. The varying results create a need to have country specific studies. It also creates a need to harmonise the studies by investigating why the results vary.

The rest of the paper is structured as follows: Section 2 reviews the empirical literature; Section 3 details the data and empirical approach, including model specification, techniques of estimation and data sources and measurement. Section 4 deals with the estimation and interpretation of the results while section five concludes.

## 2. LITERATURE REVIEW

There is a number of theoretical and empirical studies on the determinants of corporate bonds yield spread in industrial countries, more specifically, in the United States. There seems, however, to be no universally accepted variables for representing firm-specific, macroeconomic and institutional determinants of corporate bond spread. Even where a particular variable has been used by two or more researchers, the calculation and measurement of such a variable often differs. One of the first of such investigations carried out by Fisher (1959), finds that the yield spread on a firm's bonds depends on (i) the probability that the firm will default and (ii) the liquidity of the firm's bonds (that is the ease or otherwise of exchanging the bonds for cash without losing much of its value). Fisher (1959) measured the default risk with three variables, namely, variability of earnings, period of solvency, and debt-to-equity ratio. Fisher's study was more like a trail blazer based on which other works were carried out.

## **2.1. Theoretical Review**

Ordinarily, if economic agents act based on their past experiences, current happenings and future expectations, then mild shocks in an economy cannot throw the economy out of the control of the agents. In such situations, the distortions would already have been predicted and incorporated into the decisions of the economic agents. In the strong form of the rational expectations postulations, no one can have an undue advantage over the other as all information is freely and perfectly available. This situation in practical terms is most used in the pricing of securities, including corporate bonds. With a rational expectations stochastic model, a government can predict what the effect of any policy will be on the economy, even before the policy itself is announced, since economic agents are expected to behave in a particular manner. In one of his works, Sargent (1979) noted that long term yields on bonds are a function of current and past short-term interest rates since, in the spirit of the rational expectations theory, economic choices, including those from corporations; are based on a rational outlook of all available information and past experiences. Sargent opines that since decisions made by corporations are not irrational but rather based on complete and available information, by assumption, then only firm-specific factors could influence changes in corporate credit spread.

Merton (1974) applied the option pricing model in the pricing of corporate debt. In this Merton's theoretical model, the corporate default risk premium is a function of only three variables: (i) the volatility of the returns on the firm value, (ii) the debt-to-firm value ratio, and (iii) the time to maturity of the bond. Following the observed short-comings of the Merton study, Shimko et al. (1993) introduced stochastic (risk-free) interest rates into the Merton model. As a result, corporate default premiums could also be treated as a function of interest rate volatility. However, in their study of the slope of the credit yield curve for high-yield-bond issuers, Helwege and Turner (1999) argued that a case of upward yield spread for speculative grade bonds is in contradiction with the findings of Merton (1974). This view aligns with the findings of Jones, Mason and Rosenfeld (1984) who argued that some basic determinants of corporate bonds yield spread continue to be indefinable.

Mayberger (2014) identified profitability, leverage and size as possible determinants of corporate bond spreads. He stressed that an increase in profitability reduces bond yield spread, as well as a decrease in firm leverage. In the case of firm size, it was expected that larger firms will have a smaller corporate bond credit spread. Therefore, the theoretical expectations from Mayberger's study are that of a direct/positive relationship between leverage and corporate bond spread; and an inverse relationship between profitability and firm size and corporate bond spread. In addition to the firm-specific factors, Mayberger also incorporated macroeconomic factors in his study, which he found to be statistically significant. This finding aligns with the earlier finding of Tang and Yan (2006) who, in an earlier study, suggested that macroeconomic factors can account for a substantial portion of corporate bond yield spread changes.

In the real world, however, especially in the less developed countries (LDCs) of the world, such as Nigeria, information is not and cannot be free, and perfectly available. Due to information asymmetries which seem to be the order of the day in the LDCs, the postulations of the rational expectations theory and the efficient market theory may not be tenable. If anything, the symptoms of financial repression are manifested in most sectors of the economy. It therefore means, by extension, that the impact of macroeconomic factors cannot be fully incorporated in the decisions of corporations; and so they could influence corporate bond credit spreads beyond what the corporations and investors would have predicted. Also, the assumption of perfect and free information, and that only firm-specific factors influence corporate spreads is another major short-coming. In fact, Elton, et al (2001) opined that a greater influence on corporate credit spread determination is exerted by systematic rather than diversifiable risks.

Again, the use of different variables in representing firm-specific determinants of corporate bonds spread in previous studies leaves us with the question of what variables would be statistically useful in explaining the variations in corporate bond yield spread in Nigeria. Starting from Fisher (1957) to recent works, such as Mayberger (2014), different variables are used to represent both bond-specific and firm-specific variables, as well as macroeconomic and institutional factors. There does not seem to be a generally accepted set of variables: in fact Jones, Mason and Rosenfeld (1984) opined that the determinants of corporate bonds yield spread are indefinable.

There is a dearth of studies in the area of corporate bonds yield spread due to the absence of adequate bonds data. More especially, corporate bonds yield spread is usually gathered from secondary trading information on corporate bonds. This information is not available in most LDCs due to lack of trading information, as most bond-investors apply the hold-to-maturity strategy to portfolio management. The derivatives market which is an alternative source of information on corporate bonds yield spread vide credit default swap are not developed in the LDCs. This study generated the corporate bonds yields by adjusting coupons on the bonds with the annual inflation growth rates. Following what has turned out to be the norm in financial economics literature; this paper categorized the variables that influence corporate credit spread into three, namely, bond-specific factors, firm-specific factors and macroeconomic and institutional factors.

### 3. METHODOLOGY

In specifying the model for this study, the authors adapted the models used by Norliza, *et al.* (2009) and Mayberger (2014), with modifications. Mayberger used ordinary least squares (OLS) but the authors used pooled data GMM. The reason behind this derives from the fact that some of the variables used in the model possess both cross-sectional and time series characteristics (panel data) while some others possess only time series properties. The main assumption behind the use of pooled data GMM approach is that some of the explanatory variables are the same across the sections: the pooled data GMM overcomes the problem of heteroskedasticity. Also, in specifying our model, unlike in the study of Mayberger, we distinguished between the panel data and time series data. The authority behind our approach is based on the work of Wooldridge (2002).

#### 3.1. Model Specification

The factors that explain changes in corporate bonds yield spread are either bond-specific in nature, firm- or issuer-specific in nature, or macroeconomic and institutional in nature. This paper categorizes the variables that influence domestic corporate bond yield spread (CBYS) as follows; (1) bond-specific, captured by time to maturity; (2) firm-specific factors, measured by firm value volatility, profitability margin and leverage; (3) macroeconomic, captured by interest rate and financial deepening; (4) institutional factors, measured by sovereignty risk; and (5) the control variable, which is gross domestic product (GDP). CBYS in this study was calculated on each domestic corporate bond basis vis-à-vis the FGN bond of equivalent maturity over time, till maturity of each bond. The functional form of the CBYS model is specified in equation 1, with the a-priori expectations stated directly below each variable. Thus, it can be written implicitly as follows:

$$CBYS_{it} = f(TTM_{it}, FVOL_{it}, PMGN_{it}, LEVG_{it}, INTR_t, SOVR_t, M2\_GDP_t, GDP_t)(1) \quad + \quad +$$

-            +            +            -            -            -/+

where

**CBYS<sub>it</sub>**: Corporate Bonds Yield Spread for bond *i*, at period *t*

**TTM<sub>it</sub>**: Time to maturity of bond *i*, for the period *t*

**FVOL<sub>it</sub>**: Firm value volatility of firm *i*, for the period *t*

**PMGN<sub>it</sub>**: Profitability margin of firm *i*, for the period *t*

**LEVG<sub>it</sub>**: Leverage ratio of firm *i*, for the period *t*

**INTR<sub>t</sub>**: Interest Rate for the period *t*

**SOVR<sub>t</sub>**: Sovereign Risk score for the period *t*

**M2\_GDP<sub>t</sub>**: Financial Deepening (proxy for market liquidity) for the period *t*

**GDP<sub>t</sub>**: Gross Domestic Product (measure of size of economy) for the period *t*

The following are the justifications for the inclusion of the various variables in the model:

Corporate Bonds Yield Spread(CBYS)is the dependent variable. As stated earlier in this study, a spread is the difference between two values, two bonds in this case. The spread can be between the bids and ask prices of the same bond; or between a bond and the Credit Default Swap (a derivative) created on the same bond. For the purposes of this study, however, CBYS is the difference between the yield on a corporate bond and the yield on Federal Government of Nigeria bond of equivalent maturity.

Lack of domestic corporate bond yield data is a problem that prominently exist in most, if not all, less developed and emerging market economies (Min 1998, Ameer, 2007). To arrive at the yield on the different corporate bonds under study, we reasoned that the concern of investors about any investment and return therefrom is the real value of such returns or investment income. In the absence of sufficient data on corporate bond yield in Nigeria (if they exist at all), we deflated the coupon on each bond with the annual inflation growth rates. The resultant figure – inflation-adjusted coupon – is our proxy for corporate bonds yield. With this procedure we were able to overcome the problem of lack of corporate bond yield data for the period under study. It is this corporate bond yield that we related with the Federal Government of Nigeria bond yield to obtain the corporate bonds yield spread.

In financial economics literature, bond liquidity and time to maturity usually feature as the main bond-specific risk factors. The liquidity of a bond shows the ease or otherwise with which a particular bond could be exchanged for cash without much lose in value. A bond with higher liquidity is seen to be of lower risk, and as such is expected to have a lower spread; and vice versa (Amihud and Mendleson (1991), Bao, et al. (2011)). Bond liquidity is usually calculated as the volume traded of a particular bond in a given period (some other studies define it as the log of the volume traded). Hence, other studies, Mayberger (2014) inclusive, include the liquidity of the bond as a bond-specific factor in the corporate spread equation. Despite the

importance of the liquidity of the bond<sup>1</sup> as a factor that influences corporate spread, this paper excluded this factor in this study. This exclusion is not done on the basis of the insignificance of the factor, but, on the basis of the unavailability of data on secondary market transactions on corporate bonds in Nigeria. Most bond investors in Nigeria, who are mainly banks and portfolio/fund managers, buy and hold such bonds till maturity.

The bond-specific factor used in this study is time to the maturity (ITM), which shows how long more that a bondholder will wait before recouping the entire principal invested in a bond. According to Amihud and Mendleson (1991), the longer this waiting period is, the higher is the risk premium that should be paid on the asset. This positive relationship that exists between credit spread and the time to the maturity of bond was corroborated by Gkoukousi (2013) who argued that bonds with higher credit ratings and longer maturities have lower aggregate earnings-returns relationship. Ordinarily, bonds with higher credit ratings will command lower credit spreads because they possess less risk, but in the face of longer maturities, the outlook reverses.

In view of these positions, this paper hypothesizes a positive relationship between time to maturity and corporate bonds yields spread.

One of the firm-specific variables used in this study is firm value volatility (FVOL). Fama and French (1993), Paschall and Hawkins (1999) and Mayberger (2014) have all carried out studies to ascertain the impact of the size of the firm on the firm's corporate spread. From their study, Paschall and Hawkins found that smaller firms are generally seen as being riskier than large firms, and as such investors normally demand a higher risk premium from them: higher risk premiums result into higher credit spreads. Small-sized firms are usually expected to meet stricter conditions, and maintain higher levels of debt coverage ratios and covenants before they can even obtain credits which larger firms can obtain with a mere negative pledge. The outcome of Mayberger's study of how bond-specific factors, firm-specific factors and macroeconomic factors influence corporate credit spread are consistent with previous studies as in the case of Fama and French (1993) and Paschall and Hawkins (1999).

In this study, however, rather than the firm size which other researchers represent with the total assets of the firm, total net assets of the firm, logarithm of total assets, or shareholders fund, this paper used firm value volatility to capture the effects of size on a firm's credit spread. Firm value volatility extinguishes any distortions that may arise as a result of wide variances in the size of the firms under study, as could be ascertained from the study of Mayberger (2014). Mayberger observed that the combination of large-cap, medium-cap and small-cap sized firms in the study may have affected the outcome of the results. The use of firm value volatility instead, brings all firms to a common size. Based on the above findings, this paper hypothesizes a positive relationship: firms with lower volatility in their values (truly large firms, irrespective of the size of the firm's assets) have lower spreads.

The profitability margin (PATM) is another firm-specific factor used in this study. The continued existence of any firm and the ability of the firm to meet with her obligations is a function of the firm's efficiency in resource use and profitability. According to Grabowski and King (2000), firms that operate with higher profit margins give more confidence to investors; and by extension pay less as risk premium. Extending this argument, Bai and Wu (2012) opined that higher profitability results into lower risk and hence lower credit spread. From their work on credit default swaps spreads and firm fundamentals, they concluded that lower or even negative earnings connote higher risks and lead to wider credit spreads.

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1 Liquidity of a particular bond is different from the general market liquidity



In this study, the paper is extending the negative relationship between the credit spread and profitability to include the overall efficiency of the firm. Some firms may be operating in a highly fertile and virgin sector or market. As a result of their pioneer status and blue ocean environment, they operate with high profitability margins, but at the end of the year, the bottom-line may still remain thin. This is worse in economies where the level of corporate governance is low. To capture the overall efficiency of the firm therefore, in this study, this paper is using the profitability margin of the firm, rather than the bare profitability. Profitability margin for the purposes of this study is defined as profit after tax divided by total revenue.

In view of the above studies and views, this paper hypothesizes a negative relationship between profitability margin and corporate credit spread: more profitable and efficient firms will have lower credit spreads.

The leverage level of a firm (LEVG) (existing and future expectations of leverage) plays a role in explaining corporate credit spread. Collin-Dufresne et al. (2001), and Flannery, et al. (2012) have shown in separate studies that existing and expected increases in future leverage will be factored in, in the pricing of the risk of a corporate bond issuer. The outcome of these studies by Collin-Dufresne et al. (2001), and Flannery, et al. (2012) are also in line with the outcome of the work of Merton (1974), which showed that leverage is an increasing function of corporate default spread.

On this note, this paper hypothesizes a positive relationship: firms that have higher leverage ratios will have higher credit spreads; and vice versa.

The macroeconomic factors considered in this study include interest rate and financial deepening. For the interest rate (INTR), Norliza, *et al.* (2009) and Batten, *et al.* (2006) found that the interest rate is negatively related and significant in explaining bond yield spreads. These findings were consistent with those of Longstaff and Schwartz (1995), Duffee (1996) and Van-Landschoot (2004). The interest rate used in this study is the anchor interest rate which the Central Bank of Nigeria set from time to time called the Minimum Rediscount Rate or the Monetary Policy Rate. This benchmark rate sets the tone/direction for pricing every debt security within the year, as it, to a great extent, gives an idea of the direction of monetary policies for the year.

This paper therefore hypothesizes that interest rate has a positive relationship with domestic corporate bond yield spreads.

Financial deepening (M2\_GDP) is the variable used in this paper to capture the extent of development of the financial system as well as market liquidity. Beyond the liquidity of any particular bond, the general liquidity in the market plays a significant role in the corporate spreads equation. Brunnermeier and Pedersen (2008) and Lin *et al.* (2011) argue that market-wide liquidity risk is also a priced factor in the corporate spread equation. Bao *et al.* (2011) find that a market-wide liquidity explains a substantial variation of credit spreads; and that illiquidity is also priced in corporate bonds returns. Acharya *et al.* (2013) also show that time-varying liquidity risk matters for corporate bonds, suggesting a flight-to-liquidity, as well as a flight-to-quality.

When liquidity is high in the market, the opportunity cost of holding idle funds will be low, and so available investment vehicles will rather offer low yields as well. This translates into low corporate credit spreads as well. The general liquidity in the market comes about through monetary and fiscal policy decisions, including but not limited to reduced or low cash reserve ratio (CRR), infrequent use of open market operations (OMO), reduction in tax rates and operating surplus budgets. In the face of these, a well-developed financial system, through the capital market, will harness the surplus liquidity and channel it to the most efficient outlets.

In this study, financial deepening (extent of financial markets development and general market liquidity) is given by the ratio of broad money (M2) to the GDP (M2\_GDP). We chose to use this calculation of financial deepening because it is more encompassing than the alternative calculation which the Central Bank of Nigeria uses in calculating financial deepening, which is the ratio of private sector credit to the GDP (PSC\_GDP). It is necessary to emphasize here that market liquidity is quite different from the liquidity of the particular bond in question. Based on the above, this paper hypothesizes that a high market liquidity/financial deepening ratio will lead to low (narrow) domestic corporate bond yield spread. The source for this data is various issues of the statistical bulletin of the CBN.

Based on the above conditions, this paper hypothesizes that a high market liquidity/financial deepening ratio will lead to low corporate spreads.

The Sovereign default risk (SOVR) is the risk that the sovereign of incorporation of a firm will default on her obligations. This is an indirect transfer risk which seeks to capture the extent to which the risk of the sovereign of incorporation influences the borrowing cost of domestic corporations in the domestic economy. The sovereign entity technically sets the ceiling for the credit rating of every firm in its jurisdiction. Therefore, the risk of a country – sovereign risk – exacerbates the risk of an issuer of a domestic-currency-denominated bond such that no local corporate can obtain a loan at a cost lower than that at which the country can borrow. In other words, a country with a better credit rating has a positive influence on the perceived risk of the local firms. Such firms can attract both local and domestic investors at low rates of interest more than another firm in a country with poor ratings who can only attract would-be investors with high rates of interest. Elton, *et al.* (2001) opined that even in the US, corporate default premiums are significantly attributable to systematic, rather than diversifiable risks. Therefore, one could argue that in emerging markets, a major source of systematic risk is (indirect) sovereign risk. Sovereign risk is calculated at the macroeconomic level and therefore affects every corporate bond and issuer equally, subject to the specific conditions of each bond. In this study, sovereign risk is calculated using the Mo Ibrahim Index of African Governance.

Thus, we hypothesize a positive relationship between domestic corporate bond yield spread and sovereign risk: an increase in sovereign risk leads to an increase (wider) corporate spread. In other words, as sovereignty risk improves (declines), the yield spread contracts (better borrowing condition for issuers), *ceteris paribus*.

The GDP is the measure of economic growth and size of any economy. A growing economy drives up domestic bond issuance and narrows down the yield spread, however the direction of the impact of GDP on domestic bond yield spread is somewhat unpredictable as it also depends on the state of the given economy. For a developing economy, the need for infrastructural development financing drives up the need for corporate borrowings which may lead to the widening of the yield spread. This may result from the inadequacy of the available resources to meet all development needs, and as such, the available funds will go to the highest bidder in the spirit of the availability and cost doctrine. The widened corporate spread also becomes an attraction for corporate and foreign investors since their risks would have been adequately priced in. However, in a well-developed and matured economy, a growing GDP will only provide more investible resources for fewer development projects. Again the growing GDP may portend less risk perception on the part of issuers. In that case, the yield spread may contract.

The model for this study is the corporate bond yield spread. The data possess both time series and cross-sectional data characteristics. Some of the data are also primary and micro in nature (at the firm level) with the inclusion of secondary data. Following the theoretical framework laid out in the work of Merton (1974), Shimko, *et al.* (1993) and the empirical model of Grandes and Peter (2004) and Mayberger (2014), this study adopted (i) time to maturity, (ii) firm value volatility, (iii) profitability margin, (iv) leverage, (v) interest rate volatility, (vi) financial markets potential and (vii) sovereign risk as the potential determinants of corporate bonds yield spread in Nigeria. Corporate bonds yield spread is the dependent variable.

CBYS was calculated on each domestic corporate bond basis vis-à-vis the FGN bond of equivalent maturity over time, till maturity of each bond. CBYS is a function of certain variables, some of which are bond-specific, firm-specific, macroeconomic and institutional in nature. Assuming a non-linear relationship of the Cobb-Douglas Production Function form between the dependent and independent variables, the explicit function of the domestic corporate bonds yield spread equation is written explicitly as follows:

$$CBYS_{it} = ATTM_{it}^{\beta_1} \cdot FVOL_{it}^{\beta_2} \cdot PATM_{it}^{\beta_3} \cdot LEVG_{it}^{\beta_4} \cdot INTR_t^{\beta_5} \cdot SOVR_t^{\beta_6} \cdot M2/GDP_t^{\beta_7} \cdot GDP_t^{\beta_8} \cdot \varepsilon_t \quad (2)$$

where

$\varepsilon_t$ : Random term; other variables and the  $\beta_i$ s are as defined earlier.

### 3.2. Estimation Technique

The study uses the pooled data GMM estimator on an unbalanced firm-level panel dataset covering 25 bonds, issued by 19 firms distributed across five sectors in Nigeria from 2000 – 2014. The GMM methodology of data analysis is preferred in this study as it considers the cross-sectional and time-series characteristics of our sample quoted companies' data: some of the variables in the study are cross-sectional in nature while some are time series. According to Gujarati (2013), "by combining time series of cross-section observations, panel data gives more informative data, more variability, less collinearity among variables, more degrees of freedom and more efficiency." In essence, the panel data analysis accommodates 'time as well as the heterogeneity effects of the quoted companies.

In addition, the specific type of panel data econometric technique adopted in this study is the unbalanced panel data regression technique. This is justified by the fact that some data are missing in our sample, and the unbalanced structure of our panel. The use of unbalanced short panel data regression methodology is based on four fundamental justifications. First, the sampled companies have different issuing dates and year of maturity for their respective securities. For instance, some of the bonds under study that were issued in year 2000 matured in 2006 while others matured in 2004, while some others were issued in year 2005 and matured in 2013. This means that there will be an expectation of an unbalanced panel data structure since the sampled companies would be pooled with different time period. This approach of studying corporate bond was found in the work of Chen, *et al.* (2009). Second, the data collected for the work possesses both time series and cross sectional attributes. This enabled the study on corporate bond yield spread of firms over time (time series) as well as across the sampled quoted companies (cross-section). There were 25 (cross-sections) bonds in all, and the period of study spanned between year 2000 to year 2014 (time series). The yield spread was calculated for each of the domestic corporate bonds under study vis-à-vis a government bond of equivalent maturity; starting from the year of issuance of the domestic corporate bond to its year of maturity. Third, the pooled data regression provides better results since it increases sample size and reduces the problem of degree of freedom. Fourth, the use of GMM regression helped to avoid the problem of multicollinearity, aggregation bias and endogeneity problems, in line with the work of Greene (2002). The pooled panel GMM overcomes the problem of heteroskedasticity, in line with the work of Wooldridge (2002).

The sample of bonds for this study comprises local-currency-denominated corporate bonds that were issued by firms in Nigeria at different times between year 2000 and year 2014. They have different times to maturity. While there are a total of 25 corporate bonds in this sample, the longest tenure among the tenures of the bonds is 15 years. The implication of the bonds having different tenures is that the panel data is unbalanced. And since the number of subjects (in this case, the number of bonds) is larger than the maximum tenure of any of the bonds, the panel data will be a short panel data. Based on this, therefore, this study adopted the unbalanced short panel data regression method.

To test the impact of the bond-specific, firm-specific, macroeconomic and institutional factors, equation 2 is log-linearised to yield equation 3. Thus:

$$\begin{aligned} \text{CBYS}_{it} = & \alpha + \beta_1 \log \text{T*TM}_{it} + \beta_2 \log \text{FVOL}_{it} + \beta_3 \log \text{PATM}_{it} + \beta_4 \log \text{LEVG}_{it} + \beta_5 \log \text{INTR}_t \\ & + \beta_6 \log \text{SOVR}_t + \beta_7 \log \text{M2/GDP}_t + \beta_8 \log \text{GDP}_t + \varepsilon_{it} \end{aligned} \quad (3)$$

where the (log-linearised) variables are as defined above.

### 3.3. Data Sources and Measurement

Table 1 contains the names of all the variables used in the model. It has also the symbols used in representing each of the variables, as well as the description, source of data and unit of measurement of the variables.

**Table 1**  
**Data Sources and Measurement**

<i>S.N</i>	<i>Variable (Symbol)</i>	<i>Description</i>	<i>Source</i>	<i>Measurement</i>
1	Corporate Bond Yield Spread (CBYS)	Difference between the yield on each corporate bond and a government bond of equivalent maturity	Field work	Percentage
2	Time to Maturity (ITM)	number of years remaining before maturity of the bond	Field work	Number of years
3	Firm Value Volatility (FVOL)	Measure of changes in the value of each firm; calculated as the logarithm of the ratio of each firm's 52-week high to 52-week low stock prices.	Field work	Percentage
4	Profitability Margin (PATM)	Measure of profitability and management efficiency of each firm under study	Machame Stat	Percentage
5	Leverage (LEVG)	Level of indebtedness of each firm under study; given by ratio of total long term debt to equity	Machame Stat	Percentage
6	Interest Rate (INTR)	Anchor interest rate based on which all debt instruments are priced.	CBN Statistical Bulletin 2014	Percentage
7	Financial deepening (M2/GDP)	(Proxy for market liquidity and absorptive capacity of the financial market; calculated as broad money (M2) as a ratio of the gross domestic product (GDP)	CBN Statistical Bulletin 2014	Percentage
8	Sovereign Risk (SOVR)	Index to measure the strength of a country's institutional framework (proxy for probability of default on debt obligations)	MIF	Percentage
9	Gross domestic product (GDP)	Measure of size of the economy: sum total of goods and services produced in Nigeria in the respective years	NBS	Trillion Naira

*Source:* Author's compilation from various sources

**Notes:** Authors' calculations of CBYS, PATM, FVOL, LEVG and TTM were based on information sourced from various annual reports of the corporate bond issuers.

**MIF:** Mo Ibrahim Foundation. MIF calculates the Ibrahim Index for African Governance (IIAG).

The data on the bond-specific and firm-specific factors were sourced from the respective bond documents, and the annual reports of the issuers. The macroeconomic factors were sourced from various issues of statistical bulletin of the Central Bank of Nigeria and Nigerian Bureau of Statistics. The names of the firms whose corporate bonds, and yield spreads thereof, are being analysed in this paper are contained in Appendix A. It also identified all the bonds by industry, based on the Nigerian Stock Exchange categorization of listed stocks on the Daily Official List. The bonds covered in this paper are those whose issuers are listed on the floor of the Nigerian Stock Exchange. The exclusion of non-quoted companies is based on the premise that such companies' annual reports are not easily accessible to the general public. Again, since one of the vital variables in this paper is calculated based on the stock market prices of the issuers of the corporate bonds, it would have been difficult to objectively determine the share prices of such private, non-official-exchange-quoted companies.

#### 4. ESTIMATION RESULTS AND DISCUSSION

The main objective of this paper is to assess the effect of bond-specific, firm-specific, macroeconomic and institutional factors on domestic corporate bonds yield spread. Corporate bonds yield spread, in this study, has been calculated as the difference between the yield on the corporate bonds under study and the yield on government bonds. We present here, the descriptive statistics, test for multicollinearity, and discussion of the estimation result.

##### 4.1. Descriptive Analysis

Table 1 presents the summary statistics of the variables used in this study. It outlines the properties of the variables, namely, the mean, minimum, maximum and standard deviation. These properties are relevant in describing the distribution of the series in the model. As shown in Table 1, corporate bonds yield spread has a minimum value of -5.89 and a maximum value of 13.29, while mean and standard deviation are 0.223 and 1.583 percent, respectively. The economic implication of the wide gap between the mean and maximum value is that yields differ significantly across corporate bonds in Nigeria. This is in line with theoretical expectations since corporate bonds yield spreads vary across bonds and issuers to the extent that two or more bonds issued by the same firm can have varied spreads.

Profitability margin has a mean value of 0.112, minimum value of -0.159, and a maximum value of 0.513. The standard deviation is 0.126. This shows a high variability in the profitability and management efficiency of the respective bond issuers. This is expected as different the issuers have different performance level both in terms of profitability and management efficiency; in fact, some of the issuers made losses within the period under study.

In the case of financial deepening (proxy for market liquidity), there seems to be stability in the values. With a minimum value of 18.054, maximum value of 37.992 and mean value of 21.885, there seems to be stability in the level of liquidity in the market over the period under study. This relative stability is expected since the variable is a strong policy tool for the achievement of stability in the financial market and the economy as a whole.

**Table 1**  
**Summary Statistics of Variables**

	<i>CBYS</i>	<i>FVOL</i>	<i>GDP</i>	<i>INTR</i>	<i>LEVG</i>	<i>M2_GDP</i>	<i>PFMG</i>	<i>SOVR</i>	<i>TTM</i>
Mean	0.222974	0.095730	58.52758	11.28553	1.110912	21.88537	0.111887	56.08947	3.631579
Median	0.036100	0.022055	63.25858	12.00000	0.721300	19.52000	0.090000	56.20000	4.000000
Maximum	13.29000	0.632000	89.04360	19.00000	9.664000	37.99200	0.512600	57.75000	8.000000
Minimum	-5.890000	0.000000	7.795758	6.125000	0.000000	18.05400	-0.159000	55.10000	0.000000
Std. Dev.	1.583639	0.132777	27.36088	2.649576	1.472961	4.781697	0.125831	0.501694	2.264681
Skewness	5.561195	1.686683	-0.646609	-0.036847	4.400946	2.097225	0.792376	0.540180	0.053960
Kurtosis	52.51144	5.446720	1.946300	3.489455	25.01252	6.878559	4.300626	5.174422	2.038346
Jarque-Bera	10193.07	68.74055	11.01485	0.969779	2224.679	129.1867	16.63713	23.33553	3.706684
Probability	0.000000	0.000000	0.004057	0.615765	0.000000	0.000000	0.000244	0.000009	0.156713
Sum	21.18250	9.094351	5560.120	1072.125	105.5366	2079.110	10.62925	5328.500	345.0000
Sum Sq. Dev.	235.7438	1.657184	70370.09	659.9035	203.9437	2149.275	1.488348	23.65947	482.1053
Observations	95	95	95	95	95	95	95	95	95

Source: Computed by the authors using E-views 8

There seems to be high variability in interest rate with mean value of 11.286, minimum value of 6.125 and maximum value of 19.00 and standard deviation of 2.65 per cent. For sovereign risk, with a mean value of 56.089, minimum value of 55.10, maximum value of 57.75 and standard deviation of 0.502, there seems to be less variation on the sovereign risk variable. This implies that over the years under study, the strength of institutional framework remained at the same level. By extension, the expected impact of sovereign risk on the economy remained about the same over the period under study.

#### 4.2. Test for Multicollinearity

The correlation matrix is presented in Table 2. The multicollinearity test is actually a pre-estimation procedure used to ascertain the extent of linear relationship among the explanatory variables. This test is pertinent as it becomes extremely difficult to ascertain the unique effect of the explanatory variables on the dependent variable in the face of perfect collinear relationship. The correlation matrix presented in Table 2 indicates no serious problem of multicollinearity<sup>2</sup> among the explanatory variables. It is necessary to note that it is impossible to have two economic variables without any form of relationship. Multicollinearity only becomes a serious problem where there is high or perfect linear relationship among two or more explanatory variables in a model. From the matrix on Table 2, there is no serious multicollinearity among the variables, since the highest level of interdependence among the explanatory variables is about 37 per cent. This exists between firm leverage and profitability margin. The economic implication of this finding is that the explanatory variables are not influencing each other to the extent that they cannot be used for analysis.

<sup>2</sup> On the multicollinearity test, all the variables have a VIF < 10 while the mean VIF is 3.97

**Table 2**  
**Correlation Matrix**

	<i>LFVOL</i>	<i>LGDP</i>	<i>LINT</i>	<i>LLEVG</i>	<i>LM2_GDP</i>	<i>LPFMG</i>	<i>LSOVR</i>	<i>LTTM</i>
<i>LFVOL</i>	1.000000							
<i>LGDP</i>	0.143433	1.000000						
<i>LINT</i>	0.307633	-0.085492	1.000000					
<i>LLEVG</i>	0.239872	0.299826	-0.115252	1.000000				
<i>LM2_GDP</i>	0.048569	-0.138943	-0.219174	-0.128640	1.000000			
<i>LPFMG</i>	-0.340011	-0.045581	0.010962	-0.376806	0.123618	1.000000		
<i>LSOVR</i>	0.089665	0.279520	0.265697	0.250936	-0.134473	-0.040137	1.000000	
<i>LTTM</i>	0.269167	-0.044134	-0.179874	0.213526	0.176674	-0.295118	-0.149031	1.000000

*Source:* Authors computation

### 4.3. Discussion of Results

The paper now discusses the estimation results as shown in Table 3. A normality test that was carried out shows that the series are normally distributed.

The estimation result shows that three of the explanatory variables, namely, interest rate, gross domestic product and time to maturity are significant at the 1 per cent level of significance, while leverage and profitability margin were significant at the 10 per cent level of significance. Financial deepening (proxy for market liquidity and absorptive capacity of the financial market), firm value volatility and sovereign risk were statistically insignificant. The result shows also that time to maturity, profitability margin, financial deepening, leverage and gross domestic product (size of the economy) exert negative impact on the dependent variable while sovereign risk, interest rate and firm value volatility exerts a positive impact. While the magnitude of the impact of time to maturity is -0.749, that of profitability margin is -0.278, leverage is -0.425, gross domestic product is -0.812 and interest rate is 2.190. Despite the fact that their impacts are not statistically significant, sovereign risk has a magnitude of 8.171, financial deepening has -0.281 and firm value volatility has a magnitude of 0.010. The baseline equation, based on the result can be written as follows, with the standard errors in brackets under the respective parameter estimates:

In this study, we hypothesized a positive relationship between corporate bonds yield spread and time to maturity, however, the outcome shows otherwise. The outcome implies that for a one percent increase in time to maturity, corporate bonds yield spread will decline by 0.749 per cent. Though this outcome is not in line with the apriori expectation, it can explained by the fact that coupon on bonds in Nigeria are insensitive to the tenure of the bonds, because the tenures are mostly short. This explanation aligns with our observation at the beginning that most bond-investors in Nigeria adopt the hold-to-maturity strategy to portfolio management. Portfolio managers would rather hold relatively long tenured corporate bonds as this will help in immunizing their portfolios.

The estimation result shows that profitability margin met our theoretical expectation of a negative relationship. For a percentage increase profitability margin, corporate spread narrows by 0.278 per cent. An increase in profitability and management efficiency reduces the risk perception if an issuer, as it gives

more confidence to investors that the obligations on the bonds will be met as, and when due. In the case of leverage, we hypothesized a positive relationship with corporate bonds yield spread but the outcome is a negative relationship. The outcome seems to suggest that when the leverage ratio of the firm is increasing, its risk premium will be declining. This is contrary to economic rationality and expectation. This could be explained by the fact that when a firm is adjudged to be highly profitable, with an efficient management in place, leverage is expected to enhance the level of operations and profitability of the firm. In such a situation, leverage will rather reduce the firm's bond yield spread.

**Table 3**  
**Pool OLS Regression**

<i>Dependent Variable: LCBYS</i>				
<i>Variable</i>	<i>Coefficient</i>	<i>Std. Error</i>	<i>t-Statistic</i>	<i>Prob.</i>
LFVOL	0.009747	0.106364	0.091637	0.9274
LGDP	-0.812308	0.223279	-3.638082	0.0008
LINT	2.190130	0.739080	2.963320	0.0051
LLEVG	-0.425434	0.228838	-1.859106	0.0704
LM2_GDP	-0.281050	0.942067	-0.298333	0.7670
LPMFG	-0.278408	0.140047	-1.987959	0.0537
LSOVR	8.170675	16.70592	0.489089	0.6275
LTTM	-0.748790	0.277722	-2.696187	0.0102
C	-37.01521	67.04302	-0.552111	0.5839
R-squared	0.613785			
Adjusted R-squared	0.536542			
F-statistic	7.946158			
Durbin-Watson stat	0.960059			
Akaike info criterion	3.031997			

*Source:* Authors computation using E-views 8.0

The outcome shows that interest rate was significant at the 1 per cent level of significance, and met with the theoretical expectation. For every percentage increase in the monetary policy rate, corporate spreads will increase by 2.190 per cent. This outcome is consistent with the findings of Batten, *et al.* (2006) who found that interest rate is negatively related and significant in all the emerging countries they investigated their bond markets. It is also consistent with Norlizer, *et al.* (2009) who studied the factors that affect yield spreads in Malaysian bonds. This result could be explained by the fact that the monetary policy rate, which is used as the interest rate in this study, is the basis for determining all other interest rates in the Nigerian economy.

For the size of the economy, this study hypothesized a mixed relationship – positive and/or negative – subject to the investors or issuers' point of view, and stage of economic development. A large and increasing GDP portends growth in economic activities, well being of the citizens and less risk perception. Given this



argument, corporate credit spread is expected to get narrower in the face of high and growing GDP. The flip side of this argument is that in the face of high and growing GDP, there will be a greater demand for investible funds: too many projects will be competing for the available, often insufficient, resources. In the light of the principles of the availability and cost doctrine, this may push up the cost of funds, thereby increasing the spread. The estimation result shows that the size of the economy variable appeared significant at the 1 per cent level of significance, and supports the argument that a high and increasing size of the economy will reduce risk perception and help in narrowing corporate credit spread. For every percentage increase in the GDP, corporate bonds yields spread will decline by 0.812 per cent.

## 5. CONCLUSION AND RECOMMENDATIONS

Empirical studies in the area of determinants of corporate bonds yield spread in the emerging market economies are, at best, very scanty. The dearth of studies in these economies stem from lack of data, and at times, inaccurate and insufficient data, where they exist. This problem of data exists because secondary trading data are virtually non-existent. This study argued that the prime concern of investors is the real (inflation-adjusted) value derivable from their investments, rather than the absolute (nominal) value realized from such investments. In view of this, the study adjusted the coupon on the corporate bonds under study with the inflation growth rates of the respective years when the tenure of such bonds were current to obtain the corporate bond yield. The yield on government bonds was then subtracted from the yield on the corporate bonds for the different years to obtain the corporate bonds yield spread used in this study as the dependent variable. The dependent variable as calculated in this study produced a result that is comparable to those obtained in the advanced economies where there is relatively adequate corporate bonds yield spread data. This clearly supports the idea that in place of the yield spread data derived from trading activities on corporate bonds (bid-ask spread, or even spreads calculated on the basis of comparison with the credit default swaps), the inflation-adjusted corporate bonds coupons can be used as the corporate bonds yield.

Bond-specific, firm-specific and macroeconomic and institutional factors were regressed on the dependent variable and the baseline equation showed that three of the variables were significant at the 1 per cent level of significance, while 2 were significant at the 10 per cent level of significance. Three of the variables – firm value volatility, sovereign risk and financial deepening were statistically insignificant. The estimation result shows that a rise in interest rate helps in widening corporate credit spread, in line with theoretical expectations. The result is also consistent with the findings of Batten, *et al.* (2006) and Norlizer, *et al.* (2009). This outcome supports the idea that both investors and issuers of bonds should be concerned with the monetary policy rates as they determine the pricing of their debt securities. Again in times of high interest rate volatility, both issuers and investors develop cold-feet to fixed income securities. In the case of the GDP, where we hypothesized a mixed relationship, the result shows that for every percentage increase in GDP, corporate spread will narrow by 0.812 per cent.

In line with the theoretical expectations, an increase in profitability and management efficiency of the firm will narrow the spread on the yield on the firm's bonds. The result shows that profitability margin has an inverse relationship with corporate spreads. Both time to maturity (which is a bond-specific factor) and leverage (a firm-specific factor) that were hypothesized to have positive relationship with corporate spread turned out to have negative relationships. The outcome of the leverage could be explained by a situation where the firm is so profitable, with highly efficient management that investors will rather see an increase in leverage as translating directly into more profit for the debt instrument issuer.

The explanatory variables, to a great extent, explained the variations in the dependent variable (up to 53.65 per cent of the variations). Some of the explanatory variables in this model are diversifiable, while some are systematic. A simple conclusion from this therefore is that the reduction in the risk premiums paid by corporate bond issuers in Nigeria, and by extension, the cost of funds paid by borrowers in Nigeria, rests on both the issuers and the government. Reduction in risk premiums can be achieved through instituting efficient management and profitable firms on the part of the issuers. In fact, leverage can be used to enhance the enterprise value of a profitable firm. The government can assist in the reduction process by ensuring the existence of low interest rate benchmarks.

This study, therefore, recommends that bond issuers should first and foremost look inwards and establish profitable and well managed organizations so that they can give confidence to the investing public. This will reduce their risk perception and by extension, their cost of borrowing. Profitable and well managed firms should actually take advantage of their profitability and efficient management and raise debts at lower margins to enhance their enterprise value and size, and market share. Corporate spreads are also being influenced by systematic risk factors. The government, and her agencies, should therefore aim at lowering the anchor interest rates so as to drive down the rates at which corporates borrow. Scholars should not shy away from studies in the area of corporate bonds yield spread in the emerging markets because corporate credit spreads can also be calculated through other means that are not dependent of the trading information on corporate bonds.

## 6. APPENDICES

### Appendix A: List of Corporate Bond Issuers

<i>S.N</i>	<i>Name of Company</i>	<i>Sector</i>	<i>S.N</i>	<i>Name of Company</i>	<i>Sector</i>
1	Access Bank Pls 1	Financial	14	National aviation Handling Co. Plc	Services
2	Access Bank Pls 2	Financial	15	Neimeth Pharmaceuticals Plc	Manufacturing
3	C & I Leasing 1	Services	16	Nigerian Breweries Plc	Manufacturing
4	C & I Leasing 2	Services	17	Stanbic IBTC 1	Financial
5	Cement Co. of Northern Nig.	Manufacturing	18	Sterling Bank Plc	Financial
6	Chellarams Plc 1	Services	19	UACN Property Dev. Co. Plc	Real Estate
7	Chellarams Pls 2	Services	20	United Bank for Africa Plc 1	Financial
8	Crusader (Nig) Plc	Financial	21	United Bank for Africa Plc 2	Financial
9	Custodian and Allied Ins	Financial	22	United Bank for Africa Plc	Financial
10	First City Monument Bank Plc	Financial	23	West African Glass Plc	Manufacturing
11	Flour Mills of Nigeria Plc	Manufacturing	24	Tantalizers Plc	Services
12	Guaranty Trust Bank Plc	Financial	25	Fidson Healthcare Plc	Manufacturing
13	Lafarge (Wapco) Nig. Plc	Manufacturing			

**Note:** From the above list, the name of some organisations appeared more than ones. All such companies issued bonds more than ones within the period under study. For instance, United Bank for Africa Plc. issued a 13% 7-year N20 billion, Fixed rate Subordinated Unsecured Redeemable Non-Convertible Bond in 2010. The Bank also issued another bond in 2011: 14% 7-year N35 billion Fixed Rate Subordinated Unsecured Redeemable Non-Convertible Bond; and yet another in 2014: 16.45% 7-year N45 billion Fixed Rate Subordinated Unsecured Note Due 2021. For the purposes of this study, each of these issuances is rightly treated as a separate bond, with their different and respective characteristics and risks.

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