

## Factors that influence bond markets development in Ghana

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### Abstract

The various financial crises all over the globe underscore the need for economies to have vibrant bond markets to augment their financial portfolios. Among other benefits, this will enable them to support rapid and sustained infrastructural development, which in turn will lead to swift economic growth. The small size of the Ghanaian bond market, the accompanying huge infrastructural challenges, the overdependence on external debt and Deposit Money Banks (DMBs), the lopsided empirical evidence, which is concentrated on western and Asian economies coupled with mixed findings in related studies call for the need to examine the factors that promote the country's bond market development. This study therefore examines the influence of bond market determinants on the development of the bond market in Ghana. Data was collected from secondary sources covering a period from 1980 to 2015. The Vector Error Correction Model (VECM) is employed as technique of data analysis. The Augmented Dickey-Fuller (ADF) stationarity test, the Johansen Co-integration test and other tests are carried out to ensure the robustness of the results. The findings of the study reveal that bank size, external debt, money supply and size of the economy are significant determinants of corporate bond market development in Ghana. Also, level of economic development, budget deficit and bank size are significant determinants of government bond market size in Ghana. However, bank size, money supply and external debt are seen to be the most important and significant drivers of total bond market size in Ghana.

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**Key words:** Bond market, VECM, Ghana, Financial crises, infrastructural

**JEL Classification:** E44, G10, G12

### INTRODUCTION

Bond financing has become a global phenomenon and constitutes a focal point for project financing by both public and private sectors of most economies. This key role of the bond market in meeting financial needs makes it so imperative that concerted efforts have to be made to ensure its sustained development (Bailey, 2005). As a result of this, the development of domestic debt securities markets has increasingly attracted the attention of national and international policy makers (Andresen, 2000; World Bank, 2001). The domestic debt, which is predominantly government bond, stems from the need to identify and exploit alternative financing sources by other tiers of government (states and local governments) to bridge the persistent national budget deficit financing gap as well as the infrastructural need of economies (Ansah, 2015). The private sector also needs funds for investment and infrastructure. Such dearth of resources required for

project or infrastructure financing by most economies, coupled with the high cost of borrowing from the banking sector triggers the preference for domestic debt securities, which provide less risky, less costly and easily accessible financial sources.

Developing countries have up till date relied much on external debt financing from development partners and their banking sectors while largely neglecting the bond market. This is in spite of the fact that external loans and bank loans sometimes attract huge interests as well as penalties for lack of prompt repayment. The external debt challenges reflected by debt crises, leading to the classification of some of those countries by lending agencies such as HIPC (Heavily Indebted Poor Countries) because of their inability to repay their loans coupled with their huge infrastructural gaps, is reflected by poverty, mismanagement and poor strategic financial management.

Research on determinants of bond market development has focused on developed markets and economies neglecting new and emerging markets like that of Ghana. For instance Eichengreen & Luengnaruemitchai (2004) examined the subject matter in Asia while Adelegan & Radzewicz-Bak (2009) conducted similar study on sub-Saharan African countries. In addition to the above, Adofu & Abula (2010) conducted similar study on Nigeria. The review clearly shows that previous studies are mostly cross-country studies which fail to capture country specific factors and other contextual factors that could influence bond market development.

Although the Ghanaian capital market appears to be vibrant, the equity component tends to dominate the bond market, which seems to attract little attention by policy makers. The potentials of the bond market of developing economies in bridging this financing gap and serving as a cushioning effect to other sources of finance does not seem to be sufficiently and strategically explored. The relatively small size of the Ghanaian bond market, the huge infrastructural challenges, the dominance of government bonds over corporate bonds, and the over reliance on Deposit Money or Banks as major sources of corporate financing in spite of their vulnerability to financial shocks calls for the need to examine the factors that promote the development of the bond market. That is to say that government continuous borrowing from banks and other financial agencies through its short term instrument crowd out the private sector which bonds can help reduce the impact of the crowding out. Literature have relied on macroeconomic factors such as economic size, money supply, bank size, interest rate, external debt, and stock capitalization in developed countries but this study want to examine these factors in the Ghanaian context. The choice of these factors is based on availability of data and their use in literature.

The purpose of this study is to analyse why the Ghanaian bond market is not developed and factors that have contributed to this under-development. An understanding of the framing processes and dynamics used in bond markets has important implications for understanding the effectiveness and development of bond markets in Ghana. The analysis is divided into three main parts. The first section of this study gives an overview of the bond market in Ghana and Sub-Saharan Africa. It explains both the chemistry and transport associated with bond market development in Emerging Markets of which Ghana is a key contributor. The second section is a compilation of the most viable factors and forces that contribute to the bond market in Ghana being under-developed. The final section provides findings and recommendation on how to improve the under-development of the Ghanaian Bond market.

The general objective of the study is to examine the impact of macroeconomic variables on bond market development in Ghana. The specific objectives include; 1) To

examine the impact of the size of the economy on bond market development in Ghana; 2) 2. To examine the impact Money supply and bank size has on the development of bond market in Ghana; 3) To examine the influence of interest rate and external debt on the development of bond market in Ghana; 4) To examine the influence of interest rate and external debt on the development of bond market in Ghana.

It is hoped that regulatory bodies like the Securities and Exchange Commission (SEC) and policymakers will find the result of this study useful. This is because the key determinants or drivers of the Ghana bond market development could be deployed for policy formulation and reforms in the bond market and capital market in general. The findings of the study will also provide insight to policymakers and regulatory agencies towards initiating innovative avenues for the rapid development of the bond market, which should eventually reduce the overdependence on bank financing and its imminent effects. This would shape their focus on certain bond market fundamentals, which they could beam their searchlights upon.

A few researches have been undertaken in the bond market of Ghana on issues related to the types of bonds issued, the length of bond issuance amongst others. Ghana is an emerging market in securities and the research is aimed at analysing the factors that undermine the developing of the bond market.

The study will contribute to the improvement of the bond market in terms of structure and activities not only in the securities market but the Ghanaian economy at large. The outcome of this study would be of interest to scholars and stakeholders of the bond market in Ghana. It would also contribute to already available literature on Bond market development.

From a practice standpoint, this study is relevant and timely for the securities and financial market sector which is fast becoming a dominant force in spearheading the development of bond markets.

## **LITERATURE REVIEW**

### **The concept of bond market development**

The importance and centrality of the financial system to the growth of any economy is obvious and indisputable. There has been a posture by finance scholars, which suggests that a well-developed financial system boosts the efficiency of financial intermediation roles through cost reduction in terms of information, transaction and monitoring.

The bond market is a vital segment of financial system, and remains central to the development of an efficient economic system. Investment in bonds usually fills a major gap in the financial markets by generating returns that compensate for the cost of funds over the repayment period. The non- investment in bonds within the financial markets has a tendency of limiting investment options. This entails that the network of trading or investment activities in various bonds makes up a bond market.

A bond market refers to an arrangement where bonds are traded. This arrangement facilitates offer by the borrower, and acceptance, which must be backed by a consideration from the lender (Barmash, 2003). Trading in bonds therefore entails the exchange of bonds from one person or organisation to another. This may involve initial public offerings of the bonds at the primary stage, and subsequently, secondary trading of such bonds.

The ease as well as frequency of transferability of such bonds at a controlled cost (minimal transaction cost) entails bond liquidity, which is synonymous with bond efficiency. Bond market liquidity also has tendency to boost bond market development

in an economy. For both corporate and domestic bond instruments, bond liquidity entails transferability of bonds. A liquid bond market therefore entails an enhanced trading efficiency of the bond market. Rigidity, which could be measured by the bid-ask spread, which is a feature of bond liquidity provides an insight on the financial commitment of the market participants in executing transactions (Gaspar, Hartmann & Sleeper, 2002). Depth and resilience are also considered by the trio to shape the nature of liquidity of the bond market. The depth of the market determines the extent to which the bond market could cope with huge transactions, while maintaining little or no variations in bond prices. Resilience on the other hand determines the rate of dissipation of price variations.

Bond market development entails the transformations in bond market size within an economy, its access, stability, and efficiency or liquidity. The prominent aspect of bond market development is the bond market size, which is commonly considered as total value of outstanding bonds in the market as a ratio of Gross Domestic Product (GDP). Most studies on bond market development are actually hinged on the bond market size perspective.

Bond market development involves the influence of a network of bond trading activities, stock capitalisation, macroeconomic variables, bond spread, infrastructure, legal and regulatory as well as related governance issues, which add up to shape the bond market development fundamentals (indicators). Bond market development is commonly used interchangeably with bond size. It could be considered in three dimensions as done in this study, which include government bond market size (or development), corporate bond market development, and total bond market development. However, in a broader perspective, bond market development fundamentals could include bond size, bond access, bond stability, and bond efficiency or liquidity.

It is documented by Brealey, Leland & Pyle (1997), Bouheas, Mizen & Yalcin (2006), and Mizen & Tsoukas (2010) that the financial situation of an organization is a fundamental determinant of access to external finance. Bond access in the context of bond market development may be more appreciated from the view point of the mix of finance accessed from the bond market comprising private or corporate bonds, and government bonds, derived from the entire bonds generated within the economy.

Determinants of bond market development could be viewed from firm specific characteristics and the perspective market based characteristics. Mizen & Tsoukas (2010) identify the broad variables that determine bond market development as local market size and liquidity. It is worthwhile to acknowledge that market characteristics differ from firm characteristics in view of the microscopic nature of firms as against the macroscopic nature of the market. This study is not concerned with firm specific features of the bond market. A more vibrant corporate bond market would create a better opportunity to examine the determinants of bond market development from the firm characteristics angle.

Developing a bond market would shift the focus of an economy away from foreign debt dependence thereby contributing in alleviating the challenges of having to repay such loan with foreign currency. Eichengreen & Hausmann (1999), Eichengreen, Hausmann, & Panizza (2002), Turner (2003), Bordo, Meissner & Redish (2003) in Kahn (2005), and Kahn (2005) all concur that a well-developed bond market will contribute to alleviating the problem of original sin, which emanates from currency mismatch. Original sin is a term coined by Eichengreen & Hausmann (1999) and refers to the inability of developing countries to borrow abroad in their own currencies, and involves denominating a country's external debt in foreign currency, resulting in a currency mismatch.

Currency crises, which emanate from currency mismatch are characterised by depreciating domestic currency as well as rollover challenges for short-term debt, which in turn lead to balance sheet problems, thereby constituting a key source of financial instability leading to default (Kahn, 2005). However, restructuring short term bonds to longer tenured bonds could sometimes be a beneficial repositioning strategy to the issuer.

### **Bond market developments in Ghana**

Developing the bond market of Ghana will assist the government and business organizations in bridging the prevailing long term financing gaps (Aqua-Sam, 2013; Ayee, 2013). In 1999 the Financial Market Department of the Bank of Ghana (BoG) was requested by the Supervisory Technical Committee (STC) of BoG to present a paper on the bonds market of Ghana to mark the nation's attempt to develop its bond market. Since the introduction of the bonds market in the country, it has remained underdeveloped due to many factors such as unfavourable macroeconomic environment, availability of other investment substitutes, inadequate institutional investors and the lack of credit rating agency. These and many other reasons account for the reason why the bond market of Ghana still remains at its infancy level. In the past BoG issued BoG and GoG treasury bonds with 2,3 and 5 year maturity period but the issuance of 5-Year GoG Treasury bond was discontinued in 1994 due to high inflation rate in the Ghanaian economy (Bank of Ghana, 1999). One of the major reasons that stall the growth of corporate bonds in Ghana is market volatility. Macroeconomic challenges such as high inflation, unstable and persistent depreciation of the cedi also account for the reason why the nation has not been able to develop its bond market. This shows why as at 2014, there was no corporate bond listed on the Ghana Stock Exchange. There is the need for the government to take in the necessary monetary and fiscal policy measures to ensure a conducive macroeconomic environment to help ensure the development of corporate bonds to provide long-term funds to business organizations (Central Securities Depository, 2014). Since the introduction of bonds into the Ghanaian economy, the local government such as the Municipal and District Assemblies have not been able to develop municipal bonds to enable them borrow from surplus-fund units to finance their development projects at the local government level. This is due to the high rate of fund mismanagement at the local government level. Ansah (2015) indicates that one major reason why the Bond market of Ghana remains underdeveloped is that, the government has not been able to put in place a legal or operational framework to enable Metropolitan, Municipal and District Assemblies (MMDAs) to issue bonds to finance their infrastructural development projects. The current Priority Action Plan (PAP) by the African Development Bank (AfDB) has necessitated the need for local government to issue bonds to raise long-term funds for infrastructural development.

This is supported by Cobblah (2013) who indicated that there is the need for the government to encourage the Municipal Assemblies to issue bonds to raise funds for their local infrastructural development. Andoh (2010) also identified the lack of a strong industry association as one of the factors which has accounted for the underdevelopment of the Ghana bonds market since the participants of the market are not able to make significant impact on the debt market. For this reason, he suggested that there should be the need for a stronger industry association to help ensure that the key stakeholders are able to make impact on it.

Economic mismanagement, high public debt, corruption and high debt to GDP ratio account for the reason why Ghana's bond market still remains at the infancy level. These factors cause investors to lose confidence in the economy. Excessive external borrowing

by the government causes the state to lose control over its financials. There is therefore the need for government to reduce its excessive external borrowing to focus on the development of the nation's bond market to obtain long-term funds in financing its budget deficits (Osei, 2015).

High inflation has also been a major challenge to the development of the Ghana bond market. Since inflation reduces the value of money, a high inflation rate in the economy causes many investors to channel their surplus funds into other investments and ventures other than investing in bonds. For instance, due to the sharp currency depreciation of the Cedi coupled with high fuel price adjustments, the inflation rate rose from 16.4% in January 2015 to 17.3% in August 2015. The persistent rise in the general price level in the country continues to pose a major challenge to the development of bond market in the Ghanaian economy (World Bank, 2015).

Despite the numerous challenges facing the development of the bond market in Ghana, the government in recent times has taken measures to consolidate its fiscal policy to help provide a favourable environment for the development of the bonds market. Ghana's fiscal consolidation program which started in 2014 has helped narrowed the fiscal deficit. For instance, the current primary balance is estimated to be 0.6% of GDP as against a target of 0.6% represent a significant improvement from the 1.4% current primary balance in June 2014. The Fiscal Consolidation Program (FCP) has also helped reduced the overall fiscal deficit to 2.2% of GDP from 4.3% of GDP in June 2014. This has been a significant attempt by the government in the development of the Ghana bond market since fiscal indiscipline in the past years has been a major hindrance to the development of the nation's debt securities market (World Bank, 2015).

The country's political stability and maturing democracy has been a major plus to the nation's effort in the development of vibrant bond market. This has made the economy a favorite among investors who want to channel their surplus funds into high-yield sovereign bond. This accounts for the reason why the recent \$1 billion sovereign bond of the country was oversubscribed. The nation's political stability and maturing democracy continue to attract foreign investors to subscribe to its bonds (Ansah, 2015).

The GoG has also taken measures such as regular publication of issuance calendar and the extension of the yield curve to deepen the development of the corporate bond market (Terkper, 2013). This measure has been put in place to ensure that investors of government-issued bonds are regularly updated with information on the state of the investment and also to attract many investors to purchase government bonds.

### **Factors that influence on the bond market**

Ensuring macroeconomic stability, eliminating tax disadvantages, and encouraging market participation are also key ingredients required for the bond market success (Hong Kong Monetary Authority, 1999:03). Lkhagvajav, Bartnyam & Gan-Ochir (2008) examine the multivariate relationship between stock returns and monetary policy using VAR. They conducted an analysis to determine the temporal relationship between bond market development (prefixed by bond market and capitalization) and macroeconomic variables, based on a lag order 5 selected by LR test statistics. The study applied monthly data from January, 1998 to March, 2007, and augmented with the Schwarz test. It revealed that macroeconomic stability and financial intermediary development are important predictors of bond market capitalization, while the real income level and bond market liquidity do not prove significant, and that financial intermediation and bond market were substitutes rather than complements.

Eichengreen & Luengnaruemitchai (2004) establish that interest rate, exchange rate variability, absence of public sector funding needs, and interest rate variability provide a negative direction to the magnitude of bond market. Although monetary policy and bond market require some degree of government involvement, studies on the subject require a critical examination of causal relationship among the key variables.

### **Bond market size**

Bond size usually measures the value of government, corporate, or total bonds in relation to the GDP of a country. This is perceived to be the most important indicator of bond market development and is usually used by most scholars synonymously with bond market development. Bond capitalization is sometimes used as a proxy to replace bond market size. The Financial Systems Development Indicators (2010) manual reveals that the World Bank's financial structure database utilizes the basic measures of both public and private bond market size (ratio of public or private sector bonds to GDP)

Countries vary in the features and characteristics that shape the development of their bond markets. The South African bond market stands out when compared with those of Egypt, Nigeria and Kenya. There are key factors, which are responsible for the rapid development of the South Africa's bond market as rated by Fitch Rating (2010). Such factors include advanced regulatory framework, macroeconomic and physical policies, healthy banking sector, and sound quality of infrastructure.

In Tanzania, Nigeria and Ghana, between 30 to 50 percent of the government securities that are issued in the market are limited non-marketable securities (Financial independence, 2008). This ratio has reduced drastically for Nigeria. Non-marketable securities constitute a major liquidity constraint because of the difficulty of transferability of such bonds until maturity. In 2001, Africa as a whole only accounted for 7 percent of the total tradable debt of emerging markets or less than 0.4 percent of the total world bond market, with the average time to maturity of 14.8 years for all developing countries as compared to the global average of 22.1 years (Financial Independence, 2008:03). Such securities, which could hardly be traded, will compel the owner to wait until maturity to recover the principal (Baminadhu, 2003).

On the level of development, Moyo (2010) posits that bond markets, which are an integral part of the capital markets, remain largely underdeveloped in Africa with corporate bond markets non-existent or in their infancy stage despite efforts by government, private sector and donors to enhance its performance. He identifies correcting deficiencies in the legal system, enhancing bond issuance, broadening and diversifying investor base, strengthening market infrastructure, developing supranational, sub-national and corporate bond markets and the promotion of regional initiatives as germane towards enhancing bond market development.

Key determinants of bond market financing as documents by Eichengreen & Luengnaruenuitchai (2004) include: economic size, natural openness, developmental stage of the economy, interest rate, size of the banking system, exchange rate variability, traditions of legal system, law and order, corporate governance and transparency, banking concentration, absence of public sector funding needs, regulatory enforcement, and interest rate variability. The four dimensions of Size, Stability, Efficiency and Access are positively correlated (FSDI, 2010).

### **Size of the banking system**

Banks constitute part of portfolio of finance sources, which provide external finance just as bond markets. But their role cannot be taken in isolation. Although it is glaring that a combination of both financial sources is required for effective project financing, a

research effort is necessary to gauge the level and direction of contribution of the banking sector to the bond market in an economy. This would facilitate policy direction and decision making.

Emerging market economies are perceived to be over-dependent on their domestic banking systems for finance, which calls for the need for further development of their domestic bond markets (IOSCO, 2002:3). Bank loans attract higher intermediation costs as a result of branch networks and required capital as compared to cost advantages of debt securities (Diamond, 1994). This implies that blue chip firms will have preference for debt market in order to attain efficient cost savings. Furthermore, less financially secure firms will opt for bank loans due to greater flexibility in rescheduling, while the larger, creditworthy firms seek to tap the bond markets (Bolton & Freixas, 2000). It is glaring that there is a link between banks and corporate bond market development although the direction and magnitude may not be quite clear, and may differ depending on the features of the banking sector. Furthermore, finding by Demirguc-Kunt & Huizinga (2001) reveals that a transformation from an underdeveloped towards a more developed financial system reduces bank profitability and margins.

An empirical test conducted by Jiang, Tang & Law (2001) shows that bond issuance and bank lending are positively correlated both in countries of the Organisation for Economic Cooperation and Development (OECD) and the emerging economies. The outcome of a study by Hawkins (2002) indicates that highly rated companies issue more bonds than do lower rated companies.

Another study on the determinants of the financing choice for a sample of 1,560 new debt financing undertakings by publicly traded firms reveals that the choice of debt instrument is strongly linked to the credit history and current credit quality of the issuing firms (Denis & Mihov, 2003). To affirm this position, Dickie & Fan (2005) clarify those firms with high credit quality prefer public debt, while firms with average credit ratings borrow from banks, and those with low credit rating borrow from nonbank private sources. They argued that such finding suggests competition between corporate bond markets and banks with a tendency to draw away good borrowers from banks.

The interest group theory, which was developed by Rajan & Zingales (2003) posit that the actions of policy makers in relation to an initial financing source may resist financial development because of competitive tendencies. This could be so in view of their prior sources of finance in their growing business environment and the fear of loss of competitive advantage as a result any potential impairment by such financial development. This is premised on the basis of the argument that financial development aids the entry of new firms, thus enhancing competition (Dickie & Fan, 2005). Based on this theory, it could be deduced that large deposit money banks with corresponding large capital base and high lending capacity are likely to reduce corporate bond market development.

Eichengreen & Luengaruemitchai (2004) examine the relationship between the banking sector and bond market development for 41 countries and documented that countries with competitive, well-capitalized banking systems have larger bond markets. These studies point to a complementary relationship between banks and bond market development. The mixed results suggest a need for further research to explore the relationship between banks and corporate bond market development. This means that deposit money banks could either play competitive or complementary roles. Many researches, for example, Adelegan & Radzewicz-Back (2009), and Raghavan & Sarwono (2012) document the contribution of banks towards the development of effective and



liquid bond market, especially by their role as dealers and market makers. Bhattacharyay (2011) documents the presence of a large, well developed, competitive, and well-capitalized banking system as a prerequisite for developing a liquid and properly functioning bond market. According to Hawkins (2002), such banks double as dealers and market makers.

The size of the banking sector is measured as the ratio of domestic credit provided by the banking sector to GDP. A well developed and complementary banking system is expected to reveal a positive correlation with size of the bond market, whereas the reverse signals competition between the bond market and the banking sector in providing funds (Eichengreen & Luengnaruenuitchai (2004), and Raghavan & Sarwono (2012).

#### **Size of the government bond market**

This determinant from an explanatory variable perspective is relevant to corporate bond market development, and derives from the school of thought that the corporate bond market precedes a well-developed government bond market. Studies conducted by Fabella & Madhur (2003), and Park (2008) support this position by the evidence of catalytic role of benchmark yield curve of sovereign bond markets, which serves as a basis for valuing corporate bonds, towards the latter's development.

However, there may be the crowding-out phenomenon, which could affect corporate bonds in some countries through liquidity squeeze of corporate bond market generated by favourable pricing of government bonds. Raghavan & Sarwono (2012) elucidate this by giving the instance of Indian government securities, which are perceived to be more attractive to foreign investors than the corporate bonds as a result of its higher credit rating.

Although the number of government bonds outstanding could be used to assess the impact of government bonds on corporate bond market performance for a low and dwindling size of the corporate bonds, a negative correlation is expected with government bonds, which signifies that government bonds are crowding out corporate bonds (Raghavan & Sarwono, 2012). A positive correlation on the other hand signifies that government bond market is driving corporate bonds

#### **Economic size**

This is otherwise known as the size of the economy, or size of a country, and is measured by natural log of GDP. Key studies on bond market development point to the fact that a huge economy could attract huge capital, hence greater bond financing, whereas a small economy has the tendency of attracting less bond financing. According to Eichengreen & Luengnaruemitchai (2004), the size of an economy positively influences financing through the bond market, although such impact is weak. —The size or scale of an economy needs to reach a certain level to influence financial decisions of large economic entities investing in the bond market of an economy (Bhattacharyay, 2013).

There is a wide disparity in the size of domestic debt to GDP across SSA countries with some countries still recently developing (Adelegan & Randzewicz-back, 2008). The situation with the Ghanaian bond market is not glaring. There is therefore the need to empirically ascertain the correct position of the size of the bond market in relation to the economy, banking sector, and other related variables.

A large sized economy is expected to move in a positive direction with the size of the bond market. However, an economy that is small in size may be positively insignificant or even be negatively correlated with size of the bond market, especially for an economy that is dwindling in size.

**Money supply (M2) as a percentage of GDP**

Money Supply is also known as Broad Money and reflects the level of liquidity in a country. Broad money generally involves the total available cash within an economy, whether at hand, outside the bank, at bank, or in the form of demand deposits. M2 includes the sum of currency outside banks, demand deposits other than those of the Central Bank, time, savings and foreign currency deposits of resident sectors other than the central government (World Bank, 2009). It typically involves coins and notes, bills, money in current and savings accounts as well as deposits. Thus M1, which comprises money in circulation and in accounts of banks (including money deposit banks and microfinance banks), is a subset of M2.

It is expected that an increase in the ratio of M2 to GDP could enhance the potentials for investment in the capital market especially bonds provided there is a high level of awareness. M2 is measured as money supply as a percentage of GDP is expected to exert influence on bond market development.

**METHODOLOGY**

Financial information relating to bond trading activities, which is secondary in nature were gathered on Ghanaian Bond Market from various sources. Such sources included the Central Bank of Ghana (BoG) statistical bulletin, Ghana Stock Exchange (GSE) Fact Book, the SEC Annual Report, the World Bank, and IMF websites for the period between 1980 and 2015. The data on GDP per capita were accessed from both the World Bank and IMF.

Most of the data gathered, especially those that utilised Gross Domestic Product (GDP) as a quotient were predominantly derived from the BoG statistical bulletin, except for Stock Capitalisation which required heavy reliance on SEC Annual Report.

The study presents a major indicator for measuring bond market development, which is Size, patterned after the model in Eichengreen & Luengnaruemitchai (2006) but with modifications. The World Bank financial sector operation and policy through the Financial Sector Development Indicators (FSDI) presents four dimensions of the financial system: size, access, efficiency and stability. This study is limited to bond market size.

$$TBNMS = \alpha + \beta_1BKSIZ_t + \beta_2BUDEF_t + \beta_3EDGDP_t + \beta_4INSPR_t + \beta_5MNSUP_t + \beta_6STCAP_t + \beta_7ECSIZ_t + \mu$$

Where;

- TBNMS = Total Bond Market Size = Ratio of Total Bonds as a Percentage of GDP
- BKSIZE = Size of the Banking System = Domestic Credit by Banks as a Percentage of GDP
- BUDEF = Budget Deficit = Budget Deficit as a percentage of GDP
- EDGDP = External Debt = External Debt as a Percentage of GDP
- INSPR = Interest Rate Spread = Difference between Lending Rate and Deposit Rate
- MNSUP = Money supply = Money Supply (M2) as Percentage of GDP
- STCAP = Stock Capitalization = Total Equity Capitalisation as a Percentage of GDP
- ECSIZ = Size of Economy = Log of GDP

## RESULT AND DISCUSSION

### Stationery test

Prior to the regression analysis, a stationarity test is conducted on the respective variables of all the models; a phenomenon with economic theoretical underpinning designed to enhance the reliability of the regression results. Such a test could be conducted using either the Phillip Peron (PP) test or Augmented Dickey-Fuller Test (ADF). In this case, the ADF is deployed in carrying out the test. This will confirm the level of stationarity of the variables, which will be incorporated in the models after differencing while taking cognizance of the level of stationarity so as to avoid misleading results. In performing the stationarity test a maximum lag of 1 is used, and included the intercept.

**Table 1.** ADF Unit root test of stationarity for the variables

Variable	ADF test stats	Max lag	Order of integration
TBNMS	-3.996355	1	I(0)
MNSUP	-3.206755	1	I(1)
ECSIZ	-3.661444	1	I(1)
ECDEV	-3.660937	1	I(1)
BUDEF	-5.515109	1	I(0)
INSPR	-6.250330	1	I(0)
EDGDP	-3.564689	1	I(0)

*Critical values 1% = -3.6752, 5% = -2.9665, 10% = -2.6220.*

These results show that money supply (M2), size of the economy, level of economic development, budget deficit and capital expenditure, are integrated of order one, I(1) at 5% level of significance with lag 1.

The residual for the model is stationary at levels. This is an indication that all variables including the three residuals of each of the models are found to be stationary, at least once, which entails that the model follows integrating process.

### Co-integration tests

Following the establishment of stationarity of the variables, a time series set of variables requires the determination of existence of co-integrating vectors supporting the existence of long-run relationship between the dependent and the explanatory variables.

The result of the test indicates the presence of 3 co-integrating equations at 5 percent level of significance, which signifies the existence of long-run equilibrium relationship between total bonds and the independent variables. This is an indication of long run reliability of the variables, which validates the conclusions on the results.

### The effect of bond market size

The level of stationary of each variable of the model in the equation has also been established. Furthermore, the existence of a long run relationship between dependent and independent variables in the model has been established. Subsequently, the result of VECM model is presented in Table 2.

**Table 2.** VECM results (abridged) for the model

Variable	Coefficient	Standard error	t-stats.
Coint Eqn1	-5.51317	0.40266	-3.75082
D(TBNMS(-1))	0.255234	0.29779	0.85708
D(TBNMS(-2))	0.106583	0.18998	0.56101
D(BKSIZ(-1))	-0.269646	0.23237	-0.16043
D(BKSIZ(-2))	-0.494697**	0.22695	-2.17977
D(BUDEF(-1))	0.058203	0.26104	0.22296
D(BUDEF(-2))	0.287435	0.24477	1.17432
D(EDGDP(-1))	0.538376**	0.20500	2.62618
D(EDGDP(-2))	0.410986**	0.16812	2.44455
D(INSR(-1))	-0.131678	0.14444	-0.91165
D(INSR(-2))	0.213789	0.16271	1.31397
D(MNSUP(-1))	-0.719473***	0.23406	-3.07384
D(MNSUP(-2))	-0.259491	0.25229	-1.02855
C	0.117526	0.20594	0.57069
R-Square	0.864343		
Adj. R-Squared	0.746774		
Sum Sq. Resids	16.72591		
S.E. Equation	1.055964		
E-Statistic	7.351781		

*Error correction: D (TBNMS)*

*\*\*\* significant at 0.01 level, \*\* significant at 0.05 level*

The result of the VECM estimation shows that the explanatory variables account for approximately 86.43 percent variation in total bond market size in Ghana. The estimation also shows that total bond market size and the size of the banking system are negatively related. For instance, a 1 percentage increase in the size of the banking system in the previous two years reduces total bond activities in the market by approximately 49.4%. The results also indicate that total bond market size and budget deficit are not related.

Furthermore, the estimation reveals that the external debt and total bond market size are positively related and it is statistically and economically significant. A one percentage increase in the external debt in the previous one or previous two year will cause the total bond market size to rise by approximately 53.8% or 41% respectively. In addition, the result indicates no relationship between total bond market size and interest rate spread finally; it shows that the previous one year money supply is negatively related to total bond market size. A 1% increase in money supply in the previous one or previous two years leads to a decrease in the total bond market size by approximately 71.9% or 25.9 % respectively.

**Discussion**

Although bank size is significant and negative at 5% for Ghana as revealed by this study, it is insignificant and negative for SSA and also insignificant for Asia as revealed by Adelegan & Radzewiczbac (2009), and Battacharayay (2011) respectively. This explains the possibility of country-specific disparity in determinants as against regional based factors.

The interest rate spread and stock capitalisation do not exert significant impact on overall bond market development in Ghana. This implies that they do not matter much for policy decisions on to total bond market size.

Money supply and external debt constitute new phenomena on total bond market size in Ghana as they both present a significant positive impact on total bond market size in Ghana. Thus if the quantum of money in terms of M2 as a percentage of GDP within the economy increases, it will drive total bond market size negatively. But this may not necessarily be the case in isolating either corporate bond market or government bond market. For example, while money supply as a percentage of GDP does not matter much for government bond market size in Ghana, it matters for corporate bond market size as revealed in this study since it is a positive driver of the latter.

The level of economic development on the other hand is significant at 5% level, and is positively correlated with bond market size in line with the findings of Adelegan & Radzewiczbac (2009), and Bhattacharyay (2011). This contradicts the common trends in the Sub-Saharan sub-region, and Asia.

Budget deficit is seen to be a new phenomenon that is important in driving government bond market development in Ghana, in view of its significant positive impact on bond market development. This finding aligns with evidence provided by Adelegan & Radzewiczback (2009), Njiforti & Muhammad (2010) and Paiko (2012). But this would require some caution because the main cause of the budget deficit could be counterproductive, which may hamper bond market development in the long run.

It can be argued that arranging a good mix of debt instruments including corporate bonds, government bonds, and external debt, among others, in a debt portfolio of an economy would facilitate efficient debt management, which could also be achieved through restructuring of such debts. This confirms the relevance of external debt in facilitating bond market development in an economy, provided such debt is within its threshold.

## CONCLUSION

It is now evident that although a regional perspective on determinants of bond market development is essential, a study of country-specific determinants may reveal a new set of variables and raise new issues for further empirical inquiry and diagnosis. In the case of Ghana, evidence from this study indicates that the size of the banking sector remains very critical in developing policies for bond market development. Furthermore, money supply as a percentage of GDP, budget deficit as a percentage of GDP, and the composition of external debt to GDP are germane in shaping Ghana's corporate bond market development. The bond market remains the vital avenue for effective financing of projects in financial crisis ridden economy.

This makes it necessary for considering the crucial role played by the bond market in the entire capital structure of an economy.

The revelations of this research suggest that policy makers need to pay attention to the structure, objective, and efficiency of finance generated through external debt. From the evidence gathered so far, policy makers need to harmonise themselves and ascertain the most efficient portfolio of debt within the economy, cutting across domestic debt, external debt and corporate bonds, among others. It is also evident that the proportion of external debt financing is important in determining the long run development of corporate bonds and total bonds, in general. As stated earlier, the channelling of external debt financing to infrastructural developmental projects would in the long run reduce cost of doing business, enhance economic activities, increase competitiveness, and eventually force businesses to raise corporate debt through bonds in a bid to expand.

The numbers from the evidence derived from this study suggest that in order to grow the corporate bond market, the government bond market needs to be deemphasized and a greater searchlight beamed on the corporate bonds. This calls for a need to maintain a threshold for government bonds on one hand and policy that would lead to proliferation of corporate bonds on the other.

### LIMITATIONS OF THE STUDY

The study relied on data from macroscopic perspective that uses national data and as such the results and conclusions cannot be generalised to include individual firm level analysis even though firms play a major role in bond market development. The limited data point as a result of a single country study may have methodological implications which call for future studies that can have more data points to test the applicability of the findings.

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