

A Co-Integration Analysis of Interest Rate Spread and Corporate Bond Market Development in Selected African Economies

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Abstract

This paper examines the relationship between interest rate spread and corporate bond market development in thirteen African economies comprising Botswana, Egypt Mauritius Nigeria, Tunisia, Cameroon, Kenya, Morocco, South Africa, Cote d'Ivoire, Ghana Namibia, Tanzania from 2004 and 2014 using fully modified ordinary least square (FMOLS) in an autoregressive distributive lag (ARDL) framework. Subsisting literature suggests that in bank-based economies, interest rate spread could adversely affect the potency of corporate bond market development; and thus limits the financial market competitiveness. The result provides evidence that corporate bond issue, as proxy for financial development is negatively influenced by interest rate gap in the short and long term. The result affirms the 'group interest' theorem in these African economies leading to a deterrent in competitive financial development. The ECM coefficient satisfies a priori expectation, affirms the short run dynamic relationship, which implies long run equilibrium from the annual speed of adjustment, which is about 100 percent. The paper suggests policy recommendations for the reduction in interest rate, and thus the spread to encourage the growth of corporate bond issues for a market-led financial development.

Keywords: Co-integration, Corporate Bond market, Interest rate spread

JEL Code: C23, G10, E43

Introduction

The corporate bond market is very important for capital scarce developing economies as a mechanism for long term capital accumulation and allocation, but little of this potential advantage has been explored. The bond market can increase the potentials of these economies to exploit their numerous natural resources, in order to improve the people's well-being, particularly by financing sectors with high multiplier like agriculture and industrial sectors. These sectors have positive and strategic links to poverty reduction, as they enhance inclusiveness and achieve other sustainable human development goals in several ways (UNIDO, 2015). The diverse development goal may be elusive if the financial capital

required to achieve the ambitions are not harnessed, possibly by exploiting the machinery of private capital market mechanism.

In any modern economy, interest rate provides sensitive price signals to borrowers, lenders, savers, and investors; and could serve as economic policy instrument to moderate their behaviour. Ackley (1978) opines that the mechanics of interest rate term structure is of major implications for the performance of the macroeconomy. The behaviour of interest rate influences industrial outlook and service variables, such as what the US Fed rate does in the global financial market. In the domestic economy, high real interest rate makes debt servicing more expensive. The high interest differentials in many African economies may remain a deterrent to financial development, as it makes the financial system uncompetitive, antithetical to market based arm's length financial development. Ranjan and Zingale (2003) state the ease with which the financial system can provide level ground for the average entrepreneur (in a non-connected relationship) to raise the desired capital for projects at arm-length or via a non-relationship bank based finance. In such financial system, the investor's ease to dispose financial assets at fair returns would be regarded as measure of financial development. Going by this standard the current bank based financial system practice is far from promoting financial development, or near level of perfection.

Recently, thoughts on increasing interest rate spread, high average lending against low deposit rate in emerging frontier markets have occupied researchers' attention. On the 'determinants of interest rate spread', Tennant and Folawewo (2009) studied 33 developing economies while Akinlo and Owoyemi (2012) examine that of Nigeria. Moreover, Afful and Asiedu (2013) examine relationship between interest rate spread, fiscal policy and stock market in SSA and Adebisi (2005) examines financial sector reform and interest rate policy on manufacturing sector in Nigeria; Bosworth (2014) studies interest rate spread and economic growth in the Group of 7 and 19 OECD economies by; and many more. In the analysis of financial development relative to economic growth of nations, Rajan and Zingale (2003) argue the 'group interest' theory as part of structural impediment for the growth of the market based finance. The 'group interest' of the bank finance model is seen as limiting the competitiveness of financial market, hence the underdevelopment of financial system in many developing economies. In other words, a country's financial structure matters for the wide interest margin and underdevelopment of the financial market.

Adelegan and Razewicz (2008) find that the sub-Sahara Africa domestic debt market is weak relative to the bank finance, while attributing the lapse in weak financial deepening to savings constraint. Average real interest rate is low, and occasionally negative in the region, while upon low saving interest rate the willingness and propensity to save declines. Asogwa (2005) however appraises both bank and market based financial systems in Nigeria and concludes that for long term industrial financing, the bank model template seems unsuitable, claiming that if adequate strategies are in place among the borrowers, mediators and investors, the advantages of market based finance and growth could be enormous even in information-poor countries. Bank based finance has chiefly advanced the 'availability' doctrine, irrespective of cost, increase default credit risk levels, and exacerbates financial instability. The World Bank (2001) argues that if finance is fragile in developing countries, banking will be the most hit.

Figure1 below presents the picture of interest rate spread in Africa relative to other regional peers. The histogram reveals that African economies records interest rate highest margin all through, while the 2005-2008 has average spread picked at 18.46 percent. Next to Africa is Latin America region as second highest bank margin above the global average through the period 2001-2015.

Stylized Facts

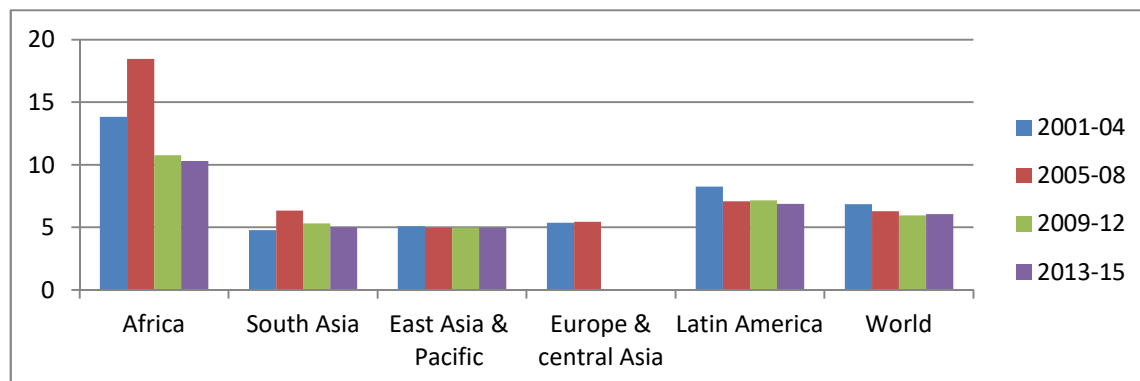


Figure 1: Average Interest rate spread of African Economies relative to regional peers 2001–2015

Source: Authors computation based on World Bank Financial Sector Development Indicator's database, UNTAD, 2014

Figure 2 below shows the trend in bond issues in Africa and the Middle East economies from 2001 to 2015 with the banking institutions as the highest issuer. Non-consistent growth pattern is seen from non-finance corporations, other finance corporations and government issuers after the global financial crises in 2011. The global financial crises from 2007 may have been responsible for the decline in bond issues by the four institution issuers in the two regions from 2007 to 2011.

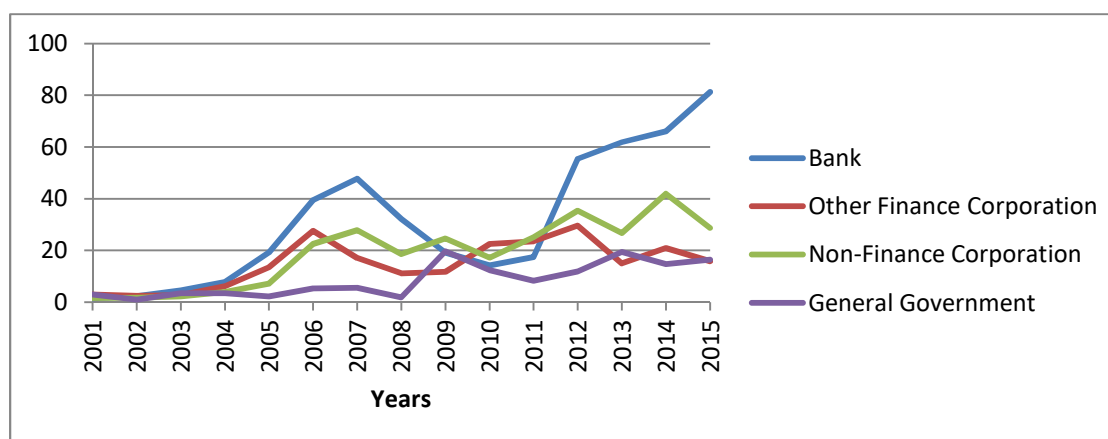


Figure 2: Bond Issue in Africa & Middle East in \$ Billions, 2001-2015

Source: Authors computation based on Bank for International Settlement (BIS) database

In theory, the most appropriate form of industrial financing between bank-based and market-based economies is still in contest. This study conjectures that to a large extent, African countries' economic policies and initiatives have over-promoted the bank-based financing option for long-term industrial finance needs which however seems inappropriate and inadequate. WEF (2015) is uncomfortable with the relative slow growth of corporate bond market among emerging and frontier economies, citing that the post 2011 credit crunch environment. This calls for acceleration of the corporate bond financing as it will

produce significant greater long term benefits than bank financing. Several industrial financing in Nigeria through the bank base model have been unsuccessful (Asuquo, 2005).

The hypothesis that increasing bank interest rate gap may constitute long term deterrent to primary corporate bond market development is worth examining. This is an idea that is yet to receive much research attention particularly in regions experiencing low bond market growth. This study therefore hypothesizes that there is no significant long run relationship between the interest rate structure and primary corporate bond market development. The remaining sections of the paper are structured as follows: next are the literature review, the data and methodology These which is followed by the results, discussion, recommendations and conclusion.

Literature Review

The theory underlying the relationship between interest rate spread and corporate bond development interconnects with theories of financial liberalization, the 'group interest' theory and financial structure. Mckinnon (1973) and Shaw (1973) made a case against financial repression successfully, which might have inspired the World Bank's pressure for liberalization of financial markets in developing economies, and the spur to achieve growth convergence. The intervention however may have resulted in high interest rate gap regime in most developing economies (Ngugi, 2001).

The financial system development debate as necessary catalyst for economic development had however been laid in arguments elicited in Schumpeter (1912), Gurley and Shaw (1955), Goldsmith (1970), Levine (2004), and many more. Each of the papers applied different methods, measurement variables, and techniques. More importantly, majority of the arguments conclude that finance spurs growth. On the financial structure, the arguments rest on the structure most desirable, as whether bank-based or market-based or a neutral system, were proffered for developing economies. The ensuing reforms may have assisted many emerging economies on the part of relative finance-growth nexus stability. Many African economies currently operate financial structures that are largely bank-based; however they are strengthened or weakened by the extent of the quality of legal and governance institutions. These antidotes however, might have been wrongly applied in Africa, as it has been experiencing high interest rate gap (see figure 2).

The contentious debate of the market-based versus bank-based economies took a new turn recently at the instance of global want of antidote for financial stability following the 2008 global stock market crash and subsequent wide spread economic recession. However, despite the enormous impact of the crises on the United States (US), the persistent pre-eminence of the market based system suggests that the US has "a strong bias that markets work", while to the rest of the world, this position may be a narrow view. The neutral-base system otherwise called the "financial functions view" regards financial structure classifications as secondary, as it is more interested in the economy operating an efficient financial system (Merton and Bodie, 2004; Levine, 2004).

Studies have also argued that in many developing economies, the 'group interest' of financial institutions play greater role in the implementation of financial policies which must have paved the way for greater dominance of the bank based system. Otherwise called the 'group interest' theory, the banks often attempt to dominate the bond issue market towards maintain their dominance of the financial intermediation structure. The indirect intermediation structure has higher interest rate consequence and higher interest rate spread (see figure 1). Bhattacharyay (2011) tests the major determinants of factors that influence the bond market across major Asia economies and finds that bank interest rate spread negatively impacts the market growth in both the government and corporate categories.

Certainly, the high rate of financial system's inefficiency contribute to high nominal interest rate, such that the attendant high cost of funds consequently reflects on high price level for goods and services. If, as it is been suggested, that the high cost of loanable funds rate structure which results in the high interest

spread in African economies in the past decade merely reflect their true scarcity, why, however does the cost of savings not reflecting their true real cost? For instance in the Nigerian case, Soyibo and Olayiwola (2000) cited in Ojo (2010) reflect that aggregate savings propensity merely correlate the real deposit rate, such that both the savings rate and real demand for money do not significantly influence deposit rate.

The disadvantage to potential savers has not increased the quantity and quality of investment in Africa, with attendant dampening of output growth (Ojo, 2010). It is observed that even at the low saving-investment gap, at times, the economies often witness excess bank liquidity, while high lending gap prevails, which some literature attributes to prevalence of a mismanaged fiscal system. An equilibrium savings rate is required to prompt scarce capital formation for real investment, leading to growth and in reverse, help to stabilize the financial system. Saving culture needs to be increasingly promoted, because in situations where savings cannot be effectively mobilised, idle funds cannot assume 'life' for productivity (Adegbite, 2015).

Table 1: Additional empirical Reviews

Author(s) & Title	Objective & Scope	Method & Measurement	Main findings	Gap(s) identified & Remark
Tendulkar (2015): "Corporate Bond market: an emerging market perspective vol. 2"	Examines the corporate bond market (CBM) relative to economic, financial, and institutional indicators including bank interest rate spread, and others in 62 countries(units) and 10 periods (2004-2013)	Correlation analysis by Kendall Tau test and Panel fixed Regression analysis	Bank spread influences as follows: negatively and significantly CBM development; positively but insignificantly CBM depth; positively but insignificantly CBM activity	Study ignored our main dependent variable-industrial output growth rate. Kenya and nine other Africa's CBM economies not sampled. Non-disaggregated study; Study on Africa needed
Bosworth (2014), "Interest Rates and Economic Growth: Are they Related?"	Studies long term determinants of interest rate, and explores relationship between real interest rate (RIR) and economic growth among G7 and 19 OECD countries and 43 periods (1970-2012)	Fixed effect Panel data regression	Weak relationship exists between RIR and economic growth; ratio of public debt to Gdp significantly influence RIR; higher saving to investment ratio redirects domestic interest rate; importantly: in a globalised capital market RIR is more determined by global influence than national economy can forecast. It makes	Opens up the need to generalise global factor: Openness- RIR nexus findings to African economies

			little sense to act otherwise.	
Adelegan and Radzewicz-Bak (2009) “Determinants of corporate bond markets in sub-Sahara Africa economies”	Examine determinants of Corporate bond market in 23 sub-Sahara Africa economies: 1990-2008	Fixed and Random effect framework	Savings and financial deepening, Gdp per capita, bank size, interest rate volatility, spread, capital control and fiscal balance are factors that determines corporate bond growth in SSA	Role of interest rate spread as competing influence against bond finance of the real sector (industrial output) is not considered
Akinlo and Owoyemi (2012) “The Determinants of Interest rate spread in Nigeria: an empirical investigation”	Examines factors that determine interest rate spread (IRS) among 12 commercial banks in Nigeria from 1986-2007	Pooled, Fixed & Random Panel regression models	IRS is influenced by Cash reserve ratio, loan to total deposits, loan to average total assets, and remuneration to total asset, GDP; while development stocks and treasury certificate are inversely related to IRS	Need to generalise study to examine relationship from IRS to corporate bond, and Real sector which weren't studied

Source: Compiled by authors

Theoretical framework

One of the mechanisms that best links the workings of the interest rate to corporate bond issues is the well-known bond price mechanism. In a simple form the mechanism establishes the bond's risk and return (benefits) framework to determine its price, as stated below:

$$Price = \sum_{t=1}^n \frac{C}{(1+r)^t} + \frac{M}{(1+r)^n} \quad 1$$

Where n = number of years; C = annual coupon payments; r = periodic required rate of return; M = maturity value; t = time period when payment is received. The fundamental convention of the bond market is that the price of a bond fluctuates with changes in market interest rate, such that its price varies inversely with the yield. As market interest rate (or market required yield) increases, the present value of its cash flows (the price) declines. This in common term is referred to as interest rate risk or price risk. The risk is inherent irrespective of the initial price that the investor pays for the bond. The bond interest rate risk or price sensitivity also depends on various features of the issue, like the maturity, coupon rate, and embedded options (Fabozzi, 2007).

However, by convention the market interest rate and the macro-economy is asynchronous, hence investing in corporate bonds entails managing the volatility of the market interest rate. In an increasingly globalised world the behavior of market interest rate becomes product of economy's macro-structure, as it correlates with major domestic and international economic activities.

Data and Methodology

Data was sourced from the Bank of International Settlement, the World Bank's World Development Indicators (WDI), Worldwide Governance Indicators (WGI), and the Annual Reports of respective African Stock Market Exchanges obtained from the website of African Securities Exchange Association (ASEA) as at 2014. There are fifty-four (54) countries in Africa, but not all the economies have corporate bond market in operation. This study's population comprises the twenty-five (25) countries who are registered members of African Securities Exchange Association (ASEA) as at 2016 (ASEA, 2016). Following dearth of corporate bond market and the omission of observations the study sample is limited to thirteen economies that have corporate bond issues and being traded on their Exchanges as at 2014 (ASEA, 2014). The summed size of the selected African capital markets is approximately 97.6% of African Stock Market Capitalization as at 2014 (ASEA, 2014). They are Botswana, Cameroon, Cote d'Ivoire, Egypt, Kenya, Ghana, Mauritius, morocco, Nigeria, and South Africa obtained from 2005-2014.

The non-bank corporate bond issue is relatively new in African development paradigm (effectively from the current millennium) with South Africa obviously having the most advanced corporate and government debt markets in Africa that have been built in many decades (Mu *et al.*, 2013). Being an emerging market, South Africa has a history of yield curve for more than thirty (30) years (Osase, 2007). The market is however dominated by the sovereign entities with corporate debt taken less position. Detail of the types and sources of the data studied are presented in table one.

Table 2: Description of Variables, Data Sources with Justification and *a priori* expectation

Variable description	Type/Source	Literature justification	Parameter's <i>A-proiri</i>
<i>Irs</i> = Interest rate spread	Secondary/ World Bank	Tendulker (2015), Adelegan and Radzewicz-Bak (2009), Bosworth (2014)	<0
<i>Cbi</i> = Corporate bond issued	Secondary/ BIS*/BM**	Tendulker (2015)	>0
<i>Rpi</i> = Real Gdp per capita	Secondary/ World Bank	Akinlo and Owoyemi (2012)	>0
<i>Pdr</i> = Public debt/Gdp ratio	Secondary/World Bank	Bosworth (2014), Akinlo and Owoyemi (2012)	<0
<i>Iqx</i> = Institutions' quality: Regulatory quality, rule of law, governance effectiveness	Secondary/ computed from Worldwide Governance Indicators, 2015:www.govindicators.org	Ayala <i>et al.</i> (2015), Djankor <i>et al.</i> (2007)	>0
<i>Svr</i> = Saving rate	Secondary/World Bank	Adelegan and Radzewicz-Bak (2009)	>0
<i>Sbi</i> = Sovereign bond issue	Secondary/ BIS*/BM**	Tendulkar (2015)	>0
* BIS: Bank for International Settlement; **BM: Bond Markets from Annual Reports of sampled countries who are members of African Securities and Exchange Association			

Source: Compiled by authors

The empirical method of study is the fully modified ordinary least square (FMOLS) of Pedroni (2000) in autoregressive distributive lag (ARDL) framework. The study obtained the short run residual of the series

and incorporated into the ARDL framework, to produce an augmented error correction linked ARDL. The ARDL specification with defined lag polynomial is in the VAR model family. The ARDL was developed by Henry, Pagan and Sargan (1984), and further popularized by Pesaran and Shin (1999) and Pesaran *et al.* (2001). Stated below is a modified Maddala and Kim (1998) generalized version of panel ARDL with p regressors m lags in y , and n lags in each p regressors denoted as ADL ($m, n; p$):

$$y_{it} = \phi_0 + \sum_{k=1}^m \alpha_k y_{it-k} + \sum_{j=1}^p \sum_{k=0}^n \beta_{jk} x_{jit-k} + \varepsilon_{it} \quad 2$$

It is assumed that $\varepsilon_{it} \sqcup \text{iid} (0, \sigma^2)$, a white noise process, and that the impact multiplier decreases in successive periods if $|\alpha_i| < 1$, and additionally by including sufficient lags of the dependent and explanatory variables, the serial correlation in the error term can be eliminated (Hill, Griffiths, and Lim, 2011). Moreover, there is a theoretical connection between the ARDL and ECM. We modify in simplified panel form Verbeek (2004) as follows:

$$Y_{it} = \delta + \phi Y_{it-1} + \gamma_0 X_{it} + \gamma_1 X_{it-1} + \varepsilon_{it} \quad 3$$

From 3.73, the long-run equilibrium relationship between Y and X can result by subtracting Y_{t-1} from both side and following transformation process, an ECM representation model could be formed as follows:

$$\Delta Y_{it} = \delta - (1 - \phi) Y_{it-1} + \gamma_0 \Delta X_{it} + (\gamma_0 + \gamma_1) X_{it-1} + \varepsilon_{it}$$

or

$$\Delta Y_{it} = \phi_0 \Delta X_{it} - (1 - \phi) [Y_{it-1} - \alpha - \beta X_{it-1}] + \varepsilon_{it} \quad 4$$

α and β are the long run equilibrium multipliers of a unit change in X_t . It connotes that the change in Y_t responds to current change in X_t plus an error correction term, and $(1 - \phi)$ is the adjustment parameter that determines the speed of adjustment, the current error in achieving long run equilibrium. In this study, the ECM is extracted from the fully modified ordinary least square (FMOLS), in an autoregressive distributive lag model (ARDL) or Bound testing framework. Thus, the superiority of the ECM over the VAR is that other than the long run equilibrium relationship, as part of explanatory variables, the past disequilibrium is introduced in a dynamic along with other current variables (Granger and Weiss, 1983; Maddala and Kim, 1998)

Model Specification

In implicit form, the corporate bond issue (Cbi) is expected to be influenced by interest rate spread (Irs), sovereign bond issue (Sbi), gross saving rate (Svr), public debt stock (Pdr), institutional governance (Iqx), and real per capita income (Rpi), as follows:

$$CBI = f(Irs, Sbi, Svr, Pdr, Iqx, Rpi) \quad 5$$

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The specification is presented explicitly below:

$$\Delta Cbi_{it} = \alpha_0 + \beta_1 \Delta Irs_{it} + \beta_2 \Delta Sbi_{it} + \beta_3 \Delta Svr_{it} + \beta_4 \Delta Pdr_{it} + \beta_5 \Delta Iqx_{it} + \beta_6 \Delta Rpi_{it} + \varepsilon_{it} \quad 6$$

more formally, including the ECM term:

$$\Delta Cbi_{it} = \beta_0 + \sum_{j=1}^P \theta_{ij} \Delta Cbi_{it-j} + \sum_{j=1}^P \delta_{ij} \Delta Irs_{it-j} + \sum_{j=1}^P \varphi_{ij} \Delta Sbi_{it-j} + \dots + \xi z_{t-1} + \varepsilon_{it} \quad 7$$

It is assumed that $\varepsilon_{it} \sqcup \text{iid}(0, \sigma^2)$, a white noise process, while z_{t-1} is the ECM term.

Summary statistics

Presented in table 5 below is the summary statistics. Corporate bond issue (*Cbi*) has the highest issue of \$4.5173bn in Botswana in 2008, while the lowest issue of \$0.2623bn was made in South Africa and Tunisia 2004 and 2012 respectively. Interest rate spread (*Irs*) has the highest value recorded in Mauritius in 2005 with 13.8 percent, while the lowest spread occurred in Mauritius with 0.5 percent in 2010. The highest institutional regulatory quality index (*Iqx*) value of 0.96 was achieved in Mauritius in 2012, while Nigeria achieved the lowest value of -1.63 in 2004. The real per capita income (*Rpi*) has the highest value of \$7,328.5 in Morocco in 2012, while the lowest value of \$11.5 was achieved by Ghana in 2006. Furthermore, Public debt ratio to GDP (*Pdr*) has its highest value of 89 percent by Egypt in 2013 while Nigeria recorded the least value of 7.45 percent in 2008, and savings ratio to GDP has highest value of 48 percent in Botswana in 2007, while the lowest is 9 percent in Ghana in 2008.

Table 3: Summary statistics table

	CBI	IRS	PDR	IQX	RPI	SBI	SVR
Mean	-0.1125	0.0457	0.3844	-0.2013	994.67	0.3034	0.2008
Maximum	8.3000	0.1380	0.8903	0.9600	7328.5	5.8795	0.4800
Minimum	0.1000	0.0500	0.0745	-1.6300	11.500	-2.3025	0.0900
J-Bera	10.092	4.1003	2.0565	4.9791	456.03	630.29	24.430
Probability	0.0064	0.1287	0.3576	0.0829	0.0000	0.0000	0.0000
Obs	94	94	94	94	94	94	94

Sources: Computed by authors using E-view 9

Optimal lag length

The optimal information lag length criteria set in the table 4.10 below suggests level conflict between lag 1 and lag 4. While the Akaike information criterion (AIC) and the Final Prediction error (FPE) suggest 4 lag length, the Schwartz information criterion (SIC) and the Hannan-Quinn (HQ) suggest 1 lag. Following insufficient number of observations, we employ the SIC and HQ criteria as the proffered choice, that is lag 1.

Correlation Analysis

Correlation study establishes the preliminary course of associations among variable, whether positive or negative association exists among the set of variables. Table 7 suggests that corporate bond issue (*Cbi*) is positively associated with interest rate spread (*Irs*), sovereign bond issue (*Sbi*), savings rate (*Svr*) and Institutional quality index (*Iqx*), but negatively related to public debt ratio (*Pdr*) and real per capital income (*Rpi*). Interestingly, the sovereign bond issue (*Sbi*) is positively associated to interest rate spread (*Irs*) but at a less value unlike the *Cbi*. Thus, while the association between the *Cbi* and *Irs* is 17%, that of *Sbi* and *Irs* is 15% among the economies of study.

Public debt ratio (Pdr) has 31% negative link with the Cbi, which suggests that increases in public debt could be increasingly detrimental to corporate bond development in the African economies. The Pdr is also negatively linked with sovereign bond issue (Sbi) with 25%, which could also suggest that increase in public debts ratio does not encourage Sbi. However, the negative 16% link between Pdr and interest rate spread (Irs) counters the public finance and monetary theory thoughts that increase in public debt is a potential source of high interest rate in many developing economies.

Largely, the high valued 41% and 42% positive association between sovereign bond issue (Sbi) and Saving rate (Svr) to corporate bond issue (Cbi) respectively generally underscore the corporate bond development theory. Institutional quality (Iqx) is about 27% and 39% positively linked with Cbi and Rpi respectively. This result suggests the weight of quality institution required in the development of corporate bond and improvement of living standards among African economies.

Table 5: Correlation analysis

	CBI	IRS	SBI	SVR	PDR	IQX	RPI
CBI	1.000000						
IRS	0.173081	1.000000					
SBI	0.412965	0.152935	1.000000				
SVR	0.427636	0.146055	0.420679	1.000000			
PDR	-0.312445	-0.16510	-0.25532	-0.206816	1.000000		
IQX	0.268929	0.067609	0.125014	0.200858	0.075965	1.000000	
RPI	-0.06638	-0.34491	0.049711	0.094585	0.189833	0.390583	1.00000

Source: computed by authors using E-view 9

The Short & Long run dynamic effects

The regression result presented in table 8 below provides for the hypothesis's parametric short and long run regressions. The regression is addressed with the use of an augmented autoregressive distributed lag (ARDL) (that is, of order $p+m$) estimation technique, where p is optimal lag length and m is the highest integration order. The result is presented in Table 6 below. The short run dynamics interaction is rightly signed by the negative error correction mechanism (ECM), and it is significant at 1 percent. This result reveals that the explanatory variables jointly influence the dependent variable, and the annual speed of adjustment to long run equilibrium is about 100 percent. The ECM result of 101 percent suggests two outcomes. First, it affirms the underlying economic theory of the explanatory variables included in the model and secondly, it affirms the long-run equilibrium relationship among the variables (Kennedy, 2008).

The long run results are addressed through individual explanatory variables. The long run development of the corporate bond market is significantly determined by the immediate part history of the corporate bond market by 93 percent, while the lag 2 period result is negative with 7 percent, however insignificantly.

Additionally, interest rate spread (Irs) in line with *a priori* negatively influences corporate bond issues in the region, which implies that a one percent increase in interest rate spread would reduce corporate bond issue by about 168 percent and 50 percent for lags 1 and 2 respectively. This result allies with the findings of Tendulkar (2015). Tendulkar (2015) adopts correlation analysis and panel fixed regression technique to study interest rate spread (Irs) and corporate bond market in 62 developed and emerging economies between 2004-2013, with an outcome that interest rate spread negatively affects the bond market development. However, perhaps due to data limitation the outcomes are insignificant.

Other complementary outcomes from the relationship meet *a priori* requirements, such that a one period lag saving rate (*Svr*) and institutional quality (*Iqx*) positively affect immediate corporate bond issue (*Cbi*) in the region by 273 percent and 77 percent respectively.

The outcome of the diagnostic results by the significance of the f-statistics and Chi square statistics at 1 percent reasonably suggest that the explanatory variables determine the dependent variable. The R^2 is 58 percent, which suggests that the model is fitted. The overall Wald test for the multivariate variables by the F-statistics and Chi-square statistics produce significant outcomes at 1 percent. The outcome of other diagnostic tests results-serial correlation, model stability, cross-section serial correlation, and residual normality tests are presented below.

Table 6: FMOLS RESIDUAL BASED ECM-ARDL: Short & Long run results

<i>Dependent Variable CBI</i>				
<i>Explanatory Variables</i>	<i>Coefficient</i>	<i>Std. error</i>	<i>t. stat.</i>	<i>P. value</i>
ECM(-1)	-1.0094	0.3286	-3.0717	0.0036*
IRS(-1)	-1.6718	7.6005	-0.2199	0.8269
CBI(-1)	0.9366	0.2982	3.1409	0.0029*
SVR(-1)	2.7318	3.8138	0.7162	0.4774
PDR(-1)	9.5678	3.6822	2.5983	0.0125*
IQX(-1)	0.7732	1.2758	0.606	0.5414
RPI(-1)	-0.0003	0.0002	-2.0543	0.0457**
IRS(-2)	-0.5	7.5451	-0.0662	0.9474
CBI(-2)	-0.0775	0.1544	-0.502	0.618
SVR(-2)	-1.6071	3.0209	-0.5319	0.5973
PVR(-2)	-9.2058	3.5764	-2.574	0.0133*
IQX(-2)	-0.8328	1.2785	-0.6514	0.518
RPI(-2)	0.0002	0.0002	0.9411	0.3516
<i>F. Stat.</i>	4.52078		0.0011*	
<i>X Stat</i>	17.12468		0.0001*	
Diagnostics				
R^2	0.5846			

Source: Computed by authors. * & ** denote significance at 1% and 5% respectively

Diagnosics Tests

4.5.1 Serial Correlation LM test: The Serial correlation LM test presented below in table 10 suggests that we fail to reject the hypothesis that there is no serial correlation among the series, given 49 degree of freedom, it helps to conclude that there is no serial correlation among the residuals.

Table 7: Serial Correlation Test

<i>Lag</i>	<i>LM-Stat.</i>	χ^2 <i>D.F</i>	<i>Probability</i>
1	58.31717	49	0.1701

Source: Computed by authors using E-view 9

Model stability test

This test examine whether the model is stable. In figure 3 below evidence of the locations of the unit root within the unit root circle indicates that we fail to reject the hypothesis that the model is stable overtime.

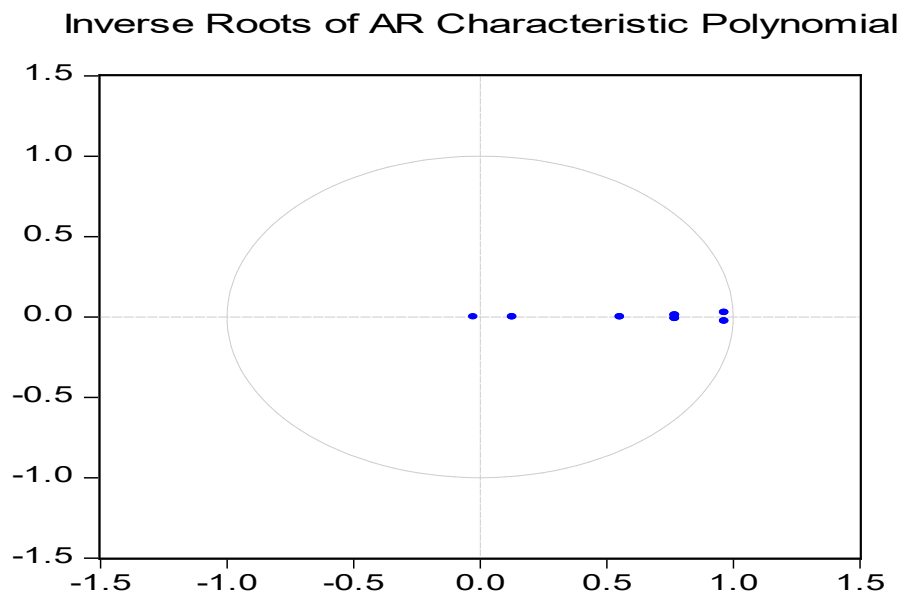


Figure 3

Source: Extract from E-view 9

Residual test for cross section serial correlation

The four residual cross section dependency (correlation) tests whose results are presented in table 11 below suggest absence of serial correlation across cross sectional unit, as the probability value is above 5% threshold. Since the null hypothesis tests 'no cross sectional dependency (correlation)', it indicate that we fail to reject the null hypothesis that the cross sections are independent.

Table 8: Cross-section serial correlation

Test	Statistics	d.f.	P.value
Breusch-Pagan LM	43.15326	36	0.1921
Pesaran scaled LM	-0.217641		0.8277
Bias-corrected scaled LM	-0.780141		0.4353
Pesaran CD	0.226660		0.8207

Source: Computed by authors using E-view 9

Test for Normality of Residual

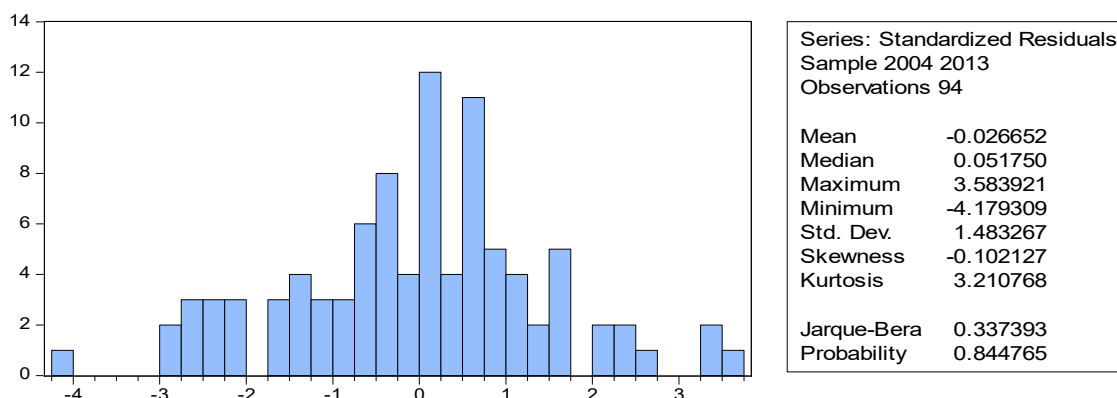


Figure 4: Normality Test Result

Discussion

The hypothesis's result suggests a 167 percent negative influence of interest rate spread on corporate bond issue. This analysis requires examination of potential developments that may arise from rising nominal interest rate. Given relative high inflation rate, often at second digit in the African region, rising nominal interest benefits the bank, as it increases the lending-deposit rate spread (profit), and infers an increase on issue cost in the bond market. When the margin is low however, banks would not have appetite to produce loans for non-finance corporations (NFC), thereby improving patronage of the corporate debt issue market.

High interest rate spread in bank based economies may be unconnected from the inherent challenge of access to corporate information. It suffices that in developing capital market economies to treat matters of corporate information as a public good. There is need to improve on the level of information about market participants. A general characteristic of developing market economies credit markets is that investors and other market participants' merely free-rides on matters of corporate information (Stiglitz, 1988). Closely linked to information availability, is the quality of response. In line with the growth of efficient market economies is the instantaneous response needed from participants.

A high interest spread regime promotes the oligopoly market structure of the banks and frustrates the competitiveness of the financial development. A low nominal lending rate would stimulate the investors' appetite in the bond market where general price of issues is strictly under control, as it is market determined; that is, a-once-and-for all issue price. This study finds support from Bosworth (2014) that there exists a weak relationship between interest rate and economic growth in G7 and 19 OECD countries from 1970-2012. In fact, despite the growth in support of finance led growth debate, several studies on African economies conclude that the financial system is maladapted and cannot promoted real growth (Ojo, 2010).

The bond market can therefore malfunction in an atmosphere of increasing inflation, which exacerbates interest rate spread (Tendulkar, 2015; Rose and Spiegel, 2015). Result from this study is consistent with Tendulkar (2015) and Bhattacharyay (2011). Tendulkar (2015) finds that interest rate spread has negative impact on international bond market development under the markets size, depth and activity categories but positive to market activity in the domestic market category. It remains that for inflation-target regimes, bond market could be an appropriate strategy to check increases in inflation, and moderate high interest rate spread in the money market.

Additionally, there is a positive impact of savings rate on corporate bond issue market in the region is supported by the work of Adelegan and Radzewick-Bak (2009). In the supply leading hypothesis, saving-investment-output nexus are positively linked. Savings rate need to be attractive to improve savings behavior of the people and institutions, needed to attract scarce capital towards the primary bond market growth.

The regression result also finds that regulatory institutional quality positively influences corporate bond issue. Financial regulation should generally govern commercial behaviour in the financial system. As social rules are needed to reconcile the conflicting interests of members of the social system, also commercial rules are to reconcile the conflicting interests of participants in the commercial system (Carmichael and Pomerleano, 2002). According to the World Bank financial regulations can assist to moderate the conflicting rights and interests of the citizens.

Recommendations

The foregoing results suggest the need to recommend the following for African economies against interest rate spread and lagging corporate bond market development. First, the bank lending dominance in the credit market needs to be managed downwards. Interest rate spread would be reduced by policies that would help to provide competitiveness in the financial market and secure the potential creditors. Government treasury bill rates need to be reduced to managed the bank lending rate downward with concurrent impact on spread. Additionally, since information asymmetry is a major constraint for growing market based economies, regulations that would make corporate information a public good and reforms that would promote access to credit bureau and credit registrar should be pursued. Secondly, the banking industry in African economies operates in oligopoly market structure, which would have contributed to high lending rate and interest margin, due to low competitiveness. African governments should improve the level of competitiveness by granting more banking license. A model of banking behaviour indicates that in oligopolistic bank market structures a rise in the bill rate raises the loan rate (Matthews and Thompson, 2014). Thirdly, there is need to provide fiscal incentive to non-finance corporations (NFC) to accommodate bond funding in their corporate finance restructuring decisions.

Fourthly, the savings rate, habit and behaviour should be improved upon by government's tax concessions. Many factors influences saving, however the desire to save in order to improve investment in corporate bond can be better addressed through higher income for the personal and corporate individuals, and managed inflation rate policies. A second digit inflation rate common with African economies discourages savings habit and behaviour, as savings has complimentary relations with consumption. Moreover, since many households only engage in 'precautionary savings', government needs to improve the level of economic certainty in the region. Government fiscal and monetary policies should be holistic to improve disposable income and provide cheap living conditions.

Fifthly, the importance of institutional regulatory quality index is stressed in the regression result for corporate bond market. Economic theory reveals that financial systems adopt rules and regulations meant to promote economic efficiency; safeguard the system against systemic risk; protect consumers against opportunistic behavior by suppliers of financial services; and achieve a range of social objectives (Herring and Santomero, 1999). The nature of the risks and the special role the financial institutions play in the financial system makes them to be singled out for special regulatory attention. The "specialness" of their role in the economy is attested to in the nature of financial services. To improve the competitiveness, innovation and efficiency in the corporate bond market, the apex and self-regulatory institutions must ensure that rules are strictly applies and be dynamic. Quality regulatory regime is anecdotal to investors' confidence.

The institutional regulatory outcome ties with the fifth recommendation since the auto- regression's outcome reveals corporate bond issue market positively correlating with past performance. For the market

to improve upon its past, associated institutions need to improve on their qualities. Capital market institutions develop on the strength of effective rule of law, effective governance and regulations.

Conclusion

This paper examines the co-integrating relationship between interest rate spread and corporate bond market, while also testing the 'group interest' theory of financial intermediation. A common characteristic of many African bank-based economies is the prevalence of high interest rate spread, which this study argues as correlating with low development of corporate bond issues. The banking institutions dominate the corporate bond issue market in the region, and hence produce loans at high rates to long term fund seekers, who hitherto, would have approached the long term market. The financial mismatch syndrome has consequences in financial instability. The study, in context of thirteen African economies, used fully modified ordinary least square (FMOLS) in an autoregressive distributive lag (ARDL) framework. Our result provides evidence that corporate bond issue, as proxy for financial development is negatively influenced by interest rate margin in the short and long terms. The result supports the postulation of the 'group interest' theory, that a bank-based financial system may be uncompetitive, hence a deterrent to financial development in the respective economies. The ECM coefficient significantly satisfies the *a priori* expectation which imply long run equilibrium from the annual speed of adjustment.

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Appendix A

List of Countries in the Study

Botswana	Egypt	Mauritius	Nigeria	Tunisia
Cameroon	Kenya	Morocco	South Africa	
Cote d’ Ivorie	Ghana	Namibia	Tanzania	