



GDP-INDEXED BOND AND BUDGET FINANCING OPTIONS IN KENYA

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Abstract

This study analyses some selected factors that could influence the adoption of Gross Domestic Product (GDP)-indexed bonds to finance budget deficits in Kenya. Its specific objectives are to examine how the openness of the economy, capital market development, government credibility and volatility of returns could influence the use of GDP-Indexed Bonds to finance budget deficit in Kenya. It adopted the explanatory research design with utilization of secondary data sources. Descriptive statistics such as means, percentages, and frequencies; and inferential statistics such as Pearson correlation and regression analysis were used to analyze the data. The findings show that openness of the economy, government credibility, capital markets development and volatility of returns had significant and positive relationships with the feasibility of GDP-Indexed Bonds to finance budget deficits. The study concluded that, ensuring openness of the economy, development of capital markets, credibility of the government as well as the predictability and steadiness of stocks returns could enhance the adoption of GDP-Indexed bonds to finance budget deficits in Kenya. It was recommended that government should focus on strategies to curb corruption, ensure stable fiscal rules, openness of the economy, as well as checking market shocks to enhance stable economy.

Keywords: Bond, Budget, Economy, GDP-Indexed, Volatility, Development finance



1. INTRODUCTION

Financing public debt remains an elusive goal for many countries the world over. In this regard, governments are always foraging for ways of financing deficits in their national budgets; often without success. Although there are various financing options, one of the most important financial tools used in several countries is GDP-Indexed Bonds. This study conceptualizes that GDP-Indexed Bonds could be a panacea to some of the glaring financing challenges facing developing countries such as Kenya.

In Greek, a study by Bonovas and Nikolopoulos (2012) shows that the government debt crisis that started in 2009 aggravated by limited financing. The country faced severe recession and operating within severely constricted fiscal limits. This shows the gravity of the lack of financing public debt in a country. In India, lack of financing has also been found to be positively linked to economic growth. A study by Sandefur and Julian Duggan (2019) showed that the Indian economy had started to slump. In the second quarter of the 2019 fiscal year, economic growth had dropped 4.5 percent; which was the gravest for a long time. This was characterized by reduction of government revenues almost to the negative territory. The scarcity of financial resources thus led to unprecedented challenges in financing government projects. This shows the need for innovative ways of financing public debt.

Financing is also an important challenge facing government at the regional level. Challenges related to financing government projects had led to the collapse of various government projects in Africa. In most developing countries, for example, lack of adequate financial resources had contributed to the collapse of infrastructural projects. Reduction of financing through the International Monetary Fund (IMF), World Bank, and tax payers led to increases in government project failure due to abandonment and cost deviation (Aziz, 2013). As envisaged by this current study, it is thus pertinent for governments to put in place tailor-made strategies for financing public debt. Failure to do so could continue challenging the economic growth of most developing countries.

Lack of financing also has had negative impacts on economic growth in other African countries. A study by Fabian and Amir (2011) for example shows that lack of funding or inadequate funding had contributed to the abandonment of many projects in developing countries. In Ghana still, a study by Damoah, Akwei, and Mouzughi (2015) affirmed that financial limitations such as fluctuation of prices, delays in payments, and release of funds are linked to the collapse of major projects.



Lack of enough financial resources has led to slow economic growth in Tanzania. In a United Nations Human Development Report (UNDP, 2014) the country was ranked 159 out of 187 countries. This means that the country is characterized by low human development; with most Tanzanians living in abject poverty. Dismal resources to finance economic development mean that over a quarter (28.2%) of mainland Tanzanians lived below the basic needs poverty line as posited by the National Bureau of Statistics (NBS, 2013). This necessitated international financing to bridge budgetary deficits.

Historically, Kenya has faced immense challenges related to lack of financing and erratic economic growth. Although the Kenyan Vision 2030 had projected GDP growth rate to be 10% as of 2012, the GDP growth rate was at 5.6% in 2015. This shows that the country was not registering the anticipated growth (Republic of Kenya, 2015). As of independence, Kenya's economy was of the same size as South Korea, Hong Kong Taiwan that is major Asian economic giants (World Bank, 2013). However, Kenya's economy was wrecked by macroeconomic instability in the 1990s. Coupled with a lack of government credibility, economic growth remained largely stagnant due to limited ability to attract sufficient international funding. This led to widespread poverty, unemployment, and inequalities. This shows the importance of sustainable financing on the economic development of a country.

The Kenyan economy is also characterized by low capital formation. This means that the country has to rely on external borrowing to finance budget deficits (Safdari & Mehrizi, 2011). In agreement with the World Bank (2013) report, macroeconomic instabilities such as inflation and exchange rate volatility also contribute to dismal economic growth. This means that without sustainable external funding, it could remain untenable to adequately finance budget deficits. This could go on to have adverse effects on Kenya's economic growth.

Kithinji (2011) found out that Kenya faced major challenges in ensuring that the country had steady economic growth. The country faced sustained fluctuated economic growth and slumps. This meant that development had largely remained slow despite the fact that the country had very liberal public policies. Slow economic growth is evidenced by a steady drop in GDP growth rate from 5.9% in April 2019 to 5.1% in December (Trading Economics, 2020). It is thus imperative to investigate ways in which economic growth in Kenya can be enhanced through various financial instruments such as GDP-Indexed Bonds. This emanates from the fact that attracting sustainable financing has remained largely elusive enhance the need for innovative financing.



However, the deployment of GDP-Indexed Bonds is often challenged by several factors. This study conceptualized that the potential use of GDP - indexed Bonds to finance economic growth in Kenya could be enhanced or challenged by the openness of the economy, capital market development, government credibility, and voluntary of returns among others. This study sets out to find out the level to which these variables influence the proclivity of Kenya to deploy these bonds.

The openness of an Economy can influence the ability of a country to Use of GDP-Indexed Bonds to Finance Economic Growth. A study by Le (2020) focused on 46 Emerging Market and Developing Economies (EMDEs) from 1990 to 2014 show that trade openness among other factors was positively correlated with economic growth. In the context of this study, it is apparent that openness of the economy could encourage investment in various sectors of the economy.

Capital market development could also influence the adoption of various financial assets. A study was based on empirical evidence for the 28 European Union (EU) and 34 OECD (Organization for Economic Co-operation and Development) countries between 1993 to 2013 show that the ability of the economy to absorb various financial tools such as loans and bonds due to enhanced capital market development positively contributed to economic growth the countries studied (Prochniak & Wasiak, 2017). This study sets out to investigate the level to which capital market development could influence the potential absorption of GDP-Indexed bonds to finance economic growth in Kenya.

Government credibility could also influence the adoption of GDP-Indexed Bonds. A report by the International Finance Corporation (2019) shows that the investment market determines the willingness of investors to invest in a country or not. In economies that are devoid of transparency, investors tend to be more cautious. In instances where there is a lack of credibility of shared financial performance records, investors may also shy away from making substantial investments. Since the former study was not focused on Kenya, the level to which its findings apply to Kenya is hard to verify without studies such as this current one.

A study by Rupande, Muguto, and Muzindutsi (2019) focused on the Johannesburg Stock Exchange between July 2002 and June 2018 show that volatility influenced the price of financial assets. In this regard, increased riskiness and volatility of selected financial assets influenced investment behaviours since investors are rational persons. As such, the volatility of returns could influence the willingness to invest in some bonds such as GDP Indexed-Bonds as hypothesized by this study.



Ikikii and Nzomoi (2013) found that there were high correlations between capitalization, trade volume, and economic growth in Kenya. In this regard, both variables explained 91% of the variation in economic growth in the country over the study period. However, the former study was not focused on GDP-Indexed Bonds in Kenya. This means the level to which stock market development could contribute to the potential adoption of GDP-Indexed bonds in Kenya is hard to vary without studies in that direction.

From the preceding discourse, it is apparent that GDP-indexed bonds affect the economy of a country. However, there is a scarcity of literature that investigates the factors that could influence the uptake of these Bonds to finance budget deficits. Most extant literature focuses on the variables under investigation in this study singly without looking at all the variables under one umbrella. This creates a literature lacuna that may be hard to fill without studies such as this current one. In this context, this study investigates the factors that could enhance the adoption of GDP - indexed bonds to finance budget deficit in Kenya.

Kenya has repeatedly experienced high levels of budget deficits. The budget deficit for the 2019/2020 financial year was Kshs 657.4 billion. Compared to the budget deficit for year 2009/2010 which was Kshs 163.0 billion, this shows an increase in budget deficit within a decade by over 300% (Government of Kenya, 2020). These financing deficits have had negative impacts on economic growth in the country. According to Kithinji (2011), Kenya is characterized by high fluctuated economic growth and slumps. Even though the Kenyan Vision 2030 had projected GDP growth rate to be 10% as of 2012, the GDP growth rate was only at 5.6% by 2015 (Republic of Kenya, 2015). The GDP growth rate dropped steadily from 5.9% in April 2019 to 5.1% in December; leading to negative impacts on economic growth (Trading Economics, 2020). Historically, the erratic economic growth in the country has been attributed to challenges related to low capital formation and erratic economic growth (World Bank, 2013). This has pushed the country to opt for external funding to bridge budget gaps. However, lack of government credibility due to rampant corruption means that economic growth faces periodic slumps due to the inability to attract sufficient and sustainable international funding. This calls for innovative financing solutions.

Though GDP-Indexed bonds could be a panacea to the financing challenges facing economic development in Kenya, they have never been applied to the country before. It thus remains unclear if the Kenyan economy is able to successfully deploy these financial instruments. Furthermore, the potential of GDP-Indexed bonds to finance budget deficit has not empirically clear based on extant literature. This creates a



literature lacuna that is hard to bridge without studies such as this current one.

Additionally, the combined effect of the factors that could influence the adoption of the bonds in the Kenya market such as openness of the economy, capital market development, government credibility, and volatility of returns as envisaged by this current study are not well understood. In this regard, it remains untenable making empirically backed recommendations on how GDP-Indexed bonds could be leveraged to finance budget deficits in Kenya. This could deny the country the benefits associated with this important financial instrument. This current study sets out to investigate how GDP-indexed bonds could be leveraged to finance budget deficit in Kenya. Therefore, the objective of this study was to analyze some selected factors that could influence the adoption of GDP-indexed bonds to finance budget deficit in Kenya. Specifically, the study sought to examine how the openness of the economy, capital market development, government credibility and volatility of returns could influence the use of GDP-Indexed Bonds to finance budget deficit in Kenya. To this end the remaining sections of the study is divided into four; section 2 literature review, section 3 methodology, section four contains the findings and discussions while section five contains the conclusion and recommendations.

2. LITERATURE REVIEW

It is worth noting that the adoption of Gross Domestic Product (GDP)-indexed bonds could have a number of positive effects for the national economies the world over. The concept of indexing debt to GPD is not new. It emerged in the 1980s. Its key proponents have been renowned economists such as Williamson among others (Shiller & Robert, 2005; Borenzstein & Mauro, 2004). Although these bonds did not see immense adoption, they started seeing a renaissance in emerging markets in the 1990s due to rampant financial and debt crises. This comes about in the wake of the realization that they could contribute to reduced cyclical vulnerability in developing countries. Presently, GDP-indexed bonds are playing key roles in debt restructuring in these countries.

GDP-indexed bonds “are financial instruments that are positively correlated with the economic growth rate of a country and can be issued to stabilize debt servicing of the nation.” In this regard, the borrowing nation designs these bonds in such a way that the coupon payment varies upwards or downwards on basis points particularly pegged to every percent rise or fall in the GDP growth rate along the GDP growth rate has numerous benefits. It ensures that the lenders are rewarded well during the periods robust of growth and vice versa. This saves upon debt payments during slump periods.



Griffith and Gottschalk (2007) argue that GDP-indexed bonds stabilized the cost of debt serving and reduce the risk of sovereign default while also assuring safe returns for the investors. Furthermore, these bonds stabilize economic growth and reduce debt servicing default. As a result, countries that deploy them are likely to reduce the chances of economic crisis and the associated negative repercussions. Guerguil, Mandon, and Tapsoba (2017) elicit that financial stability influences the link between fiscal rules and counter-cyclical. This current study sets out to find out the level to which GDP-Indexed bonds contribute to financial stability in Kenya and the associated impact on the pro-cyclicality of financial pressures affects economic growth in the country. This is pivotal since it was not the focus of the former study.

A study by Le (2020) focusing on 46 Emerging Market and Developing Economies (EMDEs) from 1990 to 2014 utilized panel econometric techniques. The findings show that “institutional quality, gross fixed capital formation, government expenditure, financial development, and trade openness” were positively correlated with economic growth. In the context of this study, it is apparent that openness of the economy could encourage investment in various sectors of the economy. These findings could be extrapolated to this current study that envisages that openness of the economy could influence the use of GDP-Indexed Bonds to finance the budget deficit.

A study by Pilinkien (2016) confirmed that there was empirical interdependence between trade openness, economic growth, and competitiveness. The study aimed at finding out the level to which such openness could contribute to enhanced adoption of GDP-Indexed bonds in developing countries such as Kenya. Another study by Zahonogo (2016) sought to find out the link between trade openness and economic growth. The study was focused on developing countries. In this regard, 42 sub-Saharan Africa (SSA) were studied using a dynamic model with data covering 1980 to 2012 being used. The study shows that there is a trading threshold that exists between which increased trade openness registers beneficial effects and beyond which these benefits decline. This study tests how openness could influence the adoption of GDP-Indexed Bonds in Kenya.

Musila and Yiheyis (2015) sought to find out how trade openness influences the level of investment and by extension the rate of economic growth in the country. Data were obtained from annual time series data. The study established that although trade-policy induced openness negatively and significantly affected investment and the rate of economic growth, Granger Causality tests showed that when trade openness changed by a unit, it had a positive relationship on long economic growth long-term rate when influenced by the rate of physical capital growth. This study sets out to find



on the level to which openness in the economy, which was not the focus of Musila and Yiheyis study could influence the adoption of GDP-Indexed Bonds to finance budget deficits in Kenya.

A study by Cabrillac, Gauvin, and Gosse (2017) on the Benefits of GDP-indexed bonds for issuing countries, investors, and international financial stability uses simulations up to 2040 to help in the identification of the countries which would benefit from using GDP-indexed bonds instead of the conventional bonds in the prevention of sovereign debt crises. Findings show that through the use of GDP-indexed bonds, countries protect their debt ratios against deflation and recession, and through this, the contribution of GDP-indexed bonds to international financial stability is a reason for international coordination to promote their use.

Borensztein and Mauro (2004) in their study “The case for GDP-indexed bonds”, sought to revive the case for countries to ensure against economic growth slowdowns by issuing bonds indexed to the rate of growth of GDP. Through the simulation of the effects of GDP-indexed bonds under different assumptions about fiscal policy reaction functions and their output effects, findings show that GDP-indexed bonds have the impact of reducing debt/GDP paths.

A study by Prochniak and Wasiak (2017) investigated “the impact of the financial system on economic growth in the context of the global crisis.” The study was based on empirical evidence for the 28 EU and 34 OECD countries. The study period was from 1993 to 2013. Its main aim was to find out how the development and stability of the financial sector in the selected countries impacted economic growth. The findings show that the ability of the economy to absorb various financial tools such as loans and bonds due to enhanced capital market development had positive influences on the economic growth of the country. This current study sets out to investigate the level to which capital market development in Kenya could contribute to the potential absorption of GDP-Indexed bonds to finance the budget deficit in the country.

A study by Bist (2018) sought “financial development and economic growth.” The study was based on evidence from a panel of 16 countries drawn from Africa as well as other low-income countries from other continents. The study period was 20 years from 1995 to 2014. Data were subjected to fully modified and dynamic OLS techniques. The findings show that financial market development had a positive and significant impact on economic growth. In this context, this study sets out to find out the level to which market development could influence the deployment of GDP-Indexed Bonds in Kenya.



A study by Consiglio and Zenios (2018) sought to model the level to which receptivity and capacities of UK and US markets as well as other developed countries contributed to the adoption and deployment of GDP-Indexed Bonds. The findings show that developed markets in these countries as well as in Germany, Italy, and South Africa enhanced the adoption of GDP-Indexed Bonds irrespective of their riskiness. This current study sets out to find out the level to which market development could influence the adoption of FGD-Indexed Bonds to finance the budget deficit in Kenya.

A study by Pradhan, Arvin, Norman, and Bahmani (2018) sought to find out if there was a Granger causal relationship between five variables. These included stock market development, bond market development, and economic growth as well as two other macroeconomic variables (inflation rate and real interest rate). Data were obtained from a panel data set of the G-20 countries with the period being 1991 and 2016. The Auto-regression model was used to find out the existent nature of Granger causality between the variables. The findings show that in the long-run, bond stock market development, market development, inflation rate, and real interest rate predicted economic growth.

Co kuna, Seven, Ertu rul, and Ulussevera (2017) carried a study aimed at exploring the relationships between capital market development and economic growth in Turkey. The study period was 2006 to 2016 and the components of the capital market under investigation were “corporate bond, stock, mutual/pension funds, government bond markets.” The findings show that while there were cointegration relationships between capital market development and economic growth, there was capital market development could support the use of GDP-bonds to finance budget deficit in the study area.

A study by Muawya (2019) sought to find out how the capital market affected economic growth in Oman. The real Gross Domestic Product (GDP) was used to represent economic growth. The study also scanned the impact of the Muscat Security Market (MSM) on the economic growth in Oman. Data was collected from annual official reports from the MSM, Central Bank of Oman as well as World Bank Development Reports. The findings show that there was a positive relationship between the capital market and Omani economic growth during the study period. This current study set out to find out the level to which capital market development could facilitate the adoption of GDP-Indexed Bonds to finance budget deficit in Kenya.

Kapaya (2020) sought to establish empirical evidence of the role of stock markets and



its importance in the Tanzanian financial system and causal relationship with economic growth in the country and vice versa. Data were obtained from a sample of quarterly time-series from Q1 to Q2 between 2001 and 2019 in Tanzania. The findings show that while in the short-run stock market development had a negative causality with economic growth but had a positive long-term causality relationship with economic growth. This study sets out to find out the level to which stock market development could contribute to the adoption of GDP-Indexed bonds and to finance budget deficits in Kenya.

Ikikii and Nzomoi (2013) undertook an analysis of the effects of stock market development on economic growth in Kenya. The study used GDP and two measures of the stock market. These included capitalization and trade volume. The findings show that there were high correlations between capitalization, trade volume, and economic growth in Kenya. In this regard, both variables explained 91% of the variation in economic growth in the country over the study period. This study sets out to find out the level to which overall market development could influence the use of GDP-Indexed bonds to finance the budget deficit in Kenya.

A study by Cytonn Investments (2019) on “The Role of the Capital Markets in Economic Development” sought to establish the role played by capital markets in financing infrastructure development, large enterprises, and Small and Medium Enterprises (SMEs) and their link to economic growth. This is aimed at filling the gap of development as outlined by the World Bank that for developing countries to achieve Sustainable Development Goals (SDGs) by 2030, an estimated USD 4.0 trillion is required. To achieve this, capital markets must be developed and strengthened to mobilize commercial financing. The findings show that a well-developed capital market creates a sustainable, low-cost distribution mechanism for various financial products and services across the country. This in turn translates to the raising of long-term funds by businesses used to purchase goods, leading to growth and support to the country's economic growth.

Co kun (2017) aimed at exploring the relations between the development of capital markets sub-components such as mutual/pension funds, corporate bond, stock, and government bond markets and economic growth in Turkey in the period of 2006 to 2016. Findings show that there is a relationship between capital market development and economic growth. Through the use of ARDL, Markov Switching Regression, and Kalman Filter models, the findings also show that capital market development has asymmetric effects on economic growth.

United Nations (2005) in a report from a brainstorming meeting titled “GDP-Indexed



Bonds: Making it Happen” showed that credibility played a key role in enhancing the adoption of GDP-Indexed Bonds. The findings show that although developing countries may be interested in GDP indexed bonds, they are less attractive to investors than in developed countries due to the risks associated with a potential default. This study sets out to find out the influence of credibility on the potential uptake of GDP-Indexed Bonds in Kenya.

Roldos (2004) posits that challenges related to lack of credibility, lack of transparency, and limited liquidity in the market contributed to poor absorption of government bonds in Mexico. However, longer-term government bonds rose sharply starting in 2004. This was facilitated by financial market reforms in the country. This was also recorded in Malaysia, where government efforts aimed at making the market easier and more attractive enhanced the uptake of government bonds. This study sets out to find out the level to which government credibility could contribute to the adoption of GDP-Indexed Bonds in Kenya (Cha, 2002).

Hanish (2005) shows that some investors, within the premise of rational expectations theory, often seek to push central bank decisions towards the fulfillment of higher inflation rates. In this regard, central banks should put in place mechanisms for buttressing their credibility in fighting inflation. Without such credibility, investor confidence would be limited. Within the context of this study, the willingness of investors to trade with a government that lacks credibility to control the macroeconomic environment in which GDP-bonds are traded could check the willingness of investors to trade in such bonds.

A report by the International Finance Corporation (2019) titled, “Creating Impact: the promise of impact investing” shows that the investment market determines the willingness of investors to invest in a country or not. In economies that are devoid of transparency, investors tend to be more cautious. In instances where there is a lack of credibility of shared financial performance records, investors may also shy away from making substantial investments. This study sets out to find out the level to which credibility of the government to honour the GDP- Indexed bonds and keep economic growth as indicated by GDP positive could influence the uptake of GDP-Indexed bonds in Kenya.

Vishnu (2012) studied 'Discussion on Feasibility of GDP-Indexed Bonds in Emerging Economies –Viewpoint India.' The background of this study is that emerging economies are prone to financial distress and debts in a bid to sustain their high level of economic growth rate and that their over-reliance on foreign investments exposes them to the risk of growth rate fluctuations. This study aims at



investigating the notion that GDP-indexed bonds are the solution to these woes. For purposes of this study, monthly data was collected on the GDP growth rate and 10-year bond yield. Results show that there is a correlation between returns on GDP-indexed bonds and economic growth in developing countries.

Kamal and Lashgari (2012) carried out a study aimed at “comparing GDP Indexed Bonds to Standard Government Bonds.” The study was based on a desk review of extant literature for the 1947 to 2010 period. The study established that when compared to the more researched standard bonds, GDP bonds though lacking historical data in the United States, had a superior performance in a risk-return framework. Since the former study was not focused on Kenya or an African country, the findings obtained may not expressly relate to this current study. It is thus important to find out how GDP-indexed bonds have been applied in the country and the level to which their use has impacted economic growth in the country as compared to standard bonds.

Brueckner and Carneiro (2017) cast light on the nexus between trade volatility and real GDP per capita growth. Analysis of 5-year panel data from 175 countries in the period starting from 1980 and ending in 2010 was undertaken. The findings show that “terms of trade volatility in countries with procyclical government spending had significant negative effects on economic growth in countries.” These findings cast light on this current study that hypothesizes that trade volatility could deter the confidence of investors and have negative impacts on economic growth. However, the level to which this could influence the uptake of GDP-Indexed Bonds in developing countries such as Kenya is hard to verify without studies such as this current.

Viceira (2012) found that bond risks affect investment behaviour. Projected bonds and stock returns from extant data are often used by financial analysts to advise investors on where to put their money. In economies where high levels of volatility of returns are anticipated, investors may shun some forms of bonds. This current study sets out to find out the level to which bond return volatility could act as a motivation for potential uptake of GDP-Indexed Bonds to finance budget deficit in Kenya.

A study by Jivraj (2013) shows that the volatility of returns from various portfolios influences their attractiveness. Fluctuations in returns over time may limit the propensity of investors to purchase some bonds over time. Perceived inability to achieve the anticipated returns could check the attractiveness of GDP-Indexed bonds by investors. This current study sets out to find out the level to which volatility of returns in the Kenyan market could influence the potential uptake of GDP-indexed bonds by investors in Kenya.



Ogotseng (2017) based on a time-series analysis of stock prices between November 1998 and December 2016 in ten African equity markets. The study found out that volatility of stock returns had a weak but positive relationship with expected returns. The volatility of stocks could go on to have negative influences on their attractiveness. This current study sets out to find out the extent to which the anticipated volatility of returns could influence the potential uptake of GDP-Indexed Bonds in the Kenyan market.

A study by Ishfaq (2018) investigated the impact of Cash Flow Volatility on Stock Returns: Evidence from Pakistan Stock Market. Data was collected from the Karachi Stock Exchange. In this light, 80 companies were studied with data focusing on 2005 to 2016. The findings show that cash flow volatility can have negative future impacts on stock returns at the firm level. Though focused on individual firms, these findings cast light on the potential impact of volatility of returns for stocks listed in the African stock market on the attractiveness of GDP-Indexed bonds by local and foreign investors.

A study by Rupande, Muguto, and Muzindutsi (2019) sought to investigate investor sentiment and stock return volatility. Data was collected from the Johannesburg Stock Exchange. The study period was July 2002 to June 2018. The findings show that volatility influenced the price of financial assets. Increased riskiness and volatility of selected financial assets influenced investment behaviours. Since investors are expected to be rational people, increases in the volatility of returns could influence their willingness to invest in some bonds, and vice versa. This current study sets out to find out the veracity of these findings within the context of the potential uptake of GDP-Indexed Bonds in Kenya.

Hab, Junboc, and Chunchia (2019) show that bonds with high volatility betas have low expected returns in all segments of corporate bonds and that bonds with high idiosyncratic bonds (stock) volatility have high (low) expected returns and that this relationship strengthens as ratings decrease. This current study sets out to investigate the veracity of these findings in Kenya. Benlagha (2014) investigated the behavior of volatility linkage between nominal and index-linked bond returns using the multivariate BEKK-GARCH approach. Analysis from data collected daily from French bonds with different maturity dates and different reference indices show two empirical regularities. These are that the relationship between nominal and index-linked bond returns is significant and is due to liquidity risk and that there is confirmation of co-persistence in volatility returns. This study sets out to find out how the volatility of returns influences the attractiveness of GDP-indexed bonds in Kenya.



A study by Viceira (2012) on “Bond risk, bond return volatility, and the term structure of interest rates” aims at exploring the time variation in the bond risk, as measured by the co-variation of bond returns with stock returns and consumption growth, and in the volatility of bond returns. Findings show that there is evidence that movements both in the short nominal interest rate and the yield spread are positively related to changes in the subsequent realized bond risk and bond return volatility.

Numerous studies were reviewed on the subject under investigation. However, most of the studies reviewed were not focused on Kenya. Nevertheless, they provide a basis for understanding the role of GDP-indexed bonds in financing processes. None of the studies reviewed address the variables under investigation in this study under banner. This current study sets out to bridge these empirical gaps.

3. DATA AND METHODS

This study adopted the exploratory research design. This design is appropriate for a research problem in cases where the researcher lacks past data or in situations where there are few documented studies for reference (Babbie, 2007). Exploratory studies act as tools for initial research. They create a platform for follow-up studies. Since GDP-Indexed bonds have not been deployed in Kenya, this is deemed a suitable design for examining the factor that could influence their adoption in Kenya.

The study targeted publications from 10 organizations namely: The Global Economy, CEIC Data, Cytonne, Central Bank of Kenya, World Bank, Transparency International, the Kenya National Treasury, International Monetary Fund (IMF), European Bank and, African Development Bank. Quarterly and annual reports from these organizations were targeted. This translated to 5 reports per organization and 50 reports from the 10 organizations per annum. Since the study was limited to the events of 2015 to 2019 (5 years). A total of 250 reports were thus targeted. The five-year period was chosen since it was anticipated that the findings obtained could cast light on the current situation on the subject under investigation. Only published relevant financial reports on the study subject from the reports were included. The study used census (total population sampling) techniques to include all the 250 reports from the targeted organizations for the study period (2015 – 2019).

The data obtained were coded and analyzed using the Statistical Package for Social Sciences (SPSS version 24). The analytical model adopted was as presented by (Harpale & Bairagi, 2019):

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \epsilon_i$$

Where:



Y_i = Budget deficit

X_1 = Trade Openness

X_2 = Capital Market development

X_3 = Government credibility

X_4 = Volatility of returns

α_0 = Constant

$\alpha_1, \alpha_2, \alpha_3$ and α_4 = Parameter estimates

ϵ_i = error term

Diagnostic tests that were used in the study include normality, autocorrelation, multicollinearity test, and tests for heteroskedasticity.

4. ANALYSIS AND DISCUSSION OF FINDINGS

This section presents various analyses carried out on the reliability of the data used, appropriateness of the method of analysis and the discussions on findings.

4.1 Diagnostic Tests

Various diagnostic tests were carried out in this study before regression analysis. These included normality tests, tests for heteroskedasticity, autocorrelation, and multicollinearity. Normal Q-Q plots were used to test the normality of the data collected from the data sets. The findings that the data were normally distributed as it appeared roughly as a straight line for both dependent and independent variables. There was no heteroskedasticity problem as shown by the lack of a clear pattern in the scatter plot. Regression analysis could thus be carried out.

4.2 Pearson Correlation

Pearson correlation analysis was undertaken to find out if there were significant relationships between the dependent and independent variables. The findings show that there all the dependent variables had significant relationships with the potential use of GDP-Indexed Bonds to finance budget deficits as follows: Openness of the Economy, $r=-0.810$, $p<0.05$; Capital Markets Development, $r=-0.858$, $p<0.05$ and; Government Credibility, $r=-0.715$, $p<0.05$. However, Volatility of Returns did not have positive relationships with budget deficits ($r=0.083$, $p>0.05$). The study went on to carry out regression analysis to find out the level to which the dependent variable could be predicted by the independent variables.



Table 1: Pearson Correlation

		Correlations				
Budget Deficit	Pearson Correlation	Trade Openness	Capital Markets Development	Government Credibility	Volatility of Returns	Budget Deficit
		-.810**	-.858**	-.715**	.083	1
		Sig. (2-tailed)	.000	.000	.000	.528
	N	60	60	60	60	60

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

4.3 Regression analysis

Regression analysis was carried out to find out the level to which financing public debt through GDP-Indexed Bonds could be predicted by the independent variables. This section presents the coefficient of determination, Analysis of Variance, and regression coefficients. The findings as presented in Table 2 show that the independent variables (volatility of returns, the openness of the economy, government credibility, capital markets development) could only explain 90.8% of economic growth in Kenya (R^2 Squared = 0.908). An adjusted R^2 value of 0.902 was obtained. This shows that in this study the population from which the study sample was obtained could explain 90.8% variance in the applicability of GDP-indexed bonds to finance budget deficit in Kenya

Table 2: Coefficient of Determination

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.953 ^a	.908	.902	.02582

a. Predictors: (Constant), Volatility of Returns, Capital Markets Development, Trade Openness , Government Credibility

Table 3 shows that the combined influence of the independent variables could statistically and significantly predict the applicability of GDP-Indexed Bonds to finance budget deficits in Kenya ($F= 136.00$, $p<0.05$).

Table 3: Analysis of Variance

ANOVA ^a						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	.363	4	.091	136.000	.000 ^b
	Residual	.037	55	.001		
	Total	.399	59			

a. Dependent Variable: Budget Deficit

b. Predictors: (Constant), Volatility of Returns, Capital Markets Development, Trade openness, Government Credibility



The regression coefficient shows that all the independent variables could statistically predict the applicability of GDP-Indexed bonds to finance budget deficit in Kenya (P values <0.05). Standardized Beta Coefficient were also obtained as follows: Openness of the Economy, = -1.227, t=-10.130, p<0.05; Capital Markets Development, =-0.709, t=-8.677, p<0.05; Government Credibility, = 0.987, t=7.529, p<0.05; Volatility of Returns, =0.129, t= 2.611, p<0.05). These findings indicate that a change in Openness of the Economy by -1.277; Capital Markets Development by -0.709; Government Credibility by 0.987 and; Volatility of Returns by 0.129 would lead to an increase in the applicability of GDP-Indexed Bond to finance budget deficit in Kenya by 1 unit each.

Using the unstandardized coefficients, the fitted regression model was as follows:

$$\text{Budget Deficit} = 1.825 - 0.028 * \text{Openness of the Economy} - 0.018 * \text{Capital Market Development} + 0.004 * \text{Government Credibility} + 0.010 * \text{Volatility of Returns} + 0.079.$$

Table 4:Regression Coefficients

Model	Coefficients ^a			t	Sig.
	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta		
(Constant)	1.825	.079		23.073	.000
Trade openness	-.028	.003	-1.227	-10.130	.000
Capital Markets Development	-.018	.002	-.709	-8.677	.000
Government Credibility	.004	.001	.987	7.529	.000
Volatility of Returns	.010	.004	.129	2.611	.012

a. Dependent Variable: Budget Deficit

4.4 Discussion of Findings

4.4.1 Influence of openness of the economy on financing public debt with GDP Index Bonds

The first objective of the study was to examine how the openness of the economy could influence the use of GDP-Indexed Bonds to finance the budget deficit in Kenya. Panel data for the years 2015 to 2019 were assessed on trade openness (exports plus imports as percent of GDP). The findings show that trade openness decreased steadily from 44.18% in 2015 to 33.4% in 2019. This shows that Kenya registered decreasing levels of trade openness during the period of study. This could have a negative influence on the attractiveness of GDP-indexed bonds as investors



are wont to invest in countries with high levels of trade openness. This could negatively influence the adoption of GDP indexed bonds and by extension economic growth as posited by Pilinkien (2016) who found out empirical interdependence between trade openness, economic growth, and competitiveness. Such openness could contribute to enhanced adoption of GDP-Indexed bonds in developing countries such as Kenya.

The study also sought to investigate the level of foreign direct investment (FDI) in Kenya between 2015 and 2019. This was particularly so since foreign direct investments show the receptivity of an economy to foreign investors. Higher volumes of FDI means that GDP indexed bond would be easily adopted and vice versa. The findings show a dip in FDI as a percent of GDP in 2016 to 0.57 from 0.97 in 2015. This was followed by increases in the level of FDI to 0.85 in 2017 and 1.85 in 2018. This however dropped significantly to 1.4 in 2019. These findings show that FDI was low and registered fluctuations over the study period. This could lead to dismal investors in stocks such as GDP indexed bonds. This buttresses the findings of Zahonogo (2016) who points out that trade openness enhanced economic growth. These findings are also in line with Adam Smith's Absolute Advantage Theory that posits that trade plays a key avenue for exchanging surplus goods with what is locally needed and that for this to take place, there is a need for openness in the economy (Emeka, 2010). As such, Adam Smith's Absolute Advantage Theory is relevant to this study since it is evident that trade openness influences economic growth.

4.4.2 Influence of Capital Markets Development on financing public debt with GDP Index Bonds

The second objective of the study was to assess how capital market development could influence the use of GDP-Indexed Bonds to finance the budget deficit in Kenya. The findings show that market capitalization, which is the amalgamation of the total publicly traded values of shares in the stocks market accounted for 32.614% of the nominal GDP in 2015. This rose and fell over the 5 years trade period to 26.077% of the nominal GDP. These findings show that the Kenyan capital markets were well developed which could influence the attractiveness of GDP indexed bonds if deployed. This corroborates the findings of Prochniak and Wasiak (2017) who was of the view that the ability of the economy to absorb various financial tools such as loans and bonds due to enhanced capital market development had positive influences on the economic growth of the country.

The study went on to study equities market performance. The findings show that between 2017 and 2019, the findings show that while several Sub-Saharan African



countries registered negative returns in their stock markets at the end of 2019, Kenya registered positive gains. However, the market performed unsteadily between 2017 and 2019. In 2018 there was negative performance. The market recorded ups and downs during the period. This shows that investors could predict the potential performance of stocks and bonds in the market using this data. The Kenyan equities market was weak compared to other countries in sub-Saharan countries. In this regard, its attractiveness to investors, if GDP-Indexed bonds were deployed, would be average. These findings corroborate those of Ikikii and Nzomoi (2013) which show that there were high correlations between capitalization, trade volume, and economic growth in Kenya. The findings further agree with Bist (2018) who points out that financial market development had a positive and significant impact on economic growth.

Interest Payments on treasury bills and treasury bonds accounted for most of the interest payments on domestic debt between 2015 and 2019. Interest paid on treasury bonds as of June 2019 was valued at 184.8 million Kenya shillings. This shows that interest on treasury bonds was more than double the value of treasury bills. Treasury bills and bonds had high levels of interest rates. This could enhance the attractiveness of GDP-Indexed bonds if deployed in Kenya as envisaged by Muawya (2019).

The study also sought to investigate net portfolio investment in Kenya. Portfolio investment is a group (portfolio) of assets such as equity, securities, stock, and bonds among others. The findings show that net portfolio investments increased steadily from USD 155.1 million in 2015 to USD 788.9 million. Portfolio investments however dropped sharply in 2018 and 2019 to – 624 million and -1000.3 million dollars. This shows a sharp drop in local portfolio investments in Kenya. This could reduce the attractiveness of GDP-indexed bonds in Kenya to local investors if deployed. This agrees with Narayanaswamy et al. (2017) who point out that capital market development affects the adoption of financial assets such as GDP-Indexed bonds in Kenya.

Conversely, 2018 and 2019 saw sharp increases in Kenya's Foreign Portfolio Investment when expressed as a percentage of GDP. This shows that foreign Portfolio investment increased significantly after an abrupt dip in 2017 which was accountable to uncertainties related to the 2017 General Elections. This shows the importance attached to Kenyan financial assets such as securities and bonds by foreign investors increased significantly in the last two years. This could enhance the attractiveness of GDP-Indexed bonds in Kenya if they were deployed as posited by Kapaya (2020). These findings further agree with Muawya (2019) who points out that capital market development could facilitate the adoption of GDP-Indexed Bonds to finance the



budget deficit.

4.4.3 Influence of Government Credibility on financing public debt with GDP Index Bonds

The third objective of the study was to explore how government credibility could influence the use of GDP-Indexed Bonds to finance the budget deficit in Kenya. Various measures of government credibility were used to assess the level of government credibility during the study period. The findings are presented in the following sections. To begin with, the ease of doing business was assessed. The findings show that the ease of doing business improved steadily from position 113 in 2015 to 56 out of 130 economies in 2019. This shows that the government had put in place policies aimed at making the business environment conducive for investors. This could have positive effects on the attractiveness of the Kenyan economy to investors since the business environment created by the government plays a crucial role in the adoption of financial instruments (Hanish, 2005).

Kenya's corruption levels were also assessed. This stems from the fact that corruption hinders a government's ability to enforce its laws. It could also make policy implementation untenable. Since GDP-Indexed bonds were highly dependent on the ability of the government to honour its bonds, corruption could affect the attractiveness of Kenya to investors. The corruption index ranks countries on a scale of 0 (very corrupt) to 100 (very clean). Kenya ranked 137 least corrupt out of 180 countries. This shows that Kenya had high levels of corruption. This could thus challenge the ability of Kenya to deploy GDP-Indexed bonds to finance public debt. These findings agree with a report by the World Bank (2013) that shows that the lack of government credibility due to rampant corruption means that economic growth faces periodic slumps due to the inability to attract sufficient and sustainable international funding. These findings buttress those of the United Nations (2005) that shows that although developing countries may be interested in GDP indexed bonds, they are less attractive to investors than in developed countries due to the risks associated with a potential default.

These findings show that government credibility was a major stumbling block to the potential use of GDP-Indexed Bonds to finance the budget deficit in Kenya. This is in line with Roldos (2004) who points out that challenges related to lack of credibility, lack of transparency, and limited liquidity in the market could contribute to poor absorption of government bonds as was the case with Mexico. These findings also corroborate those of Hanish (2005) who argue that central banks should put in place mechanisms for buttressing their credibility in fighting inflation. If this was not done,



the willingness of investors to trade with a government that lacks credibility to control the macroeconomic environment in which GDP-bonds are traded could check their willingness to trade in such bonds.

4.4.4 Influence of Volatility of Returns on financing public debt with GDP Index Bonds

The last objective of the study was to determine how the volatility of returns could influence the use of GDP-Indexed Bonds to finance the budget deficit in Kenya. The findings show that the Kenya Eurobond that was issued in 2014 saw increases and declines within the 5 years. It remained below the 6.9% anticipated yield in most of 2017 and early 2018, which could be explained by the volatile electioneering period. Though it saw a spike in November 2018, it saw declines since the beginning of 2019 and was still in decline in July the same year when the last data was collected. This shows that the yields of the bond were not steady and were characterized by high volatility. This could have negative effects on the propensity of Kenya to successfully deploy the GDP-Indexed bond which corroborates the findings of Brueckner and, Carneiro (2017) who pointed out that trade volatility affected the confidence of investors.

The findings also show that the NSE All-Share Index (^NASI) Stock Profile. The findings show that the Price to Earnings Ratio (P/E) of 11.6x as of June 2019 was below the historical average of 13.3x based on data for the last 10 years (Cytonne Report, 2019). The findings show that for most of the period under investigation in this study (2015-2019), the NASI P/E was below the average. This shows the high volatility of the stock prices and earnings ratio. This could erode investor confidence, leading to reduced attractiveness of GDP-indexed bonds if they were deployed in the Kenyan market. These findings agree with those of Viceira (2012) who points out that in economies where high levels of volatility of returns are anticipated, investors may shun some forms of bonds.

The yield projection for 24 years shows that government securities were anticipated to see a steady increase in yield from 6.6% in the first year to 12.9% by the end of the 24 years. This could enhance investor confidence and act as an incentive to the possible adoption of GDP-Indexed bonds to finance budget deficits if deployed in Kenya since the anticipated returns were expected to be stable. These findings buttress those of Brueckner and Carneiro (2017) that shows that trade volatility could deter the confidence of investors and have negative impacts on economic growth.



4.4.5 Use of GDP-Indexed Bonds to Finance budget deficit in Kenya

The dependent variable was economic growth in Kenya. Panel data on revenue, expenditure, and budget deficit in Kenya show that the country registered immense deficits during the 5 years. There were deficits for all five years ranging from 0.5 trillion Kenya shillings in the 2015/16 financial years. This increased to 0.7 trillion Kenya shillings in 2016/17 and dropped to 0.6 trillion shillings in 2017/18. It then climbed again to 0.7 trillion Kenyan shillings in both 2018/2019 and 2019/20. This shows that Kenya had high budget deficits which could be bridged by deploying the GDP-Indexed bonds among other financial innovations as posited by Seetanah et al. (2009) and Consiglio and Zenios (2018). Deploying GDP-Indexed bonds in the country was thus recommendable.

5. CONCLUSION AND RECOMMENDATIONS

The findings from multiple regression show that openness of the economy, government credibility, capital markets development, and volatility of returns had significant relationships with the feasibility of GDP-Indexed Bonds to finance budget deficits. Findings from the multivariate regression model showed that the combined influence of independent variables could explain the use of GDP-indexed bonds to finance budget deficits in Kenya though the model was strong. F-test also showed that all the independent variables combined could statistically and significantly predict the feasibility of the use of GDP-Indexed Bonds in Kenya. Regression coefficients for all the independent variables were also significant. In this regard, the level to which the independent variables could statistically predict the feasibility of the use of GDP-Indexed bonds to finance economic growth in Kenya was ascertained by the regression model. It could thus be concluded that ensuring openness of the economy, development of capital markets, the credibility of the government as well as the predictability and steadiness of stocks returns could enhance the adoption of GDP-Indexed bonds to finance budget deficits in Kenya. This means that if the profitability of government-issued bonds was assured, if investors were assured that the capital market could successfully absorb GDP-Indexed bonds and, if the government could be relied upon to keep the economy stable, the ability to deploy innovative financial tools such as GDP-Indexed bonds to finance Kenya's budget deficit could be enhanced.

The following recommendations are made. The government needs to put in place policies for checking corruption and for enhancing its credibility among local and foreign investors. There should also be efforts of ensuring that fiscal rules and the associated legislation is stable and does not change erratically to maintain investor



confidence. The openness of the economy should also be enhanced to make it able to absorb different financial tools without problems. Limitations posed by taxes and any inflexible trade laws should be dealt with. The government should also constantly revise its legal and policy frameworks to ensure that capital markets adapt to emergent capital market demands to make the country competitive in the international arena. Mechanisms for checking market shocks should be put in place to ensure the volatility of stocks is checked and that the anticipated return from stocks is kept positive.





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