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RELATIONSHIP BETWEEN PUBLIC DEBT AND FINANCIAL DEVELOPMENT IN KENYA

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Relationship Between Public Debt and Financial Development in Kenya

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Abstract

Purpose: This study sought to analyze the relationship between public debt and financial development in Kenya. The specific objectives were to examine the association between public domestic debt and financial development, to analyze the connexion between public external debt and Kenya's financial development. The study was underpinned on Financial Repression, Financial Liberalization, Lazy Bank Hypothesis, Demand following hypothesis, and the MacKinnon theoretical model.

Methodology: The study applied positivism philosophy and explanatory research design. The study used country data hence no need for sampling. Data was collected for 1964 to 2019 from Kenya's Central Bank. Descriptive and inferential statistics were used in the study. Diagnostic tests such as Multi-collinearity, Auto-correlation, Normality, and Unit root were performed. Specifically, the long-run and short-run relationships were analyzed using the Auto-Regressive Distributive lag (ARDL) bound test for cointegration. An error correction model was applied to examine the short-run association.

Finding: The test suggested the presence of a stable long-run relationship between financial development, public domestic debt, public external debt, and interest rate. The study finding indicates that public domestic debt has a statistically significant negative relationship with Kenya's financial development both in the long and short run. Also, public external debt has a statistically significant positive long and short-run association with financial development.

Unique Contribution to Theory, Practice and Policy: The affirms liberalization theory by Shaw and Mackinnon (1973), advocating for a reduction in direct government participation in the financial market credit restriction. In addition, the study's findings are consistent with the lazy bank hypothesis by Hauner (2009). In addition, the government must ensure appropriate market-determined interest rate must be applied in domestic public debt. Furthermore, the government should continue fostering financial liberalization policies that encourage public external debt has its impacts positively on financial development.

Keywords: *Public Domestic Debt, Public External Debt, Financial Development*

INTRODUCTION

Financial development is the expansion of the financial market and the institutions resulting from creating an innovative financial product and other related products (FitzGerald, 2006). Financial development in a country minimizes the adverse effects of the volatility of the rates of currency exchange on a firm's liquidity and increases long-term investment (Aghion, Marios, George, Abhijit&Kalina, 2010). According to Ayadi (2013), a well-developed and structured financial system enhances effective and efficient resource allocation, which increases savings and foreign capital inflows. Besides, Raman and Mustafa (2014) assert that a developed financial sector provides investors with a wide range of financial assets with differences in returns, risks, and maturity.

Huang (2011) asserts that institutional quality (legal and regulatory environment), geographical characteristics including the endowment of resources, level of income, cultural characteristics, population-level and macroeconomic policies including inflation, level of private investment, are the influencers of financial development. The study concludes that the government's financial repression policies tend to harm financial development; furthermore, trade, and capital account liberalization influence financial development (Law & Demetriades, 2006). Ndaluh (2018) concluded that institutional quality, financial openness, economic growth, trade openness, and appropriate government policies positively affect Kenya's financial development.

The global financial development exhibit a slow increase in the year 2018. In particular, development in Euro reduced in the year 2018 compared to 2017, mainly due to factors including fiscal policy uncertainty and weakness in consumer and business feelings (Central Bank of Kenya, 2019). In 2019, the advanced countries experienced higher financial development due to favorable financial conditions, including monetary policy normalization (Global Financial Stability Report, 2019). The report further identified corporate debt burden, a higher holding of illiquid assets and increasing reliance on external borrowing as a critical vulnerability of emerging market development. Despite extensive financial reforms like interest rate and price liberalization, elimination of credit ceilings and financial regulations, undertaken by African countries between 1990 and 2010, African financial development indices averaged 25%, which is below the standard depicted by other developing countries (Allen, Carletti, & Cull, 2014).

Africa Financial Market index report (2018) indicates that Africa's corporate bond market remains small, with many countries facing financial challenges. The report further shows that African countries' financial market development continues to be low, with average market capitalization for 20 countries averaging 56% with substantial variation between states. The market also experiences low liquidity, few financial products, low turnover, and a thin secondary market (Africa Financial Market index report, 2018).

In Kenya, the government initiates financial market transformation programs to foster financial development (Kenya Vision,2007). Despite the financial revitalization programs, including regulatory changes and liberalization, the Kenyan financial sector developed was extremely poor for 2007-2012 (Republic of Kenya, 2014). Furthermore, the gross national saving to GDP declined

from 15.4% in 2007 to 10.4% in 2011. Besides, total financial investment to GDP rose marginally from 20.1% in 2011 to 21.9% in 2013 against the 32% target (Republic of Kenya, 2014). The Medium-Term Plan II projected gross saving of 20.9% and investment to GDP of 27.6% while the actual gross saving and investment to GDP were 13.5% and 22.5%. The Kenyan financial market remained relatively less vibrant during the year 2017, with stock market liquidity ratio reducing to 6.81% against 7.62% in 2016 (Central Bank of Kenya, 2017).

The Kenya's financial development trends is, as indicated in Figure 1.

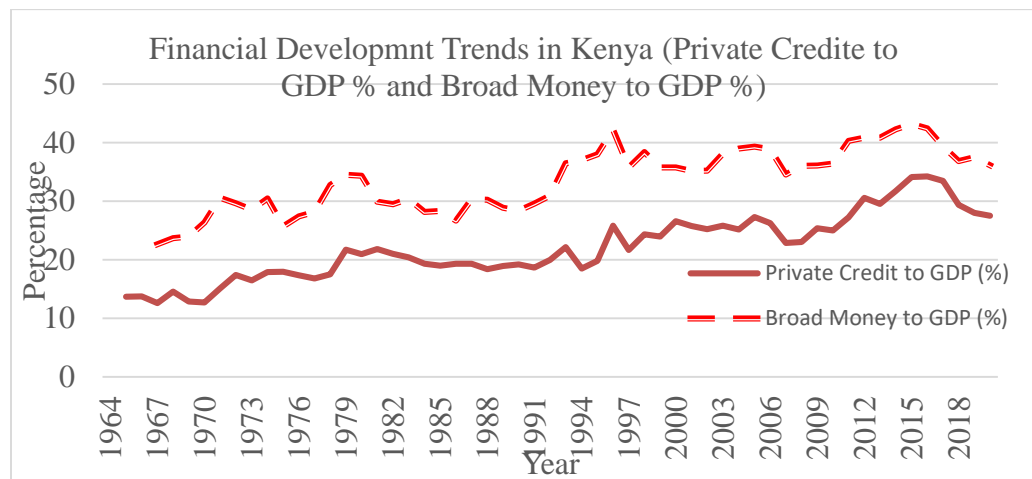


Figure 1: Trend of Financial Development in Kenya for the Period 1964-2019

Source: World Bank Data (2022)

Figure 1 displays Kenya's financial development trend indicated by private credit and broad money to Gross Domestic Product percentage and Broad Money to GDP percentage for 1964-2019. A continuous upward trend is observed between 1964 and 1980 for the two measures, mainly due to financial liberalization policies. Private credit to GDP percent has been below Broad Money to Gross Domestic Product throughout the period. The private credit to GDP increased from 22.76% in 2006 to 25.38% in 2008 but declined to 24.52% in 2009. All two measures of financial development measures indicated a decline for the period 2015 to 2019. In this period, Private Credit and Broad money to GDP percent dropped by a significant 6.6987% and 7.0656%, respectively.

On the contrary, most developing countries' public debt levels continue to rise over time as the government strives to finance infrastructural projects (Mirac, 2016). In particular, the Sub-Saharan countries have recorded considerable growth in public debt with treasury bills and treasury bonds being the majority of local financial institution investment (Greene, 2013). The Kenya non-concessional public debt continues to rise with concessional loans declining, and it is projected that expensive commercial loans could be the largest component of external debt (World Bank,

2016). Kenya's total public debt was Kes 4,406,863 million, Kes 5,047,234 million and Kes 5,809,076 million as at the end of 2017, 2018 and 2019, respectively (Annual Debt Management Report, 2019).

According to Odhiambo, Chemnyongoi, Gachanja and Karuoro (2017), Kenya's external debt depicted an upward trend from 2007 to 2017 rising from 21.7% to 29.6% of GDP. The bilateral debt component of external debt rose from 35.3% in 2007 to 38.9% of external debt in 2017. The proportion of external commercial loans increased from Kes 574 million in 2007 to Kes 634 million, representing 29.4 % of external public debt. Kenya's total debt was above the East Africa Convergence criteria of 50% of GDP from 2016 to 2018 (United Nations Economic Commission for Africa, 2018). Growth in public debt may be contractionary in countries with low financial deepening (Christensen, 2005)

Since 1963, the Kenya government has continued to accumulate internal and external public debt (Kenya Debt Relief Network, 2009). Figure 1 indicates the Trend of total public debt to GDP (%) for Kenya between 1963 and 2019.

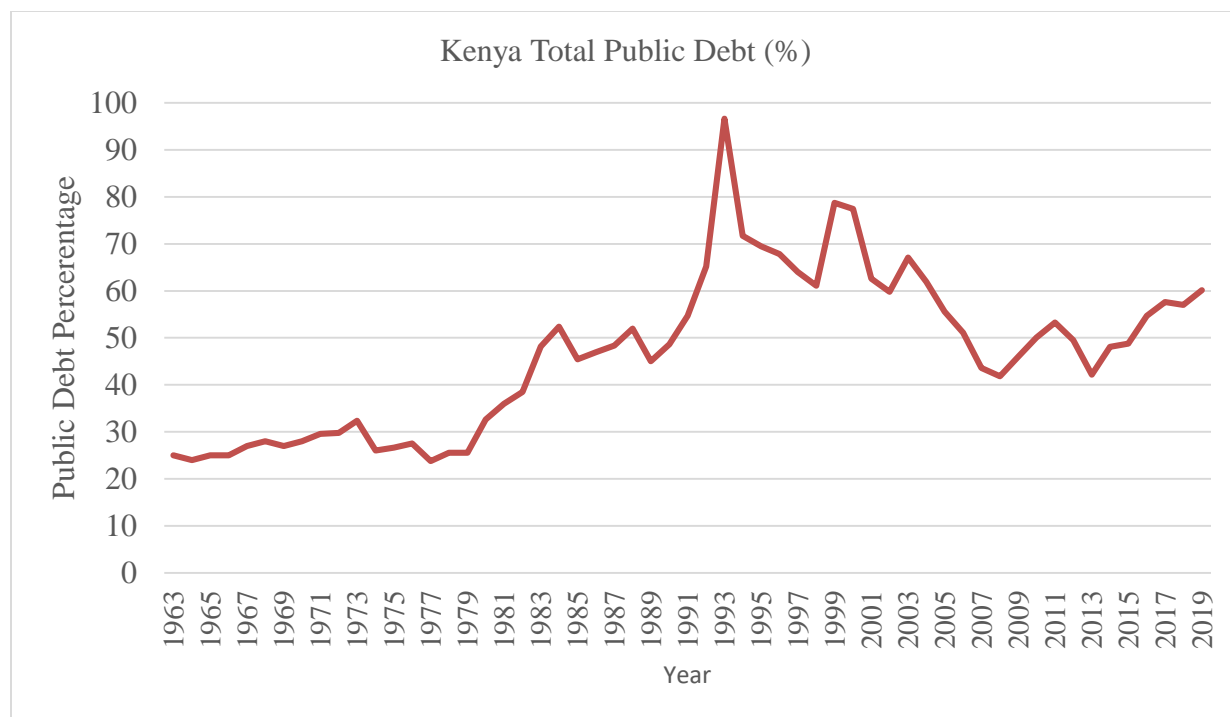


Figure 2 Total Public Debt- GDP ratio for Kenya from 1963 to 2019

From Figure 2, it is evident that Kenya's total debt had a slow growth rate between 1963 and 1977. A sharp increase is noted for 1979 and 1993, where debt grew from 16% to 96% representing an 80% increase. Public debt ratio dropped 66% in 1993-1997. A 24 % growth is observed for the period 1997-2003. Subsequently, the ratio fell to 38% in 2007. The figure indicates that debt to

GDP increased from 38% in 2007 to 44% in 2013. Total public debt growth averaged 42.2% and 60.15% in the year 2013 and 2019, respectively.

Hauner (2006), using the Lazy Bank hypothesis, asserts that excessive purchase of public debt by financial institutions renders the financial institutions comfortable with the easy profit. The easy profits drive the financial institutions away from competition over clients and reduce financial institutions' cost-effectiveness that adversely impacts financial development. Emran and Farasi (2009) opined that excessive public debt might create moral hazards that prevent the financial institution from exploring viable opportunities. Hauner (2009) asserts that a rise in government debt increases financial institution profitability but reduces financial deepening and efficiency.

An under-developed public bond market may make credit risk and equity pricing difficult due to lack of an appropriate benchmark yield curve slowing down the derivative market's development and makes risk diversification hard (Kunhof & Tanner, 2005). According to Herring and Chatusripitak (2007), the market forces should determine the public debt yield rate to minimize information asymmetry, leading to the loss of vital information. Ayadi, Groen, Arbak, and Naceur (2013) argue that public debt negatively impacts on financial development through the reduction of credit, but capital inflows increase income and thereby national saving and, therefore, positively impacts on financial development

Abbas and Christensen (2010) argued that holding a moderate level of public debt by financial institutions increases competition, boosts saving, reduces black economy size, enhances investment efficiency. The improved investment develops the required track record for international issuance and reduces risks critical for economic efficiency hence countering the inefficiency resulting from public debt. Janda and Zetek (2015) argued that since the government is the leading financier of small and medium enterprises, a rise in government debt might negatively impact the pricing of finances due to the demand-supply consideration of rising in country's financial risk.

Kutivadze (2011), on the contrary, asserts that government debt positive effect on the improvement of the domestic financial market. Altavilla, Pagano and Simonelli (2016) stated that state debt hinders the local financial market's extension mainly through the liquidity and risk channel. Although public debt provides liquidity during stress, it creates an incentive for the government to postpone fiscal adjustment until public debt becomes substantial (International Monetary Fund, 2015). According to Affonso and Jallies (2017), public external debt composition and structure have different time-varying effects on financial development. Public external debt enhances financial sustainability when the debt is held in central banks. According to Mirac (2016), public debt may, directly and indirectly, impact the financial sector development, and the direction of the impact depends on economic development and the nature of the country's public debt. According to Altaylıgil and Akkay (2013), the threshold at which public debt harms the financial sector development depends on the current economic growth levels and the amount of public debt of a country.

Statement of the Problem

Financial development is essential in mobilizing savings, private credit expansion and financial services access by the poor (Rodrik, 2013). According to Allen, Carletti and Cull, (2014), African financial development indices, private credit to Gross Domestic Product, for the period 1990 to 2010 averaged and 25%, which is below the standard depicted by other developing countries. To spur financial development, the Kenyan government initiated various financial market revitalization programs like regulatory changes, bond market growth, and liberalization to enhance financial development in the mid-1980s (Nyaoma, 2006). However, despite these programs, Kenya continues to experience decline credit growth and low access to financial services. World Bank (2019), asserts that Kenya's private credit to Gross Domestic Product averaged 30.9% compared to Sub-Saharan Africa's mean of 46% and developing countries' average of 81.4%. Kenya scored poorly in financial development with low financial product diversity (Absa Africa Financial Report, 2019). Further, financial development measure, private credit to GDP, declined by 8.5860 % between 2015 and 2019 (World Bank Data, 2020)

On the contrary, Kenya's overall public debt ratio increased from 42.1% in 2013 to 61.10% in 2019 (Annual Public Debt Management Report, 2019). According to the International Monetary Fund (2016), the Kenya public debt threshold is set at 50% of GDP. Several studies undertaken on public debt and financial development have provided varied and inconclusive results. Karel and Kravtsov (2017), analyzing the effects of government debt on financial development in Central and Eastern Europe, concluded that public debt positively impacts financial development in the short-run. Besides, Kutivadze (2011), analyzing the association between public domestic debt and financial development, established a positive connection between government debt and financial development. On the contrary, and Hauner (2009), examining the effects of public domestic debt on financial development in 73 medium-income countries, concluded that public debt beyond a given threshold is harmful to financial development. The level at which public debt turns harmful is unknown and country-specific studies are needed.

In Kenya, a majority of studies on financial development, including Odhiambo (2009), Onuonga (2014), and Ndalu (2018), focused on the influence of interest rates, inflation rates, trade openness, and economic development on financial development with limited studies on the association between public debt and financial development. Therefore, this research intends to address the identified gap by analysing the relationship between public debt and financial development in Kenya.

The Objective of the Study

The study's main objectives were:

1. To examine the relationship between domestic public debt and financial development in Kenya,
2. To analyse the relationship between external public debt and financial development in Kenya,

Research Hypotheses

The study Hypotheses are:

H₀₁: There exists no significant relationship between domestic public debt and financial development in Kenya,

H₀₂: There exists no significant relationship between external public debt and financial development in Kenya,

THEORETICAL REVIEW

Financial Repression Theory

McKinnon postulated the financial repression philosophy in 1973. The theory postulates that most developing countries' financial systems are repressed through some government interventions including nominal interest rate control, high reserve requirement and increased public debt through the mandatory holding of government debt by the financial institution at a relatively low-interest rate. McKinnon stated that several developing economies prevent financial institutions from functioning effectively by restricting competition using government intervention and policies. According to McKinnon, a repressed financial system, the return rate is too low, hence low saving. According to McKinnon, when the government is faced with a revenue shortfall, it may institute financial repression policy measures to collect tax from the financial sector, which may negatively affect financial development. Interest rate controls drive a wedge between social and private return on investment, distorting intertemporal decision-making in an economy. A low-interest rate forces investors to shy away from investing in the financial system and focus on acquiring real assets. The holding of real assets discourages financial development as it denies potential investors the finances required to stimulate private investment. In a repressed financial system, financial savings are restricted to cash, demand deposits and time deposits. McKinnon asserts that a repressed financial system ejects saving due to the low rate of returns otherwise obtained in a competitive financial sector, inhibiting financial development by restricting competition.

Financial Liberalization Theory

Financial liberalization theory was advanced by the scholars McKinnon and Shaw in 1973 to improve financial repression policies' theoretical school. The theory advocates for market-determined interest rates, lack of direct credit programs, reduced financial institution dependence on government, and free capital inflows with receipts being made in foreign currency. Market determined interest rate increases domestic saving, allowing borrowers to shift from informal to the formal financial market, fostering financial development. Investment in the formal financial market increases the credit to the economy, which promotes financial development

Lazy Bank Hypothesis

The Lazy Bank Hypothesis was developed by Hauner in 2009. The hypothesis asserts that large holding of public debt by financial institutions renders the financial institutions comfortable with the easy profit obtained and drives them away from competition over clients, impacting financial

development. The financial institution that majorly lends to the government lacks the incentive to develop new products that affect financial development. The Cost-effectiveness of the financial sector is reduced through the lazy bank view despite increasing profitability. Hauner (2009) further asserts that increased competition and financial liberalization are critical in minimising domestic government loans' adverse effects on financial development.

Demand-Following Hypothesis

Patrick Hugh developed this hypothesis in 1966. The demand-following hypothesis asserts that financial institutions' creation follows the institution's demand created through the economic growth process. The hypothesis affirms that financial assets and related financial services resulting from the demand by savers and investors created through economic growth. Patrick (1966) opines that government must maintain a reasonable size of public debt, reduce direct government participation in the financial market and enhance confidence in the financial market to ensure efficient resource allocation that spurs economic development essential in financial development. The government should only issue public debt when the private sector diverges from optimal allocation due to the high risks (Patrick, 1966).

Empirical Review

Altaylıgil and Akkay (2013) used regression and principal component score method to analyze the connection between the independent variables' domestic debt and the dependent variable financial development in Turkey between 2002-2012. Financial aggregate was used to measure financial development, while domestic debt to GDP was used to measure public debt. The interest rate margins, the turnover ratio, and the current inflation variables were controlled in the study. Growth in domestic indebtedness was found to affect financial development adversely. Decreasing the domestic debt levels allowed the Turkish financial sector to lend more to the private investors, which positively influenced financial expansion. This study was done in Turkey while the current study was in Kenya, a developing country.

Makambi, Muhindi, and Nduku(2017), using the Auto-Regressive Distributive Lag and Markov switching models, investigated the influence of government debt on private credit in Kenya's fiscal regime changes between 1966 and 2014. The researchers concluded that policy changes and economic shocks trigger fiscal regime changes in Kenya. According to the research, fiscal policy reforms were critical in explaining the existing co-relationship between the public debt in an economy and its other private credits. The current study explored the relationship between public debt and financial development using a robust autoregressive lag method.

Mogaka (2017), using multiple regression method, explored the effects of government loans on East Africa Community Member countries' financial market expansion. Stock market capitalization to GDP(%) and log of total debt value in USD was used to measure financial development and domestic debt. A significant positive association between domestic public debt and financial market development is observed in all the countries. The current study used most

recommended measure of public debt(public debt to GDP rather than the one applied by Mogaka(2017).

Bordo and Messer (2007) studied the external debt (foreign currency debt) and the financial crisis association between 1870 and 1913 in advanced and emerging economies using probit. The study's dependent variables were the first year of the government debt crisis or banking crisis or twin crisis. The regressors included hard-currency to total government loans, Square of the hard-currency debt ratio, and debt to revenues. The Study applied the probit methodology for the analysis of the data. Bordo et al. (2007) found a quadratic affiliation between debt frequency and financial crises suggesting that foreign currency debt may hamper financial development. The current study analysed the effects of external debt in Kenya an emerging economy.

Mbulawa (2015), applying fixed effect and dynamic Gaussian Mixture Model (GMM) estimators, analyzed the determinant of financial development for eleven Southern African Development Community countries. Financial development was measured using domestic credit, while the Trade Openness represented the explanatory variable, Inflation Per Capita GDP, Interest Rate, and Credit advanced to the public sector. The study established that GDP, financial openness, and interest rate positively impact the selected countries' financial development. Further, for any meaningful financial development to occur, a government must maintain low public debt levels and ensure favorable monetary and credit policies.

METHODOLOGY

For this study, positivism philosophy was used. This study applied the explanatory research design. The study was based on the McKinnon model advanced by McKinnon. According to McKinnon, a positive connection exists between financial development, deposit rate of interest, and real income resulting from money and capital complementarily. The MacKinnon Model is specified as in equation 1:

$$FD = f(r, Y, INT) \quad (1)$$

Where FD=Financial Development Measure (Private Investment to GDP), Y=Real GDP, r=rate on return on the non-financial asset while INT= real interest rate. MacKinnon asserted that financial development results from high-interest rates and credit expansion. The Model posits that restrictive government policies on credit and money market must be eliminated for greater capital allocation within the financial system. An increase in the real interest rate is believed to enhance financial development since more savings are held in financial assets than non-financial assets, which improves efficiency in the financial sector. To consider the effects of government in financial development, the MacKinnon model is extended as specified in equation 2.

$$FD = f(r, INT, G) \quad (2)$$

Where G is the Government involvement in the financial sector. To examine the association between public debt and financial development in Kenya, the McKinnon Model was extended to include domestic and external public debt. The extension was as used in the Mirac (2016) empirical study. The empirical model of the study is as specified in equation 3.

$$FD_t = \beta_0 + \beta_1 PDD_t + \beta_2 PED_t + \beta_3 INT_t + \mu_t \quad (3)$$

FD=Financial Development, PDD=Public debt Domestic. PED=Public Debt External, INT=Real Interest rate,

Equation (3) was transformed into a natural log-form econometric equation as indicated in equation (4) to eliminate heteroscedasticity and reduced the sharpness of the data as suggested by Shahbaz, Rehman and Afza, (2016).

$$\ln FD_t = \beta_0 + \beta_1 \ln PDD_t + \beta_2 \ln PED_t + \beta_3 \ln INT_t + \mu_t \quad (4)$$

Where ln=natural logarithm.

The secondary was on public domestic debt, public external debt, interest rate, and financial development was collected for 55 years from 1964 to 2019. The data were collected from World Bank, annual economic survey reports, Annual Debt Management Reports, KNBS Statistical Abstract, and the CBK website..

The OLS will then fitted using the following equation at level.

$$\ln FD_t = \beta_0 + \beta_1 \ln PDD_t + \beta_2 \ln PED_t + \beta_3 \ln INT_t + \mu_t \quad (5)$$

An Error Correction Model (ECM) was to be fitted if cointegration exists

For this study, the researcher performed diagnostic tests. Multicollinearity using Variance inflation factor, Heteroscedasticity was tested using the Breusch-Pagan-Godfrey test, Autocorrelation Breusch Godfrey test was applied to examine the null hypothesis of no autocorrelation, Normality Jarque-Bera (JB) test, and Unit root tested using Augmented Dickey-Fuller (ADF) (1981). Any violation of the CLRM assumption was corrected appropriately. In addition, Cointegration test using Autoregressive Distributive Lag (ARDL) Pesaran, Shin and Smith (2001)

FINDING, RESULTS AND DISCUSSIONS

Correlation Test Results

A correlation test was performed to analyse the association between the public debt, interest rate, inflation, exchange rate, and financial development variables. Table 1 presents the correlation test results with corresponding t-statistic and probability.

Table 1: Correlation Test Results

Variables	Financial Development	Public Domestic Debt	Public External Debt	Interest Rate
Financial Development	1.0000			
Public Domestic Debt	0.1733	1.0000		
Public External Debt	0.8652***	0.3290**	1.0000	
Interest Rate	0.3449**	0.8087***	0.4174**	1.0000

The correlation results provided in Table 1 indicate that public domestic debt has a statistically insignificant positive correlation with financial development ($r=0.1733$, $p>0.10$). This result contradicts Hauner (2006), who argued that excessive public domestic debt is detrimental to financial development as it reduces competition over clients and reduces the cost efficiency of financial institutions. The results also indicate that public external debt has a statistically positive correlation with financial development ($r=-0.8652$, $p<0.00$). This result disagrees with Bordo and Messer (2007), who asserted that public external debt might precipitate currency run in developed countries, negatively affecting financial development. The results further show that inflation negatively correlates with financial development ($r=-0.3942$, $p<0.050$). The results agree with Khan, Senhadji, and Smith (2006), who asserted that inflation is detrimental to financial development. In addition, Public domestic debt exhibit a positive correlation with interest rate ($r=0.8087$, $p<0.05$). Further, Public external debt has a significant correlation with interest rate ($r=0.8080$, $p<0.010$).

Cointegration Test Results

Cointegration is performed to determine if the variables exhibit meaningful long-run relationship and avoid running spurious regression. ADF unit root test suggested that public external debt and inflation were stationary at a level. In contrast, financial development, public domestic debt, interest rate, and exchange rate variables were stationary after first differencing, therefore integrated at level one (1). As suggested by Pesaran and Shin (2001), if the study variables are a combination of $I(0)$ and $I(1)$ but not $I(2)$, then the presence of cointegration tested using the Autoregressive Distributive Lag (ARDL) approach. The model in equation 3.5 was first estimated using the ordinary least square method with lag one as selected using Akaike Information criteria (AIC), Schwarz information criterion (SC), and Hannan-Quinn criterion. After estimation, the researcher performed an F-test on the joint significance of the lagged variables in level. The null hypothesis that the model exhibits no cointegration was tested. The null hypothesis is rejected if

computed F-statistics exceed the upper limit of the critical values provided in the Pesaran table. The F-test Result is presented in Table 2.

Table 2: Cointegration Test Results

Variables	F=statistics	Level of Significance	Lower Critical Value	Upper Critical Value
	6.4138***	10%	2.72	3.77
		5%	3.23	4.35
Public Domestic Debt, Public external Debt and Interest Rate		1%	4.29	5.61

Note *** Represent statistical significance at 1%

The F-statistics was compared with the upper and lower values, as opined by Narayan (2004). From the results in Table 2 F-statistics (6.4138) is greater than the 1% upper bound value of Narayan (2004). The null hypothesis that no cointegration is rejected at a 1% significance level, suggesting a long-run relationship between financial development, public domestic debt, public external debt, and interest rate in Kenya. Rejection of the null hypothesis indicates a meaningful long-run relationship among the variables in the model. Confirmation of the presence of cointegration affirms the need to examine both long-run and short-run relationships of the model.

Long-run Association between Public Debt and Financial Development in Kenya

Brook (2008) asserts that cointegration indicates that a combination of the variables results in the long-run stationary process. As shown in Table 2, cointegration suggests that the study variables can be linearly combined to provide meaningful long-run relationships, as Brook (2008) suggested. Since cointegration was observed as indicated in Table 2, the variables were combined into a linear model as indicated in equation 6, and a long-run model was run to get the long-run relationship of the variables at levels using the ordinary least square method. The ordinary least square regression was applied to analyse the long-run relationship between public debt and Kenya's financial development. The following equation was estimated at level.

$$\text{LnFD}_t = \beta_0 + \beta_1 \text{LnPDD}_t + \beta_2 \text{LnPED}_t + \beta_3 \text{LnINT}_t + \mu_t \quad (6)$$

The output of the ordinary least square equation is as provided in Table 3.

Table 3: Long-Run Relationship Results

Dependent Variable: Financial Development				
Variable	Coefficient	Standard Error	t-Statistic	Probability
Constant	1.8191	0.2361	7.7040	0.0000
Public Domestic Debt	-0.3514	0.1163	-3.0194	0.0041
Public External Debt	0.3526	0.0757	4.6534	0.0000
Interest Rate	0.5487	0.1583	3.4645	0.0011

Adjusted R² = 0.9283 Durbin Watson =2.0673, Sum of Squared residual = 0.2114, Se=0.0670
 F =100.9106 [0.0000]

The results in Table 3 indicate that in the long run public domestic debt, public external debt, and interest rate explained 92.83% of the variation in financial development, as indicated by the R² value of 0.9283. The model is statistically significant as indicated by the probability of F-statistics (p=0.000; α=0.050), which is significant at one percent significance level. From the result in Table 8, the following long-run regression equation is extracted;

$$\ln FD = 1.8191 - 0.3514 * \ln PDD + 0.3526 * \ln PED + 0.5487 * \ln INT + 0.0670 \mu \quad (7)$$

The results in equation 7 show that public domestic debt exhibits a significant negative association with Kenya's financial development (p=0.0041; α=0.050). An elasticity coefficient of 0.3514 existing between public domestic debt and financial development suggests that a 1% growth in public domestic debt leads to a 0.3514% decrease in Kenya's financial development in the long-run. This result agrees with Altayligil et al. (2013), which asserted that decreasing public borrowing allows the private sector to advance more to private investors, hence fostering financial development. The results contradict Mogaka (2017), which affirms that public sector borrowing positively correlates with financial development.

On the contrary, public external debt exhibits a significant positive association with financial development in the long-run in Kenya (p<0.000; α=0.050) positive. A public external debt coefficient of 0.3526 suggests that a 1% rise in public external debt leads to a 0.3526% increase in Kenya's financial development in the long-run. The public external debt to financial development relationship is inelastic since a percentage rise in public external debt leads to less than a percentage rise in financial development in the long-run. This result disagrees with Bordo and Messer (2007), who argued that public external debt harms financial development. Besides, interest rates exhibit a statistically significant positive association with financial development (p=0.0011; α=0.050) at a 5% significance level. An elasticity coefficient of 0.5487 suggests that a

one percent increase in interest rate leads to a 0.5487% increase in Kenya's financial development in the long-run. This result confirms the study by Irungu (2012), which concluded that the interest rate positively influences financial development.

From the results in equation 7, the coefficients of the variables have the priori expected signs. The long-run equation's signs conform to reality since the rise in domestic debt forces the government to institute financial repression policies that harm financial development. On the other hand, an increase in public external debt and interest rate for the domestic financial market allows credit expansion; therefore, fostering financial development.

Short-Run Association between Public Debt and Financial Development

Since cointegration was confirmed through the ARDL bound test, the error correction model was estimated to determine short-run relationships in line with (Brook,2008). Error correction model aid in determining short-run association among the cointegrating variables. To determine the study variables' short-run relationship, the researcher regressed the long-run equation and extracted residual. The extracted residual was applied to produce the Error Correction Model Term. The extracted residual series was named Error Correction Term (ECT) and was applied to determine the study variables' short-run relationship. An Error Correction Model was generated using the following equation 8.

$$ECM = LNFD - [1.8192 - 0.3514 * LN PDD + 0.2527 * LN PED + 0.5487 * LN INT] \quad (8)$$

The ECM₁ was obtained by lagging the ECM once and was applied in the error correction model.

General to the specific approach of modelling developed by Hendry (1986) was applied to estimate the short-run dynamics. The general model applied in the study is as indicated below.

$$D(\ln FD) = \beta_0 + \beta_1 * D(\ln FD(t-1)) + \beta_2 * D(\ln PDD) + \beta_3 * D(\ln PDD(t-1)) + \beta_4 * D(\ln PED) + \beta_5 * D(\ln PED(t-1)) + \beta_6 * D(\ln INT) + \beta_7 * D(\ln INT(t-1)) + \beta_8 * ECM(-1). \quad (9)$$

First, the general model was estimated with differenced non stationary variables lagged two periods. The lag length two was selected as it is common practice when modeling annual time series, as suggested by (Athukorola and Sen, 2001).

Following Thomas's (1997) work, irrelevant variables or lags were eliminated from the general model to create a parsimonious model. Low t-ratios for the Error Correction Model was applied as the standard criterion for elimination. The model with the lowest Akaike Information Criterion and Schwarz Criterion was taken to be the specific model. The results of the specific error correction Model is, as indicated in Table 4.

Table 4: Specific Error Correction Model Output

Variable	Coefficient	Standard. Error	t-Statistic	Probability
Constant	0.0005	0.0099	0.0015	0.9988
D(LNFD(-1))	0.5723***	0.1838	3.1135	0.0031
D(LNPDD(-1))	-0.1617***	0.0526	-3.0725	0.0035
D(LNPED(-1))	0.1394***	0.0435	3.2014	0.0024
D(LNINT(-1))	0.2094**	0.0788	2.6549	0.0107
ECM(-1)	-1.0642***	0.2270	-4.6865	0.0000

Adjusted R² = 0.4667 DW = 2.0032, RSS = 0.2241, F (5, 20) = 8.4024[0.00000]

Note: D(lnPDD(-1)) = Difference log of Public Domestic Debt lag one, D(lnPED) = Difference log of Public External Debt, D(lnINT(-1)) = difference log of Interest rate lag one.

Note. * p<10%, ** p<5%, *** p<1%,

From Table 4 results, the short-run model with financial development as a target variable was extracted as shown in equation 10

$$D(\ln FD) = 0.0114 + 0.5723 * D(\ln FD(-1)) - 0.1617 * D(\ln PDD(-1)) + 0.1394 * D(\ln PED(-1)) - 0.2094 * D(\ln INT(-1)) - 1.0642 * ECT(-1) \quad (10)$$

The results in Table 4 indicate that public domestic debt, public external debt, and interest rate explain 46.67% of Kenya's financial development variation in the short-run as indicated by the adjusted R² value of 0.4667. The results further indicate that the error correction term has a negative coefficient (-1.064) as expected and is statistically significant (p=0.0000; α=0.050) at a 5% significance level. The negative statistically significant ECT coefficient implies that there will be a correction of previous errors in the subsequent period at a 106.4% speed towards long-run equilibrium. It is, therefore, concluded that deviations from the long-run associations are corrected in the following period.

From the results in equation 10, it is observed that the lagged public domestic debt coefficient is negative and significant (p=0.0035; α=0.050). The negative coefficient of the lagged value of public domestic debt indicates that the increase in public domestic debt in the previous period negatively affects Kenya's current period's financial development. The results suggest that a 1% growth in public domestic debt the previous year's public domestic debt results in a 0.1617 %

decrease in financial development in the current period. This result confirms the financial repression theory that public debt tends to affect financial development negatively.

In addition, the coefficient of the lagged value of public external debt is positively significant ($p=0.0024$; $\alpha=0.050$). The result suggests a statistically significant positive relationship between public external debt and financial development in the short-run. A 1% rise in public external debt in the previous period results in a 0.1394% increase in the current period's financial development. These results support the liberalization theory, which asserts that financial liberalization enhances financial development.

Further, the coefficient of interest rate is positive and statistically significant ($p=0.0107$; $\alpha=0.050$). The results suggest that a 1% rise in the previous periods' interest rate leads to a 0.2094% increase in financial development in the current year. The work affirms Mackinnon Shaw's hypothesis, which argued that a rise in interest rate increases private credit, enhancing financial development.

Test for Model Fitness Results

Model fitness diagnostic tests were performed to check the statistical reliability and correct specification of the preferred model. The researcher examined normality, heteroscedasticity, and serial correlation of the residuals for the long-run and specific short-run models. The summary of the model diagnostic is summarized in Table 5.

Table 5 : Model Fitness Results

		Long-run	Short-run
Normality test- Histogram	Jacque-Bera	1.1432	
	Probability	0.5646	0.6402
Breusch-Godfrey serial autocorrelation LM test	Observed R-squared	0.2228	0.1133
	Probability	0.7260	0.7363
Heteroscedasticity	F-statistics	1.3626	0.9684
	Probability	0.5725	0.4466

Table 5 reports the summary results for the model fitness results for both the long and short-run models. Jarque-Bera (JB) test was applied to test for the normality of the residuals. The probability of the Jacque-Bera test statistics was 0.5646 and 0.8916 for the long-run and short-run models, respectively. The Jacque-Bera test probabilities for both the long and short run is above the 5% significance level. The conclusion is that the models' residuals are normally distributed for both the models. The null hypothesis that residual exhibits no serial autocorrelation tested. The p-value for the long and short-run were 0.7260 and 0.6402. The p-value is more than 5% significance

level hence the null hypothesis that residual exhibit serial autocorrelation was rejected, implying no autocorrelation

Further, the null hypothesis that the error term is heteroscedastic was tested using the Breusch-Pagan-Godfrey test. The null hypothesis that the residual exhibit heteroscedasticity was tested. The null hypothesis was rejected if the probability value was less than a 5% significance level. From the result, in Table 5, the p-values for the F-statistics are 0.5725 and 0.4466 for the long-run and short-run models. The p-values for both the long-run and short-run model is more than a 5% significance level. The null hypothesis that the errors are heteroscedastic is rejected at a 5% significance level. It is concluded that the error terms do not suffer from heteroscedasticity

Hypothesis Testing Results

H₀₁: There exists no significant association between domestic public debt and financial development in Kenya.

The null hypothesis (H₀₁) that no significant long-run relationship between public domestic debt and financial development in Kenya was tested using the ordinary least square methods (OLS) after testing for cointegration. When the probability value is 0.05 or greater, the H₀₁ is not rejected, indicating that domestic debt and financial development exhibit no significant relationship.

From the long-run regression results in Table 3, the null hypothesis is rejected since the public debt coefficient was statistically significant ($p=0.0041$; $\alpha=0.050$) at a 5% significance level. This suggests a long-run association between public domestic debt and Kenya's financial development. The result shows that a 1% rise in public domestic debt results in a 0.3514% decrease in financial development in the long-run. These results disagree with Mogaka (2017), who opined that public domestic debt has a positive relationship with Kenya's financial development. The results further collaborate on Mbulawa (2015) finding, who advocated for reduced public domestic debt to foster the government's effective monetary and credit policies.

In addition, null hypothesis that no short-run relationship exists between public domestic debt and Kenya's financial development was tested using Error correction Model. From the ECM results in Table 4, the null hypothesis is rejected as the public domestic debt coefficient was statistically significant ($p=0.0035$; $\alpha=0.010$) at 1% significance level. A public domestic debt coefficient of -0.1617 provided in Table 3 suggest that a 1% increase in public domestic debt leads to a 0.1617% decrease in financial development in the next period, *ceteris paribus*. The short-run association between public domestic debt and financial development is inelastic and significant, indicating that financial development variation is less responsive to public domestic debt changes. These results agree with Altaylıgil et al, (2013), who asserted that reducing public domestic debt allowed the financial sector to advance more to the private sector, which catalyses financial development. This result further confirms the Hauner (2006) lazy bank hypothesis, which asserted that financial institutions' excessive public debt held by financial institutions renders the institutions comfortable with the easy profits and reduces competition over clients hampering financial expansion. The long-run (-0.3514) and short-run (-0.1617) coefficients of public domestic debt agree that the Mackinnon theoretical model opined restrictive government repression policies, including public

domestic debt, adversely affects financial development. The government needs to advocate for reduced government domestic debt.

H₀₂: There exists no significant relationship between public external debt and financial development in Kenya,

The null hypothesis (**H₀₂**) that there exists no significant long-run relationship between public external debt and financial development in Kenya was tested using the Ordinary Least Square regression method. From the long-run regression output in Table 3, the null hypothesis that no long-run relationship exists between public external debt and financial development is rejected. The public external debt coefficient is significant ($p < 0.0000$; $\alpha = 0.050$) at a 5% significance level. The rejection of the null hypothesis suggests a long-run association between public external debt and financial development. A 1% rise in public external debt results in a 0.3526% increase in financial development in the long-run. Error Correction Model was used to test the short-run relationship between public external debt and financial development. The researcher tested the null hypothesis of no significant short-run association between public external debt and financial development using the ECM model. From the ECM results in Table 4, the public external debt coefficient was significant ($p = 0.024$; $\alpha = 0.050$) at a 5% significance level. The null hypothesis that public external debt does not have a significant short-run relationship with Kenya financial development in the short-run is rejected. The results suggest that in the short-run public external debt influences financial development in Kenya. A public external debt coefficient of 0.2094 provided in equation 10 suggests that a one percent growth in public external debt results to a 0.2094% increase in financial development in the short-run, *ceteris paribus*. The short-run relationship between public external debt and financial development is inelastic, indicating that financial development variation is less responsive to public external debt changes.

These results agree with the financial liberalization theory, which opined that the government needs to liberalize the financial sector to maximize the gains achieved through economies of scale in processing information. However, this result disagrees with Bordo and Messer (2007), who observed a strong affiliation between public external debt and financial crisis negatively impacting financial development.

Summary

This study's first objective was to analyse the relationship between public domestic debt and Kenya's financial development. From the Ordinary Least Square long-run regression model results, public domestic debt and financial development have a significant negative long-run relationship. In the long-run, a 1% rise in public domestic debt results in a 0.3514% decrease in financial development. The null hypothesis that no short-run relationship exists between public domestic debt and financial development was rejected as the public domestic debt coefficient was statistically significant ($p = 0.0035$; $\alpha = 0.050$) at a 5% significance level. A one percent increase in public domestic debt leads to a 0.1617% decrease in financial development in the short-run, holding other factors constant.

This study's findings are consistent with the lazy bank hypothesis by Hauner (2009), which asserted that excessive public debt purchase by financial institutions harms the financial development and recommended for financial liberalization to increase competition within the sector. The study also confirms the repression theory by MacKinnon and Shaw (1973). The theory asserts that government intervention, including increased public debt, tends to prevent financial institutions from functioning effectively. The researcher concluded that government should reduce domestic public borrowing and foster financial liberalization for significant financial development.

The second objective of the study sought to establish the association between public domestic debt and financial development in Kenya. The long-run association was estimated using the ordinary least square method after testing for unit root and cointegration. The results suggest presence of positive long-run association between public external debt and financial development in Kenya. A that a 1% rise in public external debt results in a 0.3526% increase in financial development in the long-run.

Further, the ECM test applied to check for short-run causal effect revealed that public external debt has a significant ($p = 0.0024$, $\alpha = 0.050$) short-run positive relationship with financial development. The error correction model results show that a 1% increase in public external debt leads to a 0.1394% increase in financial development in the short-run, *ceteris paribus*. This result is confirms the liberalization theory by Shaw and Mackinnon (1973), advocating for a reduction in direct government participation in the financial market credit restriction. The study contradicts Border and Messer (2007), who argued that growth in public external debt precipitates the financial crisis, which harms financial development.

Conclusion

From the study conclusion, new knowledge have been identified which can aid policy makers in Kenya to foster financial development. Previous studies around financial development had focused on developing countries. This study has contributed on the empirical literature on the relationship between public domestic, public external and financial development using Kenya perspective. From this study financial development can be fostered by reducing domestic debt in favour for external public debt. In addition, the study has extended empirical literature on the short-run relationship between public debt and growth in financial sector in Kenya.

Recommendation and Policy Implications

Policy: The Central Bank of Kenya needs to ensure that its fiscal policy decision does not enhance financial repression, which negatively impacts financial development. The Kenya Government should institute appropriate liberalization policy within the financial market to encourage public external debt. Besides, the Central Bank of Kenya needs to institute appropriate external debt policy measures to guide against public external debt's adverse effect resulting from the distortion caused by public external debt.

Practice: The study recommends that financial institutions advance less to the government since it negatively affects financial development. In addition, the government should focus on reducing

the domestic debt has it affects financial development. Further, the public domestic debt interest rate should be determined by market forces to minimize the low-interest rate, which may harm financial development. Foreign lenders need to continue providing funds to the Kenyan government since it positively impacts financial sector development in the short and long-run.

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