

Original Paper

Effect of Innovative Finance on Kenya's Public Debt

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Abstract

This study was to determine the effect of innovative finance on Kenya's public debt. Specifically, it aimed to establishing the effect of foreign remittance, financial transaction tax and guaranteed loan financing on public debt level in Kenya. A descriptive research design was adopted and population of interest for the study was Kenya. Secondary data for a period of 5 years from 2014 to 2018 was utilized while the Vector auto regression model was estimated to establish the relationship between the variables. The results indicated that there is a positive and significant relationship between foreign remittance and public debt in Kenya while a negative and significant relationship was established between financial transactions tax, no significant relationship was established guaranteed loans and public debt in Kenya. The study concludes that foreign remittance has a positive and significant effect on public debt level in Kenya while financial transactions tax has a negative and significant effect. It therefore recommends that the government through relevant institutions should strengthen policies on various innovative taxes including financial transactions tax. This will ensure that more revenue is obtained through taxes; this can be used to repay existing loan as well as financing development.

Keywords

innovative finance, foreign remittance, financial transaction tax, guaranteed loan, public debt

1. Introduction

Innovative funding includes both innovations in how funds are raised and innovations in how resources are spent on international development. The Organization for Economic Co-operation and Development (OECD, 2009) describes innovative funding as mechanisms to raise resources or stimulate activities to promote global growth that go beyond traditional approaches to expenditure by either formal or private industries. It includes fresh approaches to pooling private and public income streams to expand or create operations for the advantage of partner nations; new income streams such as new taxes, charges, fees, bond levies, sales procedures or multi-year voluntary contribution schemes for development operations; and new incentives (economic guarantees, corporate social responsibility or the like). The World Bank describes it as any funding strategy that helps create resources by tapping fresh sources of funding or decreasing shipping time/costs, and making economic flows more results-oriented (World Bank, 2009).

Government debt is one way of funding public activities, but not the only way in which governments can generate cash to monetize their debts, thereby eliminating the need to pay interest (Martin, 2009). This practice, however, merely decreases government interest expenses rather than truly canceling government debt and, if used unsparingly, can result in hyperinflation. Government debt is

characterized by both foreign and domestic debt (Makau, 2008). McKinnon (2010) observed that the dependence on debts to complement capital formation in the national economy is a key factor that causes debt to increase. The aim of this study was to explore other alternative sources of funds that the government can use in place of debts.

Kenya's Budget Controller lifted in February 2019; the warning on Kenya's ballooning public debt, warning that the nation would spend more than KSh61bn of every KSh100bn gathered by the taxpayer on debt repayment in the 2018/2019 fiscal year. Kenya's government debt stood at KSh5, 276 trillion as of December 2018 (CBK, 2018). The Treasury projected debt repayment expenditure of KSh1.1 trillion in the 2019/20 financial year beginning in July, equivalent to 61 percent of KSh1.87 trillion's total projected tax collection. Public debt repayment is usually a first-charge expense, meaning the treasury is paying it before it can spend on anything else. Kenyans already feel the burden of repaying public debt, with the Treasury freezing counties and state agencies' development expenditure as it seeks to honor commitments and remains in the good books of investors. This implies that the state would have only about KSh700 billion to fulfill its recurring budget for growth including running schools, hospitals, the judiciary and legislature, building highways, paying to the armed forces and public servants.

Previous studies have looked at the innovative finance as possible alternative to financing development projects. Kenyoru (2013) linked financial innovations to financial deepening in Kenya, however, the study found an insignificant positive impact on financial deepening. Maseru, Lesotho, Hellowell (2019) observed that Sub-Saharan African countries are attempting to set up Public-Private Partnerships (PPPs) to finance and operate new equipment and services for health care. Kariuki (2014) concluded that financing public-private partnership infrastructure projects is critical as the construction of infrastructure contributes significantly to aggregate financial output. Kiio, Soi and Buigut (2014) looked at the impacts of workers' remittances on economic growth in Kenya and concluded that there was a positive and highly significant relationship between workers' remittances and real GDP per capita, indicating that higher economic growth is related with higher remittances.

However, to the best knowledge of the researcher, no local study has looked at the effect of innovative finance on Kenya's public debt. It is on this premise that the current study sought to fill the knowledge gap by determining the effect of innovative finance on public debt in Kenya. Therefore, the purpose of this study was to determine the effect of innovative finance on public debt in Kenya by establishing the effect of foreign remittance, financial transaction tax and guaranteed loan financing on public debt in Kenya.

2. Literature Review

2.1 Theoretical Review

Reinhart, Reinhart and Rogoff (2012) developed the debt overhang concept. It was created in latest years as a consequence of the growth of a fiscal crisis database. They call the deterioration of the economy due to an increase in public debts a public debt overhang. In a case study on Japan's economy, they note that although the consumption tax rate had been raised twice (1997 and 2014), the amount of public debt in Japan consistently increased for around 20 years since the bubble economy era, reflecting a lack of sufficient fiscal consolidation efforts. Presumably, one major reason why Japanese policy authorities have been unable to launch a full-fledged fiscal consolidation initiative for many years is their recognition of the cause-and-effect relationship between the fiscal position and economic growth. It has generally been presumed that there is a cause and-effect relationship of "low growth

leading to fiscal deterioration”—stagnant economic growth and economic pump-priming intended to stimulate growth are aggravating the fiscal position—but that the opposite of this relationship, “fiscal deterioration leading to low growth,” does not exist.

Before Reinhart et al. (2012) developed information, it was not understood that the public debt equilibrium had an impact on economic growth. For example, Barro and Sala-i-Martin (1995) empirically demonstrated that the government-to-GDP ratio has a negative impact on GDP per capita. Whether the quantity of public debt has an important effect, however, has not been verified. Meanwhile, Fischer (1991) empirically demonstrated that a fiscal deficit has an adverse effect on GDP per capita but did not confirm whether or not the quantity of government debt impacts GDP per capita (Kobayashi, 2015). The differences between the studies by Barro and et al. and by Reinhart et al. have a notable significance. According to the studies by Barro et al. and by Fischer, an increase in government expansion and an expansion of the fiscal deficit represent a waste of resources on inefficient government activities. Therefore, their findings indicate that government activities led directly to an increase in inefficiency, resulting in a decline in economic growth.

Krugman (1988) coins the word “debt overhang” as a scenario where the anticipated capacity of a country to repay external debt falls below the contractual debt value. The theoretical model of Cohen (1993) presents a non-linear effect of foreign borrowing on investment as suggested by Clements et al. (2003), which suggests that this connection can be extended to development. Thus, accumulation of foreign debt can encourage investment up to a certain limit, while beyond that stage the debt overhang will begin to add negative pressure to the desire of the investor to provide assets. Similarly, the growth model suggested by Aschauer (2000) can be expanded to cover the effect of public debt in which public capital has a nonlinear effect on economic growth. Assuming government debt is used to finance productive public capital at least in part, a rise in debt would have beneficial impacts beyond a certain limit and adverse impact.

The argument that accumulation of public debt (fiscal deterioration) has a negative impact on economic growth was made in the studies by Reinhart et al. that concern public debt overhang (Reinhart, Reinhart, & Rogoff, 2012; Reinhart & Rogoff, 2010). Reinhart, Reinhart and Rogoff (2012) reviewed 26 cases of high accumulation of public debt in advanced countries and reported that in 23 of those cases, economic growth remained stagnant for more than a decade. What is notable about their findings is the presence of a non-linear relationship between public debts and economic growth. It was shown that when the ratio of public debts to GDP is higher than 90%, the annual economic growth rate is as much as 1.2% lower than when the public debt ratio is less than 90%.

The empirical finding that fiscal deterioration lowers the economic growth rate was confirmed by Checherita-Westphal and Rother (2012) and Baum, Checherita-Westphal and Rother (2013) as well. Checherita-Westphal and Rother (2012) examined the relationship between public debts and per-capita GDP through various methods based on data concerning 12 euro-area countries for the past 40 years. As a result, it was confirmed that when the ratio of public debts to GDP was higher than the 90-100% range, an increase in the public debt ratio had the effect of reducing per-capita GDP. It was also shown that this effect worked through three channels—a decrease in private savings, a decline in public investments and a decrease in total factor productivity. Baum, Checherita-Westphal and Rother (2013) examined the relationship between public debts and per-capita GDP based on data concerning 12 euro-area countries for the period since 1990. As a result, it was observed that when the ratio of public debts to GDP was lower than 67%, a public debt increase had a positive correlation with GDP, meaning it had the effect of increasing GDP. However, it was also shown that when the debt ratio was

higher than 95%, a public debt increase had the effect of reducing GDP. Moreover, it was empirically verified that a rise in the debt ratio affected interest rates. It was confirmed that although a rise in the debt ratio had the effect of lowering interest rates when the debt ratio was lower than 70%, it puts upward pressure on interest rates when the debt ratio was higher than 70%.

Kobayashi (2015), presents a theoretical model of public debt overhang, in which deterioration of public finance lowers economic growth. In his model, the public debt provides liquidity and thus enhances economic growth. On the other hand, income redistribution associated with public debt accumulation tightens the borrowing constraint of productive agents and thus lowers economic growth. These two effects of public debt and income redistribution lead to accumulation of debt and low economic growth.

The Debt Overhang Theory is important to this research as it advocates for public debt regulation. It argues that borrowing can have a beneficial effect on economic growth but up to a certain point. A rise in government debt beyond a point could have adverse effect on a country's economic growth. In this research, the study aimed to identify other alternative funding alternatives that can be adopted by the government to decrease the amount of public debt.

2.2 Empirical Review

Baldé (2011) evaluated the macroeconomic effect of Sub-Saharan Africa (SSA) remittances on savings and investment. In encouraging savings and investment, it also relatively analyzes the efficiency of remittances and foreign aid (formal development assistance). Using OLS and instrumental variables (2SLS) assessment techniques with country-fixed effects, the findings proposed that both remittances and international assistance encourage savings and investment in sub-Saharan Africa, but remittances are highly more efficient. Remittance is cash sent to home country by an individual in a foreign land. Remittances are now acknowledged as a significant contributor to the growth and development of the country due to the enormous amounts involved. Kenya's Central Bank performs a monthly study of remittance inflows through official channels that include commercial banks and other approved service suppliers of global remittances in Kenya.

Kiio, Soi and Buigut (2014) looked at the impacts of workers' remittances on economic growth: evidence from Kenya. Data was collected for the periods 1970 to 2010. This study relied purely on secondary annual time series data. The analysis of the data was carried out by OLS (Ordinary Least Squares) method. Time series Regression was used to analyze the data. Findings revealed that there was positive and highly significant relationship between workers' remittances and real GDP per capita, indicating that higher economic growth is related with higher remittances. Further, research found a positive impact of gross capital formation and change of exchange rate regime from fixed to floating on economic growth.

A Financial Transaction Tax (FTT) is a tax on financial securities acquisition and/or sale. The tax can be levied on the buyer, the seller, or both, and is usually an ad valorem tax, a percentage of the security's market value sold (Tax Policy Center, Urban Institute & Brookings Institution, 2015). A Financial Transaction Tax (FTT) at its most basic level is a tax imposed on a security buyer or seller when a financial transaction occurs. The FTT may be applied across the board to all financial transactions, or only to those involving specific types of securities (e.g., shares, options, futures, but not bonds). Likewise, an FTT can be extended to all traders' transactions or only to those types of transactions, such as those made by institutional traders but not individual investors (Congressional Research Service, 2019).

Publicly guaranteed debt applies to the debt owed to foreign and local lenders but guaranteed by the national government by national public bodies and county governments. In domestic or foreign currency, loans may be denominated (Kenya National Treasury and Planning, 2018). Section 61 of the Public Finance Management Act, 2012 and the amendments to Section 201 of the Public Finance Management Act allow any money paid by the National Treasury for a guarantee to be a liability to the National Government and to be recovered from the lender whose loan has been assured. Guarantees can manage and optimize commercial funding by minimizing and/or securing risks (such as financial, regulatory, and foreign exchange risk), including default on business or political risks. A government or a foreign lender decides to bring any downside risk of public guarantees, usually by bearing the debt obligation of a creditor in case of default.

Guarantees are a form of non-traditional blending method (OECD, 2018) that is an innovative way of mobilizing private capital to replace grants and loans. According to OECD statistics, 17 of 23 members of the Development Assistance State are now active in Blended Finance and have succeeded in mobilizing increasing sums of private capital for development: a total of 167 facilities engaged in mixing were launched between 2000 and 2016, with a combined size of USD 31 billion by providers of growth finance. Convergence, a blended financial network, reports that such facilities have so far mobilized more than USD 126 billion in capital towards sustainable development in developing countries, and that every dollar of concessional blending capital has mobilized \$4 of commercially priced capital on average. Similarly, development finance investments from the private sector mobilized USD 151.5 billion between 2012 and 2017, according to OECD information. Guarantees were the most mobilizing instrument collection (42 percent of the total).

3. Methodology

A descriptive research design was adopted and population of interest for the study was Kenya. Secondary data was sourced from the Central Bank of Kenya (CBK), the Kenya Revenue Authority (KRA), the Kenya National Treasury (NT), World Bank and other relevant repositories. Data was collected on monthly basis for a period of five years ranging from 2014 to 2018 and this constituted 60 observations. The data collected was time series. Times series analysis; testing for stationarity, cointegration, vector auto regression, granger causality, and impulse response analysis and factor error variance decomposition was used in the study. Vector auto regression model was estimated to establish the relationship between the variables.

4. Results and Discussions

4.1 Unit Root Test

The test for unit root was conducted using Augmented Dickey-Fuller (ADF) test. The test result for all variables is presented in Table 1. In order to make them stationary, non-stationary variables at their level were differenced and the unit root's null hypothesis was dismissed at 5 percent critical point.

Table 1. Unit Root Test

Variable Name	P-value at level	P-value at 1st Difference	Integration Order
Public Debt	0.9666	0.0001	I(1)
Remittance	0.9158	0.0000	I(1)
Financial Transaction Tax	0.8235	0.0000	I(1)
Guaranteed Loan	0.9711	0.0000	I(1)

Based on the above result, all the variables were non-stationary at level at 5% level of significance. However, after first differencing, all the variables become stationary at 5% level of significance.

4.2 Lag Length Selection

Before the Johansen cointegration test was performed, the optimal lag length for analysis was identified. The lag length can be selected using the information selection criteria which include: Sequential Modified Likelihood Ratio (LR), Final Prediction Error (FPE), Akaike Information Criterion (AIC), Schwarz Bayesian Information Criterion (SBIC) and Hannan-Quinn Information Criterion (HQIC). There is no clear rule of thumb on which criterion to use for optimal lag length selection among the above methods.

However, the decision rule is to choose the model with lowest value of information criteria. This study used Sequential Modified Likelihood Ratio (LR), since it gave the lowest value of information. Table 2 shows LR values for lag 1, 2, 3, 4 and 5 respectively. Based on the LR values, lag 2 gives the lowest value hence the lag 2 model is selected.

Table 2. Lag Length Selection

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-5217.43	NA	3.39E+77	189.87	190.016	189.9265
1	-5091.99	228.0736	6.34e+75*	185.8904	186.6203*	186.1726*
2	-5076.15	26.48412*	6.44E+75	185.8964	187.2103	186.4045
3	-5061.12	22.95313	6.84E+75	185.9318	187.8296	186.6657
4	-5046.1	20.76003	7.43E+75	185.9673	188.4491	186.927
5	-5025.43	25.55893	6.79E+75	185.7973*	188.8631	186.9829

4.3 Johansen Cointegration

In testing for cointegration two methods are usually used; two step Engle granger test and Johansen cointegration test. This study used Johansen cointegration test since it's more accurate and superior to Engle granger test of cointegration. The null hypothesis in this test is that there is no cointegration. Johansen results in Table 3 indicate that the null hypothesis of no cointegration for the model linking public debt to foreign remittance, financial transactions tax and government guaranteed loans was not rejected at 5% level of significance. The results indicate that the variables were not cointegrated. This means that they have a short-term relationship. This meant the use of Vector Autoregressive Model (VAR). Prior to running the model, several diagnostic tests were conducted.

Table 3. Johansen Cointegration Test

Unrestricted Cointegration Rank Test (Trace)

Hypothesized		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None	0.297468	36.89847	47.85613	0.3523
At most 1	0.163740	16.77384	29.79707	0.6567
At most 2	0.109041	6.581372	15.49471	0.6268
At most 3	5.83E-06	0.000332	3.841466	0.9875

Note. Trace test indicates no cointegration at the 0.05 level; * denotes rejection of the hypothesis at the 0.05 level; **MacKinnon-Haug-Michelis (1999) p-values.

4.4 Vector Auto Regression

The cointegration test has confirmed that there is no long-run relationship among all the variables. Based on this, the study runs unrestricted VAR as opposed to VECM. Summary results for VAR regression equations are presented in Table 4.

Table 4. VAR Results

	DPUBLIC_DEBT	DREMITTANCE	DFINANCIALTRANSACTIONTAX	DGUARANTEEDLOANS
DPUBLIC_DEBT (-1)	-0.318370 (0.43458) [-0.73259]	-0.000151 (0.00396) [-0.03806]	-0.000653 (0.00146) [-0.44626]	-0.008511 (0.01085) [-0.78454]
DPUBLIC_DEBT(-2)	-0.264719 (0.43308) [-0.61125]	0.000741 (0.00394) [0.18794]	-0.000381 (0.00146) [-0.26100]	-0.004460 (0.01081) [-0.41254]
DREMITTANCE (-1)	38.14913 (15.3428) [2.48645]	-0.170421 (0.13963) [-1.22049]	0.133711 (0.05170) [2.58649]	0.938937 (0.38301) [2.45148]
DREMITTANCE (-2)	65.15138 (15.1253) [4.30746]	-0.122425 (0.13765) [-0.88938]	0.080614 (0.05096) [1.58182]	1.714025 (0.37758) [4.53954]
DFINANCIALTRANSACTIONTAX (-1)	-83.16017 (34.6871) [-2.39744]	-0.035415 (0.31568) [-0.11219]	-0.830968 (0.11687) [-7.10992]	-1.958719 (0.86590) [-2.26205]
DFINANCIALTRANSACTIONTAX (-2)	-90.88151 (36.0804) [-2.51886]	-0.939093 (0.32836) [-2.85994]	-0.600065 (0.12157) [-4.93600]	-2.254285 (0.90069) [-2.50285]
DGUARANTEEDLOANS (-1)	14.96846	-0.013453	0.028442	0.397231

	(17.3504)	(0.15790)	(0.05846)	(0.43312)
	[0.86272]	[-0.08520]	[0.48652]	[0.91713]
DGUARANTEEDLOANS (-2)	10.52504	-0.077834	0.081938	0.181584
	(17.3202)	(0.15763)	(0.05836)	(0.43237)
	[0.60768]	[-0.49378]	[1.40405]	[0.41998]
C	-1.24E+10	3.45E+08	23787213	-2.93E+08
	(1.7E+10)	(1.6E+08)	(5.9E+07)	(4.4E+08)
	[-0.71335]	[2.17465]	[0.40492]	[-0.67398]
R-squared	0.340505	0.278677	0.580348	0.354195
Adj. R-squared	0.230589	0.158456	0.510406	0.246561
Sum sq. resids	7.58E+23	6.28E+19	8.61E+18	4.73E+20
S.E. equation	1.26E+11	1.14E+09	4.23E+08	3.14E+09
F-statistic	3.097868	2.318046	8.297554	3.290727
Log likelihood	-1532.734	-1264.868	-1208.231	-1322.384
Akaike AIC	54.09592	44.69714	42.70987	46.71522
Schwarz SC	54.41850	45.01973	43.03246	47.03781
Mean dependent	5.82E+09	2.54E+08	42070175	1.82E+08
S.D. dependent	1.43E+11	1.25E+09	6.05E+08	3.61E+09

From the VAR results in Table 4, all coefficients of variables indicate short run causality. Taking public debt as the dependent variable for the first equation, the two lagged variables of foreign remittance (-1, -2) indicate a positive and significant relationship with public debt ($\beta=38.14913$, 65.15138 and t statistics= 2.48645 , 4.30746) respectively. The calculated t statistics are greater than the critical t statistic of 1.96 at 5 percent significance level. The results imply that a unit increase in foreign remittance (-1, -2), is associated with a 38.15 and 65.15 unit increase in public debt in Kenya holding other factors constant.

Results also indicate that the two lagged variables of financial transactions tax (-1, -2) have a negative and significant relationship with public debt ($\beta=-83.16017$, -90.88151 & t statistics= -2.39744 , -2.51886) respectively. The calculated t statistics are greater than the critical t statistic of 1.96 at 5 percent significance level. The results imply that a unit increase in financial transactions tax (-1, -2) accounts for 83.16 and 90.88 unit decrease in public debt in Kenya respectively holding other factors constant.

Further, results indicate no significant relationship between the two lagged variables of guaranteed loans (-1, -2) and public dept. This is shown by t statistics of 0.86272 and 0.60768 respectively, which are less than 1.96 critical t statistic at 5 percent significance level. This implies that change in guaranteed loans has negligible or insignificant impact on public debt level in Kenya.

Taking foreign remittance as the dependent variable, for the second equation, results indicate that financial transactions tax (-2) has a negative and significant relationship with foreign remittance ($\beta=-0.939093$, $t=-2.85994$) at 5 percent significance level. This means that a percentage increase in financial transactions tax (-2) is associated with 94% decrease in foreign remittance.

Taking financial transactions tax as the dependent variable for the third equation, results indicate that foreign remittance (-1) has a positive and significant relationship with financial transactions tax ($\beta=0.133711$, $t=2.58649$) at 5 percent significance level. This means that a percentage increase in

foreign remittance (-1) is associated with a 13.3% increase in financial transactions tax.

Further, the two lagged variables of financial transactions tax (-1, -2) indicate a negative and significant relationship with financial transactions tax ($\beta=-0.830968, -0.600065$ and t statistics= $-7.10992, -4.93600$) respectively. The calculated t statistics are greater than the critical t statistic of 1.96 at 5 percent significance level. The results imply that a percentage increase in financial transactions tax (-1, -2), is associated with 83% and 60% decrease in financial transactions tax respectively holding other factors constant.

Taking guaranteed loans as the dependent variable for the fourth equation, results indicate that foreign remittance (-1, -2) have a positive and significant relationship with guaranteed loans tax ($\beta=0.938937, 1.714025$ and t statistics= $2.45148, -4.53954$) respectively. The calculated t statistics are greater than the critical t statistic of 1.96 at 5 percent significance level. The results imply that a percentage increase in foreign remittance (-1, -2), is associated with 93.8% and 171% increase in guaranteed loans respectively holding other factors constant.

Further, financial transactions tax (-1, -2) indicate a negative and significant relationship with guaranteed loans ($\beta=-1.958719, -2.254285$ and t statistics= $-2.26205, -2.50285$) respectively. The calculated t statistics are greater than the critical t statistic of 1.96 at 5 percent significance level. The results imply that a percentage increase in financial transactions tax (-1, -2), is associated with 195% and 225% decrease in guaranteed loans respectively holding other factors constant.

4.5 Granger Causality Test

The VAR interpretations reveal that, it is impossible to determine the effect of independent variables on dependent variable and vice versa. This is because, in most cases, (-1) and (-2) of explanatory variables indicate opposite results (positive and negative association, significant and insignificant). This prompts running of Granger Causality test to ascertain the short run causality link as a whole.

Granger causality is a post-estimation test for VAR which determines the causality relationship between the dependent and independent variables. Granger (1969) stated the null hypothesis for Granger causality is that there is no causality relationship between dependent and independent variables or that all the coefficients of the lagged variables are equal to zero. Therefore, when the p -values of the estimates are greater than 5 percent confidence level, the null hypothesis is accepted and on the other hand, when the p -values of the estimates are less than 5 percent confidence level, the null hypothesis is rejected and concludes that there is causality relationship. The results for the causality test on public debt, foreign remittance, financial transactions tax and guaranteed loans are presented in Table 5.

Table 5. Granger Test Results

Null Hypothesis:	Obs	F-Statistic	Prob.
DREMITTANCE does not Granger Cause			
DPUBLIC_DEBT	57	6.60298	0.0028
DPUBLIC_DEBT does not Granger Cause DREMITTANCE		1.22271	0.3028
DFINANCIALTAX does not Granger Cause			
DPUBLIC_DEBT	57	0.8475	0.4343
DPUBLIC_DEBT does not Granger Cause DFINANCIALTAX		5.80162	0.0053
DGUARANTEEDLOANS does not Granger Cause			
DPUBLIC_DEBT	57	0.07209	0.9305
DPUBLIC_DEBT does not Granger Cause			
DGUARANTEEDLOANS		0.06683	0.9354

Based on findings in Table 5, there is a short run granger causality running from remittance to public debt. This supported by p value of 0.0028, which is less than 0.05, hence the rejection of null hypothesis. This finding indicates that in the short-run, remittance explains changes in public debt in Kenya. However, the null hypothesis that public debt granger causes remittance was rejection since p value (0.3028) was greater than 5 percent significance level.

Further, the findings indicate there is a short run granger causality running from public debt to financial transactions tax. This supported by p value of 0.0053, which is less than 0.05, hence the rejection of null hypothesis. This finding indicates that in the short-run, public debt explains changes in financial transactions tax in Kenya. However, the null hypothesis that financial transactions tax granger causes public debt was rejection since p value (0.4343) was greater than 5 percent significance level.

In addition, the findings indicate there is no short run granger causality running from guaranteed loans to public debt and vice versa. This is indicated by p values (0.9305, 0.9354), which are greater than 5 percent significance level.

4.6 Impulse Response Analysis

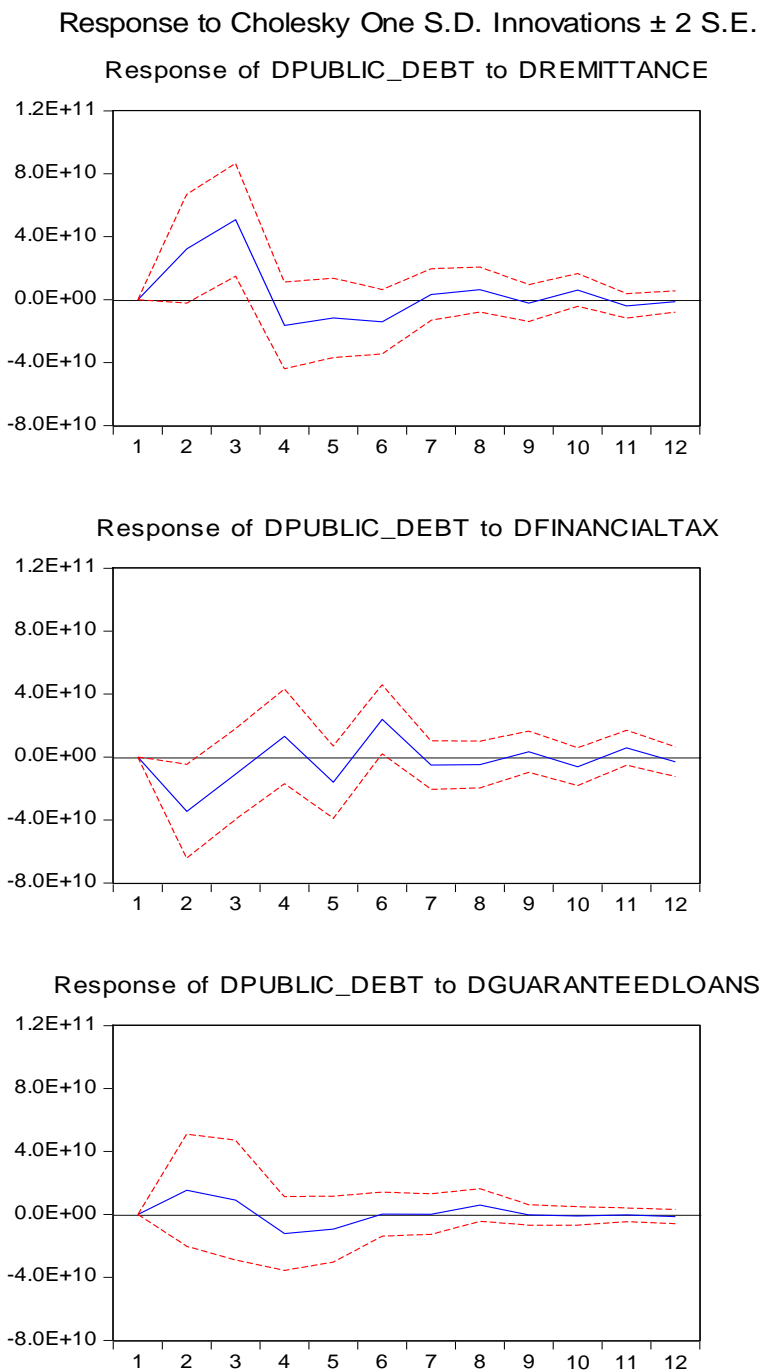


Figure 1. Impulse Response Functions

Figure 1 indicates the impulse response results. The first diagram shows the response of public debt to one standard deviation shock in foreign remittance. The impulse response function shows an increase in public debt in the first three periods, after which, it falls to the negative in the 4th period. In the 4th and 6th periods, the amount of public debt remains constant in the negative region, after which, it increases to the positive region in the 7th period. The value of public debt is almost zero between 7th and 10th period, after which, it declines to the negative region in the remaining periods. This implies that shocks to foreign remittance will have asymmetric impacts on public debt in the short run and long run.

The second diagram shows the response of public debt to one standard deviation shock in financial transactions tax. The impulse response function shows upward and downward fluctuates in public debt for the first 7 periods, after which it remains constant in the negative region up to 8th period. For the remaining periods, public debt slightly fluctuates around the zero line. This implies that shocks to financial transactions tax will have asymmetric impacts on public debt in the short run and long run.

The third diagram shows the response of public debt to one standard deviation shock in guaranteed loans. The impulse response function shows an increase in public debt up to 2nd period, after which, it remains constant up to 3rd period. From period 3 to 4, the level of public debt decreases to the negative region and then increases to zero line by 5th period. In the remaining periods, the level of public debt remains constant around the zero line. This implies that shocks to guaranteed loans will have asymmetric impacts on public debt in the short run and long run.

4.7 Forecast Error Variance Decomposition

Table 6. Variance Decomposition of Public Debt

Variance Decomposition of DPUBLIC_DEBT:					
Period	S.E.	DPUBLIC_DEBT	DREMITTANCE	DFINANCIALTAX	DGUARANTEEDLOANS
1	1.26E+11	100	0	0	0
2	1.35E+11	86.51541	5.707347	6.496284	1.280954
3	1.46E+11	75.49999	16.9351	6.090202	1.474711
4	1.50E+11	73.88105	17.42308	6.616816	2.079049
5	1.51E+11	72.41753	17.59178	7.577972	2.412717
6	1.55E+11	70.29881	17.71746	9.667315	2.316409
7	1.55E+11	70.23474	17.70723	9.748504	2.309526
8	1.55E+11	70.09228	17.71581	9.756736	2.435179
9	1.56E+11	70.05118	17.72034	9.794805	2.433666
10	1.56E+11	69.85986	17.80095	9.912164	2.427025
11	1.56E+11	69.72458	17.82351	10.03027	2.421636
12	1.56E+11	69.70181	17.81318	10.05802	2.426992

Results in Table 6 indicate that in the short run, looking at month 1, 100% of forecast error variance in public debt is explained by the variable itself. This means that other variables in the model do not have a strong influence on public debt in the short run. In the long run (month 12), 69.7% of forecast error variance in public debt is still explained by the variable itself. The impact of foreign remittance, financial transactions tax and guaranteed loans on public debt is rising gradually over the months. However, the impact of these variables on public debt is still very weak, with guaranteed loans having an almost negligible impact on public debt. Comparing the findings to VAR results, foreign remittance and financial transactions tax had a significant impact on public debt. The same can be observed in the variance decomposition results, where the impact of foreign remittance and financial transactions tax on public debt increases gradually into the future. On the other hand, VAR results indicated no significant relationship between guaranteed loans and public debt. Similar results are shown by the variance decomposition.

Table 7. Variance Decomposition of Remittance

Variance Decomposition of DREMITTANCE:					
Period	S.E.	DPUBLIC_DEBT	DREMITTANCE	DFINANCIALTAX	DGUARANTEEDLOANS
1	1.14E+09	6.440693	93.55931	0	0
2	1.16E+09	6.273258	93.69659	0.016066	0.014086
3	1.23E+09	6.072724	84.96921	8.459372	0.498695
4	1.31E+09	5.568048	75.70595	18.2052	0.520801
5	1.32E+09	6.751887	74.56608	18.09541	0.586617
6	1.34E+09	8.841468	72.01064	18.22988	0.918015
7	1.35E+09	8.77614	71.63681	18.67565	0.911399
8	1.36E+09	9.10414	71.23436	18.76354	0.897962
9	1.37E+09	9.265315	70.9734	18.864	0.897286
10	1.37E+09	9.361693	70.80517	18.91234	0.920797
11	1.37E+09	9.399129	70.75761	18.91831	0.924949
12	1.37E+09	9.399518	70.73567	18.93934	0.925475

Results in Table 7 indicate that in the short run, looking at month 1, 94% of forecast error variance in foreign remittance is explained by the variable itself. This means that other variables in the model do not have a strong influence on foreign remittance in the short run. In the long run (month 12), 71% of forecast error variance in foreign remittance is still explained by the variable itself, albeit the impact decreases into future. The impact of public debt and financial transactions tax on foreign remittance, though small, increases gradually from the short run to the long run. However, guaranteed loans have an insignificant impact on foreign remittance both in the short run and long run. Comparing the findings to VAR results, financial transactions tax had a significant impact on foreign remittance. The same can be observed in the variance decomposition results, where the impact of financial transactions tax on foreign remittance increases gradually into the future. On the other hand, VAR results indicated no significant relationship between guaranteed loans and foreign remittance. Similar results are shown by the variance decomposition.

Table 8. Variance Decomposition of Financial Transactions Tax

Variance Decomposition of DFINANCIALTAX:					
Period	S.E.	DPUBLIC_DEBT	DREMITTANCE	DFINANCIALTAX	DGUARANTEEDLOANS
1	4.23E+08	0.019722	4.050967	95.92931	0
2	5.52E+08	0.343147	4.070128	95.30928	0.277448
3	5.95E+08	11.58717	4.553943	82.62266	1.236227
4	6.26E+08	17.92593	4.289217	75.93438	1.850471
5	6.36E+08	17.3937	5.855958	74.9501	1.800244
6	6.53E+08	17.46269	8.735346	72.09358	1.708393
7	6.57E+08	17.73855	8.791291	71.75787	1.712294
8	6.61E+08	17.89014	8.748052	71.61502	1.746793
9	6.62E+08	17.99027	8.750331	71.50732	1.752078
10	6.63E+08	18.02576	8.780777	71.43248	1.760986
11	6.64E+08	17.96312	8.808404	71.46876	1.759712
12	6.65E+08	17.96611	8.838348	71.43986	1.755684

Results in Table 8 indicate that in the short run, looking at month 1, 96% of forecast error variance in financial transactions tax is explained by the variable itself. This means that other variables in the model do not have a strong influence on financial transactions tax in the short run. In the long run (month 12), 72% of forecast error variance in financial transactions tax is still explained by the variable itself, albeit the impact decreases into future. The impact of public debt and foreign remittance on financial transactions tax, though small, increases gradually from the short run to the long run. However, guaranteed loans have an insignificant impact on financial transactions tax both in the short run and long run. Comparing the findings to VAR results, lagged variables of financial transactions tax had a significant impact on financial transactions tax. The same can be observed in the variance decomposition results, where the impact of financial transactions tax on itself is very high both in the short run and long run. VAR results also indicated that foreign remittance had a significant impact on financial transactions tax. Similar results are observed under variance decomposition with impact of foreign remittance on financial transactions tax albeit small increases gradually into the future.

Table 9. Variance Decomposition of Guaranteed Loans

Variance Decomposition of DGUARANTEEDLOANS:					
Period	S.E.	DPUBLIC_DEBT	DREMITTANCE	DFINANCIALTAX	DGUARANTEEDLOANS
1	3.14E+09	89.01427	0.354919	3.79E-06	10.63081
2	3.37E+09	77.55817	5.924242	5.822622	10.69496
3	3.69E+09	66.18145	19.22435	5.525143	9.069053
4	3.76E+09	64.92014	19.70028	6.043647	9.335934
5	3.82E+09	63.56932	19.82079	7.130562	9.479331
6	3.90E+09	61.67854	19.80214	9.434182	9.085133
7	3.90E+09	61.6576	19.77669	9.507026	9.058679
8	3.92E+09	61.5885	19.74942	9.536405	9.125669
9	3.92E+09	61.54252	19.75131	9.589226	9.116947
10	3.93E+09	61.37118	19.83316	9.718616	9.077044
11	3.94E+09	61.25708	19.85046	9.837435	9.05503
12	3.94E+09	61.24224	19.83905	9.863956	9.054759

Results in Table 9 indicate that in the short run, looking at month 1, 89% of forecast error variance in guaranteed loans is explained by public debt. This means that public debt is a strong influencer of guaranteed loans in the short run. In the long run (month 12), 61% of forecast error variance in guaranteed loans is still explained by public debt, albeit the impact decreases into future. Foreign remittance and financial transactions tax also exhibits increasing impact on guaranteed loans from the short run to the long run. However, results indicate that guaranteed loan is not a strong influencer of itself, with the impact declining into the future. Comparing the findings to VAR results, foreign remittance and financial transactions tax had a significant impact on guaranteed loans. The same can be observed in the variance decomposition results, where the impact of foreign remittance and financial transactions tax on guaranteed loans though small, increases gradually from the short run to the long run.

5. Conclusion and Recommendation

5.1 Conclusions

From the findings, the study concludes that foreign remittance has a positive and significant effect on public debt level in Kenya. The implication of this finding is that, the government is likely to continue borrowing even with increase in revenue from foreign remittance. This can be explained by the ambitious development agenda of the government. In recent years, remittances inflows have increased significantly and have become the main financial external inflow in some developing countries including Kenya, surpassing other inflows that traditionally played an important role in these countries, such as official development assistance and foreign direct investment. The World Bank estimates that remittances now make up about a third of total financial inflows in developing countries. Like other regions, Kenya saw large increases in the last decade. In the past five years, total diaspora remittances to Kenya have risen as the top foreign exchange earner overtaking tea and horticulture. It is a more stable source of inflows because it is not prone to climate and world price shifts that have seen tea and horticulture lose their top position. There is a real opportunity for Kenya to promote the magnitude and

the economic impact of remittances on the economy to eventually lead to less reliance on debt. Policymakers should devise innovative incentive policies targeting sectors that exhibit high exposures to sharp declines in remittances inflows, including those due to worsening economic conditions in the country.

The study also concludes that Financial Transactions Tax (FTT) has a negative and significant effect on public debt level in Kenya. The implication of this finding is that, the government is likely to reduce the level of borrowing as the revenue from financial transactions tax increases. This can also imply that the government is using revenue from financial transactions tax to repay the existing loans and hence reducing the level of public debt. FTT could raise substantial revenue at low rates because at the base, the value of financial transactions is enormous. Financial transaction taxes attract interest because the base is so large that even a tiny tax rate would raise significant revenue. In countries like Kenya with a fairly well-developed financial sector and telecommunications sector incorporating highly acceptable and used money transfer channels, the FTT could be used to reduce public debt through targeted support to support social development programmes such as universal healthcare, sports and culture.

The study further concludes that government guaranteed loans do not have significant effect on public debt in Kenya. This implies that the government guaranteed loans have no meaningful impact on public debt in Kenya in the period of the study. Although not significant in the Kenyan context at that point in time, guaranteed loans are flexible financial instruments that promote economic growth to complement grants and debt in the country. Guarantees allow for mobilization of capital, including the countries' domestic capital. Therefore, Kenya would be able to reduce its aid dependency and instead be able to domestically finance economically viable investments. Functioning like insurance for a financial institution wanting to lend to investors, companies and countries, guarantees can help lenders deal with these risks by insuring eligible projects against losses relating to the different market risks. If there are such problems and the debtor is not able to repay its loan to the lender, guarantees cover parts of the loss. Kenya could explore more on guarantees that are designed to encourage lenders to expand their lending to new sectors and regions or to offer better loan terms. The country could use guarantees in any sector including energy, education, democratic governance, infrastructure and health.

5.2 Recommendations

From the findings, the study established that foreign remittance has a significant effect on public debt in Kenya. As such, the research recommends the need for the government through concerned agencies to streamline foreign remittance policy. This will ensure that more revenue is obtained through remittances and this way, the government can reduce heavy reliance on domestic and foreign borrowing.

Further, the study established that financial transactions tax has a significant effect on public debt in Kenya. The study recommends that the government through relevant institutions such as the National Treasury and Kenya Revenue Authority to strengthen policies on various taxes including financial transactions tax. This will ensure that more revenue is achieved through taxes, which can be used to repay existing loan as well as financing development.

Maintaining sustainable debt in Kenya will require some mind shift and exploration of the diverse available new sources of financing that does not overburden the country. Identifying new opportunities for funding requires collaboration between different actors especially investors, entrepreneurs, and policy-makers. Innovative financing provides a set of tools for governments who want to create more development impact through investment opportunities. Innovative financing is a critical tool to engage the private sector and increase the international community's focus on development outcomes. It is a

bridge that enables the transition from traditional-funding models to structures that support markets and promote long-term sustainability. Innovative financing can attract private companies that want to expand into new markets, investors and fund managers who want to produce both financial and social returns, and governments that want to achieve more and better development impact in a resource constrained environment.

There is an opportunity and need to accelerate the growth of bankable investments that mobilize resources for development and increase the efficiency and effectiveness of financial resources. To capitalize on this opportunity, the status quo needs to change: many potential sources of capital and expertise remain untapped, and new innovative financing mechanisms often fail to account for the existing business models, incentives, and constraints of investors and private business. In addition, the innovative financing market in Kenya is still very conservative; a few innovative financing options such as Public Private Partnerships, taxes such as Financial Transaction Taxes and guarantees have been tried. The more innovative mechanisms that do exist often only involve a small set of actors or target specific issues. Further innovative financing opportunities are often missed because few players have the context and credibility to translate between public finance institutions, private players, and local governments.

Increasing the use of innovative financing will require a coordinated effort from public and private partners. This coordinated effort will need to increase information and transparency on innovative finance successes and failures, demonstrate scalable models to enable innovative finance and build a global network of investors and entrepreneurs to expand the sector. By combining private sector approaches to achieving risk-adjusted returns with a philanthropic orientation to producing social impact, the Kenyan Government can harness innovative financing to address economic, social, and environmental challenges.

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