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THE EFFECT OF FISCAL POLICY ON FINANCIAL SECTOR DEVELOPMENT IN SIERRA LEONE: A TIME SERIES APPROACH

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Abstract: *This study investigates fiscal policy impact on financial sector development in Sierra Leone between 1980 and 2015. The objective of the study is to establish the long run relationship between fiscal policy variable and financial sector development. The study used a quantitative approach; the model was formulated with Private sector credit used as a proxy variable for financial sector development. This was regressed against gross domestic product, money supply, real interest rates, inflation and total tax revenue. The study used error correction model to estimate both long term and short term effects of the explanatory variables on the dependent variables in the empirical functions. The unit root tests shows that variables in the equations were I(1) variables, meaning they were stationed at first difference using both the Augmented Dickey Fuller and Philip Pheron tests. The Johansson co integration tests concludes that there are more than one co-integrating factors in each empirical function, therefore a long run relationship exists between private sector credit and its explanatory variables. To validate the quality of the data for the use of vector auto regression, all of the tests were conducted including; lag length criteria test, serial correlation test, normality test, stability test. The result from the private sector credit and fiscal and non-fiscal variables in Sierra Leone contradicts most of the theoretical and empirical literature on financial sector development. The conclusion is that even when we are expecting a negative relationship between private sector credit and money supply, real interest rates, total tax revenue and inflation, the results all came out positively and significantly in long run financial economic analysis. This study shows that the private sector is willing to borrow regardless of the interest rate in the economy and the level of taxation. Basically the risk appetite in the private sector shows the level of desperation of private institution to access short to medium term capital. This might explain the reason for the high non-performing loans (NPL) in the economy of Sierra Leone.*

KEYWORDS: fiscal policy, financial policies, Sierra Leone, time series

INTRODUCTION

Ndlovo (2013) argues that financial sector is one of the most promising economic growth areas for developing countries and it is currently at the top of decision makers` agenda of most developing countries. From decades of underutilization of resources and investments, it has now transformed the lives of many across the African continent as more credit facilities are now

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available for SMEs and emerging young entrepreneurs, in a bid to improve financial inclusion right across the board.

Numerous policy reforms have been instituted by African leaders with the aim of a strong financial sector development. Reforms in regulatory frameworks, regulatory institutions, and information communication technology all geared towards a strong and diversified financial sector. The banking industry is one of the most developed financial sector institutions in Africa. It is a highly competitive market in even the least developed African country. It is made up of African owned and foreign banks mainly from France, United Kingdom and the USA. Ecobank (Togo), UBA (Nigeria) emerge as the two biggest Banks in terms of customer base and operation, of which both collectively operate in 32 and 19 countries across the continent respectively (Al-Yousif, 2002). However, regardless of the presence of banks in all the cities on the African continent, there still exists a gap on the use of banking services by Africa`s population as compared to that of other continents.

On insurance, the continent is far behind, accounting for only 1.5% of the global market. Only Namibia, South Africa and Mauritius utilize insurance services the most in the continent, with South Africa accounting for almost 75% (2013) of the continent (Lamikanra, 2015).

Sierra Leone's economic and financial sector development was disrupted by an eleven year civil war that ended in 2002. The population of the country was was around six million (2014) with a per capita annual income of about US $314. It is a poor country by global standards, ranking 183 in the UN Human development standards (2014).

According to Johnson (2011), Sierra Leone `s financial sector is made up of about thirteen commercial banks, two discount houses, nine insurance companies, three finance housing companies (non-deposit taking), forty two foreign exchange bureaus, and six formally registered microfinance corporations. A national stock exchange was established in mid-2009.

Sierra Leone's interest rates are determined by the market forces of demand and supply. The country`s financial sector development plan (FSDP) includes; strengthening banking supervision and regulation, increasing access to finance, improving the macroeconomic environment, to modernize the payment system, strengthening short-term financial markets and monetary policy (Johnson, 2011c).

Recent developments in the gross domestic product (GDP) show a strong performance of about 15.3 % (2012) and 20.1 % (2011), that growth was severely affected when the Ebola virus disease stroke the country and destabilized the economy. The financial services sector accounted for 7.6% and 2.4% respectively. Although the lion share of the 2012 & 2013 GDP growth were mainly driven by huge exportation of iron ore by two of the biggest mining companies; African Minerals

and London mining, followed by the agricultural, construction and services sectors; there are still potentials for growth in the financial sector, after taking into consideration the effect of the EVD virus will soon be over.

The country`s insurance industry still remains underdeveloped, inadequately regulated and supervised. The industry is made up of 8 registered providers. Insurance companies are reasonably profitable although it proportion to Sierra Leone`s GDP as at 2006 was just around 0.4%.

In the area of a capital market, a stock exchange was commissioned in 2009 with the aim of ensuring that an efficient and attractive capital market is instituted in the economy, provision of different opportunities for investors and accompanies in raising capital and meeting future expansion. At the time of it inception, only few companies were listed, Rokel Commercial Bank and three brokerage firms. It establishment is aimed at attracting foreign direct investment (FDI). The financial sector development plan works in collaboration with the country`s local content policy which encourages nationals to own shares in foreign businesses.

Rationale of the Study

The importance of financial sectors particularly in solving transaction cost and information asymmetric cannot be overemphasized. Financial sectors play a vital role in the mobilization of savings; facilitation of trade, diversification and pooling of risks; monitoring of firms and exerting corporate governance; and facilitating exchange (Levine, 1997). The finance-growth nexus has attracted series of research over the years with most authors highlighting the accumulation of physical and human capital and total factor productivity growth as the major channels through which financial development impact overall economic growth (Levine 1997). The present study is motivated on the basis that despite all the empirical works, this topic remains highly contested. Unlike the study of Loayza and Beck (2000), which examines 'Financial Intermediation and Growth: Causality and Causes', this study aim to contribute to the debate by investigating the effect of fiscal policy on financial sector development in Sierra Leone from 1980 to 2015.

The extent to which a nation's financial system is developed is a key determinant of the ability of the system to effectively and efficiently perform these core functions. Theoretical and empirical development of the financial system is pivotal and crucial for resolving agency and information asymmetry challenges as well as mitigating transaction cost (Levine and Zevous, 1998 and Hernes and Lensink, 1996).

However, the Sierra Leone financial system is to a very large extent underdeveloped due to the adoption of financially repressive policies, political corruption/poor macroeconomic management, bank malfeasance, giving rise to insolvency, low savings rate and insufficient resource allocation.

Studies carried out by scholars like Ogun (1996) and Asante (2000), on the Nigerian economy have suggested that there exist a very strong positive nexus between fiscal policies on financial sector development in emerging market economies. Oshikoya and Tarawallie (2010) also presented a strong case for the speedy promotion of financial system development in Sierra Leone.

Borrowing to finance government expenditure has a crowd-out effect on private investment and financial sector development. When the public and private sector are keenly competing for funds in the financial market, the supply of government securities would increase which would in turn reduce their prices. Since there is an inverse relationship between the prices of treasury bills and treasury bearer bonds, interest rate increases which serves as a disincentive to private investment, thereby crowd-out private sector investment.

Objective of the study

i. To examine the relationship between fiscal variables and financial sector development in Sierra Leone for the period from 1980 to 2015.

Research questions

i. What are the relationships between fiscal variables and financial sector development in the Sierra Leone?

Scope of the study

Again, it has been argued that the scope of 35 years, 1980 to 2015 is not long enough to make a comprehensive conclusion on how changes in fiscal variables affected financial sector development in Sierra Leone. The literature also suggested other variables that would have represented financial sector development. However, insufficient creditable data on some important fiscal variables have caused their elimination from this study.

LITERATURE

Theoretical Literature

Fiscal Policy and Financial Sector Nexus in Sierra Leone

Fiscal policy among other issues also evolves over the years (Aschauer, 1989). Governments have used fiscal policies like taxation, as a legislative tool to discourage the consumption of some harmful commodities such as cigarettes and alcohol, or as a protection of certain investments or

operations in the economy. Studies have shown that government expenditure and tax policies affect both the demand and supply side of an economy (Aschauer, 1989).

Financial Sector Development and Private Investment in Africa

One of the prominent views in the finance-growth nexus is that well-functioning financial sectors are required to facilitate the accumulation of both physical and human capital and technological innovations (Levine, 1997). Sledzik (2013) put forward that through the allocation of savings in the economy and the identification and financing of productive investments financial intermediaries promote productivity growth and technological innovations. In this regard, King and Levine (1993) and Levine (1997) note that firms and industries that rely on external financing are in better positions to accelerate their growths in countries with well-developed financial sectors.

However, authors like Levine (1993) among others believe that rather than finance leading growth, it is higher economic performance that leads to the development of financial sectors. Alesina et. al. (2002) mentions that as an economy approach its intermediate stage of the growth process, its financial sector also begins to grow and ultimately improve once the economy develops. Other writers have expressed that though the development of financial sectors can promote long-run economic growth; it is also the case that growth will lead to increase in demand for financial services thus inducing a further development of financial sectors (Berg et. at., 2009).

According to Ndlovo (2013), the financial sector of any economy is the composition of both the money and capital market that is the total number of institutions, markets and other monetary securities (instruments) that are present in a particular country. Added is the legal and regulatory framework that allows the establishment of contracts, and the execution of transactions through the multiplication of credits, to ensure a prudent, safe and sound financial system. In context, the entity concept is applied as wealth control and ownership is driven by the financial system. Economic growth, strength, and size are dependent on the financial sector of the economy as a whole (Al-Yousif, 2002). The financial sector includes businesses that offer multiple services like insurance, banking, brokerage, accountancy, bureau and other government sponsored activities. Other financial sector activities consist of hedge fund, venture capitalist and conglomerate activities. On the other hand, financial sector development is the aggregate number of financial securities (instruments), institutions, sophistication, interrelationship, and the establishment and growth of such institutions. It includes all the financial services providers within an economy (Al-Yousif, 2002). Financial sector institutions are expected to perform best at times when interest rates are set low. The biggest revenue sources of the financial sector come from interest received from loan, mortgages, and other major investments.

The role of the financial sector in any economy is important to the financial and economic development of that particular country. For instance, commercial banks serve as intermediaries in the money market. Acting between those with excess cash and those in deficit, this occur as people make savings to the bank, and banks in turn give it as loan to other interested parties for a fixed period of time on an interest bases.

Some of the functions of financial systems are; the facilitation of trade diversification, monitoring of investments, mobilization and pooling of savings, investment and allocation of capital, corporate governance and regulation of the financial market, promotion of exchanges of goods and services, and risk management. Financial sector development programmes are undertaken by government to ensure that, enough saving; inflow of foreign direct investment, job creation, business expansion is achieve and that poverty is reduce.

Empirical Literature on Financial Sector Development

Evidence on the role of financial sector development on growth is mixed. While some writers find substantial support that financial sector development leads to economic growth, others have assessed this relationship and concluded that economic growth leads to financial sector development.

In their cross-sectional study with 77 countries, King and Levine (1993) assess the impact of four measures of financial sector development on real per capita GDP growth, the share of domestic investment to GDP, the growth rate in capital stock per person and total productivity growth. After controlling for initial conditions and other growth determinants, they found that the four measures of finance have positive and significant effects on all growth determinants. These results are similar to the results reported by Beck, Levine and Loayza (2000). They employ both cross-sectional instrumental variable estimation for 63 countries and a dynamic Generalized-Method-of-Moments (GMM) panel technique for 77 observations for the period 1960-1995. The authors find a positive and strong relationship between finance and the growth rate of real GDP per capita and its determinants. This positive correlation they argue is not as a result of simultaneity, lagged dependent variable, or omitted variable biases.

Furthermore, Bouakez, and Rebei, (2007) investigate the influence of financial development on growth through its contribution to labour, the accumulation both physical and human capital and growth in total factor productivity. They find that measures of financial sector development are strongly correlated with both physical and human capital accumulation and productivity growth. Their results further suggest that various measures of financial development may have different effects on growth and its determinants.

In a cross-sectional analysis for 71 countries for the period 1960-1995, Andvianovo and Demetriades (2008) employ various proxies for financial sector development and find significance correlation between these financial indicators and initial levels of GDP per capita. Their results support that finance is a vital factor in explaining cross-country divergences in growth rates. They observe that while other financial indicators are significant at different levels, the coefficient estimates of commercial-central bank are statistically insignificant.

Employing panel unit root tests and panel cointegration analysis, Christopoulos and Tsionas (2004) investigate the long-run association between financial depth and output growth for ten developing countries. The authors observe a positive and significant link between the two variables. However, at country levels, they note that this positive effect is not statistically significant in Ecuador and Mexico. They further observe that while investment share is positive and significant, inflation is negative but insignificant. By also illustrating this relationship at country level, Arestis and Demetriades (2012) find that financial development has strong influence on economic growth in Germany, but that the causality seems to be moving from growth in real GDP to finance in the US. Granger causality tests also supports for a bi-directional and unidirectional causality between the development of financial systems and economic growth in sixteen countries.

Ndlova (2013) researched on financial sector development and economic growth evidence in Zimbabwe. The paper brought out the relationship between financial sector development and economic development using a co-integration relationship between the two and the ultimate directions of causal relationship. The study also used the multivariate Granger Causality Test to determine the causality from economic growth to financial development. The role of financial markets in economic development has attracted and received increased attention, but due to macroeconomic imbalances and fiscal policy inconsistencies, the financial sector of Zimbabwe has met with number of challenges which have seriously crippled the financial sector. Ndlova (2013) assessed financial sector development using three indicators; domestic credit to private sector ratio, stock market capitalization ratio to GDP, liquid liability to GDP ratio. The co-integration test rejects the null hypothesis of no co-integration vectors and indicates two long-run relationships among the variables. The Granger Causality Test rejects the null hypothesis when the probability as the f-statistics was less than 5%. The test in the Ndlova (2013) study indicates a causal relationship between real GDP and capital market capitalization and a growth led financial development. In conclusion, the Ndlova (2013) study produced evidence that does not support the view that financial development promotes economic growth in Zimbabwe. This result was also supported by Adugna (2013) who suggested that developing country have their own problems of economic growth which makes them different from other developed countries.

Oderiran and Udeaja (2010), examines the relationship between economic growth and financial sector development in Nigeria for 49 years, from 1960 to 2009. The study was able to examine the

competing finance-growth nexus hypothesis using Granger causality tests in a VAR framework over the stated period. The paper aims to provide an empirical framework for understanding the finance growth relationship in Nigeria. Four variables were used to profile financial sector development, these were ; growth in net domestic credit to GDP, ratios of broad money stock to GDP, growth in banks deposit liability to GDP and growth in private sector credit. Some earlier studies used financial deepening to explain financial sector development and concluded that there was no relationship between economic growth and financial sector development in Nigeria. This study, however, employed four measures, growth in net domestic credit, financial deepening, and growth in deposit liability of DMBs to proxy financial sector development. The empirical results suggest bidirectional causality between some of the proxies of financial development and economic growth variable. Specifically, we find that the various measures of financial development granger caused output even at 1per cent level of significance with the exception of ratio of broad money to GDP. Additionally, we find that net domestic credit is equally driven by growth in output, thus indicating bidirectional causality. The variance decomposition shows that the share of deposit liability in the total variations of net domestic credit is negligible, indicating that shock to deposit does not significantly affect net domestic credit. The findings from the paper indicate that the current reforms in the Nigerian banking sector should not be emphasized unilaterally. Rather, attention should be given to the complimentary and coordinated development of financial reforms and changes in the real sector of the economy.

Assibey et.al (2012) carried out a study on the topic “Microenterprise financing preference: Testing POH within the context of Ghana's rural financial market" the primary objective of the study was to look into the determinants of financing preference of micro and small enterprises (MSEs). It was about differentiating a wider range of funding sources beyond what is known as the current system within the corporate finance literature. They adopted a methodology using a framework of ordinal logistic regression. It also further tested whether there was evidence of hierarchical preference ordering as predicted by pecking order theory (POH).

Findings show that new enterprises prefer to take less risky, internal/bootstrap, and low-cost loans for their business financing. Such businesses were found to be interested in formal loans when they grow bigger. Result also shows those micro entrepreneurs` educational status, ownership structure, and sensitivity to high interest rates attached to formal loans, and enterprise size were some of the most important factors that determines either present or future financing preference.

METHODOLOGY

This study uses the qualitative method to provide information for analyzing empirical results on the effect of fiscal policy on financial sector development in Sierra Leone for 36 years from 1980 to 2015. Quantitative data was used, to provide answer to the research question raised. The study

used annual time series data covering the period from 1980 to 2015. The collected data estimated and analyzed using Vector Auto-Regressive (VAR) methodology framework and the Error Correction Model (ECM) was generated after establishing the existence of at least one co-integrating relationship, when the time series properties are examined.

Empirical Model of Financial Sector Development (FSD):

In this model, financial sector development is a linear function of the key explanatory variables such as: real interest rate (RIR), money supply (MS), total tax revenue (TTR), consumer price index or inflation (INF), real gross domestic product (RGDP). The financial sector development model that will be estimated in this study is specified as follows:

$$FSD = f(LGDP, LMS, LTTR, LINF, LMS, D1, D2) \ldots\ldots\ldots\ldots\ldots \quad (3.1)$$

Where ***FSD*** is a measure of the level of financial sector development using private sector credit as a proxy, ***RIR*** is the level of real interest rate in the economy, ***TTR*** is total tax revenue, ***INF*** is the rate of inflation in the economy, ***MS*** is the money supply in the economy, (***D_2***) is a dummy variable used to capture the effect of the war and (***D_1***) is a dummy representing the establishment of NRA. The functional form of the model to be estimated is represented as:

$$FSD = \alpha_0 + \alpha_1 LRIR + \alpha_2 \ LRGDP + \alpha_3 \ LTTR + \alpha_4 \ LINF + \alpha_5 LMS + \alpha_6 MS + \alpha_7 D_1 + D_2 + \mu_i \quad \ldots.(3.2$$

Where α_0 is the intercept term and α_1, α_2, α_3, α_4, α_5, α_6, and $\alpha_{7\ are}$ the structural coefficients or parameters to be estimated.

Definition, Measurement and Economic Apriori Expectation of the Variables:

Financial Sector Development (FSD): This is otherwise referred to as private sector credit ratio in this study. It is the most comprehensive indicator of the activities of money deposited in banks and it is calculated as the amount of domestic credit allocated to the private sector by the commercial banking sector divided by real GDP. It indicates the extent to which the banking sector finances the economy and more specifically the extent to which commercial banks finance private investment and private sector development. According to World Bank, domestic credit provided to the private sector include financial resources which establishes a claim for repayment such as; loans, purchased of non-equity securities, trade credits and other amounts receivables. Hence these domestic credits exclude credits extended to government and public enterprises.

Real Interest Rates (RIR): A real interest rate is an interest rate that has been adjusted so to take account of the effect of inflation and to reflect the real cost of funds to the borrower and the real yield to the lender. The real interest rate of an investment is calculated as the amount by which the

nominal interest rate exceeds the inflation rate. That is Real Interest Rate = Nominal Interest rate – Inflation Rate; expected or actual. The relationship between real interest rate and financial sector development is expected to be negative, since an increase in real interest rate would imply an increase in the cost borrowing, which reduces the demand for credit from the banking system and slows down financial stimulation. The decline in the demand for credit, will consequently limit the size of financial sector, by reducing the flow of credit to the private sector. The reverse is the case when real interest rates are low, Vice-Versa.

The theoretical relationship between private sector credit ratio (FSD) and real interest rate is expected to be negatives (-).

Total Tax Revenue (TTR): This is the total amount of income that is gained by government from both taxable sources. The theoretical relationship between total tax revenue and financial sector development is assumed to be negative. This is because, an increase in the amount of revenue collected from taxes, will limit the desire on the part of the private sector to borrow so as to finance short and long-term investment. The decrease in desire to borrow from the financial system will increase the chances of the private sector to access credit, thereby increasing the flow of credit to the private sector. The reverse is the case, when there is a drop in revenue collected from taxes.

The theoretical relationship between private sector credit ratio (FSD) and total tax revenue is expected to be negative (-).

Inflation (INF): This is the rate at which the general level of prices of goods and services is rising and consequently the purchasing power of the domestic currency is falling. The Central Bank attempts to keep inflation at a lower level, in order to keep the economy up and running, to ensure a safe and sound financial system. The inflation rate at any point in time is measured by the Consumer Price Index (CPI). Inflation is expected to have a negative relationship with financial sector development. High rate of inflation is normally associated with financial repercussion, thereby limiting the development of the financial sector, particularly when the average rate of inflation is high.
The theoretical relationship between private sector credit ratio (FSD) and inflation is expected to be negative (-).

Money Supply (MS): This is the entire stock of currency and other liquid assets in a country's economy as of a particular time. The supply of money takes account of; cash, coins in circulations and balances held in savings and current account. Money supply data is collected, recorded and published periodically, typically by the Central Bank. The theoretical relationship between money supply and financial sector development is such that, growth in money has the tendency of fuelling inflation, which consequently reduces the value of money, Interest rate, and discourages savings

and financial intermediation. The resulting decline in aggregate savings will limit the ability of commercial banks in extending credit to the public, which consequently inhibit financial sector development.

The theoretical relationship between private sector credit ratio (FSD) and money supply is expected to be negative (-).

RESULTS

Units Root Test on Financial Sector Development Variables using the Augmented Dickey Fuller (ADF) and the Philip Pheron (PP) tests

This study on fiscal policy and financial sector development use time series data and vector auto regression analysis, it is therefore essential to check whether data was stationary at levels or needed to be differenced to make them stationary. This is important to validate of the results obtained after data analysis. The data series were tested for stationary using both the Augmented Dicky**-**Fuller (ADF) and Phillips-Perron (PP) methods. Table 1 below shows the unit root tests of financial sector development and fiscal variables in Sierra Leone from 1980 to 2015.

Table 1 - Units Root Test on Financial Sector Development Variables using the Augmented Dickey Fuller (ADF) and the Philip Pheron (PP) tests

Variables	Test at levels		Unit Root Test				
		ADF Test			PP Test		
		t-statistics	Probability (p.value)		t-statistics	Probability (p.value)	
LPSC	At levels	-1.860234	0.3464		-1.885958	0.3348	
	At first difference	-6.372835*	0.0000	(I) 1	-6.352718	0.0000	(I) 1
LGDP	At levels	-1.700698	0.4221		-1.712131	0.4166	
	At first difference	-4.810094*	0.0004	(I) 1	-4.654514	0.0007	(I) 1
LMS	At levels	-3.258208**	0.0248	(I) 0	-2.639865	0.0949	(I) 0
	At first difference	-3.505866**	0.0139	(I) 1	-3.663518	0.0094	(I) 1
LTTR	At levels	-3.268619**	0.0247	(I) 0	-2.789872	0.0700	(I) 0
	At first difference	-6.876958*	0.0000	(I) 1	-6.839493	0.0000	(I) 1
RIR	At levels	-2.319588	0.1719		-2.158655	0.2243	
	At first difference	-4.666970*	0.0007	(I) 1	-4.666970	0.0007	(I) 1
INF	At levels	-2.950302**	0.0498	(I) 0	-2.950302	0.0498	(I) 0
	At first difference	-4.859465*	0.0004	(I) 1	-11.02336	0.0000	(I) 1

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*1% significant, ***Source: (Constructed from the study data)***

** 5% significant

From the date above only three variables stationed at levels or are (I) 0 variables, in the ADF test. These are money supply, total tax revenue and inflation. However, all six variables were stationary at first difference, thereby accepting the assumptions of VAR as the variables are all stationary of the same order (I) 1 variables. THE PP tests also showed that the data were stationed at difference at 5% level of significant.

Lag Length Criteria of Financial Sector Development Variables

Table 2 below shows the result for the lag length criteria for the financial sector development variables.

T***able 2 - VAR Lag Order*** Selection Criteria

Endogenous variables: LPSC LGDP LMS RIR INF LTTR
Exogenous variables: C DW DNRA
Sample: 1980 2015
Included observations: 34

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-300.1305	NA	5.414379	18.71356	19.52163	18.98914
1	-139.4577	236.2835*	0.003811*	11.37987*	13.80409*	12.20659*
2	-105.0368	38.47045	0.005717	11.47275	15.51312	12.85063

* indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

Source: (Constructed from the study data)

All the five criteria indicates that the financial sector variables must be lag at 1, using VAR as the sequential modified LR, Final Prediction Error, Akaike Information Criterion, Schwarz Information Criterion and Hannan-Quinn Information Criterion all tested at 5% levels.

Serial Correlation Test of Financial Sector Development Variables

Table 3 below shows the results of the serial correlation test for the financial sector development variables.

Table 3- VAR Residual Serial Correlation LM Tests
Null Hypothesis: no serial correlation at lag order h
Sample: 1980 2015
Included observations: 35

Lags	LM-Stat	Prob
1	31.51095	0.6820
2	55.89985	0.0183
3	28.22158	0.8192
4	39.68134	0.3093
5	41.86431	0.2313
6	33.77514	0.5748
7	34.49129	0.5404
8	32.33498	0.6436
9	41.26504	0.2513
10	35.33731	0.4999
11	22.39906	0.9628
12	25.99653	0.8906

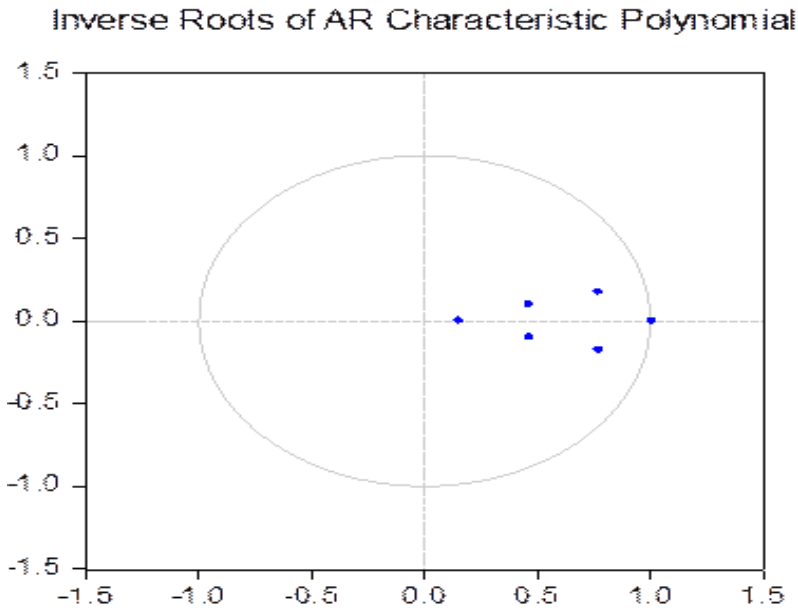
Probs from chi-square with 36 df.

Source: (Constructed from the study data,)

The p.value of the first lag shows that there is no serial correlation above 5% level of significant. Even though lag 2 shows a below 5% significant levels but all the other lags shows above the level of significant.

Stability Test (Graph) of Financial Sector Development Variables

Figure 1 shows the inverse root of AR characteristics polynomial of the financial sector development variables of Sierra Leone from 1980 to 2015.



Source: (Constructed from the study data)

In Table 4 the data is said to be stable because all the variables are within the unit circle, therefore the VAR satisfies the stability condition of the data.

Normality Test of Financial Sector Development Variables

Table 4 shows the result of VAR residual normality tests for financial sector development variables.

Table 4 - VAR Residual Normality Tests
Orthogonalization: Cholesky (Lutkepohl)
Null Hypothesis: residuals are multivariate normal
Sample: 1980 2015
Included observations: 35

Component	Skewness	Chi-sq	df	Prob.
1	0.084120	0.041278	1	0.8390
2	0.585474	1.999548	1	0.1573
3	-0.483981	1.366384	1	0.2424
4	0.036088	0.007597	1	0.9305
5	0.642074	2.404842	1	0.1210
6	-0.797526	3.710279	1	0.0541
Joint		9.529927	6	0.1459

Component	Kurtosis	Chi-sq	df	Prob.
1	2.984997	0.000328	1	0.9855
2	4.091950	1.738849	1	0.1873
3	2.560506	0.281684	1	0.5956
4	4.718064	4.304629	1	0.0380
5	4.082720	1.709580	1	0.1910
6	4.759252	4.513496	1	0.0336
Joint		12.54857	6	0.0508

Component	Jarque-Bera	df	Prob.
1	0.041606	2	0.9794
2	3.738397	2	0.1542
3	1.648068	2	0.4387
4	4.312226	2	0.1158
5	4.114422	2	0.1278
6	8.223775	2	0.0164
Joint	22.07849	12	0.2566

(Constructed from the study data)

The normality test in Table 14 shows the p.value of the Jarque-Bera insignificant at 0.25 above the 5% level of significant. The null hypothesis is multivariate normal when the p. value is not significant. Therefore the data is normal.

Heteroskedasticity of Financial Sector Development Variables

Table 5 below shows the result of heteroskedasticity test for financial sector development variables.

Table 5 - VAR Residual Heteroskedasticity Tests: No Cross Terms (only levels and squares)

Sample: 1980 2015
Included observations: 35

Joint test:

Chi-sq	df	Prob.
323.6075	294	0.1132

Source: (Constructed from the study data, June 2017)

The variables have a common standard deviation as the p.value of the heteroskedasticity is at 11% level of significant is above 5% level standard level of significant for VAR.

Johansson Co-integration Test of Financial Sector Development Variables

The result in Table 6 below shows the result of co-integration test for financial sector development variables.

Johansson Cointegration Test
Table 6 - Sample (adjusted): 1983 2015
Included observations: 33 after adjustments
Trend assumption: Linear deterministic trend
Series: LPSC LGDP LMS RIR INF LTTR
Exogenous series: DW DNRA
Warning: Critical values assume no exogenous series
Lags interval (in first differences): 1 to 2

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.925862	208.7727	95.75366	0.0000
At most 1 *	0.825525	122.9124	69.81889	0.0000
At most 2 *	0.664947	65.29533	47.85613	0.0005
At most 3	0.530819	29.21094	29.79707	0.0583
At most 4	0.107490	4.237637	15.49471	0.8834
At most 5	0.014588	0.484959	3.841466	0.4862

Trace test indicates 3 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.925862	85.86024	40.07757	0.0000
At most 1 *	0.825525	57.61709	33.87687	0.0000
At most 2 *	0.664947	36.08439	27.58434	0.0032
At most 3 *	0.530819	24.97330	21.13162	0.0137
At most 4	0.107490	3.752678	14.26460	0.8845
At most 5	0.014588	0.484959	3.841466	0.4862

Max-eigenvalue test indicates 4 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Source: (Constructed from the study data)

The trace test indicates 4 cointegrating equations at the 5% level of significant hence symbolize denunciation of the hypothesis at the 0.05 level (MacKinnon-Haug-Michelis, 1999) p-values. The max-eigenvalue test indicates 4 cointegrating equations at the 5% level of significance which denotes rejection of the hypothesis at the 0.05 level of p-value. Therefore results for the financial

sector development variables in table… shows the existence of a cointegrating relationship between private sector credit which is the proxy variable for financial sector development, gross domestics product, money supply, real interest rate, inflation and total tax revenue.

Vector Error Correction Estimates

Table 7 below shows the result of the long run vector error correction estimates for financial sector development variables.

Table 7 – Long run Vector Correction Estimates

Variables	co-efficient	Standard. error	t. statistics
LRGDP (-1)	1.255070	(-0.64595)	1.94299
LMS (-1)	0.114384	(-0.04607)	2.48286
RIR (-1)	0.005610	(-0.00635)	0.88395
INF (-1)	-0.015674	(-0.00255)	(6.14143)
LTTR (-1)	0.874966	(-0.31313)	(2.79426)

Source: (Constructed from the study data)

In table 7 above, the t.statistics of the long run equilibrium for financial sector development shows inflation to be negative and significant, while money supply, inflation and total tax revenue significant at 2% in the long run. Real Gross Domestic Product and Real Interest Rate are not statistically significant in the long run. Meanwhile the coefficient of the long run ERM shows a positive relationship between the Real Gross Domestic Product, Money Supply, Real Interest Rate and Total Tax Revenue, while Inflation shows a negative relationship with the Private Sector Credit which is a proxy variable for Financial Sector Development in this study.

Information in the long run equilibrium ECM shows that a 1% change in Real GDP will ignite a 1.255% increase in Private Sector Credit, a 1% increase in Money Supply will increase Private Sector Credit by 0.1143%. While a 1% change in Real Interest Rates and Total Tax Revenues will increase Private Investment by 0.0056% and 0.874% respectively.

Table 8 below shows the short run vector error correction estimates for financial sector development variables.

Table 8- Short run Vector Correction Estimates

Error Correction:	D(LPSC)	D(LGDP)	D(LMS)	D(RIR)	D(INF)	D(LTTR)
CointEq1	0.089978	0.101441	-0.001312	-3.313909	-48.35904	0.219455
	(0.14537)	(0.04686)	(0.06057)	(3.17269)	(14.1089)	(0.10832)
	[0.61894]	[2.16490]	[-0.02165]	[-1.04451]	[-3.42756]	[2.02598]

Source: (Constructed from the study data)

The short run error correction coefficient of Private Sector Credit is positive and insignificant at 0.6189, which is above the 5% level of significant. This shows that the data is statistically not significant for short run analysis.

The table below shows the result of vector error correction estimates for Granger Causality test.

Granger Causality Test of Financial Sector Development Variables

Table 9 below shows the results for the Granger Causality tests for financial sector development fiscal variables from 1980 to 2015.

Table 9 - VEC Granger Causality/Block Exogeneity Wald Tests
Sample: 1980 2015
Included observations: 34

Dependent variable: D(LPSC)

Excluded	Chi-sq	df	Prob.
D(LGDP)	0.003707	1	0.9515
D(LMS)	0.038282	1	0.8449
D(RIR)	0.344776	1	0.5571
D(INF)	3.083709	1	0.0791
D(LTTR)	0.687094	1	0.4072
All	5.158497	5	0.3968

Source: (Constructed from the study data)

Results from the study above shows there is no overall causality between the independent variable Private Sector Credit Ratio, which is the proxy variable for financial sector investment in Sierra

Leone and the explanatory variables. This is because the test shows an overall score of 0.39 which is above the 5% level of significant.

However, while Real Gross Domestic Product, Money Supply, Real Interest Rate and Total Tax Revenue shows there is no causality with Private Sector Credit Ratio (PSCR), the result shows causality between the independent variables PSCR and Inflation at 0.0791, at 5% level of significant.

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Summary on Empirical Results of Financial Sector Development and Fiscal Policy and Non-Fiscal Variables

Private Sector Credit and Real Gross Domestic Product

The relationship between real gross domestic product and private sector credit is expected to be negative (+). Results from long-run estimates show a positive (+) relationship between private sector credit and real gross domestic product. Meanwhile, the results shows that the estimates are not statistically significant for economic interpretation as the 2 % t.statistics level of significant was not attained.

Private Sector Credit and Money Supply

The theoretical relationship between private sector credit and money supply is expected to be negative (-). Long-run results from vector correction estimates shoes a positive (+) relationship between private sector credit and private sector credit, the results also shows above 2 % level of significant, meaning the variables can be statistically compared in the long run. A change in money supply by % increases the private sector credit by 0.11 % .

Private Sector Credit and Real Interest Rates

The relationship between real interest rate and private sector credit is expected to be negative (-). The results show that the variables have a positive (+) relationship and that private sector credit increases by 0.0056 for every 1 % change in real interest rates, though not statistically significant for economic conclusions.

Private Sector Credit and Inflation

The theoretical relationship between private sector credit ratio (FSD) and inflation is expected to be negative (-). The results are negative (-) as theoretically implied thereby suggesting that 1 % change in inflation reduces private sector credit by 0.0156 %. The variables are statistically significant for economic conclusion.

Private Sector Credit and Total Tax Revenue

The theoretical relationship between private sector credit ratio (FSD) and total tax revenue is expected to be negative (-). Total Tax revenue is positively (+) related to private sector credit, thereby abandoning the theoretical assumption. The data is statistically significant at 2.79 % t.statistics.

Conclusion

General Conclusions

The major findings of the study of financial sector development are summarized below: (i) the coefficient of private sector credit real gross domestic product is positive but statistically insignificant for further economic explanation in the long-run. This indicates that, even though there is positive correlation but the study cannot reliably conclude that an improvement in real gross domestic product can improve private sector credit in the economy, verse-versa. (ii) Between 1980 and 2015, money supply had a positive relationship with private sector credit, even when economic theory suggests otherwise but the study result shows that the relationship is statistically accepted. This implies that the credit in the private sector has been expanding as the amount of money in the economy increases in Sierra Leone, even though increase in money supply fuels inflation which tends to relates negatively with private sector credit but the case of Sierra Leone has enriched the debate on fiscal policy and financial sector development in Sierra Leone. (iii) Real interest rates and private sector credit relates positively in the models but the result cannot be used for economic analysis since it is not statistically significant. (iv) The statistically significant result shows that private sector credit relates positively with total tax revenue. This means that the private sector is willing to take credit regardless of the level of tax burden in the economy. (v) Inflation comes out positive with private sector credit in the long run, and the result is statistically significant.

The result from the private sector credit ratio and fiscal and non-fiscal variables in Sierra Leone contradicts most of the theoretical and empirical literature on financial sector development. The conclusion is that even when we are expecting a negative relationship between private sector credit

and money supply, real interest rates, total tax revenue and inflation, the results all came out positive in long-run analysis. The mean the private sector is willing to take credit in Sierra Leone regardless of cost or other economic conditions. This might explain some of the reason for a higher Non-Performing Loan (NPL) in Sierra Leone.

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