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Editorial

Journal of Economics and Behavioral Studies (JEBS) provides distinct avenue for quality research in the ever-changing fields of economics & behavioral studies and related disciplines. Research work submitted for publication consideration should not merely limited to conceptualization of economics and behavioral developments but comprise interdisciplinary and multi-facet approaches to economics and behavioral theories and practices as well as general transformations in the fields. Scope of the JEBS includes: subjects of managerial economics, financial economics, development economics, finance, economics, financial psychology, strategic management, organizational behavior, human behavior, marketing, human resource management and behavioral finance. Author(s) should declare that work submitted to the journal is original, not under consideration for publication by another journal, and that all listed authors approve its submission to JEBS. Author (s) can submit: Research Paper, Conceptual Paper, Case Studies and Book Review. Journal received research submission related to all aspects of major themes and tracks. All submitted papers were first assessed by the editorial team for relevance and originality of the work and blindly peer-reviewed by the external reviewers depending on the subject matter of the paper. After the rigorous peer-review process, the submitted papers were selected based on originality, significance, and clarity of the purpose. The current issue of JEBS comprises of papers of scholars from South Africa, Nigeria, Indonesia and China. Re-visiting the external debt-economic growth question, the governance of state-owned enterprises, business strategies and competitive advantage, role of environmental performance and environmental disclosure and impact of real exchange rate fluctuations on aggregate cocoa and coffee exports were some of the major practices and concepts examined in these studies. Current issue will therefore be a unique offer where scholars will be able to appreciate the latest results in their field of expertise, and to acquire additional knowledge in other relevant fields.

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Re-Visiting the External Debt-Economic Growth Question in Zimbabwe

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Abstract: This paper quantifies the threshold effect of external debt on economic growth in Zimbabwe between 1980 and 2016. Results from the Fully Modified Ordinary Least Squares (FMOLS) technique confirm that external debt (up to 57% of GDP) raises economic growth. Beyond the 57% of GDP threshold, external debt lowers growth. A separate analysis of variance shows that the mean GDP per capita is lower by 11% when external debt exceeds 57%. From the sample average, the 57% of GDP threshold suggests that debt stock above 4.7 billion USD can be detrimental to the country's long-run growth prospects. Currently, Zimbabwe's external debt is standing at over 11 billion USD which is way above the estimated threshold level. Therefore, the policy implication arising from this paper is that the country's Finance Minister needs to pursue debt-reduction strategies given that the country's stock of external debt is already sitting in the growth-reducing territory.

Keywords: *Fiscal Policy, External Debt, Threshold, GDP per capita, Zimbabwe.*

1. Introduction

Criticism levelled against the Zimbabwean government during the past two decades has been centred around, the accumulation of debt owing to excessive fiscal spending in spite of a collapsing revenue base. According to the Reserve Bank of Zimbabwe's May 2018 Monthly Economic Review, the government's total external debt doubled in only 8 years, from 5.6 billion USD in 2009 to 11.2 billion USD in 2017. In 2008, it stood at 147.7% of GDP, its highest since the country attained independence in 1980. With the country at a critical juncture post-elections held on the 31st of July 2018, some economists and the international community especially the IMF have begun contemplating that further debt-financed spending can stunt economic growth. It is against this background that the country's newly appointed Minister of Finance articulated in the 2018/2019 budget a raft of cost containment measures which include a 5 percent salary cut for senior government officials coupled with a 2 percent electronic transactions cost aimed at raising revenue trades performance, which is essential to raise foreign currency reserves required to repay the external debt (mostly owed to the Paris Club and the African Development Bank), has however been far from satisfactory. From an academic standpoint, several questions have been raised concerning the debt situation but the critical one appears to be one which questions the effect that this ballooning debt is likely to have on the country's long-run growth prospects. This is not a new question in economic literature.

In fact, it is an old controversial macroeconomic question whose controversy took the centre stage when Reinhardt and Rogoff (2010) confirmed from a broad sample of developed and developing countries that debt is detrimental to growth when it exceeds 90% of GDP[1]. In economic theory, debt arises from deficits and deficits reflect a mismatch between revenue and expenditure. In this sense, prima facie evidence claiming a negative effect of debt on growth (see for example, Diamond, 1965; Saint-Paul, 1992; Schclarek, 2004; Adam & Bevan, 2005; Aizenman, Kletzer, & Pinto, 2007; Malik et al., 2010; Shabbir, 2013) cites the distortionary effect of government spending that culminates into deficits as the key explanatory channel. This distortionary effect can include things like debt servicing costs, the mis-use of state resources in form of corruption and the crowding of private investment. The latter is explained by the fact that government spending when financed by domestic borrowing generally leaves insufficient loanable funds for private capital formation. Also, high debt levels imply that a significant amount of debt servicing in the country's future budgets will result in less resources for economic development. On the contrary, other scholars argue that debt can promote a country's

[1] A subsequent analysis by Herndon et al. (2014) however dismissed this 90% threshold conclusion citing methodological flaws in Reinhardt and Rogoff (2010).

long-run growth prospects if it is used to finance capital formation such as the construction of high ways, dams, airports and other types of infrastructure as opposed to recurrent expenditures[2]. This is particularly true when the return on investment is higher than the cost of servicing the debt.

The short-run positive effect of such spending includes the boost in aggregate demand emanating directly from government purchases and the formation of jobs created largely by infrastructural projects. The long-term positive effect comes from the increase in productivity stemming from capital formation. Empirical evidence supporting a positive relationship between external debt and growth comprises Ijirshar and Godoo (2016) and Spilioti and Vamvoukas (2015). In other studies, such as were (2001), Chowdhury (1994), Warner (1992) and Cohen (1993), the impact of external debt on growth is modest at best. Given these contradicting theoretical and empirical views, this paper attempts to establish how debt has interacted with growth in the Zimbabwean economy between 1980 and 2016. Literature on external debt and economic growth in the context of Zimbabwe is limited and it comprises recent studies by Matandare and Tito (2018) and Munzara (2015). Generally, these studies confirm a detrimental effect of external debt on growth. Our work differs from these studies in two respects.

First, we estimate the non-linear effect of external debt on growth and we calculate the threshold effect. A number of studies (Reinhart & Rogoff, 2010; Kumar & Woo, 2015; Cordella, Ricci, & Ruiz-Arranz, 2010; Checherita & Rother, 2012) have shown that the impact of debt on growth can be non-linear. These studies essentially claim that debt raises growth up to a certain point beyond which further debt retards growth. It remains to be known however whether this non-linearity exists for Zimbabwe given the absence of any empirical study addressing this issue. Secondly, unlike previous literature on this subject (Matandare and Tito, 2018, Munzara, 2015), we rely on an estimation technique – the Fully Modified Ordinary Least Squares – which addresses the problem of endogeneity which features prominently in the analysis of debt and economic growth. The rest of the paper unfolds as follows: section 2 provides an overview of Zimbabwe's macroeconomic performance and literature review, section 3 specifies the empirical models, section 4 presents and interprets the empirical findings while concluding remarks are outlined in section 5.

Macroeconomic Performance in Zimbabwe: Zimbabwe attained independence in 1980 and inherited an economy which was already in debt accumulated by its former colony – Britain. Subsequently, the period 1980 – 1990 was characterised by government redistributive and investment policies that were meant to address social inequalities and improve infrastructure that had been damaged during the war. Also, the expenditures were justified by the fact that the democratic government had inherited an economy that had structural problems particularly those related to the lack of schools and public hospitals for the black majority. During the colonial period, the economy was based on a narrow economic model that was chiefly dependent on resource extraction and this meant that the new government had to embark on some stimulative fiscal policies in order to address these structural issues. However, these fiscal actions culminated in increased spending, which did not match with fiscal revenues resulting in the country experiencing high fiscal deficits and rising public debt. In 1992, Zimbabwe was hard-hit by a drought that negatively affected agriculture. Instead of negotiating with multilateral institutions for aid in form of grants, the government of Zimbabwe negotiated for loans. Despite having low interest rates, these loans added to the already existing debt. The IMF and World Bank acknowledged that these loans were not going to be channelled into productive investments that could allow the country to pay back.

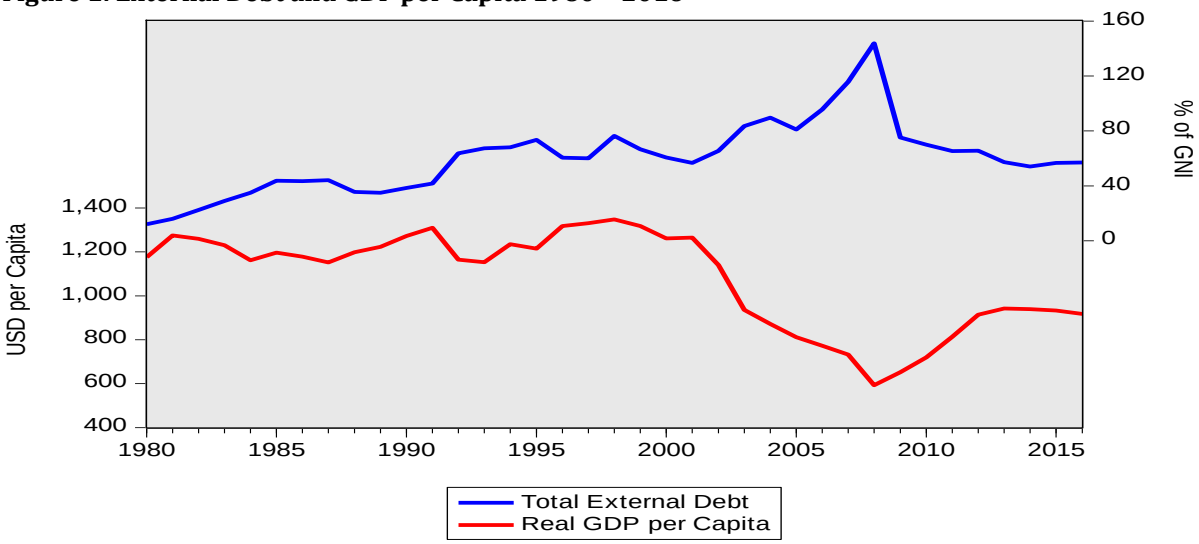
Instead, their justification was that the economy of Zimbabwe would continue to growth at an average of about 4% increasing its chances of paying back the debt. Mid-90s featured economic structural adjustment programs (ESAP) that were heavily supported by the International Monetary Fund (IMF). The ESAP period saw a significant reduction of tariffs and liberalization of markets. Having failed to reap the anticipated benefits, the government implemented the Zimbabwe Program for Economic and Social Transformation

[2] The government of Zimbabwe has been criticised for allocating over 80% of its budget on public sector wage bill

(ZIMPREST) in 1996 which was designed to achieve sustainable economic growth and poverty reduction. The economy failed to grow at a pace predicted both by the World Bank and IMF which meant that Zimbabwe was unable to pay back the debt. Instead of negotiating for debt forgiveness, Zimbabwe still pledged to these multilateral institutions for more loans. In response, the IMF came to a point of disbursing more loans that would allow Zimbabwe to settle its past arrears in order to get new loans. This therefore meant a disbursement of funds that never reached Harare but were rather transferred from one account to the other in Washington. All this meant further debt accumulation for the southern African economy which was already showing signs of economic dismay. At the same time particularly a year after implementation of ZIMPREST, (The Black Friday of 14 November 1997).

The Government of Zimbabwe paid gratuities to the liberation war veterans and simultaneously got involved in the Democratic Republic of Congo civil war[3]. This led to an increase in government expenditure that was not budgeted for and consequently marked the beginning of a persistent liquidity crisis and debt that went on to arrest the economy in the subsequent decade reversing the marginal economic gains that had emanated from both ESAP and ZIMPREST. In 2000, the government of Zimbabwe began defaulting payments. The accumulation of external payment arrears resulted in some litigations against the government by creditors. The IMF in particular reviewed Zimbabwe's overdue obligations on 25 September 2001, and declared it ineligible to access the general resources of the IMF. The African Development Bank (AfDB) took a similar stance as it imposed sanctions on the country and subsequently stopped all lending operations in the country. Owing to these external credit constraints, the Zimbabwean government shifted to domestic borrowing in form of treasury bills. This was complemented by an excessive printing of the Zimbabwean dollar which consequently led to most predicted outcome of hyperinflation that peaked in 2008.

Figure 1: External Debt and GDP per Capita 1980 – 2016



Source: Own computation using WDI Data

The economy went through a very volatile economic period that saw the Reserve Bank of Zimbabwe (RBZ) introducing a raft of measures to mitigate these problems, but to no avail. Some of the measures undertaken

[3] The government deployed at least 12000 troops in DRC to protect diamond mines which were given to Zimbabwe by the Congolese government in 1998. In 1997, the government had paid its war veterans once-off gratuity payments of Z$50000. These gratuities and the deployment of troops in DRC massively contributed to the demise of the economy in subsequent years.

included the use of bearer cheques with very high denominations[4] ($1 trillion) as legal tender but this did not solve the problem. If anything, the measures worsened the situation by fuelling inflation. Amid the crisis, Zimbabwe held Presidential elections in 2008 which resulted in a new political transformation when the ruling party united with the country largest opposition party. This new political dispensation completely abolished the Zimbabwean dollar in 2009 in favour of a de facto dollarization which allowed the use of multiple currencies. The finance ministry managed to establish the Zimbabwe Aid and Debt Management Office (ZADMO) in December 2010 which was meant to review and revise the institutional and legal framework for debt management. Total external debt came down from 75% of GNI in 2009 to 65.5% in 2012. During the same period, the economy was on a rebound and it registered growths averaging 10.5% per year (Nyarota et al., 2015). By the end of 2013 however, the economy began to show signs of a new crisis. Economic growth, decelerated sharply to less than 5% in 2013 and 2014 (Nyarota et al., 2015). The multicurrency system temporarily stabilized the economy but the problem of cash shortage owing to the RBZ's inability to print money became visible in 2016 and reached crisis levels by 2017. This resulted in the RBZ introducing new measures to mitigate the cash crisis. These measures include the introduction of Bond notes and coins which were initially pegged at par with the United States of America dollar (US$).

2. Literature Review

However, this failed to solve the financial crisis as banks, at the time of writing, are struggling to meet withdrawals. During this crisis period, economic growth fell from 1.4 percent in 2015 to 0.7 percent in 2016 continuing the recent decline in per capita income growth (IMF, 2017). This section provides a brief review of theoretical and empirical literature on external debt and economic growth. Theoretical explanations on this subject can be categorised into three groups. The first theoretical category proclaims that external debt can promote economic growth in poor countries distant position from the steady state through the capital accumulation process (Poirson, et al., 2004). The second theoretical view holds that debt accumulation has a negative effect on growth that arises as a result of the debt overhang hypothesis advocated by Krugman (1988), Sach (1989) and Cohen (1993). According to Krugman (1988), debt overhang occurs when the expected repayment on external debt falls short of the contractual debt value. Put differently, Borensztein (1990) described the debt overhang situation as one in which the country in debt experiences very little benefits from the return on investment chiefly due to debt service obligations. The third theoretical group argues that the effect of external debt on economic growth is nonlinear in the sense that low levels of debt can promote growth while high debt levels can achieve the opposite. Central to this argument is the presence of a threshold debt level beyond which the effect of external debt on growth can be negative. Empirically, results reported so far demonstrate that the impact of debt on economic growth is not obvious. Some studies report a positive effect while others confirm a negative effect and this is not surprising given the lack of a consensus from a theoretical viewpoint.

Within this empirical debate however, a result that appears to be dominant is that of a positive growth impact of external debt. The majority of these studies rely on time series techniques based on country-specific evidence and they include Senadza et al. (2012), Atique and Malik (2012), Ndubuisi (2017) and more recently Kharusi and Ada (2018). Senadza et al. (2012) apply an autoregressive distributed lag model to establish this relationship based on annual time series data spanning the periods 1970 and 2015 in the context of Ghana. They confirm a detrimental effect of external debt on Ghana's economic growth. Kharusi and Ada (2018) similarly apply the ARDL model in the context of Oman and confirm a similar finding – external debt hampers economic growth. Atique and Malik (2012) rely on the conventional Ordinary Least Squares (OLS) technique to determine the impact of domestic and external debt in the case of Pakistan using annual time series data covering the period 1980 – 2010. Like Senadza et al. (2012) and Kharusi and Ada (2018), the results indicate that external debt reduces economic growth. Further confirmed is that the negative effect of external debt is larger than that of domestic debt. Another study that applies the OLS technique in this area of research is that

[4] The Reserve Bank also resorted to the cancellation of zeros on the bearer cheques. For example, a bearer cheque worth Z$100 000 000 would be reduced to only Z$100.00

of Ndubuisi (2017) conducted in the context of Nigeria based on annual time series data observed from 1985 through 2015. Different from Atique and Malik (2012) albeit in a different country, Ndubuisi (2017) finds debt service payment as the variable that negatively affects economic otherwise the stock of external debt stock is found to have a significantly positive impact on Nigeria's economic growth. A recent paper by Shkolnyk and Koilo (2018) applies the ARDL model to examine the non-linear effect of external debt on economic growth using evidence from Ukraine and some selected emerging economies.

The authors find evidence of a non-linear relationship between external debt and economic growth. In particular, they show that very high external debt levels impede economic growth supporting the theoretical view of a tipping point in the way external debt affects economic growth. This evidence also corroborates the conclusions reached in an influential paper by Reinhardt and Rogoff (2010) which is that public debt is detrimental to growth when it exceeds 90% of GDP and that for emerging economies, external debt negatively affects growth when it exceeds the 60% of GDP mark. Studies on external debt and growth in the context of Zimbabwe are limited. They include Murangwana (2012) who sought to determine the impact of external debt on Zimbabwe's economic growth using data covering the 1985 – 2009 sampling period. Relying on the OLS technique, the author confirmed a detrimental effect of external debt on growth as reported in most studies. Other studies such Munzara (2015) and Saungweme and Mufandaedza (2013) also apply the OLS technique and confirm a similar result – external debt correlates negatively with Zimbabwe's economic growth. At the outset, we attempt to improve this literature in two ways. First, we apply a more robust estimation technique – the Fully Modified Ordinary Least Squares (FMOLS) technique – which addresses the endogeneity problem that normally features in the debt-growth relation. The OLS technique which most of these previous studies relied upon assumes exogeneity of explanatory variables which seems very unlikely to hold since external debt is often endogenous. In this case, one can argue that OLS estimates will be biased and inconsistent. Second, we consider a non-linear specification to determine the threshold effect of external debt.

3. Methodology

The objective here is to establish the relationship between external debt and economic growth in Zimbabwe and therefore we require data on real GDP per capita and external debt. Such data are sourced from the World Development Indicators (WDI) for the period 1980 – 2016 which is essentially a post-independence era. Since data are annual, this period gives us a sample size of 37 years. Stretching the sampling period to 2017 though desirable is constrained by data unavailability at the WDI. Since most of the variables that affect growth are possible indirect channels through which debt affects growth, I consider a parsimonious specification that allows me to capture the full impact of external debt. The model takes the following form.

$$\log \mathrm{GDP\_PC}_t = \vartheta_0 + \vartheta_1 \mathrm{EX\_DEBT}_t + \vartheta_2 \mathrm{EX\_DEBT}_t^2 + \vartheta_3 \mathrm{TREND} + \varepsilon_t \qquad (1)$$
$$t = 1980, \ldots, 2016$$

Where subscript t signifies time, GDP_PC denotes real gross domestic product per capita, EX_DEBT is external debt as a percentage of GDP, $\mathrm{EX\_DEBT}^2$ captures the potential non-linear effect of external debt (see Reinhardt and Rogoff, 2010). The trend component on the other hand captures time-dependent shocks that may affect both debt and growth. The last term, ε, is an error term which is assumed to follow a normal distribution with a mean of zero and a constant variance. If Reinhardt's prediction that debt raises growth up to a certain threshold point is true, then ϑ_1 and ϑ_2 should be significantly positive and negative respectively. The threshold debt would be solved by algebraically equating to zero the first derivative of equation (1) with respect to debt. Endogeneity is likely to feature prominently in the growth-debt relationship owing to the potential reverse causation and the omission of other relevant variables that may possibly affect both growth and debt. In the former case for example, it is possible that Zimbabwe engaged external creditors to save the economy that was already heading south. We do not want to unfairly blame external debt for pre-existing distortions as such would be akin to blaming humanitarian assistance for the loss of lives following a natural disaster. I therefore rely on the fully modified ordinary least squares method which addresses the endogeneity problem in non-stationary and possibly co-integrating relations.

4. Results and Discussion

To avoid running a spurious regression, I first conducted stationarity tests using the Breakpoint unit root test, the Augmented Dickey-Fuller (ADF), the Phillips-Perron (PP) and the Kwiatkowski-Phillips-Schmidt-Shin (KPSS) tests. Results in table 1 show that both GDP per capita (in logs) and external debt are generated by a non-stationary process in levels but are stationary once differenced implying an integration of order one.

Table 1: Unit Root Tests

Variable		Break-Point	ADF	PP	KPSS	Order of Integration
log GDP_PC	Levels	3.113	1.044	0.633	[TI]0.164**	I(1)
	Δ	4.848**	4.772***	6.279***	0.227	
Ex_Debt	Levels	3.115	1.386	0.587	0.605***	I(1)
	Δ	8.152***	7.571***	8.691**	0.116	

Note: **, *** denote p<0.1, p<0.05&p<0.01 respectively [TI] Signifies specification with trend and intercept.

Figures in tables are test statistics for the Break-Point, ADF and PP tests. For the KPSS, the figures represent the LM-statistic. ADF = Augmented Dickey Fuller, PP=Phillips-Perron, KSS=Kwiatkowski-Phillips-Schmidt-Shin. Having applied the FMOLS technique, two findings are in order. First, the coefficients of both the linear and non-linear terms are statistically significant at the 5% level. Second, the linear term has a positive coefficient while the non-linear term has a negative coefficient. These two results combined together indicate that external debt has a non-linear effect on GDP per capita growth. Put differently, the results support the notion that external debt has a positive effect on economic growth in Zimbabwe up to a certain point where further debt accumulation exerts a negative effect on growth. Algebraically, the threshold level turns out to be 57% which means that the positive effect of external debt on growth disappears once the stock of debt reaches 57% of GDP. Beyond 57% of GDP, further debt begins to have a negative effect on growth. The mean GDP (not GDP per capita) during the sampling period was about 8.4 billion USD which means that the threshold level is estimated to be about 4.7 billion USD. The message is that the stock of debt above 4.7 billion USD had a harmful effect on growth in Zimbabwe between 1980 and 2016.

Fully Modified Ordinary Least Squares Estimates: $\log GDP\_PC_t = 6.855904 + 0.016431 EX\_DEBT_t - 0.000144 EX\_DEBT_t^2 - 0.015701\, TREND$
Std. Err. (0.189671) (0.006574) $(4.30E-05)$ (0.004345)
Adj. $R^2 = 0.64$ Adj. n = 36, Threshold Debt = 57%

The trend component is negative and statistically significant at 5% level showing that growth on average declined by 1.5% annually between 1980 and 2016. The adjusted R^2 is 0.64 slightly lower than the 0.69 reported in Matandare and Tito (2018) suggesting that the model explains 64% variation in growth while the remaining 36% variation is accounted for by the error term. Given the estimated threshold point, we also considered, for robustness check, an analysis of variance estimated by OLS in which a dummy variable for debt above 57% is added on the right hand-side of the equation along with a trend component. Circumventing these problems means we go beyond the OLS method as it can result in estimates that have a small sample bias which does not disappear asymptotically. This type of a specification allows us to compare the intercepts of two periods one being the years in which the debt exceeded 57% and the other being the years in which debt was below the 57% mark. Results below clearly indicate that the dummy variable of interest is significantly negative at 5% level.

The corresponding coefficient suggests that the mean annual growth is lower by about 11.4% when debt is higher than 57% of GDP relative to the period in which debt is lower than the 57% threshold. Analysis of Variance, $\log GDP\_PC_t = 7.233914 - 0.114443\ EX\_DEBT > 57\%_t - 0.012243\, TREND$
Std. Err. (0.048842) (0.054584) (0.002548), Adj. $R^2 = 0.51$ Adj. n = 37

Another way of looking at the results above is to compare the mean GDP per capita in levels. This way, the mean GDP per capita is 1385.635 USD which is essentially the antilog of the intercept, 7.233914. The result therefore suggests that the mean per capita GDP is lower by about 152.42USD (which is 11% of the mean)

when external debt is above 57% of GDP as compared to the period in which external debt is below 57%. Put differently, the mean GDP per capita is 1385.635 when debt is below the threshold point and is 1233.22 USD when debt is above the threshold level. How does our main result above compare with those reported in previous studies? A recent study on external debt and growth in Zimbabwe by Matandare and Tito (2018) shows that external debt has had a negative effect on growth during the same sampling period our results do agree with Matandare and Tito (2018) in that external debt had a negative effect on growth in Zimbabwe but we particularly confirm that this is only true.

When the stock of external debt exceeded the 57% of GDP threshold otherwise below this tipping point, external debt significantly raised growth. Interesting is that the tipping point of 57% of GDP is close to the 60% of GDP threshold confirmed in Reinhart and Rogoff (2010). Other similar, but not identical, results are reported in Pattillo et al. (2002), Clements et al. (2003), Smyth and Hsing (1995) and Cohen (1997). The baseline model was subjected to a battery of diagnostic tests which include residual normality using the Jarque-Bera test, model specification using the Ramsey test, autocorrelation using the Breusch-Godfrey Serial Correlation LM test and heteroscedasticity using the Breusch-Pagan-Godfrey Serial Correlation test. Results indicated that the model was correctly specified with uncorrelated, homoscedastic and normally distributed residuals. Important is that the residual from the FMOLS was stationary in levels pointing to a cointegrating relation between GDP per capita and external debt. This outcome was also corroborated by the Hansen Parameter Instability whose null hypothesis of cointegrated series could not be rejected at 20% level.

5. Conclusion and Recommendations

This paper has provided evidence of a significant long-run relationship between external debt and economic growth in Zimbabwe between 1980 and 2016. Different from previous literature on this subject in the context of Zimbabwe, non-linear effects have been explored and they show, from the FMOLS technique, that external debt raises economic growth but this positive effect disappears once external debt reaches 57% of GDP. Beyond this threshold point, further debt accumulation is found to exert a harmful effect on the country's long-run growth corroborating results reported in previous studies albeit for different countries. The government of Zimbabwe commissioned a Debt Arrears Clearance Committee (DACC) in May 2015 to draft external debt-reducing strategies. The results of this paper are strongly in support of this arrangement since the country's stock of external debt is currently way above the threshold level of 57%.

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The Governance of State-Owned Enterprises in Africa: An Analysis of Selected Cases

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Abstract: Whilst some literature is of the view that; it is nearly impossible to cultivate good corporate governance culture in state-owned enterprises (SOEs), others believe that new strategies of implementing corporate governance systems together with political will can deliver SOEs out of their efficiency doldrums. This paper presents a scientific analysis of the contentious view on the possibility of creating efficient governance mechanisms in SOEs, explores the effective cost for governance failures in SOEs in Kenya, Zimbabwe, South Africa and Ethiopia. The paper makes conclusions and recommendation that the determinant factor to the success of SOEs in African countries is underpinned on the response of central government to the challenges of SOEs. Structural reforms, good governance, clear objectives and efficiency require governments to take a decisive position. As a lasting remedial action, knowing which entities and when to offload them through privatisation is an option in addressing the governance challenges in African SOEs. For strategic SOEs, the paper recommends that governments should consider listing them on public stock exchanges.

Keywords: *Governance; efficiency; State-owned Enterprises; privatisation; public listing.*

1. Introduction

After 1980, most African countries had attained independence from former colonisers and their new administration where under pressure to address inequalities, avert poverty and changing the fortunes of their population at the same time growing their economies. During the wave of privatisation, most governments retained companies in critical sectors in energy, rail transport, broadcasting services and telecommunication (Estrin & Pelletier, 2018). The economic strategy to retain some companies as State-Owned Enterprises (SOEs) was to provide services to the vulnerable members of the society. However the majority of SOEs have not been successful in playing their economic role due to low performance compared to private enterprises (Organisation for Economic Co-operation and Development (OECD), 2018). Further to their failing role, SOEs in Africa are accused of many ills such as monopolising certain sectors, sabotaging of structural reform programmes, gross inefficiencies, poor corporate governance, battleground of political games and being conduits for corruption. According to the World Bank Systematic Country Diagnostic (2019) poor governance and resistance to structurally reform has eroded pockets of viability leaving the majority of them in loss-making position. As strategic economic institutions, governments are forced to offer financial support, which has weighed the fiscal down at the same time driving government debt up (Balbuena, 2014).

This paper makes three key contributions to the literature on governance of in African economies debate whether SOEs are a catalyst for public value creation or a mere consumer of wasteful financing with inefficient operations. First, the paper explores and presents a scientific analysis of the research contentions on possibility of creating efficient governance mechanisms in SOEs. Some analysts argue that SOEs may not manage to create efficiency now when they have failed to do so in more than three decades (Gumede, 2019). On the other hand, other literature argue that new strategies of implementing corporate governance systems together with political will can deliver SOEs out of their past failures (Estrin & Pelletier, 2018). Second, it evaluates the effective cost for governance failures in SOEs to establish a position on when the central government should offload certain unviable entities. Lastly, amongst the most debated remedial actions, privatisation and public listing, the paper makes conclusive evaluations and recommends strategies to address the governance challenges in African SOEs. The remainder of this paper is structured as follows. Section 2 reviews the role of SOEs in developing economies. Section 3 then analyses the key corporate governance issues facing SOEs in Africa, followed by Section 4 which analyse case studies of both succeeding and failing SOEs. Then after, Section 5 present the scientific arguments on the state of SOE governance in Africa and the study then concludes with recommendations on the future of SOEs governance on the continent in Section 6.

The Role of SOEs in Developing Economies: SOEs are independent public entities established and partly or wholly owned by government to perform specific economic functions and operate in accordance with certain specific legislative Act. In line with international trends, African countries pursue the commercialisation strategy by transformation some of state the assets in key sectors into independent entities in some sectors to promote more effective and efficient service delivery (International Finance Corporation, 2018). The aim is to take advantage of private-sector efficiencies while maintaining service affordability for the vulnerable societies at the same time ensuring public accountability. The Integrated Urban Development Framework (IUDF) policy report (2013), a policy initiative of the Government of South Africa, coordinated by the Department Of Cooperative Governance and Traditional Affairs (COGTA) highlights the importance of SOEs as a stakeholder and contributor towards supporting and promoting urban growth and development.

The following are some of the key economic and socio-political roles played by SOEs in Africa's developing economies. First, in viable public enterprises, where income is higher than cost, surpluses would directly accrue to government and become readily accessible for financing both physical and human capital projects. This means government would have savings at its disposal, supporting its national budget through budget funding and reducing reliance on taxes. For instance, the government of Kenya turned to its SOEs for help ease the burden by releasing their surpluses and other unutilised funds as special dividend (Wasuna, 2019). The Kenya Pipeline Company (KPC) handed over US$49 million (Sh5 billion Kenyan shilling) to the National Treasury to cover government financial deficits from less than expected tax collections and huge interest obligations fall due. Second, in certain sectors that is capital intensive, risky or crucial sectors strategic to the economy due to the linkages they create. By nationalizing and controlling entities in key strategic sectors, the government guarantees socially responsible performance. Third, SOEs support the government mandate of providing public goods for the benefit or well-being of the public.

By running commercial enterprises, the profits generated by government are enjoyed by all members of the society through the provision and maintenance of public goods and infrastructure, instead of a few private shareholders. Fourth, many African countries that were under colonisation are still struggling to addressing the twin problems of poverty and inequality (Lephakga, 2017). It is the goal of SOEs to assume responsibilities that promote societal equality through redistribution of incomes. Well-functioning SOEs are critical in the decolonisation of the presence of colonial industrial interests, a major impediment for socio-economic development. Fifth, the creating employment is usually one of the priorities of any government policy success (Gillis, 2011). SOEs are key institutions for government to create employment as retrenchment is the soft target for restructuring and reforms in private firms (Afegbua & Ejalonibu, 2015). Governments are also sometimes forced to take over failing private companies in order to avoid the unemployment consequences upon bankruptcy. Lastly, SOEs help in reducing concentration of private economic power and breaking monopolies of private sector, which can be abused against both the government and the welfare of the society.

2. Literature Analysis

Scientific Argument on SOEs Governance: The philosophy of the argument in this study has four dimensions. First, the number of failing SOEs in Africa far outweighs the ones that are successful. Second, the business model of the majority of SOEs is not viable, they operate at a loss with expenditure outweighing revenues, and hence they are constantly seeking government bailouts. Third, SOEs have failed to transform with the changing operating environment for years, the questions is how they will transform now as the same reasons that failed them over the years are still in existence. Lastly, the role of SOEs and their original objectives have evolved, studies have been critical on whether their mandates are still relevant. Corporate governance, defined by the King III report (2009) as "the process of supervision and control intended to ensure that the company's management acts in accordance with the interests of shareholders", has been at the centre of debates on the operations of SOEs across Africa. There has been corporate governance failures and non-compliance with legislation in the majority of SOEs cases (Malunga, 2007). A good corporate governance system would ensure accountability, transparency and effective controls (Frederick, 2011). The following are some of the key corporate governance challenges facing SOEs in Africa.

Lack of Internal Controls: Lack of internal control policy to safeguard assets, promote accountability, increase efficiency and stop fraudulent behaviour has been one of the major corporate governance challenges in SOEs (OECD, 2018). In cases where internal controls are in place, they are not properly implemented. The African Peer Review Mechanism (2007; 2008) Country Review Report (CRR) of Algeria and Benin find that 97 percent of SOEs in Algeria have no internal auditing and control systems committees. Over 50 percent SOEs in Zambia, Zimbabwe, Tanzania and Uganda went for three years without publishing audited financial statements (Balbuena, 2014), against the international standards reporting best practices which recommends that audited financial statements should be published within six months after the completion of a financial year (Price Water Cooper, 2015). As a result, the available financial reports are outdated and the true financial status is unknown to executives and accounting officers. The office of the Auditors General or its equivalent in other countries usually fails to audit public enterprises mainly due to a combination of; lack of capacity, incomplete accounts and substandard financial statements.

Lack of Transparency and Oversight: Failure to produce financial statements, lack of proper accounting standards and weak auditing practices (OECD, 2018) has led to low levels of financial disclosure. There is therefore no transparency to both accounting officers and the public on how accountability and performance of most public enterprises. It is thus difficult to provide oversight, ensure accountability and responsibility on institutions whose major part of performance monitoring system is non-functional. This situation has been the underlying cause for concealment of SOEs spending, debt accumulation, creating conditions for corruption and failure of public enterprises that is weighing down the whole fiscal balances. According to the International Monetary Fund (IMF) Country Report (2018) on Mozambique, one of the key drivers of government debt is financial support to the country's biggest public enterprises which is spent through irregular expenditures. Mozambique's SOEs accumulated unsustainable and hid debt that they will not be able to repay; hence they either require debt forgiveness or restructuring. Limited control on SOEs (Proindicus, Ematum and MAM) borrowing resulted in large undisclosed external debt of US$1.4 billion, which was 11 percent of Mozambique's 2015 GDP, an extreme risk exposure in unviable SOEs.

The three companies established to operate in fishing tuna, providing maritime protection and building shipyards (respectively) were created shortly before the borrowing took place and were all headed by the same CEO, who at that time was a senior officer of the security services. Mozambique defaulted in 2016 on the $59.8 million coupon for its $727 million Tuna Eurobond, borrowed by its fishing SOE, Ematum and guaranteed by the government. This amount was borrowed on top of another $500 million from Credit Suisse and $350 million from Russian bank VTB to finance a new tuna fishing infrastructure. The APRM CRR for Uganda (2009) find that some SOEs have not properly qualified board of directors. In other cases where the directors are qualified, they will be weak and compromised to provide economic oversight. The CRR also reports that some directs are usually not willing to take risk by making critical management decisions due to fear of being victimised by their political principals or disappointing the government, even when they are subject to performance contracts. APRM CRR for Kenya (2006) find that the appointments of directors in SOEs are based on political considerations. The report highlighted that, within the SOEs themselves there is an endemic problem of 'secrecy and mistrust' as employees do have suspicions against each other's' political affiliation and allegiance, in the APRM CRR for Mauritius.

Undue Political Interference: The appointment of SOEs board of directors is the responsibility of the Minister in charge with public enterprises ministry. There is often a dilemma of maintaining a balance on the appointment of a board that promote political agendas or one that makes unpopular decisions to maintain viability of SOEs (Corrigan, 2014). Evidence from APRM CCRs suggests that the former is more common, hence boards are compromised and entangles in the liability of the appointing principals. They are therefore unable to operate without undue political interference once appointed. The CRR (2013) for Tanzania notes the problem of ubiquitous links between the ruling party, the bureaucracy and business entities. Senior government officials and Members of Parliament are on several cases part of the SOEs boards, which undermine board accountability to the wider society.

South Africa has been similarly criticised, most notably in relation to a number of its key SOEs; South African Broadcasting Corporation (SABC), Eskom, South African Airways (SAA), Denel and Transnet, where political appointments produced a deep patronage system in violation of corporate governance principles (Sunita,

2019). Deep rooted structural problems are also compounded by lack of clarity on the mandate, objectives and oversight of SOEs. In some instances, SOEs have been used by political figures to pronounce their establishments in fighting their factional battles, with some deliberately sabotaging their areas of core competences for them to fail on delivering their mandate (Friedman, 2017). Loyal ruling party 'cadres' that cannot be deployed to government are usually deployed into SOEs either as a way to get rid of them from mainstream politics or for them to hang around awaiting government appointments. For instance, in Zimbabwe, Retired Army Service Chiefs and former war liberators with strong links.

Nepotism and Corruption: Several reports (Balbuena, 2014; Frederick, 2011; OECD, 2018a; OECD, 2018b) have revealed that SOEs have been used as conduits for perpetuating acts of corruption and nepotism. The OECD report (`2018a) reveals that nepotism and cronyism has become apparent in African SOEs as appointments are not subject to any standard selection process, assessments and interviews. A report by the Public Protector of South Africa (2015) reveals that the Passenger Rail Agency of South Africa (PRASA) – one of the largest SOEs – was riddled with nepotism and conflict of interest where senior management employed their relatives and give their spouses business. In the majority of the country's SOEs departments, salutations in the corridors were "*good morning uncle, good afternoon sister*". This challenge costed SOEs billions of dollars through incompetence and inefficiency. In the South Africa's Commission of Inquiry into State Capture (2019), it was revealed that, one of the SOEs senior managers had 12 blood relatives working in the same department, promoted twice and got an average salary increase of 350 percent in one year without reasonable justification or merits.

In Nigeria, a case study by Amakiri (2015), absenteeism in SOEs was over 80 percent and no disciplinary actions was being taken against them. PRASA's chief engineering executive, who was at the centre of the acquisition of unsuitable locomotives, had fake doctoral qualification and was employed without verification of qualifications, a corporate governance failure which costed the SOEs more than US$338 million (R5 billion). Generally, the salaries and packs in many SOEs are beyond the standard cost to company expected for such posts levels (OECD, 2018). Executives over the retirement age limit are still working, others have been retired and rehired as specialised consultants, some of them over 60 years still claiming for their children school fees allowances (Gomba, 2019). The anti-corruption units in most countries face challenges in prosecuting these cases due to lack of evidence (Times of Swaziland, 2019). In South Africa, during the investigations into the "State Capture" cases revealed several incidences of threats and intimidation against witnesses of corruption and nepotism cases, which indicate deep-rotted patronage networks (Mutize & Gossel, 2017).

Inefficient Monopolies: Many SOEs in Africa enjoy monopoly or monopsony powers by virtue of government ownership, lack of competition and policy which is favourable for them, which often provide cover for inefficiencies and abuse of resources. These entities are largely known for their bureaucratic constraints, lack of investment incentives, pricing controls, centralized decision making, and restriction on hiring and firing workers. Due to control of the businesses by government bureaucracies or by legislation, decisions are slow and unresponsive to the immediate needs of the company. The fact that any surpluses revert back to the government; it is a disincentive for management and labour to work more profitably. Due to their monopolistic position, SOEs create make distortions as there is no free and open competition in the sectors they operate.

Weak Capitalisation: Over 90 percent of SOEs that are fully controlled by government are currently facing this challenge of inadequate capitalisation (Balbuena, 2014). The main drivers of low capitalisation and balance sheet shrinkage is the unsustainable business models of SOEs, in which they are not able to generate sufficient revenue to cover the business running costs. As such, without balance sheet support, SOEs capitalisation position fast shrink and their liquidity positions deteriorate. Most of the services they provide such as electricity, transport, communication and broadcasting benefit the poor bracket of the society. To the ruling party are either CEOs, board of directors and senior managers in key public enterprises such as the Grain Marketing Board (GMB), National Railways of Zimbabwe (NRZ), Zimbabwe United Passenger Company (ZUPCO) and Air Zimbabwe. These individuals often have no skills or experience in managing such enterprises, leading to disastrous performance. These success case studies are a result of a clear, considered

and profit-orientated strategic business model underpinned on professionalism, industry experience and commercial astuteness.

The government is therefore normally reluctant to approve service costs increase in order to protect its poor population that may not afford and will be most affected by the rising cost. As a result, for SOEs to survive, they are in constant need of government bailout and subsidies, which has severely strained fiscal budgets and investments in crucial developmental projects (IMF, 2018). Weak capitalisations have left government with no option but to either bailout or issue guarantees for SOEs to borrow through financial markets. In Senegal, government-guaranteed liabilities and debt of SOEs constitute 11.4 percent of the country's GDP (IMF, 2019). The South African government have exposure to the tune of 4 percent of GDP in Eskom Power Company, in which it guaranteed a total of R462 billion rands. These amounts are quickly exhausted as the SOEs are not profitable and government takes times to respond to the balance sheet challenges.

Multiple and Conflicting Objectives: In most of the cases government owns 100 percent or significant portion of share and has sufficient power to determine objectives and other decisions. Governments spells the mandates of SOEs as providing goods and services affordable to the poor members of the society, which is certainly less than cost-covering prices, at the same time they are expected to operate viably, In many cases, SOEs have gone for years seeking approval without success from government and its regulatory arms for price increases that will help them to remain profitable. The much talked about 'reforms and restructuring' programmes are never implemented as they are met with strong resistance from employee unions and politicians who seek to avert possible retrenchments (Ritchken, 2014). The government and its SOEs are perceived to be generators of employment, restructuring decisions are often overridden by political objectives, at the detriment of commercial performance and economic efficiency.

3. Methodology

To examine the governance failures and success of SOEs in Africa, the study considers selected cases of SOEs; the Ethiopian Airlines, South Africa's Telkom Company, Democratic Republic of Congo (DRC)'s Gecamines, Air Zimbabwe, South Africa's Eskom Power Company and Ghana's Tema Oil Refinery. These large SOEs present a spectrum of government entities in which significant resources have been committed but with outcomes on the different sides of the continuum. These SOEs represent government entities that have done well and others that have not been successful to adequately analyse the argument in literature that the number of SOEs that have performed well financially and economically are outnumbered by those that failed to meet the expectations of their governments. The analysis further considers aggregate data from the World Bank Report (2018) Energy Sector Management Assistance Program on SOE performance which presents 12 West African countries, 62 percent of which are operating at a loss and 36 percent are in a state of technical insolvency with a negative net worth. The OECD report of 2018 was also qualitatively analysed, which presents a cumulative SOE losses in Mali amounting to 6 percent of the country's GDP over the past 10 years.

4. Findings

The Successful SOE Cases: According the CAPA Centre for Aviation Outlook for Africa (2019), the Ethiopian Airways is currently the fastest growing, most profitable and largest African airline, which has grown at an annual average of 25 percent since 2005. Its annual profit has been exceeding US$175 million since 2014, higher profit than the total of all the African airlines. The Ethiopian Airlines now has the highest international connectivity than any other airline in Africa. Its fleet is also the largest, youngest and most sophisticated passenger airplanes in Africa, with an average age of less than five years (Barlow, 2016). Another successful SOE, Telkom SA Ltd, a South African wire line and wireless telecommunications company, operating in more than 38 countries across the African continent is a semi-privatised SOE in which the government owns 39 percent shareholding. Telkom has consistently posted a profit after tax of more than R2.5 billion rands since 2016 from its 4 billion subscribers.

The company is currently the market leader in the broadband space and according to the World Factbook (2019), it is the best developed and most modern telecommunications company in Africa. In 2019, the government received a significant dividend of 249c per ordinary share despite the difficult operating

environment in the country. The governments and board of directors have allowed the management space to exercise their capacity professionalism and operate the business on commercial considerations, only maintaining clear lines of accountability. With the support of the board, Telkom cut 2000 jobs during the year ending March 2019 to reduce operational costs and remain viable. Being managed like this, without full privatization, these enterprises are able to generate sufficient income to mid their expenditure needs, repay their own debts and on top of that pay dividends to the government.

The Failing SOE Cases: Gecamines was the biggest mining company in DRC's, but failed in 2014 due to mismanagement and poor investment decisions. The company reportedly failed to account for US$750 million from DRC's copper mine privatisation program in 2017. Air Zimbabwe is amongst 92 other SOEs whose latest audit reports by the country's treasury show that they are technically insolvent. For the past 10 years, the airline has been operating at a loss and currently has only a single aircraft covering its routes. Moody's rating agency has downgraded the state power firm, Eskom's credit rating deeper into sub-investment territory (from B2 to B3, six notches below the investment grade level, with a negative outlook) citing that the government's plan to reorganise the cash-strapped South African firm would be hard to implement as it has no explicit support from the cabinet. Many years of mismanagement and corruption has resulted in a ballooning debt burden which currently stands at around R440 billion, 62 percent of which is guaranteed by government. The company has also been allocated R59 billion in operational support as it cannot operate optimally. Tema Oil Refinery, Ghana's state-owned oil refinery recently sought US$70 million credit guarantees from the government after lenders declined to issue it loans for crude purchases. The company had halted production on June 21 after running out of crude stock. Its weaknesses are well documented, ranging from distress financial position, and utilization capacity, weak governance structure, poor maintenance culture, to production and storage losses.

5. Conclusion & Recommendations

The Future of SOES Governance: There is no doubt that Africa needs SOEs to successful support its development goals and to realise its Agenda 2063, 'the Africa we want'. There is however an urgent need to rethink the ways of maintaining SOEs relevant to the current developmental needs. It is the governance of SOEs that has been letting most governments down. It is not by coincidence that there are very few examples of successful SOEs compared to the failing ones. The future of SOEs is underpinned in developing good governance throughout the ownership, management and employee structures as the tone for good work ethics begins with the shareholders, boards and senior executives before cascading down the structure of command. This paper makes the following recommendations.

Rationalisation: Rationalisation of state-owned enterprises has become inevitable as most SOEs dates back to the post-independence era and many are no longer relevant to SA's economic trajectory since market conditions have changed from the original "post-independence era reasons" for their existence, in many instances rendering their business models unsustainable. There is need urgent rationalisation, periodically and substantively identifying those that are strategic to the country's development. The motive for the mandate of the strategic SOE must be proven on a clear and acceptable basis, such as security of supply, correcting a development failure, state security or natural monopoly. An SOE remaining strategic is a function of factors that may be affected by changes in the operating environment, such as markets, technological advancements and political evolution. The evaluation of the strategic SOEs should be repeated periodically to ensure they remain so and nonstrategic SOEs should account for their continued existence through a rigorous parliamentary process.

Based on their relevance to the country's strategic plans. There should be a framework for rationalisation would need to be adopted and serve as a basis for the evaluation and final decision on each SOE. SOEs exist to address development failures and close gaps where markets or the private sector cannot. Doing away with some SOEs could create more efficiency and more jobs as well as a better environment for businesses. Opening spaces to the private sector reduced operation costs and improve the quality of services rendered due to increased competition. The government will need to make a budget available for the rationalisation of the SOEs. Technical teams responsible for rationalisation will have to account to the Treasury, and the proposed SOE committee or council should be chaired by the president of the republic. A planned, negotiated

rationalisation process will help avoid a less considered fire-sale of state assets. Such a formal transparent process will also inspire confidence in all stakeholders.

Listing on Public Exchanges: SOEs may be listed on financial market exchanges without necessarily privatizing them. By selling their shares on public exchanges, public entities will have access to capital and also have the opportunity to measure their competences through daily share performance. On the other hand, governments will retain majority shareholding whilst SOE management is held accountable through strict compliance requirements. Private sector investments through exchanges will also improve business confidence and become part of the enforcement structure to keep SOEs competent.

Unbundling Monoliths and Disposing Non-Essential SOEs: Some institutions become less important with time. It becomes costly to keep them. Governments should know when to dispose some non essential SOEs through liquidation or privatisation. When government continue to bailout non-essential and incompetent SOEs with a goal to either preserve employment or maintain national brand image, the indirect cost is massively huge. Economic reforms should come up with structural changes that weed out government business that are consuming government resources at the expense of priotising resource allocations to critical development.

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Business Strategies and Competitive Advantage: Evidence from Flour Mill Companies in Lagos State, Nigeria

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Abstract: The authors argued from business strategies perspective to understand competitive advantage among homogenous producers. The population consisted of top and functional managers of flour mill companies in Lagos State, Nigeria. Cross sectional survey research design was adopted and primary data were collated and used. The research instrument was an adapted questionnaire. Its validity and reliability were statistically determined. Six hundred and twenty copies of the questionnaire were administered and 605 retrieved. Econometric equation was formulated and multiple regression analysis was employed for data analysis. Business strategies were found to have significantly affected competitive advantage. The study recommended product differentiation and portfolio diversification in order to achieve competitive advantage.

Keywords: *Backward integration, Business development, Competitive advantage, Regrouping*.

1. Introduction

Competitive advantage seems to be elusive and the strategic approaches to gaining and sustaining it differ across firms, industries and nations. This has brought polarization in option and divergence in perspectives, and prescriptions. The differential in approach and prescriptions unearth challenges as firms in diverse business operations struggle to determine the best-fit towards preventing strategic drift or flux. Competitive advantage further differs in meaning and terminology usage with concepts dealing with development and deployment of a set of attributes that allow competitors' outperformed (Nuryakin, 2018), industrial superiority (Porter, 1985) above industry average (1980), and excellence (Maury, 2018; Namada, 2018). The looseness in meaning and usage is equating competitive advantage with competitive success. Changes in the business world, hyper-competition, and language dynamism are imposing operational re-engineering in strategic reconfiguration to strengthen organization's capability to compete for limited customers and market share with products that meet and exceed customer's expectation (Sharma & Singh, 2013).

The race among and between firms, is often centered on how do we survival for foreign and local competitive onslaught. For firms to gain advantage or success, the business strategies applied are commonly in tandem with the firms' strength, objectives, desired future, and the business environment. Researchers (Araghi, Nikoomaram & Ghaffari, 2019; Bailey, Benson & Bruner, 2019; Muda & Erlina, 2019) have investigated business strategies with performance measures and achieved different results. Moravcikova, Krizanova, Kliestikova and Rypakova (2017) had associated business strategies practices with competitive advantage but the positive impact although significant, varies across constructs. The wealth of knowledge and the depth of managerial effect discovered in the aforementioned works might not suit some context due to economic differentials and methodological focus. In addition, the studies did not investigate the business strategy proxies entrenched herein and competitive advantage especially in Lagos State and the flour mill sector, therein, leaving unfilled academic gap in literature as to how business strategies influence competitive advantage within Nigerian flour mill sector.

The global competitiveness of Nigerian flour mill is evident in consumers' perception of lower quality vis-a-vis imported flour as observation in consumption and patronage favored foreign brands. As such, the Nigerian government had intervened to salvage the situation by closing borders and encouraging local investment in order to regain competitiveness according to Bala and Alhassan (2018) and Egbo (2018). The report of Flour Mills of Nigeria [FMN] (2019) and Obasaju, Olayiwola, Okodua and Adekunle (2019) suggest that the adoption of backward integration to control quality challenges and selective diversifications are necessary solutions to the impending doom of the sector. Noe, Hollenbeck, Gerhart and Wright (2017) shares similar position which Namada (2018) who identified product differentiation along quality, efficiency, innovation, and accountability as enablers of competitive advantage. However, Nithisathian, Wall, Thanitnan

and Ponwiritthon (2018) found that business strategies negatively affected competitive advantage which Lawal.

Thompson and Thompson (2016) identified as weak effect on competitive advantage. Gakuya and Mbugua (2018) identify cost leadership strategy as the missing link for achieving competitive advantage and overall organizational performance. Nevertheless, the position of Giama, Mamaloukakis and Papadopoulos (2019) was that operational efficiency and organizational excellence are drivers of competitive advantage. Kwayu, Lal and Abubakre (2018), Geisler and Turchetti (2018) discovered that business strategies had little influence on competitive advantage. The polarization in perspective among scholars (Bailey et al., 2019; Kwayu et al., 2018) prompted the investigation into what drives competitive advantage. The objective of this study was to examine the effect of business strategies on competitive advantage with a focus on Lagos State, Nigeria Four Mills. The work is capable of deepening managers and stakeholders' insight and shapes their managerial capabilities in the sector as price-war, product cannibalism, and foreign products dominate the market with reasons less understood.

2. Review of Related Literature

Noe et al. (2017) defined competitive advantage as firms' ability to produce goods and services more efficiently than competitors. This definition infused waste elimination, cost reduction (Maury, 2018), and quality to denote the hallmark of operation which Namada (2018) had previously sustained. Jones, Harrison and Felps (2018) defined competitive advantage similar to firm's ability to produce goods or services that customers see as more valuable than competitors. Tincani and Travers (2018) added to the concept definition that competitive advantage is a set of a company's unique features, products and services that are perceived by the market as significant and superior to the competitors. The term strategy denotes *means* deployed towards achieving organizational goals and objectives (Zhou & Wen, 2019). According to Mishra et al. (2019), strategy is the creation of unique and valuable position involving different sets of activities. Similarly, Majid, Yasir, Yasir and Javed (2019) portrayed strategy as a perceived long-range plan of a business, which provides and sustains shareholders value. Mac-Donagh et al. (2019) argued that strategy is the basic long-term goals and objectives of a firm and the adoption of the courses of action and the allocation of resources necessary for achieving the goals. Pereira et al. (2019) explained that it consisted of combinations of competitive moves and business approaches that managers employ to please customers, compete successfully, conduct operations and achieve organizational objectives.

In this paper, strategy is seen as means to an end with its proxies as cost leadership, market development, diversification, regrouping backward integration and product development. Cost leadership is about reducing cost, building quality into operation and producing the least expensive goods (Hunjra, Faisal & Gulshion, 2018). Alkasim et al. (2018) defined cost leadership as the way in which firms charge lower price for their products than rivalry firms. Gakuya and Mbugua (2018) believed that cost leadership is the projected brand image of an organization with reference to cheapest goods or a provider of a particular products or commodities but with best value. Kharub, Mor and Sharma (2018) expanded the concept by describing cost leadership as creating low cost of operations within a niche. Jyoti, Arora and Kour (2017) argued that cost leadership is drawing customer's attentions towards company's products with least financial implication. Farzin, Yaghubipoor and Nekoui (2017) defined cost leadership as marketing products that is highly effective in gaining market share. Kiprotich, Gachunga and Bonuke (2018) viewed cost leadership as achieving competitive advantage through lowest cost of operation in the industry. Product differentiation as a strategy consists of creating differences in a firm's product which Ghiyasi (2017) defined in terms of innovation differentiation, brand image differentiation and positioning.

Lawal et al. (2016) added that it's about providing product to a discriminating segment of a market by offering product with excellent image and strong brand identification. Bui and Villiers (2017) believed that product differentiation creates a defensible position for overcoming competition. Wahal (2019) argued that product differentiation is investing heavily in research and development activities in order to increase their innovative capability and enhance their ability to keep-up with their competitors' innovations. Backward integration involves both mental and physical alertness, exploring opportunities, taking chances and risks in order to control price and raw materials sources (Camba, Mendez & Werner, 2017). Ahmad, Iqbal and Ali

(2018) defined backward integration as a business model whereby a company takes direct control of how its inputs are supplied. Jensen, Rust and Mackool (2018) argued that backward integration ensures that a firm produces inputs or segments of its supply chain. Backward integration is an approach of a company to increase its level of control on its inputs (Opolot & Mpagi, 2017). The concept of market development as a construct was defined by Jones et al. (2018) as taking current products to new markets thereby opening up previously excluded market segments and distribution channels or entering new geographic markets.

Maury (2018) affirmed that it involves moving the present product into new geographical areas and expanding sales by attracting new markets. Anwar (2018) believed that market development is increasing sales by selling an existing product to a new market that was originally considered non-profitable for the organization. Kuik, Branger and Quirion (2019) argued that market development is getting into a new geographical market, creating new product dimensions like packaging, using new distribution channel or by creating a new market segment by offering different prices. Business diversification is a collection of individual businesses (Qamri, Haq & Akram, 2015), which Cegarra, Jiménez, Garcia and Perez (2019) also defined as collection of businesses under one corporate umbrella. Axenbeck (2019) defined business diversification as competing with an array of different portfolios that may or may not be related. Wen, Xiao, Huang and Xia (2018) added to the concept as expanding business fields either to new markets, new products or both while retaining strong core businesses.

Guzman, Ocampo and Stiglitz (2018) defined business diversification as expanding firm's operations by adding markets, products, services or stages of production to the existing business. Regrouping as a construct is the fundamental change in staff number to increase financial structure and or designed to increase the company's financial value (Bodhanwala & Bodhanwala, 2018). The study of Bryksina, Golovina and Legotin (2018) found that overall cost leadership strategy propels competitive advantage for an organization over rivalry firms. According to Pervan, Curak and Kramaric (2018) regrouping radically alters the contractual relationship with staff. Wahal (2019) argued that regrouping is increasing economic viability of the underlying business model by reducing staff strength. Nakatani (2019) believed that regrouping is an opportunity to end business cycle, recap the performance and outline a plan of success by restructuring staff. Lawrence, Crecelius, Scheer and Patil (2019) defined regrouping as an attempt to recast organizational structure, leadership, culture and reward systems that change cost competitiveness and quality.

Business Strategies and Competitive Advantage: Several studies (González-Rodríguez, Jiménez-Caballero, Martín-Samper, Köseoglu, & Okumus, 2018; Namada, 2018) have discussed the interrelatedness between business strategies and competitive, advantage with varying empirical findings and conclusions. Empirical discussions on business strategies and competitive advantage have shown that there exists consensus amongst scholars (Distanont & Khongmalai, 2018; Husgafvel, Linkosalmi, Hughes, Kanerva & Dahl, 2018) in some situations and constructs. Isiavwe, Ogbari, Ogunnaike and Ade-Turton (2015) concluded that cost leadership strategy is useful for goals accomplishment but fundamentally drives competitive advantage. Nyaucho and Nyamweya (2015) shared the same position that cost leadership influences market price which enables sales volume increase, profit margin, service delivery, reduced operational costs and wastage, which Gregson and Andrew (2008) had previously established. Ordonez et al. (2018) added that competitive advantage is a derivative of cost reduction and operational excellence without comprising quality. Wijaya's (2018) approach to cost leadership and competitive advantage is similar to Akram, Sanaz and Mohammed (2018) that competitive advantage is derived from product differentiation along quality, efficiency, innovation and accountability. The assumption is that competitive advantage (Y) position at a categorical time is a progenitor of business strategies (X) deployed. The primary population was five flour mill companies which are Flour Mills of Nigeria Plc, Honeywell Flour Mills, Life Flour Mill Limited, Crown Flour Mills, and Dangote Flour Mills.

The selection of these companies was anchored on their operational performance, financial results, capacity utilization, employees' number, and market dominance in the sector. The top and functional managers were purposively selected since this group constituted the top-decision makers, members of the strategic development group, think-tank and the brain-bank of the companies. Ibidunni (2009) added to the debate but concentrated on product differentiation anchored on product re-engineering, logistics synergy, and intense marketing to achieve competitive advantage. From the views of Isiavwe et al. (2015), Akram et al. (2018),

Lantos (2001) and Porter's (1980; 1985) cost leadership, differentiation, and regrouping are strategic recipes for competitive advantage. In addition, the synchronization of cost leadership and product differentiation enhances customer-centric operations and waste elimination, which are preconditions for competitive advantage. The market perspective to the interpretation of product differentiation was Galdeano-Gomez, Céspedes-Lorente and Martínez-del-Río's (2008) work that competitive advantage depends on a firm's ability to adapt to product features that are eco-friendly and customer focused. As such, Chiou, Chan, Lettice and Chung (2011) demonstrated that value addition and strategic alignment to environmental dynamism enables competitive advantage. The decision to adopt a cross-sectional design resulted from its ability to allow reliable data collection (Knottnerus, 2003), generate robust results (Groves et al., 2004) and valid scientific conclusion in knowledge creation.

3. Methodology

The paper is quantitative cross-sectional survey research design. It's, scientific application was justified by Ariguzo, Egwakhe and Adefulu (2019) along coexistence of possibilities in constructs association and causal-effect relationship. In addition, its strength revolves around its ability to capture respondents' perception at a categorical point in time (Heeringa, West & Berglund, 2010). Evidences of its use are prevalent in Ariguzo et al. (2019), Haseeb et al. (2019), McKenney and Reeves (2018) and Tincani and Travers (2018). The total population of the selected top and functional managers was six hundred and seventy-eight, hence total enumeration sample technique was used. The decision to use total enumeration sample technique was based on (Groves et al., 2004), Heeringa et al. (2010) perspectives along size, traits, experience and knowledge of the phenomenon under investigation. A structured questionnaire was adapted from previous studies (Anyanwu & Umeh, 2019; Boddy, McCalman & Buchanan, 2018; Cassia & Magno, 2019; Guzman, Ocampo & Stiglitz, 2018; Maury, 2018; Nakatani, 2019; Ngwakwe & Sebola, 2019; Qamri, Haq & Akram, 2015) whose content, construct and criterion validity were established. The questionnaire is a Likert-type scale ranging from very high (6) to very low (1) on business strategy and competitive. A total of 620 copies of the questionnaire were administered to top and functional managers who were available and accessible during the four weeks of field-work. Six hundred and five copies were retrieved and were judged usable.

Model Specification: The assumption behind the work is that business strategies affect firms' competitive advantage in the flour mill sector. Zhou and Wen (2019) concluded that the deployment of business strategy enhances the possibility of achieving competitive advantage. Fifteen copies had errors in filling and were dropped from the work to prevent error in coding and analysis. It was on this premise that a mathematical model was elicited as $Y = f(X)^n$. The Y is the competitive advantage (CA) and X with it proxies (x_1, x_2, x_3, x_4.x_5, x_6) as cost leadership (CL), product differentiation (PD), backward integration (BI), business development (BD), business diversification (BDI) and Regrouping (RG). The dynamism in business strategies (cost leadership, product differentiation, backward integration, market development, business diversification, regrouping) as unique means employed by organization determines a firm's competitive advantage or superior performance. This implies that the bundle of strategy deployed has direct effect on competitive advantage. The work therefore borrowed from the position of Kor and Mahoney (2004) that adopted business strategies $(X)^n$ and it's $(x.....x)^n$ affect competitive advantage (Y). This was expressed mathematically as $CA = \beta_0 + \beta_1 CL_i + \beta_2 PD_i + \beta_3 BI_i + \beta_4 MD_i + \beta_5 BD_i + \beta_6 RG_i + \mu_i$. The paper's *apriori* expectation was anchored on the premise that business strategies will have positive significant effect on competitive advantage. The ethical issues and the rules governing the conduct of research were respected and the data collected from the field were not manipulated to reflect otherwise.

4. Findings and Discussion

The results of the analysis are presented in Table 1 showing the effect of business strategies on competitive advantage of selected flour mill companies in Lagos State, Nigeria. The assumption of the work was investigated through multiple linear regression analysis. The results as shown,

Table 1: Result of Analysis for Business Strategies on Competitive Advantage

Model	B	Sig.	T	ANOVA (Sig.)	R^2	Adju. R^2	F (df)
(Constant)	0.910	0.000	4.292				
Cost Leadership	0.095	0.057	1.910				
Product Differentiation	0.205	0.000	4.055				
Backward Integration	0.028	0.502	0.672	0.000[b]	0.388	0.382	63.153 (6, 597)
Market Development	0.144	0.001	3.331				
Business Diversification	0.180	0.000	3.654				
Regrouping	0.173	0.000	3.704				

Predictors: (Constant), Regrouping, Cost leadership, Market development, Business diversification, Backward integration, Product differentiation
Dependent Variable: Competitive Advantage

Source: Field Survey, 2020

The R^2 value, which is the coefficient of determination = 0.388, thus indicated that business strategies had weak positive and significant effect on competitive advantage in selected flour mill companies. The research model was multiple, as such the coefficient of multiple determination, adjusted R^2 0.382, $F(6, 597) = 63.153$, $p<0.05$) demonstrated that business strategies explained 38.2% changes in competitive advantage, while the remaining 61.8% could be attributed to other factors not included in this model. Also, the F-statistics ($df = 6, 597$) = 63.153, $p<0.05$) which revealed that the overall model was robust and significant in predicting the effect of business strategies on competitive advantage. The analysis revealed that four out of the six dimensions of business strategies had positive significant effect on competitive advantage. The result showed that product differentiation ($\beta = 0.205$, $t = 4.055$, $p<0.05$), market development ($\beta = 0.144$, $t = 3.341$, $p<0.05$), business diversification ($\beta = 0.180$, $t = 3.653$, $p<0.05$).

Regrouping ($\beta = 0.173$, $t = 3.704$, $p<0.05$) had positive and significant effect on competitive advantage. However, the other variables cost leadership ($\beta = 0.095$, $t = 1.910$, $p>0.05$) and backward integration ($\beta = 0.028$, $t = 0.672$, $p>0.05$) had positive but insignificant effect on competitive advantage among the selected flour mill companies. The result inferred that out of all the business strategies, only product differentiation, market development, business diversification and regrouping had positive significant effect on competitive advantage. Thus, the multiple regression model as previously expressed was changed to reflect reality as:
CA = 0.910 + 0.205PD + 0.144MD + 0.180BD + 0.173RG …… eq.
This indicated that an increase in product differentiation, market development, business diversification and regrouping would lead to a subsequent increase in competitive advantage in selected flour milling companies.

Discussion of Findings

The findings indicated that business strategies affect firm's competitive advantage. Empirically, the result corroborates with the work of Galdeano-Gomez et al. (2008) on the nexus between strategies and competitive as interpreted through the eyes of product differentiation. Chiou et al. (2011) further sustained that strategies and progressive value addition enabled competitive advantage. Zhou and Wen (2019) position that business strategy strengthen competitive advantage was corroborated with current findings. Credence is added to Isiavwe et al. (2015) perspective that product differentiation enhances competitive advantage of firms. Nyaucho and Nyamweya (2015) also corroborated that differentiation influences drives operational excellence which is a parameter for competitive advantage, which Gregson and Andrew (2008) had established. The findings of this work are not in isolation, since Ordonez et al. (2018) had earlier established that competitive advantage is enthroned through strategies which this work subscribed. Also, Wijaya (2018)

approach to market development and competitive advantage was substantiated and Akram et al. (2018) perspective on competitive advantage and strategy is sustained. Noe et al. (2017) was affirmed that business strategies have positive impact on competitive advantage, which Namada (2018) and Zikria et al. (2019) had established through product differentiation.

Lawal et al. (2016) and Kwayu et al. (2018) earlier works on business strategies and competitive advantage was also corroborated. Borda, Geleilate, Newburry and Kundu's (2017) work is confirmed that business diversification affects competitive advantage, which contradicted Namada (2018) that business diversification does not necessarily lead to competitve advantage. The hybridization of regrouping and backward integration is reinforced as Kwayu, Lal, and Abubakre (2018) demonstrated that it has positive significant effect on competitive advantage. Likewise, Ghiyasi's (2017) position was sustained that increased internal efficiency (regrouping) through waste elimination enabled competitive advantage. The differences in perspectives and conclusions resonate with the existing debate that context divergence and capability dissimilarity make achieving competitive advantage attributable to firms' specifics. The core thesis revolves around strategic approaches. The synergy achieved in the configuration of resources and strategies. Scholars (Gakuya & Mbugua, 2018; Raj, 2018; Yoo, 2019) have emphasized this as firms' rivalary develop, deepen, and duplicate across the industry, each firm's strategic option will determine who leads. Theoretically, the findings supported dynamic capability theory that product differentiation, market development, business diversification.

Regrouping and backward integration can be employed both in the short term and long term to create and explain competitive advantage. The relevancy of this theory within context is that it focused on firms' ability to quickly self-fine-tune, calibrate, and align activities to environmental dictates in order to achieve competitive advantage. The self-alignment is intended to build strategic fit, transformation and leverage on strategic asset using diverse business strategies that would enable them to compete in a changing business environment.

5. Conclusion and Recommendations

This paper examined business strategies effect on competitive advantage with focus on selected flour mill companies in Lagos State, Nigeria. The results showed that business strategies (product differentiation, market development, business diversification, and regrouping) affected competitive advantage positively. However, the individual effect differs in terms of statistical significance, direction and relative effect. Product differentiation, market development, business diversification, and regrouping showed positive and significant effects on competitive advantage, leaving cost leadership and backward integration which showed negative significance on competitive advantage. Thus, the study concluded that organizations should focus on adopting product differentiation, geographical market expansion, and portfolio diversification, and regrouping. Though the findings cannot be generalized and its application in other sectors where competition is equally stiff, the adoption and utilization may require some level of caution. The researchers suggest that the application of the findings and recommendations of this study be limited to the flour mill industry in Nigeria, but with gradual adoption in the manufacturing sector in general. Further empirical survey on change adoption practices and competitiveness with infrastructure as moderator is inevitable for future researchers in the sector.

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Financial Performance in Indonesian Companies: The Role of Environmental Performance and Environmental Disclosure

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Abstract: This study takes the aim to acquire empirical evidence which financial performance has been exerted influence by the environmental performance and environmental disclosure. The key differentiation between this study and the earlier ones is the utilization of different variables and measurement methods. The theories of stakeholder and legitimation become the basis to formulate the hypothesis. To collect data, the purposive sampling method was used. The data came from manufacturing companies listed in the Indonesian Stock Exchange and the PROPER 2016-2018 program. Instruments for classic assumptions have been tested. Afterwards, multiple linear regression is used as the method analysis along with the secondary data types with the use of documentation methods. The finding of this study presents that environmental performance and environmental disclosure deliver an essential positive influence towards financial performance.

Keywords: *Financial performance, environmental performance, environmental disclosure.*

1. Introduction

Financial performance is expressed in the perennial financial report of a company. A good financial performance provides an intelligible description of the successes of a company. However, the current economic market does not only demand the conception of financial performance that solely focuses on generating large profits for the company, but also accompanied with an ethical attitude towards financial performance. There is a rise of awareness on sustainable business development as a method to increase long-term financial performance (Gatimbu & Wabwire, 2016). The demand for ethical financial performance has an implication towards the manifestation of industrial activities as a harmonic interaction between shareholders or the business actors themselves. The Ministry of Industry states that the growth of industries in Indonesia in the third quarter of 2017 had reached 5.51%. Although the industrial sector had increased the income of Indonesian citizens, it in turn also left a huge environmental impact. Financial ratio analysis becomes a standard method used to measure the performance of a company financially.

This correlates with the statement made by the World Health Organization (2016) mentioning global health observations have brought up as much as 23% of all considered global deaths are linked to the environment. Furthermore, Stern (2006) states that Indonesia is the third largest contributor for carbon footprint, just behind USA and China. The continuously deteriorating issues of the environment in Indonesia have drawn the attention of the government, citizens, and related industries. Commission VII DPR RI (2011) has stated that the mining industry had become one of the industries often solicited as the main source of environmental damage. Wong (2017) also states that one of the largest contributors to greenhouse gas emission is the paper industry. Environmental performance due to production processes had caused a large shift in manufacturing technology to comprehend environmental concern and environmental awareness as reported by Basuki, (2015). Wisuttisak and Wisuttisak (2016) point out that businesses rely on both natural and human resources, and therefore it is assumed responsibility for their operational consequences and contribute to the local community they control.

The involvement of the government in preserving the environment can be observed from the issuance of regulations such as PP No. 47, 2012 regarding corporate social and environmental responsibility. Companies performing business operations in sectors related to natural resources are required to conduct responsibilities towards social and environmental aspects. Moreover, the BUMN Ministerial Regulation No. PER-05/MBU/2007 regarding partnership programs of state-owned enterprises and small businesses also include natural conservation assistance. Furthermore, the government also offers appreciation towards companies who have environmental awareness and are environmentally friendly. In 2002, the Ministry of Environment had launched a performance rating assessment program for companies regarding

environmental management (PROPER) that aims to encourage the increase of company performance in environmental management by disseminating information regarding companies' performance in environmental management.

Companies that fulfill the criteria will be awarded with a Green rating. Organizational activities towards the natural environment are then reported as environmental disclosure. These activities mentioned by Gatimbu and Wabwire (2016) include: carbon and waste management, recycling, emission, pollution, both wetland and wildlife conservation. However, this is not in accordance with a conducted study mentioning environmental performance presents an effect on financial performance (Rockness et al., 1986; Jaggi & Freedman, 1992). Not only environmental performance but also environmental disclosure have influenced the financial performance (Gatimbu & Wabwire, 2016; Nor et al., 2016; Li et al., 2017; Haninun et al., 2018). However, this also contrasts with a study by Rahman et al. (2010) stating that no significant influence towards financial performance is interfered by environmental disclosure. This study pays attention to industrial companies because of their having the highest environmental risk in Indonesia and their having a first-hand impression towards the natural environment. However, although there has been a rise in global and local public environmental awareness in Indonesia with regards to companies' reputations, a contrast relationship between a company's environmental performance and financial performance exist. Considering that matter, analyzing the relationship between environmental performance and environmental disclosure towards the financial performance of companies is the objective of this study.

2. Literature Review

Theory: The stakeholder theory and the legitimation theory are chosen as the two main theories in this study. The stakeholder theory is a theory explaining the connection between stakeholders and received information (Hill & Jones, 1992). The stakeholder theory is a theory regarding management, attitude recommendation, structure and practices, which, the implementation will form a stakeholder management philosophy (Donaldson & Preston, 1995). Meanwhile, Gray (2005) argues that the stakeholder theory assumes that a company requires support from stakeholders to maintain its existence. This theory is considered as one of the implemented strategies applied by companies in order to maintain their relationship with relevant stakeholders by disclosing sustainability reports that encompasses economic, social, and environmental performances. This theory is beneficial in analyzing organizational behavior.

Besides, the legitimation theory is another theory that motivates managers or companies in disclosing sustainability reports (Dowling & Pfeffer, 1975). This is in line with O'Donovan (20020 who states that legitimation is an idea to continue success operating for an organization. Then, the organization should act according to a set of rules that have been widely accepted by the public. The legitimation theory elucidates organizations seeking implemented methods to guarantee that organization operations are appropriate with the scope and norms practiced in the community (Deegan, 2004). Companies will voluntarily disclose their activities if the management regards it as the community's expectation. If the public is aware that both the organization and public convey in line value systems, the organizations or companies have a tendency to continually exist (Gray et al., 1995). In addition to that, legitimation can also provide limitations for an organization or group regarding norms and social values on environmental awareness.

Financial Performance: Financial performance is an analysis done to observe how far a company has implemented and followed financial implementation correctly (Fahmi, 2012). A significant influence between economic performance and environmental performance has been divulged (Al-Tuwaijri, et al., 2004), as well as between environmental disclosure the performance of environmental. Jimenez et al. (2013); Muhammad et al. (2015); Qi et al. (2014), and Kucukbay and Fazlilar (2016) also agree than environmental performance influences financial performance. Ratios are instruments that measure one thing to another, to show the relationship or correlation between financial reports, such as the statement of financial position and the income statement. These ratios are given very close attention to by investors, who wish to see the ability of the company in allocating its funds to generate large profits in the future.

Environmental Performance: Environmental performance deals with the company's conducting acts to preserve the environment and decrease environmental damage due to the company's activities (Lankoski,

2000). In this study, environmental performance is measured using the performance rating assessment program for companies regarding environmental management (PROPER). PROPER is the government's effort, executed by the Ministry of Environment, to motivate companies to better manage the natural environment through a reputation incentive instrument or appreciation for companies that practice good environmental management, and disincentive for companies with bad environmental management.

Environmental Disclosure: Environmental disclosure is reflected as information collection related to past, present, and future environmental management activities (Al-Tuwaijri et al., 2003). It is derived from various methods, such as qualitative statements, assertions or quantitative facts, financial reports, or footnotes. In order to measure the scope of environmental disclosure, previous studies have used checklists based on standard references of environmental disclosure (Leimona & Fauzi, 2008). This study utilizes the Global Reporting Initiative (GRI) in the wide measurement of environmental disclosure. The use of GRI as a benchmark for environmental disclosure measurement correlates to the fact that GRI becomes a mostly applied sustainable reporting framework worldwide as mentioned by Suhardjanto, Tower and Brown, (2007).

The Effect of Environmental Performance on the Financial Performance: Environmental performance is a company system to willingly fuse both environment attention and awareness to the company's operations and interactions with stakeholders that exceeds the organization's legal responsibility (Ikhsan & Muharam, 2016). It is thought to be influential. If there is a good environmental performance of a company, the public will put more trust and satisfaction with the company's manufactured products. Otherwise, the public has the tendency to judge and avoid products made by companies with bad environmental performance, since they are thought to not be environmentally friendly and harms the environment. Therefore, shareholders and stakeholders demand the management to prioritize social and environmental responsibility. Muhammad, et al. (2015) shows that there is a significant influence of environmental performance of companies for the financial performance. Maintaining the environment does not only benefit the public, but also the company, since decreasing environmental damage and waste can enable the company to become more productive in utilizing resources that create products that hold value in the eyes of consumer? Products that hold added value in the eyes of the consumer have better sale value compared to other products, and therefore can increase the number of sales. Studies conducted by Al-Tuwaijri et al. (2004); Jimenez et al. (2013); Muhammad et al. (2015); Qi et al. (2014); and Kucukbay and Fazlilar (2016) point out that environmental performance delivers an essential influence for financial performance. Based on the statement, the proposed hypothesis is as follows: **H1**: Environmental performance influences financial performance.

The Effect of Environmental Disclosure on the Financial Performance: For companies, the environmental performance will be responded to by the public, and consumers will be more inclined to purchase environmentally friendly products, and thus the company's sales will increase. Stanwick and Stanwick (2000) also states that with high levels of responsibilities, a company will also obtain high financial performance. Richardson and Welder (2001) had executed an observation towards social disclosure, focusing on environmental disclosure. Richardson and Welker mention that being measured by the cost of capital, that environmental disclosure presents a positive notable influence towards financial performance. Companies carry out better disclosure whenever their profitability increases (Richardson and Welker, 2001). It is conveyed that a good environmental disclosure will in turn encourage good financial performance (Al-Tuwaijri et al., 2004). Likewise, Gatimbu & Wabwire (2016) also found significant influence from both environmental disclosure and financial performance. It is also mentioned that a notable relationship between environmental disclosure and financial performance exists (Nor et al., 2016). Likewise, an affirmative influence between environmental disclosure and financial performance has been performed (Li et al., 2017; Haninun et al., 2018). Based on these, this following hypothesis is formulated: **H2**: Environmental disclosure influences financial performance.

3. Research Method

The manufacturing companies listed in the Indonesian Stock Exchange for the period 2016-2018 have been the samples of this study. There were 66 companies in total as samples out of a total population of 136 mining companies in the list of the Indonesian Stock Exchange. The samples in this study were taken through the use

of the purposive sampling method. Secondary data in this study is derived from the annual and sustainability reports of the companies. These reports were issued on websites of Indonesian Stock Exchange website: www.idx.co.id and each respective company websites. Analysis and hypothesis testing were done using computer software, which are Microsoft Office Excel 2013, and IBM SPSS Statistics 25. In this study, the measurement of financial performance was limited to the measurement of the company's profitability, using the Return on Asset (ROA) ratio analysis. According to Rizkan, et al. (2017), ROA is a ratio that shows the result (return) with respect to the total assets used by the company. A larger ROA portrays better performance, since the return rate is larger (Ang, 1997 in Rizkan, et al., 2017). This measurement method of financial performance is adopted from a study conducted by Haninun, Lindrianasari and Denziana (2018), which used the return on assets (ROA) ratio, with the formula: Earnings after taxes ÷ total assets.

PROPER is implemented for the measurement of the environmental performance of a company. It is an attempt by the Ministry of Environment to support company organizations to conduct environmental management using information instruments. The five colors and their respective scores indicate the ranking system in PROPER. Environmental disclosure was proxied with the use of the environmental disclosure score that is found in the sample companies' annual and sustainability reports. Each item was scored regarding the disclosure of activities related to the environment found in the annual report. The scores taken were based on the Indonesian Environmental Reporting Index (IER) as the result of a study conducted by Suhardjanto et al. (2007). The use of this scoring method was selected because the weight given is in accordance with the disclosed information regarding the environment in Indonesian companies, and thus the results are more accurate.

4. Results and Discussion

From the total number of companies listed in the Indonesian Stock Exchange in 2016-2018, the amount of companies listed for those periods is 66 companies. Out of 136 companies, 114 companies did not have financial reports that matched the criteria. Thus, there are 22 research samples, each for three years, which brings the total number of samples to 66. Measuring the ability of the model to explain the independent variance variable, the coefficient of determination is used.

Table 1: The Result of Coefficient of Determination (R^2)

Model	R	R Square	Adjusted R Square
1	.555	.354	.314

Table 1 presents the result of the R^2 test. Based on this, the adjusted R^2 value is 0.314. It demonstrates 31.4% of the dependent variable variation (financial performance). It can be explained by the variation of the two independent variables namely environmental performance and environmental disclosure. In the meantime, other factors outside of the model explain the remainder (100% - 31.4%=68.6%). Furthermore, to determine the effect of the independent variables on the dependent variable, multiple regression is carried out. The coefficients for each of the independent variables or independent variables become the results of the regression analysis. This coefficient is acquired by predicting the value of the dependent variable or the dependent variable with an equation. The results of multiple regression are as follows:

Table 2: Multiple Regression Result

Model		Unstandardized Coefficients		Standardized Coefficients
		B	Std. Error	Beta
1	(Constant)	13.970	2.436	
	PROPER	3.285	1.281	.446
	IER	.598	.396	.327

Based on Table 2, the equation for regression is as follows: ROA= 13.970 + 3.285 PROPER + 0.598 IER. The equation above shows a constant value of 13,970. This states that environmental performance and environmental disclosure are regarded as constant. Hence, the average value of financial performance is 13,970. The statistical t-test was conducted to find out whether the environmental performance and environmental disclosure perform an essentially positive influence on financial performance.

Table 3: Regression Result and Hypothesis Testing

Model		T	Sig.
1	(Constant)	9,349	,000
	PROPER	3.677	.002
	IER	2,352	,028

The first proposed hypothesis states that environmental performance affects the financial performance of manufacturing companies listed in the Indonesian Stock Exchange. The regression analysis indicates the result of the variable of environmental performance showing a regression coefficient of 3.285 with a significance rate of 0.002. It is lower than 0.05. It is explained that environmental performance gives impact on the financial performance of those manufacturing companies (H1 proves true). The result of this study is accordant with some studies done by Jimenez et al. (2013) and Kucukbay & Fazlilar (2016). They express that environmental performance delivers a notably significant influence towards financial performance. It is also related to the results of studies conducted by Muhammad et al. (2015); Gatimbu & Wabwire, (2016); Manrique & Ballester (2017); and Haninun et al. (2018). They have mentioned that environmental performance influences financial performance. However, the result of this study is not correlated with the studies by Sarumpaet (2005) and Li et al. (2016). Thus, it can be concluded that the PROPER program by the government, specifically by the Ministry of Environment, does have an influence towards the interest of stakeholders, especially investors and the general public.

Based on the above explanations, it can be drawn that it is possible for the environmental performance to become a consideration in viewing a company's financial performance, since the positive reputation of a company can increase their financial performance (in which the company's revenue increases). This increase in financial performance also increases the price and value of its shares, which in turn attracts investors to company investment. The second proposed hypothesis states that environmental disclosure influences the manufacturing company's financial performance which the companies are noted down in the Indonesian Stock Exchange. The regression analysis reveals that the variable of environmental disclosure has a regression coefficient of 0.598 with a significance rate of 0.028, which is less than 0.05. This proves that environmental disclosure influences the financial performance of listed manufacturing companies in the Indonesian Stock Exchange (H2 proves true). The result of this study is consistent with studies conducted by some researchers specifically Gatimbu and Wabwire (2016); Nor et al. (2016); Li et al. (2017); and Haninun et al. (2018). It is conveyed in their studies that environmental disclosure influences financial performance. However, Rahman et al. (2010) affirms that there is not any positive yet essential influence performed by environmental disclosure towards financial performance.

5. Conclusion and Recommendations

The main issue motivating the conducted investigation is providing the understanding regarding the role of environmental performance and environmental disclosure influencing the financial performance companies in Indonesia. This is supported by literature reviews regarding financial performance. Based on the issue, this leads to the formulation of the hypothesis mentioning that the financial performance of companies in Indonesia has been affected by the first factor namely the environmental performance and the second factor namely the environmental disclosure. Based on the data that have been collected and analyzed, this study concludes that environmental performance and environmental disclosure influence the financial performance of the Indonesian Stock Exchange manufacturing companies. This is further supported by the theories of stakeholder and legitimation which focus on the company and the public interaction. It possibly increases the benefits for both parties. Thus, prior explanation mentions that environmental performance becomes a consideration to look over the financial performance of a company. It is because the positive reputation of a company is able to increase the interest of the public to purchase the company's products.

The discussion's result and conclusion of the study uncover a recommendation given to the management to consider environmental factors in regulations regarding the financial performance of the company. Therefore, it is conveyed that the environmental performance of a company has exerted influence towards the financial performance crucially even though there remains to be many other factors that influence it. For

investors, it is advised that before investing capital into a company to analyze its financial performance, and consider the positive and negative regulations regarding the environmental performance of the company. Investors should consider the variable of environmental performance and environmental disclosure because their company's financial performance is notably impacted. It leads the investment made to provide maximum profit rates and to minimize investment risks. Studies conducted in the future can extend the period of observation to increase data distribution. The researcher also considers expected variables to impact on the financial performance in order to understand the actual condition of the company to produce more encouraging information.

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Impact of Real Exchange Rate Fluctuations on Aggregate Cocoa and Coffee Exports in Sierra Leone

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Abstract: The regression and the vector autoregressive VAR models are employed in this analysis. I use the auto-distributed lag regression model to estimate both the short and long-run impacts. In the VAR model, orthogonalized impulse response functions are employed to estimate the short-run. The regression result shows that while the depreciation of the real exchange rate RER increases aggregate cocoa and coffee exports AGX in the current year, this variable is not significant in determining AGX in Sierra Leone. This is because AGX has a long gestation period and until this period is over; suppliers cannot raise their output and hence exports. The negative effect of the one-period lag of the RER variable on AGX can be attributed to the fact that in the long run, depreciation in the nominal exchange rate leads to real exchange rate depreciation. This will lead to an increase in the cost of imported farming inputs in domestic currency terms. The reduction in imports that follows decreases the output and hence cocoa and coffee exports. However, this variable is not significant in determining AGX in Sierra Leone. An increase in the orthogonalized shock to the first difference of the RER causes a short series of increases in the first differences of AGX followed by a decrease, followed by an increase that dies out after four periods. The null hypothesis that the lag of the first difference of RER does not Granger-cause the lag of the first difference of AGX cannot be rejected. The paper concludes that in the short and long term, the government should not use the depreciation of the real exchange rate as a policy tool to promote the total export of cocoa and coffee products.

Keywords: *Real exchange rate; trade openness; aggregate cocoa and coffee export; vector autoregressive model; auto-distributed lag regression model.*

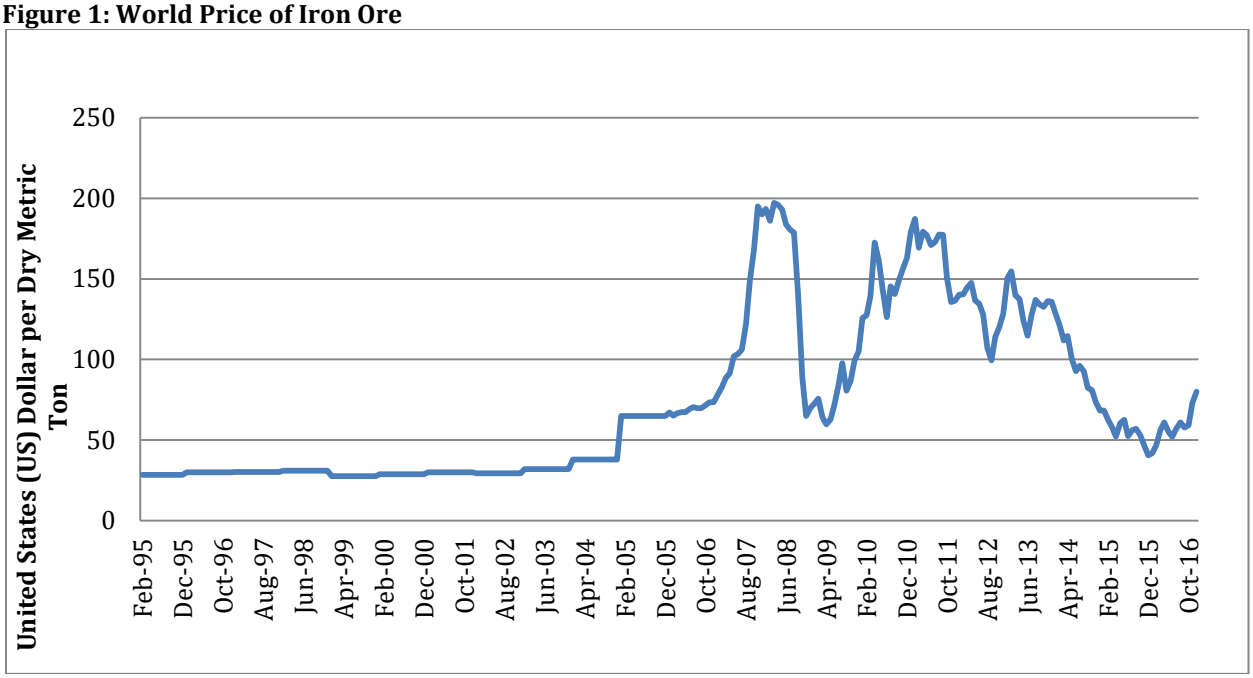
1. Introduction

Sierra Leone is one of the poorest countries in the world. More than 50% of the government revenue comes from foreign aid and the majority of the population of 7,883,123[5] relies on subsistence agriculture and is classed by Food and Agricultural Organization (FAO) as a Low Income Food Deficient Country (LIFDC). On the United Nation's Human Development Index (UNHDI), Sierra Leone was 0.419 points in 2018, leaving it in 184th place in the table of 189 countries[6]. Sierra Leone's economy is strongly reliant on the primary sectors, which are the agricultural and mining sectors. However, despite the country's potential in the mining sector (for example, iron ore, diamond, rutile, and oil reserves), with declining international commodity prices, especially in iron ore (see figure 1 pp 2) which was one of the country's main exports, agriculture, including forestry and fisheries, is one of the diversified sectors the government is focusing its growth potential. This sector accounts for the largest Gross Domestic Product (GDP) share. The share has increased from its lowest from 29 percent in 1981 to an estimated 60 percent in 2017 (see figure 2 and table 1, pp 2 and pp 3 respectively). Currency depreciation operates in a way that either increases the domestic price or reduces the foreign currency price of exports. It generates an incentive which tends to increase the demand for export goods. It is important to note that depreciation of RER will tend to increase agricultural supply from the transfer of productive resources from the import-substituting and the non traded good sector of the economy. The sector is also the primary source of employment for the majority (60-70%) of the population[7]. And also contributes to the generation of foreign exchange needed to service foreign debt and other bills. Smallholder farmers dominate the sector and are engaging in subsistence and traditional methods of farming, using limited farming inputs. There are fairly large agricultural estates, both government and privately owned. The

[5] See population by country; (www.worldometers.info)
[6] See Sierra Leone economy.com 2019 report.
[7] Review of ongoing agricultural development effort. pp1 (www.resakss.org)

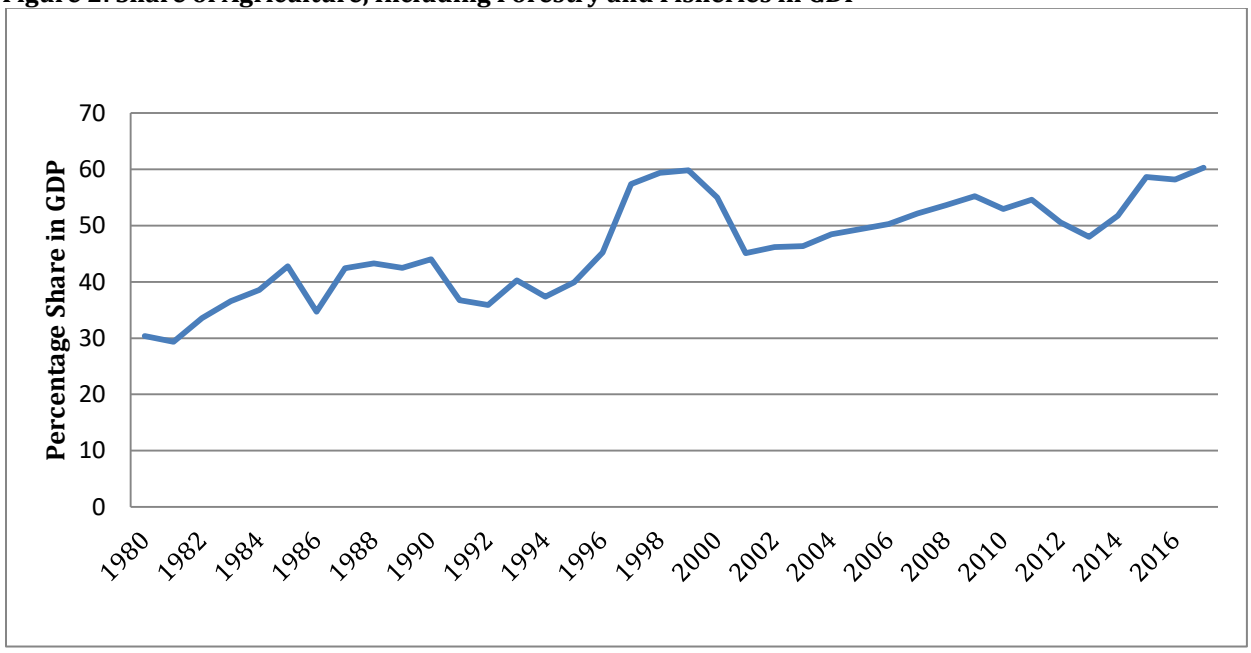
government is investing heavily in the sector by improving transport infrastructure to ease the movement of goods, encouraging and supporting private sector investment, as well as lending support to farmers.

Figure 1: World Price of Iron Ore



Source: Thomson Reuters Data Stream, World Bank

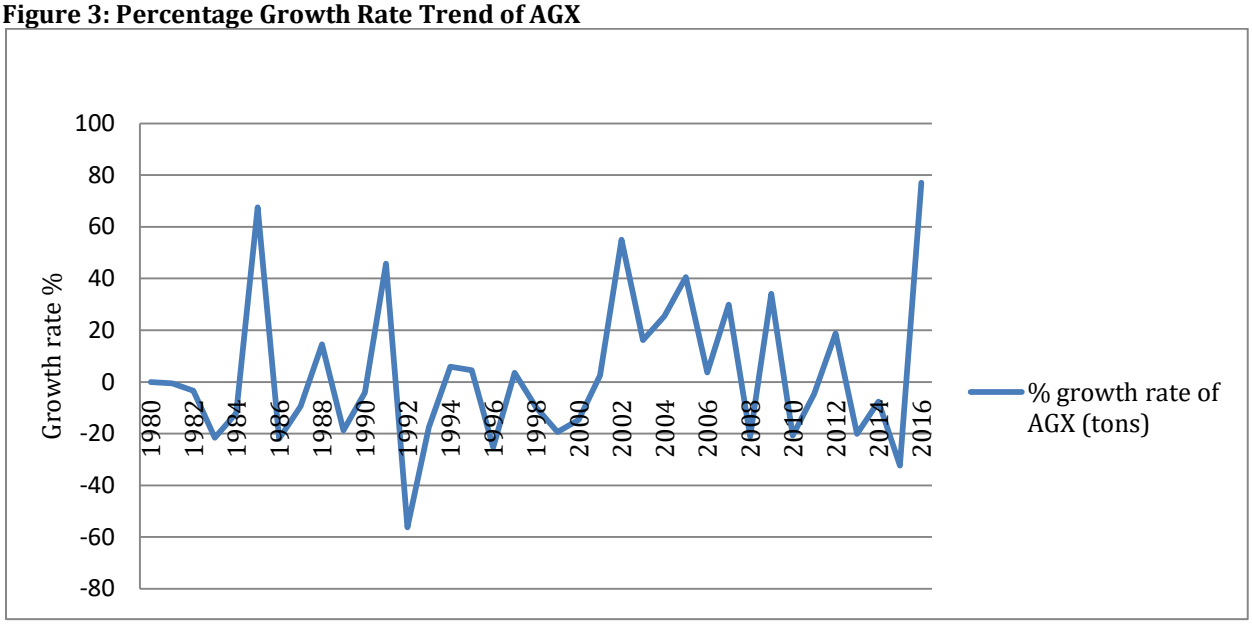
Figure 2: Share of Agriculture, Including Forestry and Fisheries in GDP



Source: World Bank Data Stream

Historically, the focus of agricultural policies in the country is on the achievement of higher export earnings on major crops like cocoa, coffee, and palm kernel. As such, cooperatives were formed in 1939 to improve the productive capacity of the farmers and also help them get better value for their produce[8]. These cooperatives were under the control of government officials, but they could not, however, control the day to day activities of the farmers. The lack of coordination between the farmers and the government officials coupled with corruption and financial difficulties led to the closure of the cooperatives. Continuous support of the production of cash crops by the government led to the formation of the Sierra Leone Produce Marketing Board (SLPMB) in 1949 as the sole legal entity responsible for the purchase, promote growth and stabilize the price of export, and marketing of the country's agricultural cash crop products (cocoa, coffee, palm kernel, piassava, and ginger). This Monopoly has caused severe distortions in the prices of cash crop products, thereby hindering production. However, the continual drive to increase the output of export crops led the government to implement the Structural Adjustment Program (SAP) in 1986, and a subsequent introduction of a floating exchange rate system in which the prices of cash crop products were set at a level equal to the world market prices to provide an incentive to farmers. However, agricultural exports still perform poorly, characterized by large fluctuations in cocoa and coffee exports (see figure 3 below).

Figure 3: Percentage Growth Rate Trend of AGX



Source: *FAO Data Stream*

In order to attract a positive response from the agricultural sector, market liberalization reforms have been implemented to ensure that the private sector participates in agricultural export sales. Thus, private sector companies participated in the buying and exporting of produce. They offered better service to farmers than the Sierra Leone Produce Marketing Board through price premiums, pre-financing, and barter systems that provided essential goods in exchange for produce (for more details see Review of past Agricultural Policies in Sierra Leone, www.fao.org). The liberalization policy contributed significantly to the stimulation of cocoa and coffee exports in the late 1980s and early 90s. For example, total exports of cocoa and coffee grew from -18.78% in 1989 to 45.74% in 1991 (see table1 below).

[8] Review of past agricultural policies in Sierra Leone. pp17 - 19, (www.fao.org)

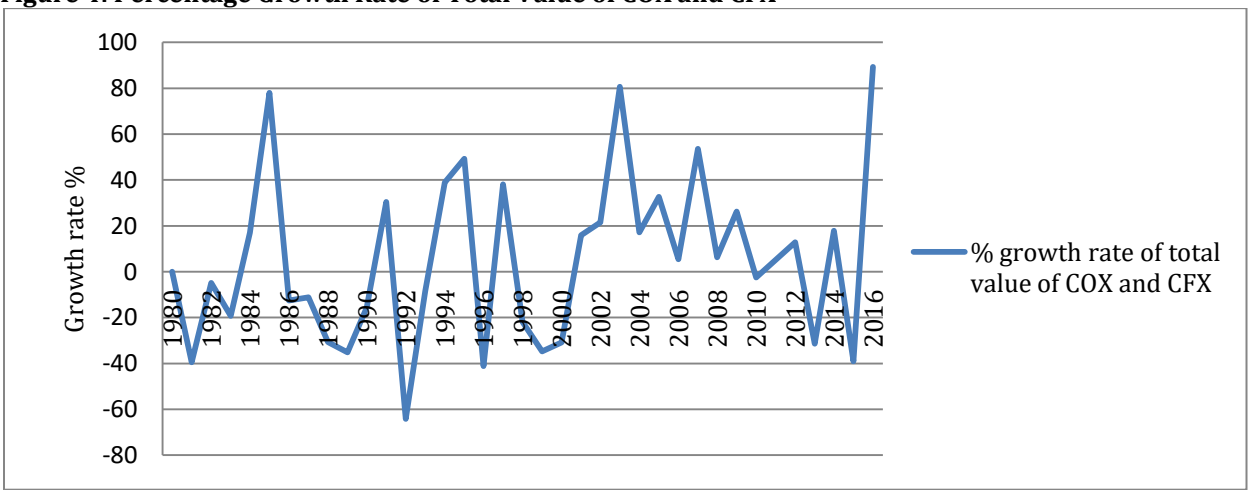
Table 1: Percentage Growth Rate in Total Tones, Values of Cocoa and Coffee Exports, and Share of Agriculture Value Including Forestry and Fisheries in GDP

Year	*Aggregate cocoa and coffee exports AGX (tons)	*Percentage growth rate of AGX (tons)	*Total export value of cocoa COX and coffee CFX (1000 US$)	*Percentage growth rate in the total value of COX and CFX	*Share of Agriculture value including Forestry and Fisheries in GDP
1980	18406	.	50630	.	30.376
1981	18314	-8.234	30644	-39.475	29.330
1982	17701	26.279	29161	-4.839	33.593
1983	13877	12.574	23562	-19.200	36.565
1984	12213	-11.807	27590	17.095	38.578
1985	20461	6.990	49131	78.075	42.793
1986	15969	4.256	42983	-12.513	34.730
1987	14460	-42.427	38205	-11.116	42.463
1988	16557	2.764	26464	-30.732	43.313
1989	13448	7.087	17165	-35.138	42.509
1990	12900	-1.309	14495	-15.555	44.029
1991	18800	-24.741	18900	30.390	36.745
1992	8223	-9.617	6782	-64.116	35.887
1993	6780	-5.103	6216	-8.346	40.302
1994	7178	-11.269	8639	38.980	37.395
1995	7500	-2.681	12900	49.323	39.955
1996	5600	-1.672	7600	-41.085	45.210
1997	5800	52.882	10500	38.158	57.396
1998	5230	-11.683	8200	-21.905	59.402
1999	4220	19.957	5350	-34.756	59.866
2000	3600	1.746	3700	-30.841	55.014
2001	3690	-19.402	4287	15.865	45.136
2002	5722	6.275	5206	21.437	46.214
2003	6646	-1.341	9402	80.599	46.357
2004	8337	-0.090	11020	17.209	48.486
2005	11722	7.598	14625	32.713	49.391
2006	12146	3.918	15416	5.409	50.294
2007	15774	1.479	23679	53.600	52.176
2008	12453	9.150	25164	6.271	53.654
2009	16697	20.960	31755	26.192	55.261
2010	13235	0.578	30979	-2.444	52.943
2011	12621	3.880	32576	5.155	54.593
2012	14982	-5.476	36748	12.807	50.592
2013	11966	-14.255	25196	-31.436	47.983
2014	11057	16.423	29704	17.892	51.793
2015	7487	18.411	18114	-39.018	58.652
2016	13252	9.193	34294	89.323	58.209
2017	.	.	.	.	60.284

Source: FAO and World Bank Data Stream
Note: *Author's calculation

However, the lack of stable prices for cocoa and coffee exports and the abandonment of quality control are the limiting factors for continued expansion. Also, the intensification of the civil war since 1991 severely affected cocoa and coffee exports as thousands of farmers fled their farms and homes, this event puts the total cocoa and coffee exports from 18,800 tons in 1991 to 3,600 tons in 2000 (see table 1 above). After the cessation of the civil war, and subsequent investment by the government and external donors in the agricultural sector, the total tones of cocoa and coffee exports increased, but showed persistent fluctuations and declining growth rate trends from 2002 with the exception of 2016 (see figure 3 and table 1). Correspondingly, the total value of cocoa and coffee exports also showed continued fluctuations and downward trends, except for 2016. For example, the growth rate of the total value of cocoa and coffee exports showed 80.60% in 2003. This trend dropped to -39.02% in 2015 (see figure 4 below and table 1 above).

Figure 4: Percentage Growth Rate of Total Value of COX and CFX



Source: FAO Data Stream

Research Problem: The empirical literature suggests that the exchange rate fluctuation is likely to be a major factor influencing exports decline (see Zafar and Ahmad (2011); Sandu and Ghiba (2011); Tarawalie et al. (2013); Serenis and Tsounis (2014); Srinivasan and Kalaivani (2013); Bahmani-0skooee and Gelan (2018); Khalighi and Fadaei (2017); Betten and Belongia (1984) and many more). However, little information is available about the extent to which this conclusion may be true for Sierra Leone in the case of aggregate cocoa and coffee exports and because the supply of cocoa and coffee is inelastic and depends on the weather condition.

Research Questions: The review of some relevant pieces of literature on this field of study, aid the development of the research questions, (hereinafter, RQ). Consequently, the two questions are thus: RQ1: What is the short-run impact of real exchange rate fluctuations on aggregate cocoa and coffee exports in Sierra Leone? RQ2: What is the long-run impact of real exchange rate fluctuations on aggregate cocoa and coffee exports in Sierra Leone?

Research Aim and Objectives: This paper aims to investigate the impact of fluctuations in the real exchange rate on aggregate cocoa and coffee exports in Sierra Leone for prudent policy implication. To achieve the aim, the research presents three objectives with the research questions acting as a foundation, and these objectives are:

(A) To investigate the short-run impact of real exchange rate fluctuations on aggregate cocoa and coffee exports in Sierra Leone.

(B) To investigate the long-run impacts of real exchange rate variation on aggregate cocoa and coffee exports in Sierra Leone.

(C) Propose policies to improve the production and export of cocoa and coffee in Sierra Leone.

Research Hypothesis: The research tests the following hypothesis:
H_0: Real exchange rate variations have a significant impact on aggregate cocoa and coffee exports in the short run in Sierra Leone.
H_1: Real exchange rate variation does not have a significant impact on aggregate cocoa and coffee exports in the short run in Sierra Leone.
H_0: Real exchange rate variations have a significant impact on aggregate cocoa and coffee exports in the long-run in Sierra Leone.
H_1: Real exchange rate variation does not have a significant impact on aggregate cocoa and coffee exports in the long-run in Sierra Leone.

Significance of the Study and Outline: This paper disaggregates Sierra Leone's trade with the rest of the world, by sector and by-product, and considers the impact of real exchange rate variation on cocoa and coffee exports. Thus, this study would serve as a good guide to the government and private sector in realizing the impact of fluctuations in the real exchange rate on aggregate cocoa and coffee exports in Sierra Leone. It will also be of great help to students and researchers in related fields as it would widen and improve their knowledge of the sector and on cocoa and coffee products in particular. The remainder of this research is as follows: Section 2, the literature review. The third section is the model specification, the scope and source of data and methodology. Section 4, the result presentation, and interpretation. Section 5 presents conclusions and policy recommendations.

2. Literature Review

This section discusses the extent and related literature, including theoretical and empirical review of past works by different writers and researchers on the exchange rate, trade, agricultural exports, and related field of study.

Theoretical Review: Economists normally agree that changes in the exchange rate can either be nominal or real (Betten and Belongia 1984). The nominal exchange rate is the relative price of the currencies of two countries. These rates are observable and are a result of the market and other forces out of our control (Kristinek and Anderson, 2002). For example, if the exchange rate is $1=SLL10, it means the exchange rate of one United States Dollar (USD) is ten Sierra Leone Leones (SLL) in the world market. Correspondingly, Sierra Leoneans can exchange ten Leons for one US dollar. Edwards (1989), opined that in an inflationary world, changes in the nominal exchange rate would have no clear meaning and that researchers should give consideration to changing values in the domestic and foreign currencies, as measured by the rates of inflation. In this context, the central focus of any international transaction is the real exchange rate. The real exchange rate involves adjusting to a specify nominal exchange rate for relative inflation between a domestic economy, and the rest of the world to determine the effect on incentives to produce, purchase and store commodities and services (Snape 1988; Kristinek and Anderson, 2002). The concept is a measure of the degree of competitiveness of a country in the international market. Expressed as $RER = e * P_f / P_d$.
Where: RER = real exchange rate
e = nominal exchange rate
P_f = foreign price level
P_d = domestic price level

Theoretically, when the exchange rate appreciates, foreign goods become cheaper in the domestic market and there is downward pressure on domestic prices. In contrast, the prices of domestic goods paid by foreigners go up, which tends to decrease foreign demand for domestic products. Thus, the exchange rate appreciation tends to reduce exports, and if there is no corresponding change in the relative prices in the rest of the world, the appreciation of the exchange rate would represent a decrease of the country's competitiveness in the international market (Tarawalie et al., 2012; Jiang 2014). Exchange rate depreciation has the opposite effect. It tends to improve the competitiveness of domestic goods in foreign markets while making foreign goods less competitive in the domestic market by becoming more expensive, this event transmits to higher exports and lower imports (Tarawalie et al., 2012). If the domestic currency depreciates, exports become cheaper due to the change in relative prices. However, the effect of depreciation depends on the elasticity of demand for exports and imports (Cao-Alvira 2014). The experience with the Structural Adjustment Programs (SAP) in

developing countries seems to suggest the important facts in the failure of a depreciation in the exchange rate to increase exports is the inability of the authorities to ensure that the exchange rate falls significantly and remains at its depreciated rate for a period long enough to permit adjustment supply.

Invariably, this is due to the failure by the authorities to pass on price increases to exporters where there is price regulation. Furthermore, lags in recognition of the changed situation lag in the decision to change variables, lag in delivery time, lags in replacement of inventories and materials, and lags in production. These lags ensure that the demand for exports remains inelastic in the short term. In the long run, when prices become flexible, there will be a positive quantity effect because domestic consumers tend to buy fewer imported goods and foreign consumers tend to buy more exported goods. A fundamental issue facing the exchange rate is whether a country's RER is out of line to its long-run equilibrium level. It is a general belief that maintaining the RER at the wrong level will generate welfare costs because it will often produce incorrect signals to economic agents and lead to greater economic instability. According to Edwards (1989), the immediate determinants of the equilibrium RER are the fundamentals. Therefore, at any point in time, RER behavior depends on the value of fundamentals and macroeconomic pressures, such as excessive money supply and fiscal deficits. Orden (2002) pointed out that exchange rate changes depend on international capital flows, and macroeconomic factors determine these flows, including monetary policy. These structural policy implications of exchange rate movements, along with their direct effects on markets at any given moment in time, are why exchange rate movement is important to agriculture.

Empirical Review: The literature has shown many pieces of researchers investigating the impact of the exchange rate on export trade. According to Edwards (1989), there are no indications that higher variability in the real exchange rate affects the level of exports. However, the study by Serenis and Tsounis (2014) found significant negative effects from the volatility of the exchange rate on exports for the countries in their sample when using a measure of unexpected fluctuation. The empirical analysis of Serenis and Tsounis (2013) suggests that exchange rate volatility when measured as the sample standard deviation of the log effective exchange, does not affect the level of exports for both Croatia and Cyprus. However, using an alternative measure there is an indication of a stronger effect from movements of the exchange rate to the level of exports. Consequently, the results show a negative statistically significant relationship for Croatia. This result implies that different measurements in the exchange rate have different implications for exports. Serenis and Tsounis (2012) use three different volatility measures. The empirical analysis suggests that exchange rate volatility when measured as the sample standard deviation of the log effective exchange has a small effect on the level of exports for the sample European Union (EU) countries. However, using alternative measures that capture the effects on high and low values of the exchange rate, there is an indication of a stronger effect from movements of the exchange rate to the level of exports. Consequently, their findings suggest a significant statistical relationship that displays negative effects between sectoral exports and exchange rate volatility. This result confirms the view that different exchange rate measurements have different implications for exports. The empirical findings of Zafar and Ahmad (2011), apply a fixed-effects model to find out the impact of exchange rate volatility on export growth of 16 Latin American countries. The study finds a significant negative effect of exchange rate volatility on export growth. This finding is consistent with the findings of many earlier studies confirming a negative relationship between exchange rate and export. Equally, Srinivasan and Kalaivani (2013) empirically investigate the impact of exchange rate volatility on the real exports in India using the Autoregressive Distributed Lag (ARDL) bounds testing procedure. Their findings suggest that the exchange rate volatility has a significant negative impact on real exports both in the short-run and long-run, implying that higher exchange rate fluctuation tends to reduce real exports in India. This study also confirms the negative relationship between exchange rate volatility and exports.

According to Tarawalie et al. (2013) in their study, "The relationship between exchange-rate volatility and export performance in the West African Monetary Zone (WAMZ) countries," using quarterly data. Their results suggest that increases in the exchange-rate volatility exert a significant negative effect on exports in Liberia, Nigeria, and Sierra Leone. While the result shows a positive relationship in the case of The Gambia, exchange-rate volatility impact on Ghana and Guinea is insignificant. Their study also finds that the real effective exchange rate hurts export performance in the case of The Gambia, Ghana, and Nigeria. Their results also show a positive relationship in the case of Guinea and Liberia. However, although the long-run result indicates a positive relationship for Sierra Leone, its impact in the short run is negative. Correspondingly,

Bahmani-Oskooee and Gelan (2018) investigate a sample of twelve African countries to distinguish the impact of the real exchange-rate volatility on their exports and imports, both in the short-run and long-run, using the bounds-testing approach. The short-run impact of the real exchange-rate volatility either worsens or improves exports in eight out of twelve African countries. The list includes Egypt, Ethiopia, Lesotho, Mauritius, Morocco, Nigeria, Sierra Leone, and South Africa. However, short-run effects lasted into long-run negative effects in Nigeria and Sierra Leone, and positive effects in Egypt, Ethiopia, and Lesotho. Furthermore, the findings suggest that currency depreciation stimulates exports of Egypt, Lesotho, and Nigeria but hurt exports of Ethiopia and Sierra Leon. The negative sign of depreciation in the exchange rate on the export of Ethiopia and Sierra Leone implies that an increase in the exchange rate harms exports of the two countries.

In their paper, Sandu and Ghiba (2011) analyze the exchange rate influence on export volume in Romania using a vector autoregressive (VAR) model. Their analysis, vis-à-vis the 2003 quarter two to 2011 quarter one period, reflects a negative relationship for the first lag and a positive one in the second lag. Considering the importance of the first lag, the increase in the exchange rate has an impact on the reduction in exports. Also, according to the impulse-response function, a shock in the exchange rate has significant effects on exports after two periods. On the other hand, Bouoiyour and Selmi (2013) make use of meta-analysis in an attempt to answer the question, whether exchange rate uncertainty affects export performance? The total sample of 56 studies from 1984 to 2013 provides stronger support for the link between risk aversion and hedging instruments, which is a conflicting relationship between exchange rate fluctuations and exports that are generally expected in theory. Using subgroup meta-analysis to provide further evidence on the results already obtained by decomposing their sample into four subgroups depending on the nature of countries, and the models explored to determine volatilities, the evidence from subgroups is not supportive of this association. Caglayan and Di (2010) empirically studied the impact of real exchange rate fluctuations on the sectoral bilateral trade flows between the United States and its top 13 trading partners. They provide evidence that exchange rate volatility does not systematically affect sectoral trade flows. On the other hand, Huchet-Bourdon, and Korinek (2011) examine the impact of exchange rates and their volatility on trade flows in China, the Euro area and the United States in two broadly defined sectors, agriculture on the one hand and manufacturing and mining on the other. The study finds that exchange rate volatility impacts trade flows only slightly. Exchange rate levels, on the other hand, affect trade in both agriculture and manufacturing and mining sectors, but do not explain all the trade imbalances in the three countries examined. Another study that examines the question of exchange rate effects on agriculture comes from Orden (2002). The study shows that exchange rate movements determine the wedge between the domestic and foreign prices of a traded good. And those monetary shocks have non-neutral effects that explain some of the variability in agricultural prices. Khalighi and Fadaei (2017) study the impact of exchange rate on date export in Iran from 1991-2011. Applying the ordinary least squares (OLS) method in the estimation, the results suggest that the exchange rate is a crucial factor for date export and also for exporters. The results also show that the implementation of a unified exchange rate policy without the appropriate exchange rate to encourage exporters would harm date exports. In Shane et al. (2008), their paper estimates the trade-weighted exchange rate and trade partner income effects on U.S. agricultural exports. For the period 1970–2006, the results suggest that a one percent annual increase in trade partners' income increase total agricultural exports by about 0.75%, while a 1% appreciation of the dollar vis-à-vis trade partner trade-weighted currencies decreases total agricultural exports by about 0.5%. The empirical results of Wondemu and Potts (2016) suggest that while overvaluation is harmful to exports, undervaluation of the real exchange rate boosts export supply as well as export diversification. The high growth rate of exports is related to the period when the currency is undervalued. However, an export expansion achieved through undervaluation raises the rate of inflation for Tanzania. Uduh (2017) examined the impact of the exchange rate on cocoa export in Nigeria.

Employing the Augmented Dickey-Fuller Unit root, Johansen cointegration, ordinary least square, and diagnostic tests, as well as error correction mechanisms to analyze the secondary time series data. The t-test showed a direct relationship between cocoa export and exchange rate, but an inverse relationship with trade openness and world cocoa price. In general, the paper concludes that agricultural exports, exchange rate, trade openness, and the world price of cocoa taken together affect cocoa export in Nigeria. The findings of Fosu (1992) show that the effect of the real exchange rate on the domestic aggregate agricultural to non-agricultural price ratio is statistically significant at the 10% level. The result further shows that nominal exchange rate changes influence public policy regarding the pricing of cocoa, coffee, and shea nuts. Also, the

study suggests that the decline in the agricultural exports of cocoa and coffee, and the share of exports in the value of real agricultural output during the period 1960-87 is due to the appreciation of the real exchange rate. Furthermore, the study shows that the response of agricultural exports to a change in the real exchange rate is inelastic; suggesting that a large change requires to stimulate the desired increases in agricultural exports. Snape (1988) opined that the appreciation of the real exchange rate made it more difficult for U.S. farmers to compete with foreigners in the export as well as domestic markets. In countries where the real exchange rate appreciates against the US dollar, unless agriculture also requires a lot of capital, agriculture can more easily compete with US producers. The empirical result of Hossain (2018) shows that the depreciation of Bangladeshi currency maximizes agricultural exports and encourages producers to produce more agricultural products. Betten and Belongia (1984) in their paper "The recent decline in Agricultural Exports: Is the exchange rate the culprit?" Empirical evidence on factors affecting U.S. agricultural exports suggests a negative relationship between real exchange rates and exports. Overall, their analysis shows that foreign income and not real exchange rate is the most primary determinants of U.S. agricultural exports. Correspondingly, Akinniran and Olatunji (2018) employed the unit root test and regression analysis to evaluate the trend in agricultural exports, examine the effect of the Structural Adjustment Program (SAP) in agricultural exports and investigate the determinants of agricultural exports in Nigeria. The results show that the lag values of exchange rate devaluation have a significant and positive relationship with agricultural exports. The results also show that the exchange rate devaluation in the SAP, and the pre SAP eras has no significant effect on agricultural exports except in the case of natural rubber exports. Furthermore, the results also suggest that per capita agricultural gross domestic product in Naira has a significant negative relationship with total agricultural export commodities. The results of the analysis suggest that agricultural export in Nigeria does depend on the exchange rate and the price of crude oil in the long run. In general, the literature has received mixed empirical support. Some have suggested that exchange rate volatility does depress the level of exports, whilst others suggested positive and some insignificant effects. However, little information is available about the extent to which these conclusions may be true for Sierra Leone in the case of cocoa and coffee.

3. Model Specification, the Scope and Source of Data and Methodology

This section specifies the model, explains the scope and data sources, and presents the research methodology, which determines the way by which the research is done through collecting relevant and appropriate data and information following research aims, objectives and research questions (Saunders et al., 2009). The motivation of this paper is the lack of extensive literature on agricultural commodity levels in Sierra Leone. And also, the inability of the existing literature to develop a measure, which captures the short and long-run impact of variation of the real exchange rate on aggregate cocoa and coffee exports in Sierra Leone. Thus, there is a need to conduct more research in order to fill these gaps to provide relevant information for a policy review. Hence, the topic "Impact of real exchange rate fluctuation on aggregate cocoa and coffee export in Sierra Leone".

Model Specifications: To investigate the impact of real exchange rate fluctuations on aggregate cocoa and coffee exports in Sierra Leone, appropriate aggregate cocoa and coffee export model for this study would be a regression model that combines the effect of both real exchange rate movements with some control variables suggested by conventional trade theory as influencing cocoa and coffee exports. An alternative approach would be a vector autoregressive VAR model to estimate the impact of real exchange rate fluctuations on aggregate cocoa and coffee exports. Employing the regression model to estimate both the short-run and long-run impacts, while utilizing the VAR model and orthogonalized impulse response functions to estimate the short-run impact. Presuming the variables are I(1) and there is no cointegration[9]. The regression model for this analysis is as follows:

[9]This is the characteristics of the series in this analysis. It is in accordance with time-series unit root and cointegration techniques.

$$\Delta LogAGX_t = c + \alpha_1 \Delta LogRER_t + \alpha_2 \Delta LogM2_t + \alpha_3 \Delta OPEN_t + U_t \quad (1)$$

Where AGX = Aggregate cocoa and coffee export (tones)
c = constant parameter
RER = Real exchange rate
t = current time subscript
Δ = first difference
M2 = Broad money supply
OPEN = Trade openness, is a proxy for trade policy.
U = error term

The analysis includes the variables ($\Delta LogM2_t$, $\Delta OPEN_t$) to control for the effect of certain factors and to introduce dynamics in the relation. The analysis estimates a distributed lag model to determine the short-term and long-term effects of RER fluctuations on total cocoa and coffee exports. Hence, the impact coefficient α_1 is the total reaction of cocoa and coffee, including the direct and indirect effects of real exchange rate fluctuations (operating through control variables). VAR is specified with n lags. This model is an alternative model for estimating the short-term impact of RER on total cocoa and coffee exports, so:

$$y_t = c + A_1 y_{t-1} + A_2 y_{t-2} + \ldots\ldots + A_n y_{t-n} + U_t \quad (2)$$

Where $y_t = (\Delta LogAGX_t, \Delta LogRER_t, \Delta LogM2_t, \Delta OPEN_t)$, U_t is a vector error of reduced-form shocks. An extended version of the equation includes additional variables. Based on orthogonalized impulse response function(with $\Delta LogAGX_t$ as the first as well as the impulse variable), the short-run impact is obtained by observing how would $\Delta LogAGX_t$ respond to a standard deviation shock to $\Delta LogRER_t$. Note that, in this paper, an increase in real exchange rates is referred to as a depreciation of the domestic currency, and a decrease is referred as an appreciation of the domestic currency. The essence of introducing a logarithm on some of the variables is to express the parameters in terms of their elasticities and to scale down the variables and therefore reduce the incident of heteroscedasticity.

Scope and Source of Data: The early 1980s were characterized by large fluctuations in aggregate cocoa and coffee exports, which have been blamed mostly on the low producer price of cash crop product; the intensification of the civil war in 1991 caused instability in most productive areas of Sierra Leone. As such the exchange rate could not maintain the stability it gained before 1991 and total tons of cocoa and coffee exports were adversely affected, this study, therefore, collect time series annual data for the period 1980 to 2016. See Table 2 below for the variables, unit of measurement, and their respective source. Note that, some of the variables have been transformed into natural logarithms so that the regression result can be interpreted as elasticities. That is the response of the dependent variable that is explained by a 1% increase in the independent variable.

Table2: Variable, Unit of Measurement and Sources

No.	Variables	Unit of measurement	Source
1	Nominal exchange rate (NER)	The relative price of the local currency unit per relative price of the US dollar (RPLCU/RPUSD).	World Bank
2	Real exchange rate (RER)	Current US dollars	RER = (NER* P_f/P_d). P_f =foreign price level (proxy as USCPI) P_d =domestic price level (proxy as domestic CPI)- (author's calculation)
3	The United States Consumer Price Index (USCPI)	Current US dollars	World Bank
4	Consumer price index (CPI) for the domestic economies/countries	Current dollar	World Bank

5	Quantity of cocoa exports (COX)	Tones	Food and Agricultural Organization data
6	Quantity of coffee exports (CFX)	Tones	Food and Agricultural Organization data
7	Aggregate cocoa and coffee exports (AGX)	Tones	AGX = COX + CFX (author's calculation)
8	Value of cocoa exports	Current US dollars (thousand)	Food and Agricultural Organization data
9	Value of coffee exports	Current US dollars (thousand)	Food and Agricultural Organization data
10	Exports of goods and services (X)	Current US dollars	World bank
11	Imports of goods and services (M)	Current US dollars	World bank
12	Gross Domestic Product(GDP)	Current US dollars (billions)	World bank
13	Openness (OPEN)	Current US dollars	OPEN = X+M/GDP (author's calculation)
14	Broad Money supply (M2)	Percent of GDP	World bank

Methodology: Since the primary objective is to check the short and long-run impacts of RER fluctuations on aggregate cocoa and coffee exports. For this, I used the cointegration technique, which states that the variables, LogAGX, LogRER, LogM2, and OPEN are said to be cointegrated if they can be combined linearly and hence exhibit a long-run relationship. On the other hand, if the series are not cointegrated, then the series does not exhibit a long-run relationship. Two types of tests are normally carried out in this analysis; the Johansen cointegration technique, and the Engel-Granger cointegration test. However, this study employs the Johansen cointegration test because of its advantages over the Engle-Granger approach (discussed below). The regression and the VAR models have been employed in this analysis. I use the auto distributed lag regression model to estimate the short and long-run impacts of RER fluctuations on aggregate cocoa and coffee exports. In the VAR model, orthogonalized impulse response functions are employed to estimate the short-run impact of RER movement on aggregate cocoa and coffee exports. The Granger causality test is used to establish a causal relationship between the variables. I discussed these approaches in brief below.

The Unit Root Test: Ullah, et al. (2012), said that almost all the economic variables are non-stationary at their level form which makes the coefficients inconsistent and empirical results spurious. The literature has shown that most macroeconomic variables are not mean reverting as a result of their time sensitiveness, reported by (Uduh 2017). Hence, they are not stationary at their level form. A stationary process is a stochastic process whose unconditional joint probability distribution does not change when shifted in time. Consequently, parameters such as mean μ and variance σ^2 also do not change over time. Three tests are applicable in the test of stationarity. The Augmented Dickey-Fuller (ADF) test, Philip-Perron (PP) test, and the ADF-Generalizes Least Square test. However, since the variables in this study do not have structural breaks[10], the research therefore employs the Augmented Dickey-Fuller (ADF) test to check whether the variables are stationary at a level or not (see Kemal and Qadir 2005). The null hypothesis is that a unit root is present in a time series sample. And the alternative hypothesis is different depending on the version of the test, but is usually stationary or trend-stationary. The general model of the ADF is:

$$y_t=\alpha+y_{t-1}+U_t \quad (3)$$

Where U_t is an independent and identically distributed zero-mean error term, presumably $\alpha = 0$, which is a random walk without drift, we allow for a drift term by letting α be unrestricted. The Dickey-Fuller test involves fitting the model

[10] See cumulative sum test result on page 19.

$y_t = \alpha + \rho y_{t-1} + \delta_t + U_t$ (4)

by ordinary least squares (OLS), perhaps setting $\alpha = 0$ or $\delta = 0$. However, such a regression is likely to be plagued by serial correlation. To control for that, the augmented Dickey-Fuller test instead fits a model of the form;

$\Delta y_t = \alpha + \beta y_{t-1} + \delta_t + \zeta_1 \Delta y_{t-1} + \zeta_2 \Delta y_{t-2} + \ldots\ldots\ldots + \zeta_k \Delta y_{t-k} + \mathcal{E}_t$ (5)

Where k is the number of lags specified and Δ is the difference. The no-constant option removes the constant term α from this regression, and the trend option includes the time trend δ_t, which is left out by default. Testing $\beta = 0$ is equivalent to testing $\rho = 1$, or, equivalently, that y_t follows a unit root process. In the first case, the null hypothesis is that y_t follows a random walk without drift, and (5) is fitted without the constant term α and the time trend δ_t. The second case has the same null hypothesis as the first, except that we include α in the regression. In both cases, the population value of α is zero under the null hypothesis. In the third case, we hypothesize that y_t follows a unit root with drift so that the population value of α is non zero; we do not include the time trend in the regression. Finally, in the fourth case, the null hypothesis is that y_t follows a unit root with or without drift so that α is unrestricted, and we include a time trend in the regression.

The one-tailed null and alternative hypotheses are;
H_o: $\beta = 0$ or $\rho = 1$ (where $\beta = \rho - 1$)
H_a: $\beta \neq 0$ or $\rho \neq 1$

Deciding which case to use involves a combination of theory and visual inspection of the data. If economic theory favors a particular null hypothesis, then we can decide on the appropriate case based on that. If a graph of the data shows an upward trend over time, then case four may be preferred. If the data do not show a trend, but do have a nonzero mean, then case two will be an effective choice. The intuition behind the test is that if the series is characterized by a unit root process, then the lagged level of the series (y_{t-1}) will not provide information in predicting the change in (y_t) besides the one obtained in the lagged changes (Δy_{t-k}). In this case, the $\beta = 0$ and the null hypothesis is not rejected. On the other hand, when the process has no unit root, it is stationary and hence exhibits reversion to the mean - so the lagged level will provide relevant information in predicting the change of the series and the null of a unit root will be rejected.

Cointegration: Cointegration is a long-run or equilibrium relationship between different random variables (Ullah, et al. 2012). When the variables are I(1) we perform a cointegration to establish a long-run relationship. The popular approaches to cointegration are the Engle-Granger test and the Johansen approach (Kemal and Qadir 2005). The Engle-Granger test is to run a static regression after first having verified that an I (1) process exists, and finally estimate the error correction model. However, this test takes one variable as the dependent variable and the remaining as independent variables, but reversing the order could indicate no cointegration even if the variables are cointegrated (see Kemal and Qadir 2005, for more details on the shortfalls). Thus, in order to overcome the shortfalls of the Engle-Granger test, this study therefore employs the Johansen approach. Johansen's method is the maximum likelihood estimator of the so-called reduced rank model. The general form of the model is;

$\Delta y_t = \Pi y_{t-1} + \Gamma \Delta y_{t-1} + e_t$ (6)

Where Π is the long-run cointegrating matrix and it contains equilibrium (error) correction terms and Γ shows the coefficient of VAR. The existence of a cointegrating relationship depends on the rank of the matrix Π.

Impulse Response Function: If the variables in y_t are I(1) but not cointegrated, Π is a matrix of zeros and thus has rank 0. This implies that Π is a null matrix meaning there is no linear combination. If the variables are I(0), Π has full rank, implying that both rows are linearly independent and the variables are stationary and cannot cointegrate (Kemal and Qadir 2005). When the series is I(1) and have zero cointegrating relationships, we can use a VAR to find out a short-run relationship in the series. VAR models are usually not precise enough to be all that informative from a practical standpoint. This issue is overcome by using an

impulse-response function which describes the evolution of the variable of interest along a specified time horizon after a shock in a given moment. It is a useful tool for characterizing the dynamic responses implied by estimated VARs (Kemal and Qadir 2005). Let us first consider the case of a univariate first-order autoregressive AR(1) process:

$$x_t = \varphi_0 + \varphi_t x_{t-1} + e_t \quad (7)$$

Where φ_0 is the vector of intercepts, x_t is a scalar, $\varphi < 1$ (what makes the process stationary) and e_t is a (scalar) random disturbance with mean 0. This equation is given as the Vector Moving Average (VMA) equation[11].

$$x_t = \mu + \sum_{i=1}^{\infty} \varphi_1 + e_{t-1} \quad (8)$$

Kemal and Qadir, (2005) "pointed out that VMA is a basic equation that can track the time path of the various impacts of variables in the VAR system." Thus, in this analysis, the focus is mainly on the impact of standard deviation shocks of real exchange rates, on aggregate cocoa and coffee exports.

Granger Causality Test: After fitting a VAR, we may want to know the direction of the relation between the variables. The Granger Causality test is useful in evaluating the direction of the relation. A variable x Granger-causes a variable y if, given the past values of y, the past values of x are useful for predicting y. A common method for testing Granger causality is regress y on its own lagged values and lagged values of x and tests the null hypothesis that the estimated coefficients on the lagged values of x are jointly zero. Failure to reject the null hypothesis is equivalent to failure to reject the hypothesis that x will not cause y.

4. Results Presentation and Interpretation

Table 3: Correlation Matrix of the Variables (1980-2016)

	AGX	RER	M2	OPEN
AGX	I.0000			
RER	-0.4571**	1.0000		
	(0.00045)			
M2	0.5996**	-0.3737*	1.0000	
	(0.0001)	(0.0227)		
OPEN	0.1145	0.4845**	0.0054	1.0000
	(0.4998)	(0.0024)	(0.9748)	

Note that the figure in the bracket indicates probability. * and ** indicate statistically significant at the 5% and 1% levels, respectively. Table 3 presents the correlation between AGX and other variables, including the RER, M2, and OPEN. The column "AGX" shows that the correlation between AGX and other variables ranges from -0.4571 to 0.5996 and two of them are statistically significant at the 1% level (with RER and M2). The correlation between AGX and RER is negative, but appears to be weak. And the non-significant between AGX and OPEN suggests that OPEN does not affect AGX.

Table 4: Summary Statistics of the Variables (1980-2016)

	AGX	RER	M2	OPEN
Mean	11487.14	3469.64	18.12988	0.510987
Median	12213	3595.16	17.10477	0.45906
Standard Deviation	4809.35	685.47	5.43748	0.178352
Variance	2.31e+07	469865.9	29.56619	0.031809
Skewness	-0.0288	-0.37594	0.514683	0.71095

[11]See Walter (1995) for details.

Kurtosis	1.872263	2.6272	2.331598	2.732939
Observations	37	37	37	37

Source: Author's computation using STATA 15

Table 4 provides the summary descriptive statistics for the variables with a sample of 37 observations for each. The mean of AGX is 11487.14, the median value is 12213, the deviation of the sample mean is 4809.35, and whilst the variance is 2.31e + 07, which indicates that the observations have certain variations. The skewness is -0.0288, which means the skewness is negative. While the kurtosis is 1.872263, meaning lower values below the sample mean. In the case of the RER variable, the mean is 3469.64, the median value is 3595.16, and the deviation of the sample mean is 685.47, whilst the variance is 469865.9, which indicates that the observations have high variations. The skewness is -0.37594, which means the skewness is negative. The kurtosis is 2.6272, meaning lower values below the sample mean. Also, the variable M2 shows that the mean is 18.12988, the median value is 17.10477, and the deviation of the sample mean is 5.43748, whilst the variance is 29.56619, which indicates that the observations have certain variations. The skewness is 0.514683, which means that the observed values tend to a normal distribution around the mean. And the kurtosis is 2.331598, meaning lower values below the sample mean. The OPEN variable shows that the mean is 0.510987, the median value is 0.45906, and the deviation of the sample mean is 0.178352, whilst the variance is 0.031809, which indicates that the observations have certain variations. The skewness is 0.71095, which means that the observed values tend to a normal distribution around the mean. And the kurtosis is 2.732939, indicating lower values below the sample mean.

Figure 5: Time Series Behavior of the Variables(1980 – 2016)

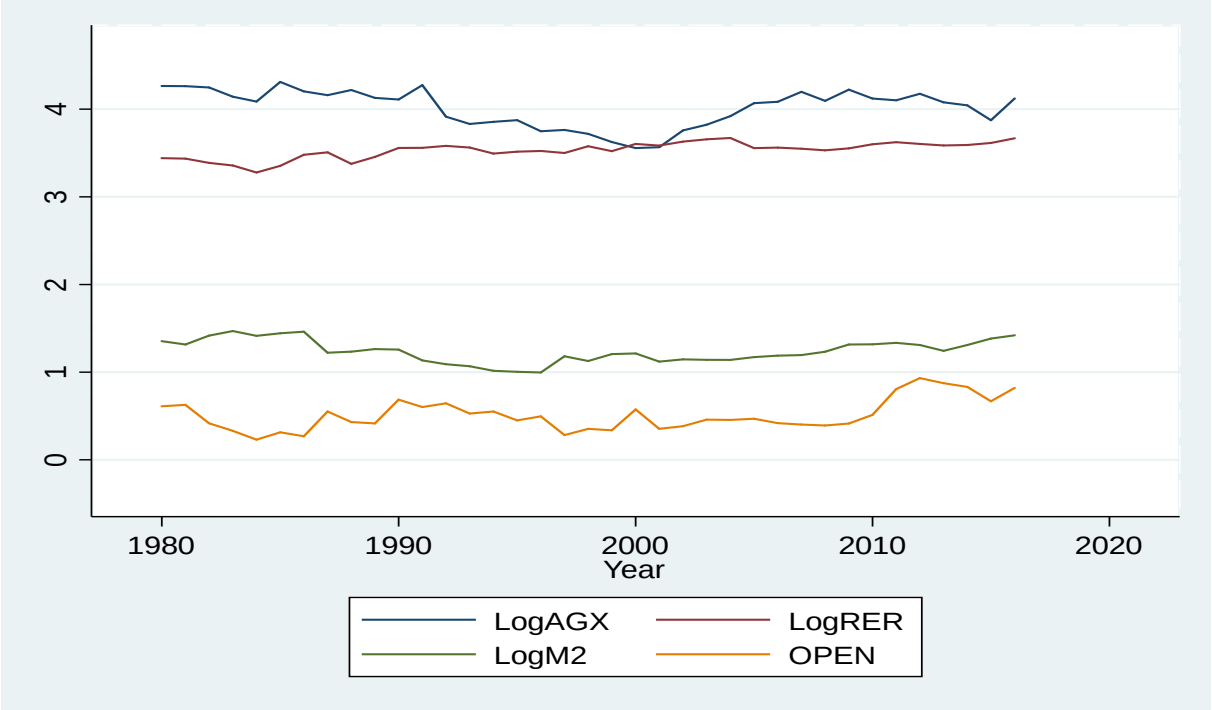


Figure 5 above shows that all the variables are trending, which means that the data generation process does not revolve around zero. Therefore, it shows that the data exhibit the potential of the I (1) process. The time trends in the data appear to be more or less linear. Hence, the study conducts a unit root test on the series as shown in the tables below.

Table 5: Augmented Dickey-Fuller Test Result for Unit Root (Regress Lag 1 for all the Variables)

Same Period	Variable	Levels		First Difference	
		With intercept	Without intercept & trend	With intercept	Without intercept & trend
1980-2016	LogAGX	-1.664(-2.972)	-1.454(-3.560)	-4.371(-2.975)**	4.470(-3.564)**
	LogRER	-1.662(-2.972)	-3.261(-3.560)	-5.275(-2.975)**	-5.191(-3.564)**
	LogM2	-1.320(-2.972)	-1.087(-3.560)	-4.417(-2.975)**	-4.870(-3.564)**
	OPEN	-1.632(-2.972)	-2.531(-3.560)	-3.983(-2.975)**	-3.958(-3.564)**

Note: ** indicates significance at the 5% level. The numbers in columns 3 to 6 in parentheses show the critical value.

In general, the results of the unit root test at the first difference show that the variables are stationary since the probability values exceed the critical values at 5% for the respective variables, hence, we cannot reject the null hypothesis of a unit root at the first difference, meaning that the variables are stationary at the first difference I(1). Therefore, it is necessary to analyze the long-term relationship through the Johansen cointegration test.

Selecting the Number of Lags: To test for cointegration, we must specify how many lags to include. Table 6 below shows the result of the output after using Stata 15 commands for each model.

Table 6: Lag Selection Output of the Model

Lag	Log-likelihood (LL)	Likelihood Ratio (LR)	Degree of Freedom (DF)	Probability	Final Prediction Error (FPE)	Akaike Information Criterion (AIC)	Hannan–Quinn information Criterion (HQIC)	Schwarz Bayesian Information Criterion (SBIC)
0	88.1957				7.1e-08	-5.20277	-5.04173	-4.92137
1	152.46	128.53	16	0.000	3.9e-09*	-8.02785*	-7.72268*	-7.12088*
2	165.441	25.962	16	0.055	4.9e-09	-7.84489	-7.29558	-6.21234
3	176.228	21.574	16	0.157	7.6e-09	-7.52896	-6.73552	-5.17082
4	190.954	29.452*	16	0.021	1.1e-08	-7.45173	-6.41415	-4.36802

From the output in Table 6 above, the FPE, AIC, HQICandSBIC methods all choose lag one (L1), as indicated by the **"*"** in the output. Hence, since four criteria, select one lag, this study will use L1.

Johansen Co-Integration Test: Here, there are two statistics; the trace statistics and the maximum statistics. For both test statistics, the Johansen test the null hypothesis of no cointegration against the alternative of cointegration. Table 7 below shows the output of the Johansen cointegration test.

Table 7: Output of Johansen Cointegration Test [lag (L) 1]
Panel A: Unrestricted Cointegration Test – Trace Statistics

Hypothesized No. of CE (S)	Eigenvalue	Trace Statistics	5% Critical Value
0	0.00000	23.2265	29.68
1	0.33236	8.6822	15.41
2	0.13624	3.4096	3.76

Panel B: Unrestricted Cointegration Test- Maximum-Eigen Statistic

Hypothesized No. of CE (S)	Eigenvalue	Maximum-Eigen Statistic	5% Critical Value
0	0.00000	14.5443	20.97
1	0.33236	5.2725	14.07
2	0.13624	3.4096	3.76

CE(s): Cointegrating equation

Table 7 shows the results of the Johansen cointegration test for the aggregate export model of cocoa and coffee. The results show both the trace and maximum statistics at a 5% critical level. From the outputs of both statistics, the analysis strongly fails to reject the null hypothesis of no cointegration. Thus, the study accepts the null hypothesis at the maximum rank of zero (0) that there is no cointegration between the variables. This implies that the variables exhibit a short-run relationship. The reduction in imports that follows decreases the output and hence cocoa and coffee exports. However, this variable is not significant in determining aggregate cocoa and coffee exports in Sierra Leone. The existence of no cointegration between the dependent variable and the fundamentals necessitates estimating a VAR model to find out the short-run impact.

Table 8: The Estimated Aggregate Cocoa and Coffee Exports, Auto-Distributed Regression Output Model

$\Delta LogAGX_{t-1}$	Constant	$\Delta LogRER_t$	$\Delta LogRER_{t-1}$	R^2	Probability> F
Coefficient	-0.0118592	0.4677226	-0.3686428		
T	-0.56	1.04	-0.82	0.0654	0.9173
P>|t|	0.577	0.308	0.421		
Standard Error	0.0210244	0.4504047	0.4517941		

Note: I only show the estimate of the total output of cocoa and coffee exports and RER.

The aggregate cocoa and coffee exports in table 9 show that while the depreciation of the real exchange rate increases aggregate cocoa and coffee exports in the current year, this variable is not significant in determining aggregate cocoa and coffee exports in Sierra Leone. The reason for the insignificant results may be that the production period of cocoa and coffee is relatively long, and before this period ends, suppliers cannot increase production and therefore cannot increase exports. Also, the negative effect of the one-period lag of real exchange rate variable on aggregate cocoa and coffee exports may be as a result of the fact that in the long run, depreciation in the nominal exchange rate leads to a real exchange rate depreciation, which leads to increase in the cost of imported inputs in domestic currency terms. Because the probability > F = 0.9173, the study concluded that the variables do not jointly affect Sierra Leone's total cocoa and coffee exports.

The output of the Diagnostic Test of the Autoregressive Distributed Lag Model (the rejection is at the 5 % level): The Shapiro-Wilk W test for normal data shows that Probability > z = 0.09188; thus the study concludes that the distribution of the residuals is normal. Breusch-Pagan / Cook-Weisberg test for heteroskedasticity indicates that Probability > chi^2 = 0.9689; which suggests that the residuals are homoscedastic. Also, Durbin's alternative test for autocorrelation shows that Probability > chi^2 = 0.5541; implying that there is no serial correlation in the residuals. On the same note, the Breusch-Godfrey LM test for autocorrelation shows that Probability > chi^2 = 0.5034; this also supports the conclusion that there is no serial correlation in the residuals.

Vector Autoregressive (VAR) Model: The VAR model can determine the relationship between multiple variables, and it is useful for forecasting, but the forecasts are usually not precise enough. Instead, researchers will usually end up looking at the following: Impulse response functions and Granger causality test, which reveal something about the nature of the variables. This paper employs the impulse response function to determine the relationship between the dependent and the policy variables, and the Granger causality test to investigate whether the variables are jointly significant or not.

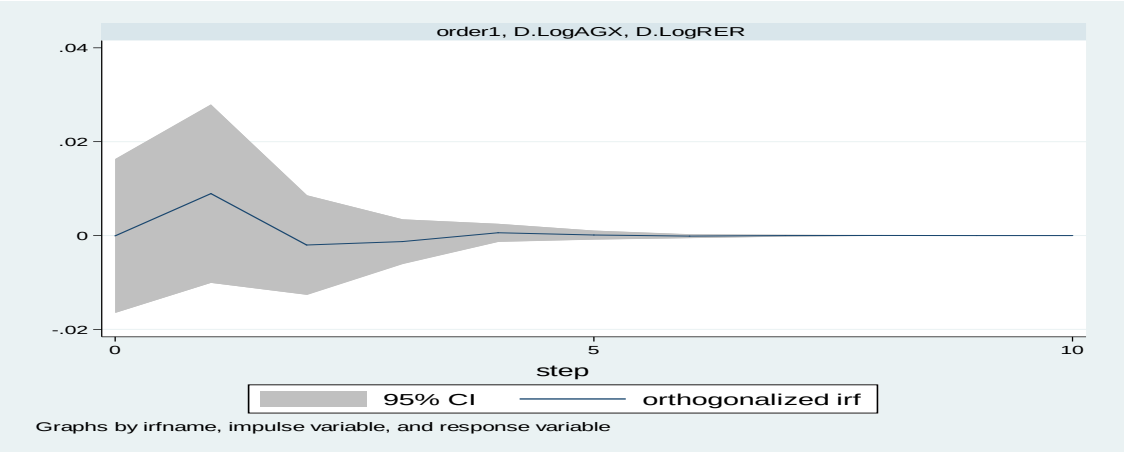
Table 9: Output of Vector Autoregression

Equation	Parms	RMSE	R^2	Chi^2	$P>chi^2$
D_LogAGX	5	0.127323	0.0542	2.00432	0.7350
D_LogRER	5	0.053451	0.2305	10.48358	0.0330
D_LogM2	5	0.070621	0.1438	5.878139	0.2084
D_OPEN	5	0.130645	0.1560	6.471082	0.1666
	Coefficients	**Std. Error**	**z**	**P>|z|**	**[95%Confidence Interval]**
D_LogAGX					
LD.	-0.2310289	0.178406	-1.29	0.195	-0.5806982 0.1186403

LogRER						
LD.	-0.1431299	0.4073832	-0.35	0.725	-0.9415864	0.6553265
LogM2						
LD.	0.0095228	0.3020876	0.03	0.975	-0.5825581	0.6016037
OPEN						
LD.	0.1186994	0.1855822	0.64	0.522	-0.2450352	0.4824339
Constant	-0.0060873	0.0200864	-0.30	0.762	-0.0454558	0.0332813

As we can see from the output in Table 10 above, when lagging by one (L1), there is a negative but negligible effect between ΔLogRER and ΔLogAGX. The results also show that there is a positive and insignificant effect between ΔLogM2 and ΔLogAGX in L1. Furthermore, the result reveals a positive, but insignificant relationship between ΔLogOPEN and ΔLogAGX in L1. The diagnostic test of the Lagrange-multiplier concludes that there is no autocorrelation, implying correct specification of the model. The Jarque-Bera test also shows that the distribution of the residuals is normal, and the vector autoregressive model VAR satisfies the Eigenvalue stability condition. Varwale test shows that in all equations, the coefficients on the lag of the endogenous variables are jointly zero. And the Cumulative sum test reveals that the parameters are stable over the analysis period. The graph below shows the impulse response function (IRF) to examine the response of aggregate cocoa and coffee export for a standard deviation shock to ΔLogRER.

Figure 6: Impulse Response Function



From figure 6, a shock to ΔLogRER causes an increase in ΔLogAGX, followed by a decrease, followed by an increase, until the effect dies out after roughly four periods.

Table 10: Display of the Irf Results (Irf Name = Order 1)

Step	(1) Orthogonalized irf	(1) Lower	(1) Upper
0	-0.000071	-0.016466	0.016323
1	0.00894	-0.010074	0.027954
2	-0.002017	-0.012607	0.008573
3	-0.001284	-0.006023	0.003455
4	0.000597	-0.001317	0.002511
5	0.000115	-0.000837	0.001066
6	-0.000118	-0.000537	0.000301
7	-2.2e-06	-0.000202	0.000198
8	0.000021	-0.000072	0.000114
9	-2.9e-06	-0.000046	0.00004
10	-3.2e-06	-0.000023	0.000017

Table 10 report 95% lower and upper bounds with, impulse = ΔLogAGX, and response = ΔLogRER. Both the table and the graph show that the two orthogonalized IRFs are essentially the same. In both functions, an increase in the orthogonalized shock to ΔLogRER causes a short series of increases in ΔLogAGX followed by a decrease, followed by an increase that dies out after four periods. The output below shows the Granger causality test to ascertain whether the variables are jointly significant in the short run or not.

Table 11: Output of the Granger Causality Test

Equation	Excluded	Chi^2	Degree of Freedom (df)	Probability>Chi^2
D_LogAGX	D.LogRER	0.12344	1	0.725
D_LogAGX	D.LogM2	0.00099	1	0.975
D_LogAGX	D.OPEN	0.40909	1	0.522
D_LogAGX	ALL	0.45493	3	0.929

Note: Significant level is at 5%, and df is degrees of freedom.

From table 11, the first is a Wald test that the coefficients on the lag of D.LogRER that appear in the equation for D_LogAGX are jointly zero. The study accepts the null hypothesis that the lag of ΔLogRER does not Granger-cause Δ_LogAGX. Similarly, we cannot reject the null hypothesis that the lag of D.LogM2 does not Granger-cause D_LogAGX. Again, the null hypothesis that the lag of D.OPEN does not Granger-cause D_LogAGX cannot be rejected. On the whole, we cannot reject the joint probability that the lags of D.LogRER, D.LogM2, and D.OPEN do not Granger-cause D_LogAGX.

The output of the Diagnostic Test of the VAR Model

Table 12: Lagrange-Multiplier Test

Lag	Chi2	DF	Prob > Chi^2
1	10.6238	16	0.83209

From table 12 above, since the probability is greater than the critical value at 5%, the study accepts the null hypothesis and concludes that there is no autocorrelation. Thus, the model is correctly specified.

Table 13: Jarque-Bera Test

Equation	Chi^2	DF	Prob > Chi^2
ALL	4.192	8	0.83939

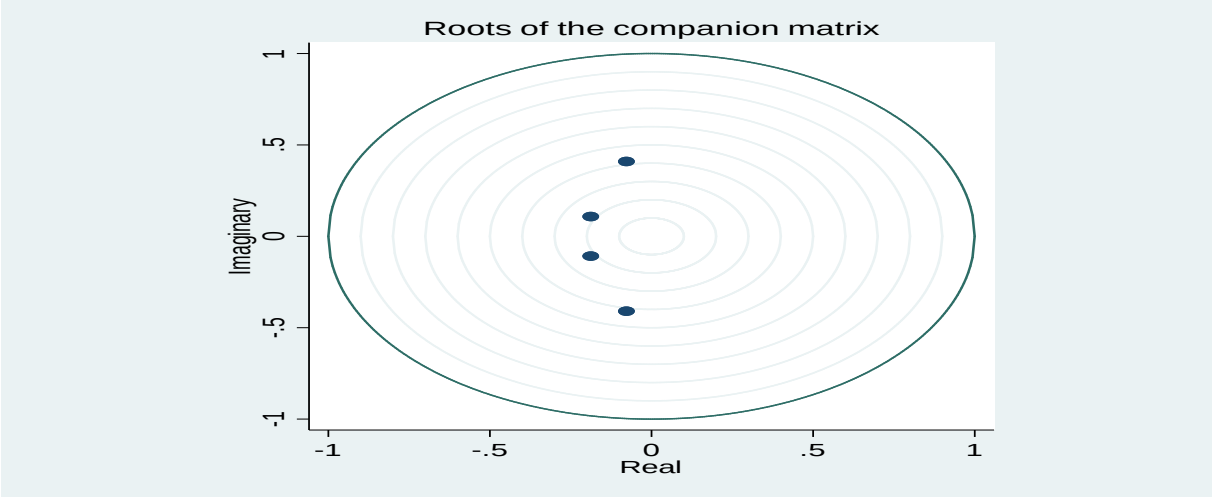
From table 13 above, since the probability for all equations is greater than the critical value at 5%, the study accepts the null hypothesis and concludes that the residuals are normally distributed.

Table 14: Eigenvalue Stability Condition

Eigenvalue	Modulus
- 0.07776085 + 0.4094602i	0.416779
- 0.07776085 - 0.4094602i	0.416779
- 0.1881609 + 0.1082357i	0.21707
- 0.1881609 - 0.1082357i	0.21707

Because the modulus of each eigenvalue is strictly less than 1, the estimates satisfy the eigenvalue stability condition. Specifying the graph option produced a graph of the eigenvalues with the real components on the x-axis and the complex components on the y-axis. The graph below indicates visually that these eigenvalues are well inside the unit circle.

Figure 7: Below Shows a Plot of the Eigenvalues



From figure 7, all the eigenvalues lie inside the unit circle. This implies that VAR satisfies stability conditions. After fitting a VAR, one hypothesis of interest is that all the endogenous variables at a given lag are jointly zero. (Ho: endogenous variables are jointly zero. Ha: endogenous variables are not zero). Reject Ho, if Probability is less than 5%, otherwise, accept.

Table 15: The Estimated Result of Varwale

Lag	Chi^2	DF	Prob > Chi^2
1	21.27789	16	0.168

From table 16, On the whole, I strongly cannot reject the null hypothesis that the coefficients on the lag of the endogenous variables are zero in all the equations jointly. Thus, confirming the fact that there is no joint causality running from the endogenous to the exogenous variables.

Table 16: Cumulative Sum Test for Parameter Stability

Variable	Statistic	Test Statistic	1% Critical Value	5% Critical Value	10% Critical Value
D.LogAGX	recursive	0.2661	1.1430	0.9479	0.850
D.LogRER	recursive	0.3785	1.1430	0.9479	0.850
D.LogM2	recursive	0.3785	1.1430	0.9479	0.850
D.OPEN	recursive	0.4310	1.1430	0.9479	0.850

From table 16 above the null hypothesis is that all parameters are stable over time (Ho: No structural break), no alternative hypothesis is required. We reject this null hypothesis based on the test statistic being larger than a critical value or based on the plotted cusum being outside the confidence bands. Thus, based on the result, I accept the null hypothesis of a constant mean at the 1% level for all the variables, because the test statistic values of the first difference of all the variables are lesser than the respective values at the 1% critical level. We can also observe the cusum plots from figures 8a, b, c, and d; we see that the plots of the recursive cusum process are within the 99% confidence bands in each graph, which implies that the mean of the regression model is stable at the 1%, 5%, or 10% significance levels.

Figures 8a: Below Show Recursive Cusum Plot of the First Difference of the Variables

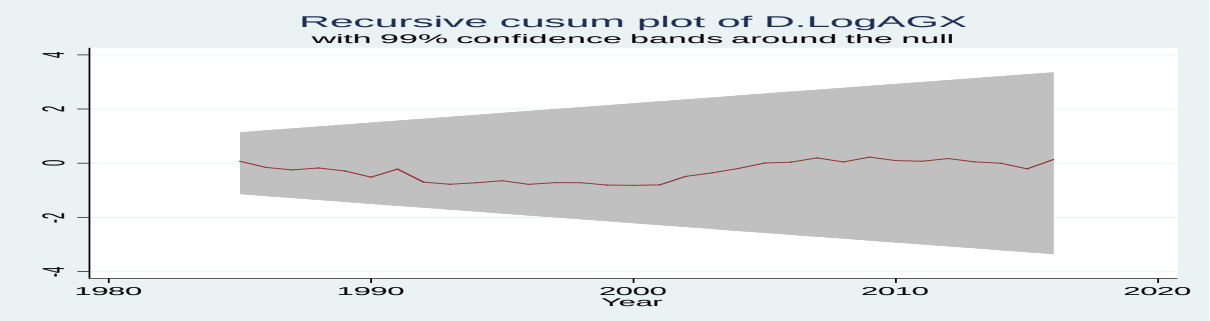


Figure 8b

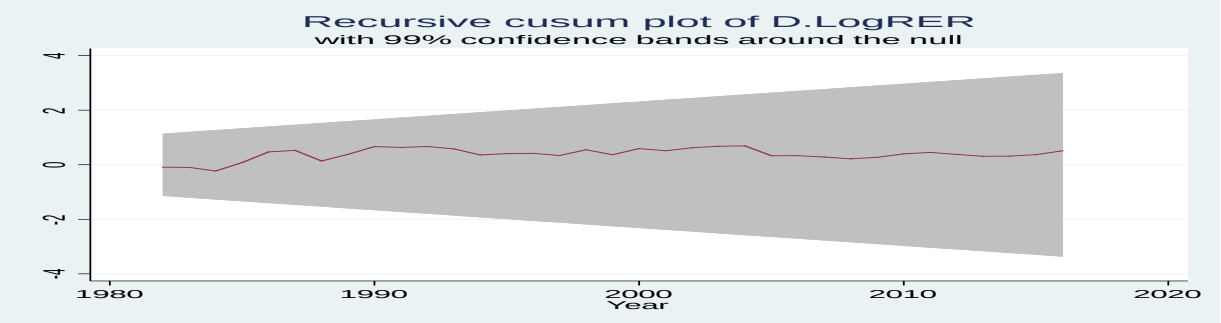


Figure 8c

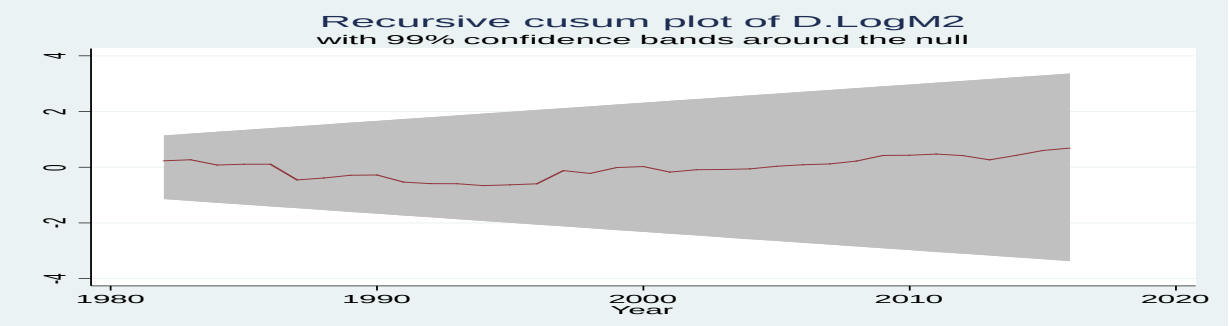
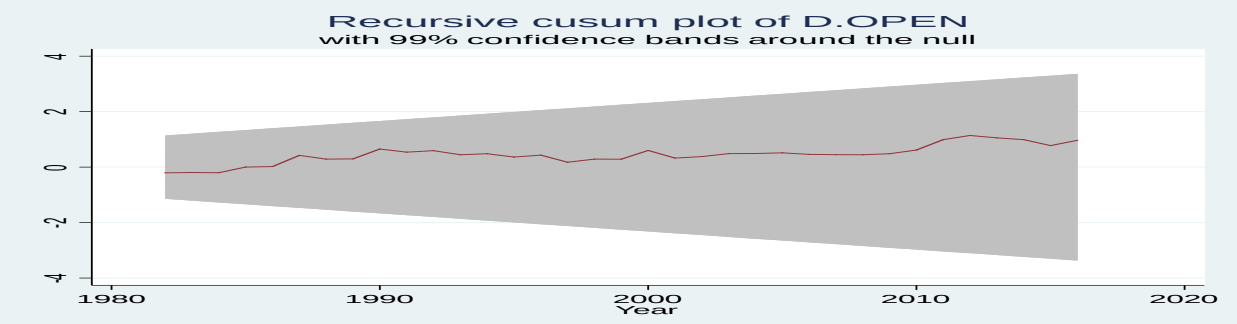


Figure 8d



5: Conclusion and Policy Recommendations

Conclusion: Ultimately, answers have been provided to the two research questions raised which ultimately led to the achievement of the objectives and aim of this study. The regression and the VAR models have been employed in this analysis. I use the auto distributed lag regression model to estimate both the short and the long-run impacts of RER fluctuations on aggregate cocoa and coffee exports. In the VAR model, orthogonalized impulse response functions are employed to estimate the short-run impact of RER movement

on aggregate cocoa and coffee exports. The Granger causality test is used to establish a causal relationship between the variables. The regression result shows that while the depreciation of the real exchange rate increases aggregates cocoa and coffee export in the current year, this variable is not significant in determining aggregate cocoa and coffee exports in Sierra Leone. The case for insignificant is because aggregate cocoa and coffee exports have long gestation periods and until this period is over, suppliers cannot raise their output and hence exports. The negative effect of the one-period lag of the RER variable on aggregate cocoa and coffee export can be attributed to the fact that in the long run, depreciation in the nominal exchange rate leads to real exchange rate depreciation which will lead to increase in the cost of imported inputs in domestic currency terms. The reduction in imports that follows decreases the output and hence cocoa and coffee exports. However, this variable is not significant in determining aggregate cocoa and coffee exports in Sierra Leone. Figure 6 and table 10 show that the two orthogonalized impulse response functions are essentially the same.

In both functions, an increase in the orthogonalized shock to ΔLogRER causes a short series of increases in ΔLogAGX followed by a decrease, followed by an increase that dies out after four periods. The study accepts the null hypothesis that the lag of ΔLogRER does not Granger-cause Δ_LogAGX. In general, we cannot reject the joint probability that the lags of ΔLogRER, ΔLogM2, and ΔOPEN do not Granger-cause Δ_LogAGX. The short-run analysis suggests that the estimate based on the regression equation tends to be similar to the orthogonalized impulse response function derived from the VAR model. Thus, confirming the fact that there is no joint causality running from the endogenous to the exogenous variables. It is interesting to note that, the insignificant relation between the real exchange rate and aggregate cocoa and coffee exports obtained in this study does not agree with the findings of Tarawalie et al. (2013); and Bahmani-Oskooee and Gelan (2018) even though they considered total exports of all commodities in Sierra Leone. However, the study does agree with the study of Akinniran and Olatunji (2018) even though they considered all agricultural products except natural rubber in the SAP and pre SAP periods in Nigeria. For future research, students or prospective researchers should consider including more variables and increase the scope of observations. This is to ascertain any different results. And also, researchers can include the nominal exchange rate to ascertain whether there would be differences in the outcome of the analysis when using either real exchange rate or nominal exchange rate.

Policy Recommendations: In the short and long term, the government should not use the depreciation of the real exchange rate as a policy tool to promote the total export of cocoa and coffee products. However, in order to stimulate the total export of cocoa and coffee, the government should allocate more resources to increase productivity, thereby increasing the export of high-quality cocoa and coffee products. A joint government and private sector participation and mobilization of foreign aid geared towards improving cocoa and coffee production and exports should be encouraged, and also the government should maintain a peaceful political atmosphere to improve the confidence of cocoa and coffee farmers.

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Appendix

Appendix 1: Data Used in the Analysis

Year	Total cocoa exports COX (tons)	Total coffee exports CFX (tons)	Export value of COX (1000 US$)	Export value of CFX (1000 US$)	RER	OPEN	M2	GDP (Current US$ in billions)	Value of Agriculture, including Forestry and Fisheries (US$ in billions)
1980	8497	9909	22739	27891	2764.762	0.610818	22.569	1100685845	334349400
1981	9026	9288	13662	16982	2730.016	0.627534	20.711	1114830472	326977828
1982	9043	8658	14602	14559	2441.050	0.416890	26.154	1295361886	435151173
1983	8315	5562	13579	9983	2277.276	0.331059	29.442	995104305	363862029
1984	10289	1924	23180	4410	1896.285	0.230299	25.966	1087471862	419530270
1985	10224	10237	21318	27813	2257.592	0.314318	27.781	856890499	366685591
1986	8586	7383	23405	19578	3023.599	0.269270	28.963	490181457	170240293
1987	8779	5681	20893	17312	3216.304	0.551531	16.675	701307602	297799354
1988	8531	8026	12221	14243	2380.843	0.431162	17.136	1055083945	456993594
1989	8202	5246	9168	7997	2855.211	0.415884	18.350	932974412	396594540
1990	4700	8200	6423	8072	3612.140	0.686907	18.110	649644827	286029665
1991	12600	6200	13000	5900	3622.484	0.602440	13.630	779981459	286604579
1992	3900	4323	4000	2782	3813.486	0.644929	12.319	679997998	244032839
1993	3525	3255	3665	2551	3650.041	0.528598	11.690	768812335	309850220
1994	3400	3778	4300	4339	3117.846	0.551601	10.373	911915971	341012442
1995	2800	4700	3600	9300	3274.857	0.450293	10.095	870758739	347907839
1996	4000	1600	5000	2600	3337.419	0.495955	9.926	941742153	425763006
1997	2900	2900	4000	6500	3167.315	0.282780	15.175	850218034	487987774
1998	2730	2500	3800	4400	3780.770	0.353327	13.402	672375927	399405219
1999	2870	1350	3500	1850	3324.740	0.337492	16.077	669384769	400737169
2000	1500	2100	1700	2000	4019.165	0.575300	16.357	635874002	349820754
2001	2453	1237	2586	1701	3843.094	0.354244	13.184	1090467712	492197367
2002	2566	3156	3605	1601	4266.109	0.383858	14.011	1253340520	579221874
2003	4608	2038	8065	1337	4535.630	0.459060	13.823	1385810072	642414080
2004	7387	950	10428	592	4692.186	0.455881	13.811	1448536631	702338286
2005	11088	634	14078	547	3595.156	0.468728	14.860	1650494367	815203123
2006	10419	1727	13563	1853	3647.130	0.419128	15.442	1885112202	948099973
2007	13580	2194	20275	3404	3538.268	0.402954	15.671	2158496873	1126218347
2008	11411	1042	23087	2077	3391.341	0.392135	17.105	2505458705	1344266495
2009	11422	5275	23000	8755	3570.638	0.414365	20.690	2453899847	1356046715
2010	10780	2455	27588	3391	3978.088	0.512776	20.809	2578026297	1364876220
2011	10453	2168	28000	4576	4201.268	0.807169	21.617	2942546781	1606438273
2012	11425	3557	30000	6748	4018.407	0.932741	20.433	3801862611	1923442767
2013	9039	2927	19574	5622	3853.778	0.874528	17.521	4920343195	2360943478
2014	9615	1442	26888	2816	3907.997	0.831858	20.398	5015157816	2597477049
2015	4244	3243	12132	5982	4118.322	0.668026	24.153	4218723875	2474361443
2016	11707	1545	31942	2352	4656.052	0.820682	26.374	3556036535	2069924108
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