

Ibadan Journal *of the* **Social Sciences**

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VOLUME 13 / NUMBER 1 / MARCH 2015

**FACULTY OF THE SOCIAL SCIENCES, UNIVERSITY OF IBADAN
ISSN 1597 5207**

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External Debt Accumulation and Economic Growth: Evidence from West African

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This paper investigates how indebtedness has affected the growth of 14 West African countries directly, and via investment and fiscal balance mechanisms, using data from 1970 to 2012. This task was approached through a standard growth framework through which debt indicators were incorporated. Two econometric specifications (linear and non-linear) were used, and evaluated with the fixed effects and GMM estimation techniques on the relationship between debt and growth. The hypothesis that external debt affects growth is well-supported by the results. All debt variables have the expected signs and were statistically significant. The results reveal that debt appears to have a non-linear effect on growth. The debt overhang hypothesis is affirmed, given the existence of a threshold beyond which debt negatively contributed to growth. The average impact of debt on per capita growth becomes negative for debt levels above 60% to 74% of GDP. Thus, increasing debt beyond this threshold yields a negative marginal contribution to growth. There is a pressing need to take measures to not only stabilize external debts, but to place them on a downward trajectory in the future.

Key words: External debt, debt overhang, economic growth, debt threshold, investment, fiscal balance

JEL classifications: E22, F34, H63, O41

Introduction

Since the 1990s, high external debt accumulation by developing countries and the subsequent debt burden have received increasing attention from academics, policymakers, and analysts, as the main factor constraining poor countries to weak economic performance. Following the independence of WA countries in the 1950s and 1960s, growing their

economies at an appreciable rate was accorded top priority. However, the available resources were grossly inadequate to achieve the desired economic growth objective. Thus, the need to acquire external resources to support the growth agenda was pursued vigorously by attracting foreign investment and through direct

Acknowledgements: I am grateful for the financial and technical support of the African Economics Research Consortium (AERC) toward this research. I am extremely grateful for the constructive criticisms, comments and suggestions from the resource persons,

especially Prof. Ibi Ajayi, and from fellow researcher in Group B. The findings, interpretations and conclusions expressed in this study and any omissions and errors are entirely my own and should not be attributed to the African Economics Research Consortium (AERC).

borrowing by governments to augment domestic resources for investment. This marked the beginning of external debt accumulation by these countries, and the consequent burden it has constituted over the years, which has attracted serious concern from the international community. The governments of most WA countries used the tool of foreign borrowing to generate an inflow of resources to support their economic growth aspirations. Some of these countries received huge sums in foreign credits, often at highly concessional interest rates. In some Sub-Saharan African (SSA) countries, the stock of external debt has piled up over recent decades to a level widely considered as unsustainable. While it has been acknowledged that the obligation of repaying the accumulated value of these debts may not be feasible, fear has been expressed that it is likely to compound the economic problem of poor countries. During the 1980s and 1990s, many debtor countries experienced low (or even negative) growth and investment concomitant with negative net resources transfers (Dijkstra and Hermes, 2001). Well over five decades after independence and the drafting of growth agendas, the performance of WA economies are still generally judged to be poor. For instance, the sub-region has the lowest GDP (PPP), US\$1,361, among the different economic blocks in Africa (compared to an average of US\$4,182) in 2005. A number of reasons have been put forward for the poor economic performance of SSA countries in general. Prominent among which is the burden of repayment and servicing of accumulated foreign debt (see Ajayi, 2003). The consequence of

debt burden, which developing countries have to grapple with, constitutes a drain on the available resources for investment activities required to generate economic growth.

While the debt relief initiatives of the first decade of the 21st century was in acknowledgment and response to the economic growth limitation of debt burden, recent trend have shown a gradual accumulation of external debt owned by West Africa countries. Apart from the effect on growth, the economic union integration programme of ECOWAS may remain threatened and unachievable by fresh accumulation of external debt by these countries. Despite the central importance of economic growth, and the constraints that debt burden impose on the development of the investment base for economic growth, few studies have addressed the following related questions in the context of West African countries: How and when does external debt impact on economic growth? What are the magnitudes of these impacts on economic growth?

Though studies on external debt and growth involving West African countries abound in the literature¹, the countries have been included along with countries from other regions of the world in a non-systematic way. Conclusions from such studies are therefore hard to generalise for West African countries. While a number of empirical studies involving West African countries have established the negative effects of high external debt on growth², to draw policy decisions to address external debt effects on the economic growth potential of West African (WA) countries, there is a need to investigate how it contributes to the growth problems, specifically in these countries.

¹Reviewed in the literature review section.

² E.g. Zouhaier and Fatma, 2014; Erhieyovwe and Onovwoakpoma, 2013; Panizz and Presbitero, 2012; Patillo et al, 2011, 2004; Ogunmuyiwa, 2011; Kuman and Woo, 2010; Iron and Bivens, 2010; Iyoha, 2000, 1999; Schclarek, 2004; Aizenman et al., 2007; Fosu, 1999; Reinhart and Rogoff, 2010.),

³ They are: Benin, Burkina Faso, Cape Verde, Côte d'Ivoire, Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Mauritania, Niger, Nigeria, Senegal, Sierra Leone and Togo.

⁴Benin, Burkina Faso, Côte d'Ivoire, Guinea Bissau, Mali, Mauritania, Niger, Senegal, and Togo.

⁵Of the 15 member countries of ECOWAS, only Nigeria and Cape Verde are not included, even though Nigeria has also benefited from the debt relief initiatives. Mauritania is in West Africa but not a member of the ECOWAS.

Thus, the paper contributes to the understanding of the effect of external debt on the economic growth of countries from the WA sub-region, in the light of fresh accumulation of external debt in these countries as an economic union block. The paper explores the optimal growth-maximizing external debt for WA countries using a non-linear relationship, to test for the existence of debt overhang and crowding out effects on growth in WA.

Macroeconomic Background of West African Countries

The WA sub-region is made up of 16 countries,³ 15 of which are members of the *Economic Community of West African States* (ECOWAS, a regional organization formed in 1975), with the exception of Mauritania, who opted out in 2002. For European Union (EU) Economic Partnership Agreement (EPA) negotiations, Mauritania is usually grouped along with ECOWAS countries. Given the colonial history of the West African countries (WACs), most of these countries still maintain strong political, cultural, and economic ties, and in some cases military cooperation, with their colonial master countries. Nine of the countries in WA are Francophone⁴ while the rest are made up of Anglophone and other non-French speaking countries. The national currency in most of the Francophone countries is the West African CFA franc, managed by the West African Economic and Monetary Union (UEMOA). The economy performance of countries in the ECOWAS bloc is the poorest relative to other African economic blocs. For instance, the region's GDP (PPP) per capita is US\$ 1,361, whereas

others in the African region, such as Southern African Customs Union (SACU), Arab Maghreb Union (UMA), the Greater Arab Free Trade Area, (Agadir), Southern African Development Community (SADC), Central African Economic and Monetary Community (CEMAC) and Common Market for Eastern and Southern Africa (COMESA), have per capita GDPs (PPP) of US\$10,605, US\$5,836, US\$4,075, US\$3,152, US\$2,435 and US\$1,811, respectively (CIA World Fact Book, 2005; IMF WEO Database, 2010). Of the 40 countries identified as at the end of the first quarter of 2007, under the *Heavily Indebted Poor Countries* (HIPC) Initiative, 30 countries (75%) were from SSA, of which more than one-third (13⁵) were from WA.

The macroeconomic performance of WA countries for the past four decades is shown in Table 1. Given the specific differences between the Francophone and non-Francophone countries within the region, we provide the macroeconomic performance indicators along this divide. In both, there was general positive growth in the gross domestic product (GDP), but the real gross domestic product (RGDP) per capita suffered a decline for about half of the last three decades. The observed poor economic performance is not unconnected with the low investment/GDP ratio. The ratio of investment to GDP generally remained at less than 10% in non-Francophone countries, and less than 16 per cent in Francophone countries.

GDP ratio (to capture crowding out). Debt accumulation was found to prevent growth, and debt stock to stimulate growth. Ajayi (2003) finds the existence of debt overhang and crowding-out's effects on growth. He identifies two channels through which external debt works against growth: accumulated debt stock measured by the debt-export ratio (debt overhang effect), and the debt-service to GDP ratio (to capture the crowding out effect).

Notably, only a few studies have examined the theoretical model of the non-linear effect of debt on growth (Oleksandr, 2003; Maghyereh et al., 2002; Pattillo et al., 2011; Cohen, 1997; and Elbadawi et al., 1997). Theoretical models expect reasonable levels of current debt inflow to have a positive effect on growth. Cohen (1991) shows that lower debt levels are associated with high growth in models with repudiation risk rather than financial risk. Extending Uzawa-Lucas' model, Eaton (1993) shows that low long-run growth is generated by an increase in the cost of foreign capital that reduces external borrowing.

The practical experience of the HIPC's appears to be consistent with the theoretical propositions that low and tolerable levels of debt positively affect growth, while growth is hindered by large accumulated debt stock (Pattillo et al., 2011). Various studies have found different growth maximum debt thresholds for different groups of countries, ranging from 30% to 115% of exports, 5% to 97% of GDP (Pattillo et al., 2011; Elbadawi et al., 1997; Cohen, 1997; Oleksandr, 2003; Maghyereh et al., 2002; and Clement et al., 2005).

4. Methodology

Theoretical Framework

The theoretical framework for this study is premised on the Solow (neoclassical) Growth Model. Using a Cobb-Douglas production function of the form:

$$Q = A K^\alpha L^{1-\alpha} \dots\dots\dots(1)$$

where Q is output, K is capital, L is labour, and A is a parameter meant to capture the technological state or total factor productivity (TFP), and $0 < \alpha < 1$. The function is assumed to exhibit constant return to scale and smooth substitutability, varying continuously with K and L.

Considering the capital-labour ratio expression of the function, the marginal product of capital-labour ratio is given as:

$$\frac{dQ}{dK} = \alpha A (k)^{-(1-\alpha)} \dots\dots\dots(2)$$

where $k = K/L$. This expression describes the rate of return on capital, negatively related to the capital-labour ratio but positively related to the TFP variable. The latter is a production shift factor representing a collection of measures of the state of technology, the adequacy or otherwise of institutions, conduciveness of the economic environment for productive activities, and others. Many studies in the literature, such as those by Hall and Jones (1999), Klenow and Rodriguez-Clare (1997), and Gournichas and Jeanne (2006), emphasize the importance of TFP on growth.

Given that output is positively related to the marginal product of capital-labour ratio, the growth rate of output is dependent on the growth rate of capital

⁸ Pattillo et al (2011); Elbadawi et al (1997); and Ajayi (2003).

per unit of labour, endogenously determined within the model. Notably, the perception of investors who are at the heart of capital formation about the conduciveness or effectiveness of institutions and the implication for productive economic activity as well as the state of the technology, influence their investment portfolio decisions.

This leads to the capital accumulation process, which describes how capital stock evolves over time. The capital accumulation equations can therefore be expressed as dependent on the proportion of output saved and the rate of depreciation of capital. Given that a proportion of output saved is invested in the economy, the macroeconomic equilibrium condition for capital accumulation can be written as:

$$\dot{K} = sY - \delta K \dots\dots\dots(3)$$

In this equation “s” is the savings rate: a fraction of every unit of output is saved and δ is the depreciation rate: a fraction of every unit of capital that is depreciated. Both “s” and “ δ ” are exogenous to the model. The intuition for this equation lies in the national income accounting identity for a closed economy, such that the sum of private and government savings is equal to the gross investment in the economy.

Discounting the next period capital stock in the current period for depreciation in addition to current investment, the aggregate capital growth is as stated in Equation 4:

With savings expressed as a function of output, and savings = investment, this equation becomes

$$K_{t+1} = (1 - \delta)K_t + sAL_t^\alpha L_t^{1-\alpha} \dots\dots\dots(5)$$

Assuming labour growth rate to be “n”, the capital-labour growth ratio becomes:

$$k_{t+1} = \left(\frac{1 - \delta}{1 + n}\right)k_t + \frac{sA}{1 + n}k_t^\alpha \dots\dots\dots(6)$$

The long-run steady state growth of the capital-labour ratio can be derived from equation 6, by making k the subject of the formula:

$$k_{t+1}^* = A\left(\frac{sA}{n + \delta}\right)^{1/(1-\alpha)} \dots\dots\dots(7)$$

The steady state level of real income and investment can be deduced respectively as:

$$y^* = A(k^*)^\alpha = A\left(\frac{sA}{n + \delta}\right)^{\alpha/(1-\alpha)} \dots\dots\dots(8)$$

$$k_{t+1}^* = \frac{\delta}{s}k_t^* = \frac{\delta}{s}A\left(\frac{sA}{n + \delta}\right)^{1/(1-\alpha)} = A\left(\frac{sA}{n + \delta}\right)^{\alpha/(1-\alpha)} \dots\dots\dots(9)$$

The steady state capital growth allows capital (K) to grow to accompany the effective unit of labour and to cover the depreciation of old capital. Thus, the required investment rate becomes:

$$i^r = (n + \delta)k^* \dots\dots\dots(10)$$

Therefore, the fundamental Solowian differential equation is given as:

$$dk/dt = sA(k^*)^\alpha - (n + \delta)k \dots\dots\dots(11)$$

Given that the mechanism through which external debt affects growth is investment, a slight modification is inserted in the model to account for external debt flows and external debt servicing. This is consistent with Fosu’s (1996) argument that debt can additionally influence economic growth via its

effect on the productivity of investment, and by leading to severely compressed budgets and the fiscal balance (i.e., fiscal deficit, where a positive sign indicates a deficit and a negative sign indicates a surplus). Equation 11 is therefore modified to become:

$$dk/dt = sA(k^*)^\alpha - (n + \delta)k - (v - d) \dots \dots \dots (12)$$

where v is external debt servicing rate, and d is external debt flow rate. While debt servicing and repayment adversely affect the rate of capital formation, the inflow of external debt tends to increase resources available for investment. Equation 12 represents the investment equation incorporating the debt variables as determinants of variations in investment.

Theoretically, economic growth is a function of investment growth, as suggested in the steady state Equation 8. Our theoretical proposition supports the direct link of external debt to economic growth, as well as via the investment and fiscal balance variables as the mechanism through which they influence the growth pattern.

Empirical Specification

Given the linear and non-linear effect of the debt variable, the linear and non-linear specifications of the growth equation, as well as the investment and fiscal balance equations were investigated as the plausible transmission channels through which external debt affects economic growth. In order to facilitate the determination of the external debt threshold, the direct implication of external debt on economic growth was investigated by directly including the debt variables in the growth equation. This is done separately for the linear and non-linear specifications, in which the square of external debt is included in the non-linear specification. The estimable equations for linear specifications for investment, fiscal balance and growth are represented by Equations 13a, 13b, and 13c, respectively, while the estimable equations for non-

linear specifications for investment, fiscal balance and growth are represented by Equations 14a, 14b, and 14c, respectively.

Drawing from the exposition in the literature review, it is well-established that external debt affects investment as well as the fiscal balance of government. The burden of debt service can lead to increased tax efforts on the part of the government, as well as possible crowding out of public investment. Given certain conditions, possible ambiguity of the impact of external debt on economic growth is well stabled in the literature. It is theoretically supported that debt initially enhances growth up to a particular threshold, beyond which further accumulation of debt starts to impact negatively on growth. Tracing this impact on the investment, fiscal balance and growth equations the linear and non-linear relationship with respect to external debt is investigated. For the growth model, the econometric growth model in Pattillo et al. (2011) is adapted. The linear and non-linear growth equations are therefore specified as in Equations 13c and 14c, respectively:

Linear specification

$$Inv_{it} = \pi_0 + \pi_1 DTS_{it} + \pi_2 EDT_{it} + \pi_3 IR_{it} + \pi_4 y_{it} + \varepsilon_{it} \dots \dots \dots (13a)$$

$$FIB_{it} = \tau_0 + \tau_1 DTS_{it} + \tau_2 EDT_{it} + \tau_3 y_{it} + \varepsilon_{it} \dots \dots \dots (13b)$$

$$y_{it} = \lambda_0 + \lambda_1 INVT_{it} + \lambda_2 FIB_{it} + \lambda_3 DTS_{it} + \lambda_4 EDT_{it} + \lambda_5 X_{it} + \mu_{it} \dots \dots \dots (13c)$$

where Inv_{it} stands for aggregate investment/GDP, while FIB_{it} is primary fiscal balance to GDP. An increase in fiscal balance implies a worsening of the deficit. EDT and DTS are debt stock/GDP and debt servicing/GDP, respectively. IR is interest rate, while y represents per capita growth, and X_{it} is the set of control variables. The set of control variables includes: initial income per capita, population growth rate and external shocks measured by terms of trade growth.

Table 3: Non-linear specification estimates of investment, fiscal balance and growth

Variables	Investment		Fiscal balance		Economic growth	
	Fixed effect	GMM	Fixed effect	GMM	Fixed effect	GMM
Constant	0.053*** (4.96)	0.060*** (4.44)	0.021*** (4.70)	0.027** (1.98)	0.126*** (10.10)	0.137*** (6.10)
RGDPG _{t-1}	0.057** (2.09)	0.048** (1.95)	-0.018 (0.56)	-0.021* (1.76)	0.027* (1.78)	0.034* (1.81)
INVT _{t-1}	0.544*** (4.69)	0.555*** (5.27)			0.123*** (8.71)	0.195** (2.06)
FIB					-0.017** (2.21)	-0.083*** (5.65)
FIB _{t-1}			0.335* (1.76)	0.341* (1.81)		
EDT _{t-1}	0.044** (2.16)	0.032** (2.38)	0.012 (1.08)	-0.022*** (3.53)	-0.021 (0.98)	0.038** (2.53)
EDTSQ	-0.012** (2.06)	-0.009*** (3.43)	-0.011* (1.79)	-0.012** (2.06)	-0.011* (2.17)	-0.020** (2.46)
TDS	-0.028** (1.91)	-0.021** (2.01)	0.027 (1.17)	0.025* (1.75)	-0.067* (1.82)	-0.085** (2.26)
IR	-0.182 (0.54)	-0.168 (0.12)				
EXR					0.028* (1.94)	0.036*** (2.56)
INF					-0.185* (1.79)	-0.101* (1.73)
OPN					0.044 (1.00)	0.034 (1.04)
TOT					0.001** (2.19)	0.002*** (4.88)
POG					<u>-7.425*</u> (1.70)	<u>-7.150</u> (0.27)
POLITY _{t-1}					<u>0.205</u> (1.55)	<u>0.001</u> (1.21)
Arellano-Bond AR(2) test p-value		0.20		0.18		0.33
Hansen J- statistics (p-value)		0.22		0.21		0.29
R ²	0.49		0.51		0.53	

Note: ***1%; ** 5%; * 10%

A percentage increase in the debt service burden yields between a 0.21% and 0.31% point decline in the investment-GDP level. The debt stock and debt service variables have the correct sign and are highly significant. These results demonstrate clear evidence of the existence of “debt overhang” and “crowding out” effects. This result is consistent with Elbadawi et al., (1997), Ajayi (1997), Iyoha (1999), Mbanga and Sikod (2001), and Were (2001).

In line with a priori expectation, interest rate variable has a negative sign implying that high interest rates discourage investment. However, the coefficient of the variable is statistically insignificant. The accelerator effect is captured by the coefficient of the RGDPG term and, as expected, it has the correct sign and is significant for the various estimated regressions. The lag values of the growth rate of real GDP ($RGDPG_{t-1}$) are significant at the conventional 5% level, except for the FE non-linear estimate. Thus, there is strong evidence of an “investment accelerator” effect, whose sign and statistical significance suggests that growth stimulates investment.

The fiscal balance variable is based on primary balance, which excludes the debt effect on government’s fiscal position. The linear and non-linear estimates of fiscal balance with respect to the external debt variable were estimated. The debt variables are significant with the expected signs. Changes in external debt stimulate fiscal balance in the government’s financial position. One period lag of the external debt variable has a negative influence on the fiscal balance. The reported coefficients for external debt suggest that a percentage increase in external debt-GDP yields a worsening fiscal balance of between 0.2 and 0.3%. This is consistent with Sachs’s (1990) conclusion that high debt tends to undermine macroeconomic stability by increasing budget deficits. This is further affirmed by the positive coefficients of debt service, as expected, which is indicative of the incremental effect on government expenditure that creates a further gap between government revenue and expenditure. A

percentage increase in the debt service obligation results in around a 0.14–0.27% worsening of the fiscal deficit position of governments.

Economic Growth Estimation Results and Discussion

The real GDP growth equations estimate, where the debt variables are directly included for the corresponding linear and non-linear specifications are shown in the last two columns of Tables 2 and 3, respectively. Other growth control variables, such as macroeconomic stability: exchange rate and inflation rate; openness of the economy, population growth, terms of trade, and a measure of political stability¹ were included. The effect of investment is statistically stronger than the effect of fiscal balance on growth. This is not surprising, as the fiscal deficit may either positively or negatively affect economic growth.

The statistical significance of the debt variables supports the hypothesis that these variables do influence the economic growth process. In the linear growth specification, the external debt variable is negative and statistically significant, which is suggestive of the fact that debt accumulation tends to retard economic growth. On average, a percentage point increase in the initial debt-to-GDP ratio is associated with a slowdown in annual real per capita GDP growth of between 0.12% and 0.19% per year. There is evidence of nonlinearity, with high levels of debt having a significant negative effect on growth. In the non-linear estimation, the signs of the coefficient of external debt, which are statistically significant, turn out to be positive, while the debt square variable is negative. This confirms the initial positive influence of debt accumulation on growth, and the existence of the debt overhang phenomenon in the economic growth experience of the sample countries.

A rise in the investment variable (one-year lag) has a positive effect on growth, as would be expected, and is highly significant. In line with the accelerator principle, growth in investment facilitates faster

economic growth. The one-year lag values of the investment variable positively affected growth, suggesting that investment stimulates growth. A percentage rise in previous period investment ($INVT_{t-1}$) leads to an increase of between 0.11% and 0.21% in the rate of economic growth.

The stimulating effect of fiscal balance on growth is not supported by the results, as indicated by the negative and statistically significant sign of the coefficient of contemporaneous values of the fiscal balance (FIB). This is contrary to the a priori expectation of the stimulus effect of extra government spending on economic growth, however reaffirms the often non-productive or non-growth-contributing spending of governments in less developed countries. Also, the tendency towards corrupt practices by government officials through which public funds are continuously siphoned abroad (capital flight) lead to a recurring fiscal balance with marginal or no effect on infrastructural development that is expected to promote growth in the economy. The absence of such necessary infrastructure required for productive activities in the economy tends to reduce the growth rate.

The other control variables have the expected a priori signs and are mostly significant. The sign of the exchange rate variable is positive and significant, which implies that the strength of the local currency has implications for growth. The devaluation of a domestic currency tends to stimulates foreign demand for domestic goods and generates a growth response from the economy. In the literature, it is shown that inflation may stimulate growth at low and containable levels, but that it can also impact negatively on growth at high levels. The results show that the inflation rate (INF) slows economic growth, but remains statistically insignificant. This implies that the expectation of a persistently high inflation rate by economic agents in the current period tends to slow down output.

Terms of trade and openness of the economy (current and lagged) values have positive effects on

economic growth. This implies that economic growth is promoted by favourable terms of trade and more economic interaction with the rest of the world. Population growth that is used as a measure of the labour force is generally reported with negative coefficients, but is not significant in GMM estimates. The regression results indicate that political stability enhances economic growth. The lag values of the political stability variable are positive and significantly different from zero. The past state of the political atmosphere has implications for the depth of economic activities that can take place in a year. The more stable politically, the more growth a country is likely to experience.

Debt Threshold

Based on the coefficients of the debt and debt square variables, the debt threshold for economic growth was calculated. Drawing from the turning point calculation of Pattillo et al. (2011), the debt turning point was also calculated. The level at which the marginal impact of external debt on growth becomes negative is calculated for the FE and GMM estimates of the quadratic specification.² The turning points of growth with respect to external debt seem to be between 60% and 74% of GDP.³ This implies that, on average, the marginal impact of debt on growth becomes negative

¹We used POLITY as a measure of the political stability in each of the countries. It is a measure that rates the political stability between 0 and 10, and is available for all countries. The value 10 signifies the most conducive political situation.

² $\text{Exp}[-\hat{\alpha}_{EDT}/(2*\hat{\alpha}_{EDTSQ})]$

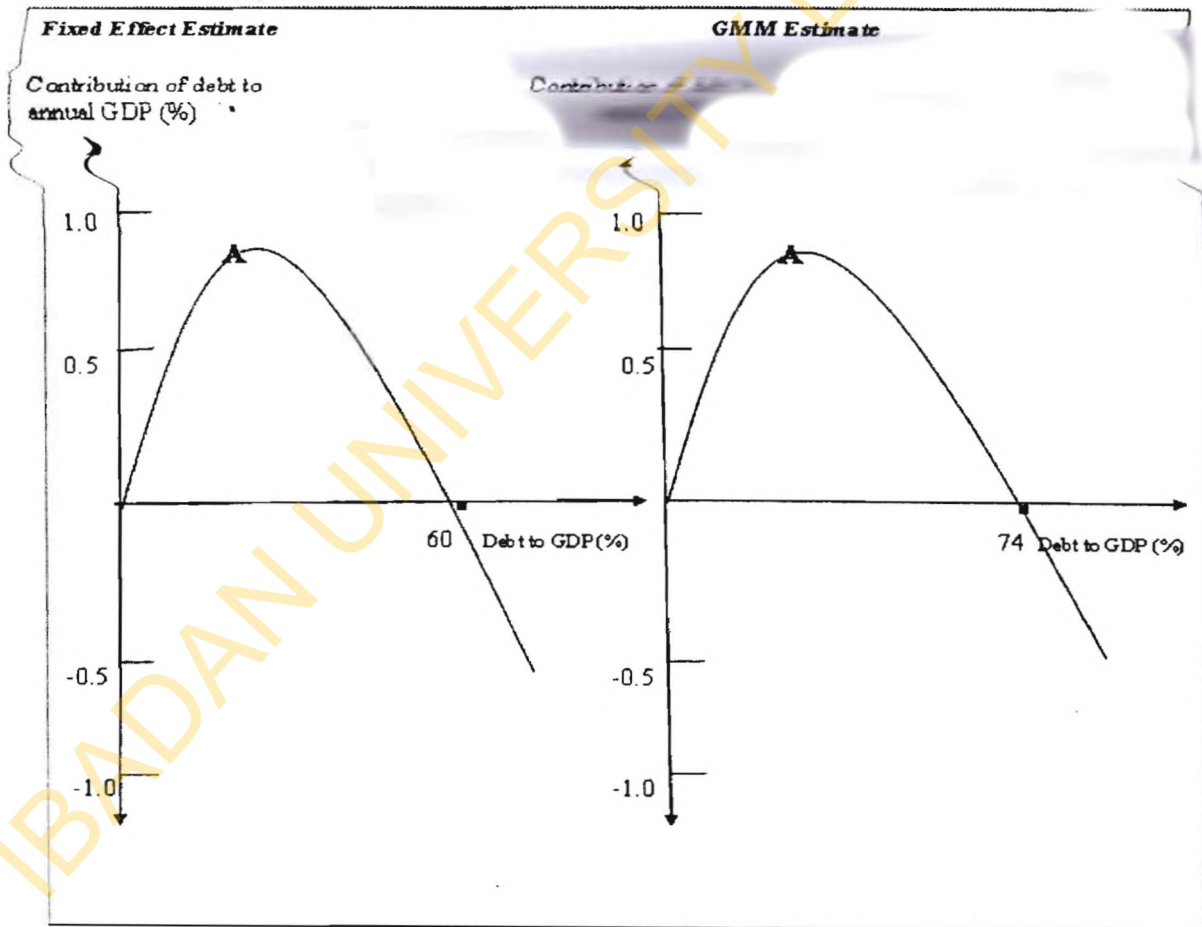
³ These results fit into the range of values found in different studies that have found the threshold to be between 5% and 97% of GDP (Clement et al., 2005; Oleksandr, 2003; Pattillo et al., 2011; Maghyereh et al., 2002; Cohen, 1997 and Elbadawi et al., 1997).

for any ratio of debt stock to GDP exceeding 74%. These threshold results are not entirely out of sync with the literature. While Pattillo et al. (2011) obtained a threshold of between 35% and 40%, Checherita and Rother (2010) obtained a threshold of government debt to GDP of 90%–100%. Greenidge et al. (2012) concluded that as debt rises beyond 30% of GDP, the effects on economic growth diminish rapidly, and with debt levels reaching 55%–56% of GDP, the growth impact switches from positive to negative. Also, Clement (2005) shows that external debt slows growth only after its face value reaches a threshold level

estimated to be about 50% of GDP. These variations may not be unconnected to the differences in sample of countries used in these studies.

The considerable variation implies that the precision of the turning point is not a straightforward matter. The negative impact of debt on growth beyond the threshold in the GMM is much greater than the impact estimated from the FE regressions. This study's results suggest that imposing a linear specification could be misleading. See figure 1 for the turning points derived from the fixed effect estimates. This indicates the threshold for the marginal impact of debt is regarded as the growth-maximizing level of external debt.

Figure 1: Stylized graphical shape of the non-linear relation between debt and growth



Conclusion

Using data from 14 WA countries from 1970 to 2010, the study investigated how indebtedness has affected growth in West African countries directly and via investment and fiscal balance mechanisms. This was approached using a standard growth framework which included debt indicators. Two econometric specifications (linear and non-linear) were used. The study employed two different estimation techniques (fixed effects and GMM) to take advantage of estimation efficiency in the presence of endogeneity problems. A separate estimate was conducted for the growth equations as influenced by debt variables through the investment and fiscal balance mechanisms, and as directly influencing growth

The hypothesis that the effect of external debt on growth is transmitted through changes in the investment and fiscal balance variables was tested and found to be well-supported by the results. The results from different estimation techniques (fixed effects and GMM) affirmed that external debt directly affects growth, and that investment and fiscal balance are veritable mechanisms through which they have an impact on growth. All the debt variables have the expected signs and were statistically significant in the investment and fiscal balance estimates, as well as in growth estimates. The existence of the debt overhang and crowding out hypotheses were confirmed in the study.

The results revealed that debt appears to have a non-linear effect on growth. The debt overhang hypothesis, as affirmed by the study's results, established the existence of a threshold beyond which debt negatively contributes to growth. The average impact of debt on per capita growth seemed to become negative for debt levels above 60% to 74% of GDP. Thus, an increase in debt beyond this threshold yields a negative marginal contribution to investment and growth. This result implied that imposing a linear specification could be misleading. In conclusion, there is a pressing need to take measures to not only stabilize

external debts but to place them on a downward trajectory in the future.

Other control variables such as openness, terms of trade, inflation, and the exchange rate have mixed effect on growth. The interest rate variable turned out to be correctly signed in the investment estimates, but was found to be insignificant.

References

- Acemoglu, D., Johnson, S., Robinson, J. and Thaicharoen, Y. (2003), "Institutional causes, macroeconomic symptoms: Volatility, crises and growth". *Journal of Monetary Economics*, 50(1): 49–123.
- Adepoju, A. A., A.S. Salau, and A. E. Obayelu, (2007), "The Effects of External Debt Management on Sustainable Economic Growth and Development: Lessons from Nigeria", Munich Personal RePEc Archive (MPRA), Paper No. 2147. Available @: idcas.repec.org/p/pra/mprapa/2147.html.
- Agenor, P-R and P.J. Montiel.(1996). *Development Macroeconomics*. Princeton: Princeton University Press.
- Aizenman, Joshua, Brian Pinto and ArturRadziwill, (2007), "Sources for financing domestic capital – is foreign saving a viable option for developing countries?", *Journal of International Money and Finance*, 26: 5, 682-702.
- Ajayi, S.I. (2003). "External debt, capital flight, and growth in Nigeria". In N. Okonjo-Iweala, C.C. Soludo and M. Muhtar, eds, *The Debt Trap in Nigeria: Towards a Sustainable Debt Strategy*. Trento, N.J.: Africa: World Press.
- Ajayi, S.I. (1997). "An analysis of external debt and capital flight in the severally indebted low income countries in Sub-Saharan Africa". Research Department, International Monetary Fund Working Paper No. 68, Washington, D.C.
- Ajayi, L.B. and M.O. Oke (2012), "Effect of External Debt on Economic Growth and Development of Nigeria", *International Journal of Business and Social Sciences*, Vol3 No. 12.
- Ali and Mshelia (2007)
- Ayadi, F.S. and Ayadi, F.O. (2008), "The impact of external debt on economic growth: A comparative study of Nigeria and South Africa", *Journal of Sustainable Development in Africa*, 10(3): 234-264.
- Borensztein, E. (1990). "Debt overhang, debt reduction and investment: The case of the Philippines". *International*

- Monetary Fund Working Paper No. WP/90/77, Washington, D.C.
- Bove, J. (1992). "Linkages between external debt data and balance of payments, government finance and monetary statistics". Statistics Department, International Monetary Fund, Working Paper No. 92/93, Washington, D.C.
- Boyce, J.K. and L. Ndikumana. (2001). "Is Africa a net creditor? New estimates of capital flight from severely indebted Sub-Saharan African countries: 1970–1996". *Journal of Developing Studies*, 38(2), December.
- Calvo, G.A. (1998). "Growth, debt and economic transformation: The capital flight problem". In C. Fabrizio, M. di Matteo and F. Hahh, eds, *New Theories in Growth and Development*. New York: St. Martin's Press.
- Cerra, V., M. Rishi and S.C. Saxena. (2008). "Robbing the riches: Capital flight, institutions, and debt". *Journal of Development Studies*, 44(8): 1190–213.
- Checherita, C. and P. Rother. (2010). "The impact of high and growing government debt on economic growth: An empirical investigation for the Euro Area". European Central Bank Working Paper Series, No. 1237.
- Claessens, S., Detragiache, E., Kanbur, R., and Wickham, P. (1996). Analytical aspects of the debt problems of heavily indebted poor countries. *Policy Research Working Paper* 1618, World Bank, Washington D.C.
- CIA World Fact Book, (2005); <https://www.cia.gov/library/publications/download/index.html>
- Clement, B., R. Bhattacharya and T.Q. Nguyen. (2005). "Can debt relief boost growth in poor countries?" *IMF Economic Issues*, No. 34
- Cohen, D. (1991). *Private Lending to Sovereign States: A Theoretical Autopsy*. Cambridge, MA: MIT Press,
- Cohen, D. (1993). "Low investment and large LDC debt in the 1980s". *The American Economic Review*, 83(3): 437–49.
- Cohen, D. (1997). "Growth and external debt: A new perspective on the African and Latin American tragedies". *Centre for Economic Review*, 30: 529–50.
- Collier, P., A. Hoeffler and C. Pattillo. (2001). "Flight capital as a portfolio choice". *The World Bank Economic Review*, 15: 55–80.
- Cuddington, J.T. 1986. "Capital flight: Estimates, issues and explanations". *Princeton Studies in International Finance*, 58. Princeton, N.J.: Princeton University.
- Chowdhury, A.R. (2004), "External Debt, Growth and the HIPC Initiative: Is the Country Choice too Narrow?", In: Addison T., Hansen H. and Tarp F. (ed.), *Debt Relief for Poor Countries*, New York: Palgrave Macmillan
- Clements et al. (2003); Clements, B., Bhattacharya, R., Nguyen, T.Q. (2003). External Debt, Public Investment and Growth in Low-Income Countries. *IMF Working Papers* 03/249. International Monetary Fund.
- Cordella, T., L. Antonio, L., and M.R. Arranz (2005), "Debt Overhang or Debt Irrelevance? Revisiting the Debt-Growth Link, *IMF Working Paper*, WP/05/223.
- Degefe, B. (1992). *Growth and Foreign Debt: The Ethiopian Experience: 1964–86*. Research Paper No. 13. African Economic Research Consortium, Nairobi.
- Deppler, M. and M. Williamson. (1987). "Capital flight: Concepts, measurement and issues". *Staff Studies for the World Economic Outlook*. Washington: International Monetary Fund.
- Dijkstra, G. and N. Hermes. (2001). "The uncertainty of debt service payments and economic growth of highly indebted poor countries: Is there a case for debt relief?" Paper prepared for WIDER Conference on Debt Relief, Helsinki, Finland, 17–18 August.
- Drukker, M.D. (2008). "Econometric analysis of dynamic panel data using STATA". North American STATA Users Group meeting, STATA Corp, Summer.
- Depetris, C.N., and A. Kraay (2005), "What has 100 Billion Dollars Worth of Debt Relief Done for Low-Income Countries?", Available @: <http://ssrn.com/abstract=818504>
- Eaton, J. (1993). "Sovereign debt: A primer". *The World Bank Economic Review*, 7(2).
- Eggerstedt, H., R.B. Hall and S.V. Wijnbergen. 1995. "Measuring capital flight: A case study of Mexico". *World Development*, 23(2).
- Edsel, L.B. Jr. (2006). "Capital flight and the hollowing out of the Philippine economy in the neoliberal regime". *Kasarinlan: Philippine Journal of Third World Studies*, 21(1): 55–74.
- Elbadawi, A.I., J.B. Ndulu and N. Ndung'u. (1997). "Debt overhang and economic growth in Sub-Saharan Africa". In Z. Iqbal and R. Kanbur, eds, *External Finance for Low-Income Countries*, 26: 245–66.
- Ezeabasi, V. N., H.O. Isu, and J.N. Mojekwu (2011), "Nigeria's External Debt and Economic Growth: An Error Correction Approach", *International Journal of Business and Management*, 6 (5), 156-170.
- Ekperiwara and Oladeji (2012); "External Debt Relief and Economic Growth in Nigeria", *American Journal of Economics* Vol. 2 No. 7: 195-205
- Erhieyovwe E.K. and O. D. Onovwoakpoma (2013) "External Debt Burden and its Impact on Growth: An Assessment of Major Macro- Economic Variables in Nigeria", *Academic journal of interdisciplinary Studies*, Vol. 2, No. 2

- Fosu, A.K. (1999). "The external debt burden and economic growth in the 1980s: evidence from Sub-Saharan Africa" *Canadian Journal of Development Studies/Revue*, 20(2),
- Fosu, A.K. (1996). "The impact of external debt on economic growth in Sub-Saharan Africa". *Journal of Economic Development*, 21(1): 93–118.
- Global Development Finance (2010), available at: <http://data.worldbank.org/data-catalog/global-development-finance/gdf-2010>
- Gournichas, O. and O. Jeanne.(2006). "The elusive gains from international financial integration". *Review of Economic Studies*, 73(3).
- Greenidge, K., R. Craigwell, C. Thomas and L. Drakes.(2012). "Threshold effects of sovereign debt: Evidence from the Caribbean". IMF Working paper No. WP12/157. International Monetary Fund, Washington, D.C.
- Frimpong, J.M. and E.F. Oteng-Abayie (2006) "The Impact of External Debt on Economic Growth in Ghana: A Cointegration Analysis", *Journal of Science and Technology*, Vol. 25 Number 3
- Hall, R. and C. Jones.(1999). "Why do some countries produce more output than Others?" *Quarterly Journal of Economics*, 114.
- IMF WEO database, (2010) <http://www.imf.org/external/pubs/ft/weo/2010/02/weodata/weoselgr.aspx>
- IWGEDS.(1988). *External Debt, Definition, Statistical Coverage and Methodology*. World Bank, International Monetary Fund, Bank for International Settlements, Organization for Economic Corporation and Development, Paris.
- Iyoha, M.A. (1999). *External Debt and Economic Growth in Sub-Saharan African Countries: An Econometric Study*. African Economic Research Paper No. 90 African Economic Research Consortium, Nairobi, March.
- Iyoha, M.A (2000a). "Policy Simulation with a Model of External Debt and Economic Growth in Sub-Saharan African countries" *Nigerian Economic and Financial Review*, Vol. 2.
- Iyoha, M.A., (2000b). The impact of external debt reduction on economic growth in Nigeria: Some simulation results. *Nigeria Journal of Economic and Social Studies*, Vol. 42.
- Johansson, P. (2010) Debt Relief, Investment and Growth. *World Development*, 38(9), 1204-1216.
- Kahn, M.S. and N. Ul Hague.(1987). "Foreign borrowing and capital flight: A formal analysis". *Staff Papers*, 32(4). Washington, D.C.: International Monetary Fund.
- Klenow, P., and A. Rodriguez-Clare (1997), "The Neoclassical Revival in Growth Economics: Has it gone too Far?," *NBER Macroeconomics Annual 1997*, Vol. 12.
- Krugman, P. (1988). "Financing vs. forgiving a debt overhang: Some analytical notes". *Journal of Development Economics*, 29: 253–68.
- Krugman, P. (1998). "Saving Asia: It's time to get radical". *Fortune*, 7 September, pp. 74–80.
- Kumar, M. S. and J. Woo (2010) "Public Debt and Growth", *International Monetary Fund Working Paper Series* 10/174
- Lawanson, A.O. (2005). "An econometric analysis of capital flight from Nigeria: A portfolio choice approach". Final report presented at the African Economic Research Consortium Biannual Workshop, Nairobi, May 2007.
- Le, V.Q. and P. J. Zak.(2006). "Political risk and capital flight" *Journal of International Money and Finance*, 26(2): 308–29.
- Lensink, R., N. Hermes, and V. Murinde.(2000). "Capital flight and political risk". *Journal of International Money and Finance*, 19: 73:92.
- Lessard, D.R. and J. Williamson.(1987). "Capital flight and third world debt". Washington, D.C.: Institute for International Economics.
- Maghyereh, A., G. Omet and F. Kalaji.(2002). "External debt and economic growth in Jordan: The threshold effect". Unpublished manuscript in the Faculty of Economics and Administration Sciences, The Hashemite University, Jordan.
- Mbanga, G. N. and F. Sikod.(2001). "The impact of debt and debt-service payments on investment in Cameroon". Final report presented at the African Economic Research Consortium Biannual Research Workshop. Nairobi, 26–31 May.
- Murinde, V., N. Hermes and R. Lensink.(1996). "Comparative aspects of the magnitude and determinants of capital flight in six Sub-Saharan African countries". *Saving and Development*, 20(1).
- Ndikumana, L. and J.K. Boyce (2012), "Capital Flight from Sub-Saharan African Countries: Updated Estimates, 19870-2010" PERI Working Paper, October 2012 Available at: http://works.bepress.com/james_boyce/39.
- Oleksandr, D. (2003). "Non-linear impact of external debt on economic growth: The case of post-Soviet countries". Thesis submitted for Master's Programme in Economics, Department of Economics Education and Research Consortium National University of Kyiv-Mohyla Academy., Kiev, Ukraine.



- Ogunmuyiwa, M.S. (2011). "Does External Debt Promote Economic Growth in Nigeria?", *Current Research Journal of Economics Theory*, 3(1).
- Onah, F.E. (1994), "External Debt and Economic Growth African Debt Burden and Economic Development" selected papers for the 1994 Annual Conference of the Nigeria Economic Society (NES), May, 1994
- Pattillo, C., H. Poirson, and L. Ricci, (2004) "What Are the Channels through which External Debt Affects Growth?," *IMF Working Paper* WP/04/15.
- Pattillo, C., H. Poirson and L. Ricci. (2011). "External debt and growth". *Review of Economics and Institutions*, 2(3), Article 2.
- Pattillo, C., Poirson, H., Ricci, L. (2002) External Debt and Growth, *IMF Working Paper* 02/69 (Washington: International Monetary Fund), pp. 1-47
- Penn World Table 6.3, available at: https://pwt.sas.upenn.edu/php_site/pwt63/pwt63_form.php
- Presbitero, A.F. (2010), *Total public debt and growth in developing countries*, the European Journal of Development Research, Palgrave Macmillan, 24 (4), 606-626.
- Reinhart, C. M. and K. S. Rogoff (2010). "Growth in a Time of Debt", *American Economic Review: Papers & Proceedings* 100, 573-578, <http://www.aeaweb.org/articles.php?doi=10.1257/aer.100.2.573>.
- Rodrik, D. (1989). "Policy uncertainty and private investment in developing countries". Working Paper No. 2999.NBER, Cambridge, Mass., June.
- Sachs, J. D. (1989). "The debt overhang of developing countries". In G. Calvo, R. Findlay, P. Kouri and J. Macedo, eds, *Debt, Stabilization and Development*. Cambridge, MA: Basil Blackwell.
- Sachs, J.D. (1990). "External debt, structural adjustment and economic growth". *International Monetary and Financial Issues for the 1990s*, IX: 45-55.
- Saint-Paul, G (1992). "Fiscal policy in an endogenous growth model", *The Quarterly Journal of Economics*, 107 (4), 1243-59.
- Schclarek, A. (2004). "Debt and Economic Growth in Developing and Industrial Countries", Lund University, *Department of Economics Working Papers Series* Number 2005:34.
- Schneider, B. (2003). "Resident capital outflows: Capital flight or normal flows?" A Statistical Interpretation", Overseas Development Institute Working Paper No. 195, London.
- Tornell, A. and A. Velasco. (1992). "The tragedy of the commons and economic growth: Why does capital flow from poor to rich countries?" *The Journal of Political Economy* Centennial Issue, 100(6): 1208-31.
- Umaru, A., A.A. Hamidu, and S. Musa (2013), "External Debt and Domestic Debt Impact on the Growth of the Nigerian Economy", *International Journal of Educational Research*, Vol. 1 Issue 2.
- Were, M. (2001). "The impact of external debt on economic growth and private investment in Kenya: An empirical assessment". Working Paper, Kenya Institute for Public Policy Research and Analysis, Nairobi.
- World Bank. (1993). *Latin America a Decade After the Debt Crisis*. Washington, D.C.: World Bank.
- World Development Indicator (2010), available at: <http://data.worldbank.org/data-catalog/world-development-indicators/wdi-2010>

Biographical Note

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Appendix A1: Country means of regression variables

	Invt (% of RGDP)	RGDP (% growth)	CAF (% of GDP)	FIB (% of GDP)	EDT (% of GDP)	TDS (% of GDP)	IR (%)	EXR (Curr/\$)	OPN (% of GDP)	TOT
Benin	11.6	3.5	3.3	-4.4	53.7	1.6	7.4	392.1	46.1	-1.5
Burkina Faso	12.1	3.8	3.5	-2.1	30.8	1.2	7.8	392.1	34.8	-46.9
Cote D'Ivoire	7.5	2.6	1.3	-3.9	103.8	9.5	7.8	392.1	72.3	-857.3
Gambia	8.8	4.1	-1.8	-3.8	93.0	5.5	12.4	8.7	102.4	49.8
Ghana	9.5	3.0	1.6	-4.1	60.2	4.3	20.9	1890.7	51.9	-27.5
Guinea	4.2	3.8	0.5	-3.8	74.2	3.7	14.7	757.4	54.3	-7.6
Guinea Bissau	23.1	2.3	91.6	-14.8	213.1	4.5	28.8	392.1	121.4	-15.5
Mali	8.4	3.6	0.8	-4.4	84.9	2.3	7.7	392.1	51.0	-48.0
Mauritania	17.0	2.7	7.5	-1.2	147.4	7.9	7.4	114.8	100.4	-66.7
Niger	10.0	1.7	-13.9	-3.7	56.0	3.5	7.8	392.1	43.7	-180.7
Nigeria	10.1	4.1	6.4	-7.1	176.7	77.3	11.1	30.9	58.9	15063.5
Senegal	5.1	3.2	2.1	-1.2	61.8	5.0	7.8	392.1	68.3	-97.1
Sierra Leone	5.9	2.0	3.5	-7.7	109.5	4.4	10.0	685.9	48.5	-3234.4
Togo	17.5	2.7	7.6	-4.8	85.0	4.5	7.8	392.1	87.4	-42.3

Appendix A2: Country means of currency composition of West African Countries' long-term external debt (1970–2008)

	Benin	Burkina Faso	Côte D'Ivoire	Gambia	Ghana	Guinea	Guinea Bissau	Mali	Mauritania	Niger	Nigeria	Senegal	Sierra Leone	Togo
Deutsche Mark (%)	1.2	4.5	4.2	1.3	8.0	2.5	0.2	2.0	1.4	3.4	9.8	5.8	5.9	12.7
Euro (%)	1.5	0.6	7.1	0.8	0.8	1.4	1.9	2.7	1.0	2.7	3.4	2.7	2.3	2.9
French Franc (%)	20.1	22.0	26.7	2.2	1.7	7.4	2.8	20.0	12.3	39.7	4.5	22.7	3.5	12.9
Japanese Yen (%)	0.7	0.0	0.7	0.0	5.0	1.4	0.0	0.9	1.4	1.0	6.5	1.6	4.4	2.2
Multiple currencies (%)	7.7	11.7	13.0	13.5	7.8	7.4	17.3	10.8	3.3	0.4	18.7	7.9	6.4	4.7
Pound Sterling (%)	0.6	2.4	0.7	25.7	7.7	2.1	0.0	9.3	0.3	0.7	10.5	0.2	5.6	3.5
SDR (%)	1.5	2.1	0.3	0.3	1.2	0.7	0.0	0.3	1.7	2.0	0.2	1.0	4.8	0.6
Swiss Franc (%)	0.2	0.0	2.3	0.5	0.1	0.4	6.0	3.8	0.1	0.1	0.7	0.4	4.3	7.3
US Dollars (%)	36.1	36.8	33.3	33.1	51.9	37.1	29.5	19.4	39.7	28.2	38.3	33.3	42.9	34.4
All other currencies (%)	30.5	19.9	11.9	24.6	15.7	39.7	18.6	30.7	39.0	21.9	7.4	24.5	20.1	18.8