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The Dynamic Impact of External Debt Accumulation on Private Investment and Growth in Africa

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Abstract

The paper attempts, using recent empirical literature, to characterise the dynamic effects of external debt on private investment rates and growth performance. It shows that once the critical threshold of external debt accumulation is passed, the effects on private investment develops into a vicious circle and this has negative effect on current and future growth. It is shown that few countries in Africa have managed to reverse this trend in the sample period, 1970-1994.

The argument in the paper is that external debt problem in Africa has led to an investment pause and reduced growth performance substantially. To strengthen the argument, results from recent empirical work by Elbadawi, et. al. (1997) have been used to show the dynamics of the problem and how a country moves from the one side of the Laffer curve to the other and the effects on investment and growth. The conclusion to be drawn from the sequential classification of countries in terms of the magnitude of their debt accumulation, private investment rates and growth performance shows that debt overhang is associated with negative consequences on sustaining a virtuous circle of reforms and adjustment. This is shown from the dynamics of debt accumulation and private investments. Once a country gets into the wrong side of the Laffer curve and does not reverse the trend, the accumulated effects further affect growth performance.

Second, it is shown that the effects on private investment rates, the channel through which debt overhang affects investment and hence future growth, starts early (at a computed threshold of 33.5% of debt accumulation to GDP) and few countries have managed to reverse the trend in Africa and this provides evidence why there has been an investment pause in Africa. This also provides support to the fact that SAPs policies have failed to revive and sustain growth in Africa due to the presence of debt overhang. In addition to the debt accumulated, the debt service burden which crowds out domestic expenditure needed for supporting productive capacity further compounds the problem and shows that it is difficult to stimulate investment and hence growth under these circumstances. This explains why most of the countries were found on the wrong side of the Laffer curve.

I. Introduction

The debt problem in Africa has reached crisis levels but has only been recognised in the 1990s. The crux of the region's debt problem is the excessive magnitude of debt overhang which has led to a large number of countries in the region to be classified as insolvent. Debt overhang refers to the existence of a large debt which has adverse consequences for investment and growth because investors expect that current and future taxes will be increased to effect the transfer of resources abroad. This dimension of the debt problem has three important implications that concern macroeconomic management in Africa and which has been at the centre of the debate on the revival of growth in the continent:

- Impact on fiscal adjustment
- Current and future resources to enhance economic growth
- Current and future resources and resource flows to enhance private and public investments.

Thus, the debt crisis in Africa has led to reduced growth and sharp declines in domestic and foreign investment, substantial capital outflows and in some countries accompanied by accelerating inflation.

The debt situation in SSA has acquired significant proportions and attention. This is because among the poorest countries are to be found in Africa. For example, of the 32 highly indebted poor countries, (HIPCs) 26 are in SSA. In addition SSA is the only region where average debt stock exceeds its GNP. Debt servicing in 1994 on average took up 18.6% of total exports. Furthermore debt service on average consume more than 21% of government revenue collected each year in these countries. In addition, due to insolvent problems coupled with lack of fiscal adjustment, most of the countries in the region have resorted to domestic borrowing with severe macroeconomic consequences[1].

[1] For example, in Kenya currently, domestic debt interest payments comprise 35% of total central government expenditure. This complicates macroeconomic management because interest rates are kept high and default on domestic debt unlike external debt would lead to a banking crisis - the banks are the main holders of domestic debt via government commercial paper.

The debt distress problem in Africa is indicated more directly by rising arrears of servicing obligation. In spite of net inflows and revolving relief schemes (including refinancing) Africa in the past six years on average could only service a third of its obligations. Consequently the growth momentum of the debt stock has been dominated by accruals of arrears and this is the essence of the debt overhang. What is perhaps more worrisome is the fact that the composition of the outstanding debt is rapidly changing towards preferred creditors and so are the debt servicing requirements. These creditors have much less scope for relief arrangements largely for fear of deteriorations of their credit rating.

The consequences of debt overhang problem for the regions future are indeed very grave, more so for HIPCs in the region. The expenditure crowding out effects of servicing rapidly growing stock of debt has been shown in the context of cross-country regressions involving all developing countries[2] - rising debt service ratios imply reduced availability of resources for supporting renewal of growth, and because growth cannot be restored the solvency problem deepens in a vicious circle. The challenge of the paper is to use the existing results and then attempt to show the critical thresholds when debt overhang starts affecting private investment and then growth performance. This is in recognition that the debt problem in Africa affects growth via the overhang and the crowding-out effect on investment. It is shown that the negative impacts on private investment starts early. Once a country enters into the wrong side of the Laffer curve, that is the critical thresholds are surpassed, a vicious circle starts building and this affects growth.

Several factors influence this outcome. First, rising debt servicing requirements against stagnant exports has meant either default in payment or parting with scarce foreign exchange badly needed for imports required for production and investment. Real outward resource transfers were effected when servicing requirements were met in the context of rapidly depreciating local currencies. This implies that investment crux starts earlier even before growth starts halting, which is consistent with lagged adjustment and growth dynamics. As we argue later, most African countries went beyond the critical threshold of debt accumulation vis-a-vis investment response and so started having an affect on their rates of investment even before the debt crisis. But growth for most of these countries did not start to decelerate until the 1980s when the debt crisis was at hand.

[2] See for example Elbadawi, Ndulu and Ndung'u (1997a).

Second, it has become evident that a greater concern of the debt overhang problem is its negative consequences on sustaining a virtuous circle of reforms/adjustment, where it has occurred, particularly in relation to re-establishing fiscal sustainability and renewing growth in the short-run. The uncertainty - induced effect of debt overhang threatens to undermine the effectiveness and hence sustainability of an otherwise credible reform program. Furthermore, debt service burdens are viewed by potential investors as a threat to sustaining reforms and a potential for higher inflation tax to meet debt service requirements in future. It has thus become critical to assess the magnitude of the impact of debt on growth and investment and draw policy conclusions based on the strength of the identified factors and seek solutions to reverse these negative effects. This becomes even more important with the current HIPC Debt Initiative, which is a recognition that a vicious circle need to be broken by some external agent or mechanism in these countries in order to restore credibility of reforms and break the tendency of market participants to wait. It is hoped that this mechanism for the HIPCs will reverse the current trend and create a virtuous circle of reforms and adjustment.

The paper is organised as follows; section II discusses briefly the magnitude of the debt problem in the African region using some historical external debt indicators. Section III discuses the macroeconomic impact of the debt problem, it distills the discussion in order to show the performances of investment and growth and the channels through which external debt affects them. Section IV shows the critical thresholds calculated by Elbadawi, et al.(1997a, 1997b) for the debt overhang on growth and investments. The model used and its comparative static aspects are outlined. These critical thresholds are used to classify the countries in the region in terms of the side of the Laffer curve (right or wrong) they are to be found in and when they got there. Section V provides a short summary of the paper and concludes with policy implications for resolving Africa's debt problem.

II. The Nature of the Debt Problem in Africa

Historical Dimension of the External Debt Problem

The debt problem/crisis in Africa became evident in the 1980s. This has been exacerbated by internal constraints (and conflict in some countries) and a reach to external help for adjustment via the structural adjustment and liberalization programs of the World Bank and IMF. These policies have been adopted with the institutional adjustment lagging and thus the institutions have been unable to support the adjustment process.

Table 1 shows some indicators of indebtedness in Sub-Saharan Africa, while table 2 shows the same indicators for a group of severely indebted countries. It shows that by 1995, debt stock was 74% on average for SSA countries, having increased from 30.6% in 1980. In relation to exports of goods and services, the increase in indebtedness was dramatic, form 90.9% to 270% in 1995. This is a three-fold increase which perhaps indicate that export growth in the region was somewhat stagnant or the rate of debt accumulation was very fast, or a combination of the two.

Table 1: Indicators of Indebtedness in SSA*

	EDT/GNP	EDT/XGS	INT/XGS	TDS/XGS
1980	30.6	90.9	6.2	9.7
1988	67.2	242.9	10.0	20.7
1989	69.1	237.7	9.5	17.9
1990	70.8	225.7	9.1	17.8
1991	70.6	239.4	8.9	16.4
1992	69.8	235.6	7.8	15.7
1993	73.2	251.9	6.3	14.9
1994	78.7	265.7	6.9	14.0
1995	74.1	269.8	7.2	14.7

* where EDT/GDP is Debt stock to GNP, EDT/XGS is debt stock to export of goods and services, INT/XGS is total interest payments to exports and TDS/XGS is total debt service payment obligations to export goods and services.

Interest payments on the other hand have fallen as a ratio to exports of goods and services. For the severely indebted countries however, the debt stock to GDP stood on average 28% above their respective GDP (at 128%) in 1995, while as a ratio to exports of goods and services, it stood at a staggering 487.9%.

The question then is what has caused this dramatic accumulation of the debt in the 1980s and 1990s. There are endogenous as well as exogenous factors which have been surveyed in various papers[3] but in addition, the growth momentum of the debt stock has been dominated by accrual of arrears and this is the essence of the problem of debt overhang.

Table 2: Severely Indebted Low Income

	EDT/GNP	EDT/XGS	INT/XGS	TDS/XGS
1980	31.4	106.3	6.0	11.2
1988	104.1	489.0	13.9	29.1
1989	127.5	515.4	11.9	24.9
1990	140.5	457.1	11.5	23.0
1991	136.1	498.6	12.2	23.0
1992	137.9	498.8	10.2	22.2
1993	139.9	530.0	8.3	17.4
1994	145.2	529.4	9.4	20.0
1995	128.4	487.9	7.9	21.0

The overarching theme has been that restoration of solvency for HIPCs rests squarely on raising growth through among others factors reducing the debt burden.

[3] See for example Greene and Khan (1990) one of the earliest papers in the AERC Special Paper series. They emphasise that the countries in the region have over-borrowed over time and this coupled with debt servicing problems have, and arrears have worsened the situation.

Factors Leading to the Worsening of the Debt Situation in Africa

Africa's debt crisis did not become recognised and critical until the 1980s. There are a variety of factors that have led to this problem. Among them is over borrowing (see Greene and Khan, 1990). Other factors include (see Thisen, 1994): First, floating interest rates, which is attributed to changes in monetary policy in the U.S. and where interest rates moved from fixed to floating rates in 1971. This implied that banks in the industrialized countries started negotiating loans at floating interest rates. This had the effect of increasing the debt servicing costs as interest rates rose.

Second, in the 1980s the terms of borrowing started to worsen. These included short term maturity periods, high interest rates on commercial borrowing and reduced element of grants in the official debt commitments. These factors led to a rapid growth of external debt for the African countries. This period also coincides with a rapid growth of aid flows through the structural adjustment programs (SAPs) that were proposed in the 1980s to revitalise and sustain growth and reverse the investment pause and slowdown in growth.

The third contributory factor emanated from the strength of the dollar and with loans denominated in dollars and thus the cost of servicing loans increased. The overall effects of exchange rate fluctuations was to increase the level of indebtedness in the African countries. In addition one of the SAPs requirements was a component of trade liberalisation that would enhance external competitiveness. This required devaluing national currencies and then either adopt a real exchange rate rule or a floating exchange rate which would ensure a competitive exchange rate and that would stimulate the export sector. But majority of the African countries export primary commodities so that this policy was not helpful in stimulating the export sector so that it has worsened the debt situation more than improved the external sector. In most of these countries exports have stagnated against a background of increasing debt accumulation, debt arrears and debt serving problems.

Finally, in this period of the debt crisis, debt rescheduling increased tremendously. The amount of formal rescheduling of both official and commercial loans increased from an average of 5 per year in 1975-80 to 148 per year in 1980-90 (Thisen, 1994, pp. 10). As the number of African countries rescheduling external debt increased, the amount of debts rescheduled increased from U.S. $ 558 million in 1980 to $ 1.4 billion in 1982, $ 5 billion in 1983 to $ 10 billion in 1990 (Thisen, 1994, pp.11).

Current On-going Solutions to the Debt Crisis in Developing Countries

There has been several proposed solutions to the African debt crisis. But it is only recently that studies have shown that in order to reverse the growth decline, a major initiative needs to be undertaken with the major aim of reducing the debt stock by debt relief/reduction measures. This has come to be known as the Highly Indebted Poor Countries (HIPC) Debt Initiative. The Initiative was launched in 1996 by the World Bank and the IMF. The World Bank established a HIPC Trust Fund in November 1996 and allocated an initial contribution of $ 500 million. The IMF established the ESAF HIPC Trust for financing special ESAF operations under the HIPC Debt Initiative and allocated an interim tranche of SDR 180 million.

The Initiative represents a commitment by the international community to reduce to sustainable levels the external debt burden of eligible African countries that successfully establish a strong policy track record. The Initiative encompasses all external debt in order to target overall debt sustainability. Sustainability is defined in terms of:

- Present value of debt-to-export ratios in the range of 200-250%
- Debt-service-to-export ratio in the range of 20-25% on present value terms, which requires some forecast of future stream of export earnings.

The principal objective of the HIPC Debt Initiative is to ensure that adjustment and reform efforts are not put at risk by continued high debt and debt servicing burdens. This would be achieved by ensuring that policy programs place particular emphasis on strengthened macroeconomic adjustment and structural reforms. In addition, social development policies geared towards poverty reduction should be put in place, especially through improving quality of public expenditures, strengthening institutional capacity and enhancing the delivery of social services.

Several key issues have been put forward to assess the eligibility and continued participation in the Initiative. They include:

- Eligibility criteria; This is open to HIPC countries who pursue or adopt programs of adjustment and reforms supported by the IMF and the World Bank. These HIPC countries must be facing unsustainable debt

situation even after the traditional relief mechanisms are applied. Sustainability is defined within the ranges postulated above. In addition, these countries must have demonstrated an appropriate track record of adjustment and reforms.

- Debt sustainability levels are subject to satisfactory policy performance. The specific targets are determined in light of country specific vulnerability. These include concentration of exports, variability of export earnings and fiscal indicators of the burden of debt service.
- Once the country has been invited to the Initiative, track record will be assessed after the initial 3 years into the program. Debt sustainability should be achieved over the next three years provided strong performance is sustained.

These issues present serious performance problems because of the assumptions made about the critical thresholds, the forecast of export earnings as a guide to policy performance as well as the discount rates used in the present value calculations. There is also a feeling that the Developing Countries may be poorer in the Initiative due to stringent conditionalities required and the moral hazard problem that may arise . These issues are beyond the scope of this paper, suffice it to say that the Initiative presents the most serious and active solution to address the debt problem in Africa and the range of HIPC countries.

III. Macroeconomic Impact of the External Debt Problem in Africa

The African region merits much more serious scrutiny due to the current reforms and deepening poverty. Africa has been the only region of the world to have registered negative per capita growth rates (on average) over the last two decades. Table 3 shows some highlights of the level of indebtedness and some indicators of economic performance in Africa in the 1990s. Per capita growth has been negative on average. The economies have been in recession up to 1994, while a comparison of debt service ratio with the total for developing countries indicates the high level of indebtedness and export performance disappointing up to 1994.

Table 3: The African Economies: Debt and Macroeconomic Indicators

	1990	1991	1992	1993	1994	1995	1996	1997
Real GDP growth	2.4	2.2	0.3	0.8	2.6	2.8	5.0	3.7
Per Capita Growth	-0.4	-4.8	1.2	-6.2	-3.0	0.0	2.2	0.9
Fiscal balance GDP	-4.7	-5.4	-5.9	-7.5	-5.4	-4.0	-3.2	-1.9
Export Growth	3.6	1.9	0.2	1.5	2.4	10.2	8.9	6.7
Debt service Ratio(DSX)	26.3	29.7	30.5	27.1	21.5	25.5	19.4	21.7
Inflation Rate	16.7	24.4	28.3	27.6	40.4	32.5	24.4	17.6

Sources: African Development Indicators, World Band, various issues and African Development Report, African Development Bank, 1997 and 1998.

What channels has external debt worked through to affect growth and investment rates in Africa? The relationship between external debt and growth works through the investment channel. There are three transmission channels to affect output growth:

- Effect of debt overhang on investment
- Liquidity constraint and related to debt servicing
- Indirectly via effects on public sector expenditure and deficits .

The original formulation of the debt overhang hypothesis centred on the adverse effects of debt on investment in physical capital. How debt overhang is envisaged to affect and discourage private investments depends on how the respective governments are expected to raise fiscal revenue necessary to finance external debt service obligations (inflation tax and excessive government expenditure will contribute to increased domestic inflation which also discourages private investment). The other channels that compound the problem are through the "crowding out" effects, lack of access to international financial markets due to solvency indications and the effects on the stock of debt on the general level of uncertainty in the economy. These effects combine to discourage private investments and thus have negative impact on national output growth.

This implies that the initial impact falls on investment, public expenditure and deficit before the accumulated effects starts to affect growth via the lagged effects. This link to growth becomes important for the results and classifications of the countries in terms of empirical critical thresholds applied in this paper. But first, we need to document briefly the determinants of investment and growth and highlight the links through which the effects of debt overhang are transmitted.

III.1 External Debt and the Determinants of Private Investment[4]

Five broad categories of determinants of private investment are identified here incorporating risk factors. The first is what we would call "basic fundamentals" which correspond to a large extent to those factors considered under the neoclassical framework. They emphasize profitability of investment as affected by projected returns and cost of capital. Returns are typically proxied by real growth of output, and cost of capital by the level of real interest rates. An alternative measure of cost of capital in a credit-rationed economy is the availability of credit. More recently the list of fundamentals has been extended to include human capital and regional spillover effects, which influence the productivity of fixed capital and therefore returns.

[4] This subsection and the next attempts to motivate the channels through which external debt affects growth and investments in SSA and other contributory factors. The sections borrow form Elbadawi, Ndulu and Ndung'u (1997a and 1997b).

Available evidence suggests that net returns to investment (unadjusted for risk) must have risen in the last decade. As Table 6 shows, investment productivity, measured as the ratio of growth to investment rate, rose from a very low 9.3% during 1980-84 to 15.5%, 1985-94. Although investment productivity has not recovered to its level of the 1970s (median of 25.4%), its increase since the crisis period is quite large (a 66.6% gain)[5]. This gain in efficiency occurred in spite of the fact that private investment over the same period declined slightly. Relative to the efficiency in other regions however, SSA level is very low indeed.

The non-response of investment over the last decade must therefore be on account of other offsetting factors. We review this in the next section by classifying countries in relation to which side of the Laffer curve they are found using Elbadawi et el. (1997a, 1997b) critical thresholds beyond which debt overhang impacts negatively on growth and investment.

The second category is that of policy-related risks. These are dominated by macroeconomic policy uncertainties and in essence they affect the variability of prices and interest rates and therefore expected net returns to investment. Macroeconomic policy credibility is perceived via three main indicators - inflation and its variability, real exchange rate variability and the sustainability of fiscal balance. Other important policy-linked risks relate to ease of transfers across borders as affected by exchange controls (transfer risk) and openness to trade.

Although significant improvements in the macroeconomic policy stance may be achieved from adjustment, continued uncertainties as to whether or not such achievements will be sustained is associated with the observed investment pause in the periods immediately following adjustments. Imperfect policy reforms create value for the option to wait before investing in irreversible assets (Rodrik, 1991). Lower fiscal deficits and low inflation may reduce such uncertainty (Kumar and Mlambo, 1995 and Serven 1996) since they are associated with reduced variability of returns, either directly by stabilizing prices in the case of inflation or indirectly through maintaining viable fiscal balance which reduce pressure on inflation. It is however the volatility of these indicators and relative prices rather than their levels that is more important for risk perceptions of would-be investors. Policy credibility

[5] Based on the most recent growth performance, 1994-96 investment productivity has increased further with higher growth in 1995 and 1996. The investment productivity rate could be approaching the level of the 1970s.

is thus fundamental to breaking the tendency of the market participants to wait and to dislodge the investment pause (World Bank, 1994).

The majority of these countries are in fact insolvent, considering the magnitude of the external debt overhang. Suspicions of potential pressure for future reversal of policies are closely linked to this status. The second factor is the endogeneity of sustainability of reforms which produces a serious coordination problem. Lack of investment response can trigger reversals of reforms by raising adjustment costs (Laban, 1991). Thus investor-pessimism can be self-fulfilling. The issue is what external mechanism can stem this pessimism and the problem of coordination failure[6].

The third category is that of risks associated with external shocks. The two key types of shocks we consider here are external terms of trade changes and debt overhang. In the case of terms of trade both the average rate of change and its volatility are considered. Debt overhang is considered an external factor due to the fact that it results from past decisions and autonomous decisions by creditors. Debt overhang and debt service charges affect the investment through the liquidity effect.

Higher instability in the poorer countries may well reflect their larger exposure to foreign shocks and their lower capability to cope with these shocks. The effect of external shocks on growth performance have been shown empirically in cross-sectional growth studies (e.g. Schmidt-Hebbel et al, 1994; Elbadawi and Ndulu, 1995; and Easterly and Levine, 1995). There are two lines of the arguments here, first, these effects are mediated partly through the influence of terms of trade shocks on savings and hence investment. Second through the external debt overhang.

[6] Elbadawi, Ndulu and Ndung'u (1997a) discuss both aspects in the context of the relationship between debt overhang/debt relief and growth.

Among the features which distinguishes SSA most from other developing regions is the rapid growth of and magnitude of the debt overhang problem. The ratio of external debt to GDP has more than tripled over the past one and a half decades, in SSA. This very high indebtedness leads to three key influences on private investment via risk perceptions. First, are uncertainties with respect to the ability of the government to service the large obligations expected in the future without seriously reversing recent gains in narrowing the fiscal gap. Second and related to the first is the perception by investors that future taxes may have to be increased (internal transfers) so as to finance large external transfers to service the largely public or public-guaranteed debt. This raises uncertainties on future returns to investment. Thirdly, transfer risks associated with constrained-repayment capabilities and even debt repudiation raises suspicions on potential restrictions for remittance of funds across national borders. A high debt overhang will therefore undermine sovereign credit-worthiness.

In view of the above we would expect a significant and negative relationship between debt/GDP ratio and private investment beyond a threshold which is associated with a debt servicing problem. Before the threshold is reached however, the positive effects of current debt inflows in stimulating investment would dominate. These results have been used to show in the next section that once this critical threshold is reached, it becomes difficult for countries to get out of the crisis. Few countries using this classification have managed to get out of the debt crisis and develop into a virtouos circle. That is why Elbadawi, Ndulu and Ndung'u (1997a) argue that "after more than a decade's experience with adjustment and economic reforms in Sub-Saharan Africa (SSA), it is becoming clear that stabilization by itself may not be enough to trigger the "good equilibrium" which is consistent with a virtuous circle - from stabilization to growth".

The fourth category includes risks associated with the political (and social) environment as well as the quality of institutions. Political risks encompass perceptions of civil unrest, instability of governments and violation of civil liberties. Concerns with the quality of institutions largely pertain to safe guarding of property rights and bureaucratic red tapes of investment.

The fifth category is that of the level and structure of public investment which is considered to be autonomously determined here. To the extent investment in public infrastructure raises the private sector absorptive capacity it crowds-in private investment. State involvement in commercial activities and budgetary financing of

these crowds-out private investment. The interest has been to determine the net effect.

Finally, country risk has been shown to be partly sensitive to political and social risk. The main avenue of influence is the perception of potential loss of value of assets due to destruction of property if civil unrest or war erupts or expropriation of property with changes in political regimes. These factors have been shown to influence private investment with some empirical success so that we can use the results to discuss further the dynamic effects of debt on investment and then how growth performance halts.

III.2 Impact on Growth

The main focus of the earlier studies on explaining the slow growth in SSA countries was to isolate the influence of policy against the background of wide pursuit of reforms in this area since early 1980s. World Bank (1994), Elbadawi (1992), Elbadawi and Ndulu (1995), Easterly and Levine (1994) are among the most prominent of them. These studies confirm the strong influence of macroeconomic instability and misalignment of the real exchange on slow growth but much weaker influence of external shocks, predominantly terms of trade effects.

Drawing these studies together, a clear conclusion has been reached that the included factors now explain growth in SSA. There is no distinct features (unknown) which fail to explain the response of growth to policy, structural features or external shocks. External shocks do not significantly feature in most studies of growth in Africa. But as shown in Elbadawi et al.(1997a) these become important when the effects of debt overhang are included.

So what factors have been included in the empirical models that determine growth in the region? Empirical literature suggests that economic growth and other related macroeconomic targets (e.g. exports and private investment) are associated with five broad categories of variables:

- macroeconomic policy environment, mainly reflecting the extent of departure from fundamental macroeconomic balances or the degree and quality of intermediate macroeconomic public sector policies and outcomes, such as public investment policy;

- macroeconomic instability;
- external shocks;
- human capital and regional spillover effects; and
- institutional and political uncertainty variables.

The theoretical strand of the endogenous growth literature and the recent investment-irreversibility literature provide the rationale, as well as suggestions about the channels of influences of the above variables, especially those in the category of nontraditional determinants such as macroeconomic uncertainty, institutional, political and regional variables. The empirical success in incorporating these factors in the recent works allows us to move further and use these results for a concise discussion of effects and thus outline what we think are the dynamic effects from debt overhang to private investment and to growth and the debt crisis that has been evident in SSA countries.

IV. Critical Thresholds from Empirical Studies on Debt Overhang in SSA

Two studies Elbadawi, Ndulu and Ndung'u (1997a, 1997b) have analysed the effect of external and debt overhang on investment and output growth using the Laffer curve approach. This approach analyses a possible turning point where further debt accumulation starts to have negative effects on growth and investment response. Using their results, it is possible to classify countries in Africa in terms of which side of the Laffer curve they are to be found and what year they exceeded this critical thresholds. In addition it is also possible using their results to show whether there are countries that have managed to reverse their growth and investment rates and have managed to get out from the wrong side of the Laffer curve. Before this is done, we first re-produce and discuss the simulation model used and its comparative statics in order to situate the country classification on a plausible theoretical context.

Debt Sustainability

The model of debt sustainability used is built around two behavioural equations one for per capita output growth and for private investment. In addition, there is an identity for fiscal policy consistency. These two behavioural equations emphasise the links between private investment and output growth on one hand and external debt, fiscal balance, public investment and other factors, on the other. These are the factors discussed in the lats section. There is a simple behavioural relationship between public investment and the ratio of external debt service to public sector revenue. The model, its definitional identities and variable definitions are re-produced here below.

The model is highly aggregative and assumes two agents, the private and public sector on the investment, but only the public sector side is modelled in the spirit of the gap models. No goods market prices are included so that the adjustment via prices is absent. The motivation behind this formulation is that it is the public sector constraint that dominates in the context of external debt in SSA. This allows the model to focus on some useful benchmarks of the debt problems in SSA.

The model is solved for debt and fiscal deficit indicators consistent with a target real growth rate of 5%. The solution to the model is summarised by two key relationships that link both sustainable external debt to GDP and deficit to GDP ratios to output growth and public investment to GDP ratio.

The model closure (selection of exogenous and endogenous variables) is mainly driven by the structure of the model and the issues of interest for the analysis. These closure equations are shown on section B, equations 1-5. The model closure adopted for solving the model follows the "normative" mode, where a target for growth is fixed (5% per capita growth) and the model is solved for debt and fiscal deficit indicators consistent with this target growth rates as well as other assumptions about relative prices (real interest rates, real exchange rate), inflation and terms of trade shocks.

The model solution can be summarized by two key relationships linking both of sustainable external debt/GDP and deficit/GDP ratios to output growth and public investment/GDP ratio. If we make the logical assumption that HIPCs fall on the "bad" part of the Laffer curve, sustainable debt is negatively associated with both variables, while sustainable deficits is positively linked to the two variables. A summary of the simple comparative statics of higher growth target (or public investment ratio) generated by this model on sustainable external debt and public sector deficits is shown in the figure below.

Equation 1 is a quadratic equation with external debt accumulation, which is our major interest in order to solve for the turning point to approximate the Laffer curve representation. It shows that growth is affected by current external debt flows, EXDEBT, past debt accumulation squared and other variables. The most prominent of the other variables are deficit to GDP ratio, DEF, public investment to GDP ratio, PUINV, external debt service, EXDSX and variability of the terms of trade, CVTOT. When this equation is partially differentiated with respect to debt it produces the Laffer curve shown on figure 3.

The Simple Model of Debt Sustainability

A. Basic Model

1. $g_y = 5.38\,EXDEBT - 2.77\,EXDEBT^2 - 0.312\,DEF + 2.34\,PUINV - 0.046\,EXDSX - 0.029\,CVTOT + ADF\,(1990)$

2. $PRINV = .0041\,g_y + .021EXDEBT - .031EXDEBT^2 - .0024DEF - .023TOTSHK - .154EXDSX + ADF(1190)$

3. $PUINV = y_1 \frac{TDS^* xE}{R} + \text{ADF(1990)}$

4. $DEF = (R\text{-}G) + r \times DOMDEBT + r^* (EXDEBT^* - NFA^*)e + ADF(1990)$

5. $\text{EXDSX} = \frac{TDS^* \times E}{X}$

6. $\text{EXDSR} = \frac{TDS^* \times E}{R}$

B. Model Closure

1. $EXDEBT = f_1\,(g_y, PUINV, \ldots)$
2. $DEF = f_2\,(g_y, PUINV, \ldots)$
3. $PRINV = f_3\,(g_y, PUINV, \ldots)$
4. $EXDSX = f_5\,(g_y, PUINV, \ldots)$
5. $EXDSR = f_5\,(g_y, PUINV, \ldots)$

C. Main Assumptions

1. $gy = 0.05$
6. $e \times NFA^* = 0.0001$

2. $PUINV = 0.10$

3. $r = -1.8934$

4. $r^* = -0.48$

5. $DOMDEBT = 0.1141$

7. $e = \frac{E(local/US\$)}{CPI} = 0.89$

8. $R = 0.1033$

9. $G = 0.2132$

D. Definitions

g_y	Real per capita GDP Growth
EXDEBT	Total public and publicly guaranteed debt to GDP
DOMDEBT	Domestic debt to GDP
DEF	Overall deficit to GDP
EXDSX	Public and publicly guaranteed debt service to exports
EXDSR	Public and publicly gurarantеed debt service to revenue
PUINV	Public investment to GDP
PRINV	Private investment to GDP
R	Government revenue excluding grants to GDP
G	Government expenditure to GDP
EXDEBT*	Public and publicly guaranteed debt to GDP (in $)
NFA*	Net foreign assets to GDP (in $)
E	Nominal exchange rate (local/US$)
e	Real exchange rate
r*	Foreign real interest rate
r	Domestic real interest rate

Figure 1: Comparative Statics of Debt Dynamics

Equation 2 is a similar behavioural for investment. It is a quadratic equation with external debt accumulation, which is our major interest in order to solve for the turning point to approximate the Laffer curve representation. It shows that investment is affected by growth, by current external debt flows, EXDEBT, past debt accumulation squared and other variables. The most prominent of the other variables are deficit to GDP ratio, DEF, external debt service, EXDSX and terms of trade shocks, TOTSHK. When this equation is partially differentiated with respect to debt it produces the Laffer curve shown on figure 2.

Equations 3-6 define consistency requirements of public investment, fiscal consistency, external debt service and external debt to public sector revenue. The

main assumptions in this simple debt sustainability model are summarised in box C, equations 1-9. The idea here is to fix the growth rate at 5% and other policy and exogenous variables and then solve the model consistent with the target growth.

The purpose of this model is to show the dynamics of external debt on investment and growth drawing from the recent empirical works and summarising the salient features of debt dynamics. The broader results from these works are used to define the critical threshold where the Laffer curves defined by equations 1 and 2 and shown in figures 2 and 3 achieve a maximum limit and further debt ..accumulation from this point has negative effects.

Some Comparative Statistics

The whole exercise of the debt sustainability issue was to aid in the computation of some simple comparative statics in order to show the effect of external debt on private investment and growth. These are shown in figure 1, which emanates form the simple model discussed.

Equations 1 and 2 give the solution for external debt/GDP and deficit/GDP ratios as functions of output growth and public investment/GDP ratio. If we make the logical assumption that HIPCs fall on the "bad" part of the Laffer curve, sustainable debt is negatively associated with both variables, while sustainable deficits is positively linked to the two variables. Figure 1 summarises the simple comparative static of higher growth target (or public investment ratio) on sustainable external debt and public sector deficits. An increase of the growth target from g_0 to g_1, requires a reduction of sustainable external debt ratio from b_0 to b_1; but this would allow for a higher consistent fiscal deficits from d_0 to d_1, and would also require a higher public investment ratio from $(Ig/y)_0$ to $(Ig/y)_1$.

The Empirically Calculated Critical Thresholds

The model described above provides us with an idea about the dynamics of external debt on growth and investment. In order to push the discussion further, we re-produce the critical thresholds and categorize the countries in terms of what side of the Laffer curve they are to be found. It would thus be interesting to compare such classifications with the reality of the best and worst performers in the region. Tables 8 and 9 summarise these classifications using growth and investments. This

classification has a time dimension, such that when a country goes beyond the critical limits, it slowly sinks into a vicious circle and does not manage to get back on the right side of the Laffer curve. In a sense the debt crisis in a country would start to creep in.

Figure 2: The Critical Turning Point: Private Investments and External Debt

From the private investment behavioural equation, we can solve for the private investment rate consistent with this threshold. This is 10.2%, that is, the private investment as a ratio of GDP. It shows that the optimal investment rate that can be supported by an optimal debt accumulation of 33.5% reaches 10.2% and then any further debt accumulation beyond 33.5% will depress private investment.

The critical threshold relating external debt accumulation and private investment rates are used to classify countries in terms of their position in this critical divide. It shows that once external debt passes the critical threshold o 33.5%, further debt accumulation depresses private investments. Table 4 classifies those countries on the right and wrong side of the Laffer curve using an empirically calculated threshold of the investment equation vis-a-vis the debt overhang and the respective years when the respective countries found themselves either on the right or wrong side of this divide. A few points from this classification can be noted:

- Few countries are to be found on the right side which implies that the effect of debt overhang starts depressing private investment fairly early.
- Most of the countries seem to have gone from the right to the wrong side of the Laffer curve in the 1980s. But the debt overhang problem seem to started in the 1970s.
- Very few countries seem to have managed to reverse their position. Botswana managed to reverse its position between 1978 and 1989, Swaziland and Mauritius in 1990 and 1993, respectively.
- Those countries that have managed to reverse their positions on the Laffer curve are also some of the best performers in the region. Good examples are Botswana and Mauritius.
- This classification tend to support and confirm the channel through which debt overhang affects the economy. This is through private investment and explains why African countries seem to slowed their investment performance.

Table 4: Investment and Debt overhang in Africa

Right Side of the Laffer Curve < 33.5% Debt to GDP ratio	Wrong Side of the Laffer Curve > 33.5% Debt to GDP ratio (Years indicate when the threshold was passed)
Algeria (1971-1972), Botswana (1978-1989), Gabon (1981-85), Swaziland (1990), Mauritius (1993).	Algeria (1973), Benin (1982), Botswana (1972), Burkina Faso (1984), Burundi (1984), Cameroon (1978), Cape Verde. (1981), Central African Republic (1981), Chad (1979), Comoros (1980), Congo (1971), Cote d'Ivoire (1975), Djibouti (1985), Egypt (1975), Equatorial Guinea (1977), Ethiopia (1987), Gabon (1971-1980,1986-1994), Gambia (1980), Ghana (1981), Guinea (1986), Guinea Bissau (1978), Kenya (1974), Lesotho(1982), Liberia(1978), Madagascar (1981), Malawi (1971), Mali (1971), Mauritius(1980-1992), Morocco(1977), Mozambique (1985), Niger(1981), Nigeria (1986), Rwanda(1991), Sao Tome Principe (1978), Senegal (1978), Seychelles(1977), Sierra Leone(1977), Somalia (1976), Sudan (1975), Swaziland(1978-1989), Tanzania (1975), Togo (1977), Tunisia(1977), Uganda (1980), Zaire (1981) and Zambia (1971) and Zimbabwe(1984).

From the growth behavioural equation, we can solve for that growth rate consistent with the debt accumulation to GDP of 97%..This is calculated and shown to be 3.6%. It shows that the optimal rate of growth that can be supported by an optimal debt accumulation of 97% reaches 3.6% and then any further debt accumulation beyond 97% will depress growth.

Figure 3 re-produces the critical thresholds in relation to growth. It shows that after an accumulation of external debt beyond a threshold of 97%, external debt starts to have an negative impact on debt. This debt accumulation is higher than that of investment. It shows that there is a dynamic effect where the effects on private investments starts early and then this compounds the effect on growth. Table 5 summarises the countries position on the Laffer curve using this threshold.

There are several points to note from this table:

- A large number of countries is to be found on the right side of the Laffer curve compared to the investment case.
- Most of the countries on the right side have also recorded relatively higher growth performance.

Figure 3: Debt and Growth Dynamics

- This classifications also confirm and support the conclusion in most studies that debt overhang problem in SSA countries has led to an investment pause as evidenced on table 4 and a large number of countries' growth performance has declined.
- These two tables show a dynamic process where a country could have a low growth and low investment rates but with less debt accumulation, so that at the right side of the divide, external debt may revitalise growth via investment along the lines suggested by the gap models. However, as recent growth literature has shown, economic agents respond to incentives and there is strong relationship between incentives and investment and incentives and growth on one hand and there is a strong relationship between investments and growth. Thus the moment the critical threshold of debt accumulation is surpassed, economic agents develop an averse response and investment pause starts. This pause affects the potential of future growth. If the situation is not reversed, then the accumulated effects of debt overhang gets to the critical threshold in relation to growth and countries slowly sink into a vicious circle. This explains why few countries in the sample have managed to break the vicious circle. Those countries that have managed to break the vicious circle are also the countries that have managed to reverse their positions on the Laffer curve.

These results tend to reinforce the conclusions of earlier studies, that "after more than a decade's experience with adjustment and economic reforms in Sub-Saharan Africa (SSA), it is becoming clear that stabilization by itself may not be enough to trigger the "good equilibrium" which is consistent with a virtuous circle - from stabilization to growth". Thus it is necessary to stem to eradicate the investment pause via reducing drastically the current external indebtedness in SSA countries and revitalise incentives that would support investment, capital accumulation and thus revive and sustain growth in incomes.

V. Conclusions

The argument in this paper has been that the external debt problem in Africa has led to an investment pause and reduced growth performance substantially. To strengthen the argument, results from recent empirical work by Elbadawi, et. al. (1997) was used to show the dynamics of the problem and how a country moves from the one side of the Laffer curve to the other and the effects on investment and growth. The conclusion to be drawn from the sequential classification of countries in terms of the magnitude of their debt accumulation, private investment rates and growth performance shows that:

- Debt overhang is associated with negative consequences on sustaining a virtuous circle of reforms and adjustment. This is shown from the dynamics of debt accumulation and private investments. Once a country gets into the wrong side of the Laffer curve and does not reverse the trend, the accumulated effects further affects growth performance.
- It is shown that the effects on private investment rates, the channel through which debt overhang affects investment and hence future growth, starts early (at a computed threshold of 33.5% of debt accumulation to GDP) and few countries have managed to reverse the trend in Africa and this provides evidence why there has been an investment pause in Africa. This also provides support to the fact that SAPs policies have failed to revive and sustain growth in Africa due to the presence of debt overhang. In addition to the debt accumulated, the debt service burden which crowds out domestic expenditure needed for supporting productive capacity further compounds the problem and shows that it is difficult to stimulate investment and hence growth under these circumstances. This explains why most of the countries were found on the wrong side of the Laffer curve.

Thus the conclusions arrived at earlier that "after more than a decade's experience with adjustment and economic reforms in Sub-Saharan Africa (SSA), it is becoming clear that stabilization by itself may not be enough to trigger the "good equilibrium" which is consistent with a virtuous circle - from stabilization to growth", seems to be valid and reinforced by the conclusions in this paper. Thus it is necessary to stem to eradicate the investment pause via reducing drastically the current external indebtedness in SSA countries and revitalise incentives that would

support investment, capital accumulation and thus revive and sustain growth in incomes. The HIPC Debt Initiative is a first step in this direction but needs to be supplemented by other relief measures that will quickly show the results and produce a relevant supply response.

Appendix

Table A.1: Investment and Growth in SSA

(a)	**Sub-Saharan Africa (Medians %)**			
		1970-79	1980-84	1985-94
I)	Private fixed investment to GDP	7.89	8.88	8.42
ii)	Public Fixed investment to GDP	9.47	10.56	9.0
iii)	Real GDP growth	4.37	1.78	2.68
(b)	**Comparison with other regions (in %)**			
I)	Private Fixed Investment to GDP	1985-94		
	SSA	8.42		
	Latin America	11.15		
	East Africa	20.92		
ii)	Public Fixed Investment to GDP			
	SSA	9.00		
	Latin America	4.98		
	East Asia	7.79		
iii)	Real Per Capita GDP growth			
	SSA	-0.3		
	Latin America	0.8		
	East Asia	5.6		

Table A.2: Macroeconomic Policy Stance in SSA(Medians)

		1981-86	1987-92
a.	**Inflation** (%)		
	SSA	10.5	7.5
	CFA countries	6.6	0.2
	Non-CFA countries	18.4	22.5
b.	**Change in real** ^{effective}		
	exchange rate (%)		
	CFA countries	-7.6	11.4
	Non-CFA countries	60.0	47.6
c.	**Parallel market exchange**		
	rate premium (%)		
	Non-CFA countries	59.7	36.5
d.	**Seigniorage** (%)		
	SSA	1.1	0.7
	CFA countries	1.0	0.3
	Non-CFA countries	1.6	2.0
e.	**Real interest rate for deposits** (%)		
	SSA	-0.7	1.0
	CFA countries	2.0	6.0
	Non-CFA countries	-5.2	-4.7
f.	**Overall fiscal deficits** (excl. grants)		
	SSA	7.6	8.5
	CFA countries	7.5	9.4
	Non-CFA countries 10.1	8.5	
g.	**Overall fiscal deficits** (incl. grants)%		
	SSA	6.2	6.1
	CFA countries	6.0	6.4
	Non-CFA countries	7.3	4.7

Notes: (1) An increase in RER index indicates real depreciation of REER
(2) Seigniorage is calculated as the change in M_1 cover GDP less the share of M_1 to GDP times real GDP growth rates

Source: Bouton, Jones and Kiguel (1994)

Table A.3: Trends in Investment Productivity SSA (Median)

	1970-79	1980-84	1985-94	1991-1997
GDP growth	4.4	1.8	2.7	2.5
Investment Rate	17.3	19.4	17.4	20.1
Productivity of Investment[1]	25.4	9.3	15.5	na

Notes: 1. Investment productivity is calculated as an inverse of ICOR, here simply measured as GDP growth/investment rate.

Source: Calculated from the data base of African Development Indicators (1996), World Bank, Washington, D.C.

Table A. 4: External Shocks and Variability

External Indebtedness			
Debt Overhang (%) SSA			
	1970-79	1980-84	1985-94
External Debt to GDP	23.8	49.6	81.2
Debt Service (SSA)	1980	1990	1995
Interest payments to Exports	6.2	9.1	7.2
Total Debt Service to Exports	9.7	17.8	14.7
Terms of Trade			
	1970-79	1980-84	1985-94
TOT (median)	129.19	110.98	99.92
Variability of TOT[1] (median)	11.17	8.73	7.57
(average)	13.25	10.14	9.36

Notes: 1. Variability of TOT is measured by its coefficient of variation.

Source: Computed from African Development Indicators 1996, the World Bank, Washington.

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