



**New Estimates of Capital Flight
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New Estimates of Capital Flight from Sub-Saharan African Countries: Linkages with External Borrowing and Policy Options¹

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1. Introduction

The analysis of capital flows to and from Africa presents a stunning paradox. On the one hand, African countries are heavily indebted and must make difficult decisions with regard to the allocation of national resources between debt payments and provision of vital social services to their populations. Over the past decades, African countries have been forced by external debt burdens to undertake painful economic adjustments while devoting scarce foreign exchange to debt-service payments. On the other hand, African countries have experienced massive outflows of private capital towards Western financial centers. Indeed, these private assets surpass the continent's foreign liabilities, ironically making sub-Saharan Africa a "net creditor" to the rest of the world (Boyce and Ndikumana 2001). Compared to other developing regions, Africans tend to exhibit a significantly higher preference for foreign assets relative to domestic assets; hence Africa has the highest proportion of private assets held abroad (Collier, Hoeffler, and Pattillo 2001).

Some of the private assets held abroad by Africans may well be legally acquired. But the legitimacy of a significant part of these assets is questionable. This is especially the case for the wealth held by African political and economic élites in international financial centers that provide the coveted secrecy of banking operations. Recently, international pressure on Swiss banks has uncovered large sums of money belonging to former African rulers including Sani Abacha of Nigeria and Mobutu of the Congo

(former Zaïre). These may be only the tip of the iceberg of looted African national resources.

The problem of capital flight from African economies deserves serious attention for several reasons. First, capital flight constitutes a diversion of scarce resources away from domestic investment and other productive activities. In recent decades, African economies have achieved significantly lower investment levels than other developing countries (International Financial Corporation, 1998; Ndikumana, 2000). Moreover, evidence in the literature shows that the African continent is the most capital-scarce among all developing regions (Collier, Hoeffler, and Pattillo 2001: 59). Collier, Hoeffler, and Pattillo (2001) estimate that if Africa were able to attract back the flight component of private wealth, domestic private capital stock would rise by about two-thirds. These authors find that capital flight carries high social costs in terms of lost output: Africa's GDP per capita is estimated to be 16 percent lower than it would be if the continent had been able to retain its private wealth at home (p. 60). The hemorrhage of capital is likely to be accompanied by losses of human capital due not only to outmigration but also to missed opportunities for "learning-by-doing" amongst entrepreneurs and financial institutions (Nyarko 2007).

Second, capital flight is likely to have pronounced regressive effects on the distribution of wealth. The individuals who engage in capital flight generally are members of the subcontinent's economic and political élites, who take advantage of their privileged positions to acquire and channel funds abroad. Both the acquisition and the

transfer of funds often involve legally questionable practices, including the falsification of trade documents (trade misinvoicing), the embezzlement of export revenues, and kickbacks on public and private sector contracts (see, for example, Ndikumana and Boyce, 1998). The negative effects of the resulting shortages of revenue and foreign exchange fall disproportionately on the shoulders of the less wealthy members of the society. The regressive impact of capital flight is compounded when financial imbalances result in devaluation: the wealthy who hold external assets are insulated from the effects, while the poor enjoy no such cushion.

A third reason for greater attention to African capital flight is that most sub-Saharan African countries remain in the grip of a severe external debt crisis. By 2000, debt service amounted to 3.8% of gross domestic product (GDP) for sub-Saharan Africa (SSA) as a whole. By comparison, SSA countries spent 2.4% of GDP on health in that year. Only 55% of the people in SSA have access to clean drinking water, while illiteracy rates and infant mortality rates in SSA are among the highest in the world (UNECA 2007). Insofar as the proceeds of external borrowing were used not to the benefit of the African public, but rather to finance the accumulation of private external assets by the ruling élites, the moral and legal legitimacy of these debt-service obligations is open to challenge. We discuss this issue further in the paper.

The debate over strategies to increase development financing in Africa must include a discussion of the policies to curb the continent's hemorrhage of capital, as well as strategies for inducing repatriation of capital legally held by Africans abroad. Efforts

to recover African wealth that was acquired illicitly and is now held abroad will meet resistance both from the holders of the assets and from their bankers in the West. While economic reforms in African countries may attract the return of legally acquired assets (as well as foreign direct investment), repatriation of illicit capital and the prevention of future illicit outflows will require a concerted effort by the international political and financial community to increase transparency and accountability in international banking practice.

The first objective of this paper is to provide a comprehensive set of estimates of capital flight for a sample of 40 African countries over the period of 1970-2004 to help in assessing the magnitude of the capital flight phenomenon. Second, the paper reviews the literature on the causes of capital flight from sub-Saharan Africa as a way of identifying the factors that may be reversed by appropriate policy responses. Third, we provide new econometric evidence on the linkages between external borrowing and capital flight, one of the key relationships identified in the empirical literature. We confirm the robustness of the debt-capital flight relationships by estimating the capital flight equation using a proxy of capital flight that is independent of debt in its construction. This proxy is bank deposits held by African non-bank private agents in Western banks. Bank deposits are one of the means by which smuggled funds are held abroad and thus are related to our measure of capital flight. Thus we are able to confidently conclude that the strong relationship between capital flight and external borrowing is not a spurious relationship arising from the definition of capital flight that we use in the paper. Fourth, the paper discusses strategies to prevent and reverse capital flight with a special emphasis on the

rationale for advocating the doctrine of odious debt for the repudiation of illegitimate debts. The paper closes with a summary of the evidence and the arguments.

2. Magnitude of capital flight from sub-Saharan Africa

2.1 *New estimates of capital flight over the 1970-2004 period*

Existing studies reveal large amounts of capital outflows from sub-Saharan African countries over the past decades. The estimated magnitudes of capital flight have varied, primarily due to differences in data and time-period coverage.¹ The standard methodology is to calculate capital flight as the residual difference between capital inflows and recorded foreign-exchange outflows. For country i in year t , capital flight is computed as follows (Boyce and Ndikumana 2001):

$$KF_{it} = \Delta DEBTADJ_{it} + DFI_{it} - (CA_{it} + \Delta RES_{it}) + MISINV_{it} \quad (1)$$

where $\Delta DEBTADJ$ is the change in the country's stock of external debt (adjusted for cross-currency exchange rate fluctuations, so as to take into account the fact that debt is denominated in various currencies and then aggregated in US dollars); DFI is net direct foreign investment; CA is the current account deficit; ΔRES is the change in the stock of international reserves; and MISINV is net trade misinvoicing. This method is a variant of the one used by the World Bank (1985) among others, based on the difference between the inflows of foreign exchange from external borrowing (as reported in the World Bank's *World Debt Tables*) and the uses of foreign exchange reported in the IMF's

¹ For discussions of the methodology for the computation of capital flight, see Lessard and Williamson (1987); Ajayi (1997); and Boyce and Ndikumana (2001).

Balance-of-Payments Tables. Boyce and Ndikumana (2001) refine this measure by incorporating adjustments for trade misinvoicing and for the impact of exchange rate fluctuations on the dollar value of external debt.

In this study, we include two further innovations to the method of computation of capital flight. First, we adjust the change in debt to account for debt write-offs. Debt write-offs reduce the stock of debt although they have no corresponding flow of debt service. Hence, they lead to an overstatement of debt service and an understatement of the change in debt obtained as the change in annual debt stocks over consecutive years. Second, we include an adjustment for underreporting of remittances. A detailed description of the algorithm we use to compute capital flight is provided in Appendix A.

The annual flows of capital flight for the 40 sub-Saharan African countries over the 1970-2004 period (in million of 2004 dollars) are given in Table B1 in the appendix.² Table 1 summarizes these data. Real capital flight over the 35-year period amounted to about \$420 billion (in 2004 dollars) for the 40 countries as a whole. Including imputed interest earnings, the accumulated stock of capital flight was about \$607 billion as of end-2004. Together, this group of SSA countries is a “net creditor” to the rest of the world in the sense that their private assets held abroad, as measured by capital flight including interest earnings, exceed their total liabilities as measured by the stock of external debt. Their net external assets (accumulated flight capital minus accumulated external debt) amounted to approximately \$398 billion over the 35-year period. To give a sense of the

² Boyce and Ndikumana (2003) report estimates of capital flight for the period 1970-96 for a sample of 30 countries included in this study. For these countries and this period, we simply convert these series to 2004 dollars, and add the further adjustments for debt write-off and unrecorded remittances.

relative magnitude of the region's net external position, the region's external assets are 2.9 times the stock of debts owed to the world. For some individual countries, the results are even more dramatic: for Côte d'Ivoire, Zimbabwe, Angola, and Nigeria the external assets are 4.6, 5.1, 5.3, and 6.7 times higher than their debt stocks, respectively. For some countries, the stock of capital flight is negative implying that inflows outweigh outflows over the period.

The data indicate that capital flight is not solely a phenomenon dating from the onset of the debt crisis of the 1980s (see Ndikumana and Boyce 2003). The outflows of the 1970s were often comparable to, and in some cases greater than, those of more recent decades. Over the period, a number of countries appear to have experienced episodes of capital flight reversal (that is, net outflows followed by net inflows), but in the period as a whole, outflows more than outweigh inflows for all but seven countries in the sample (Benin, Comoros, Mali, Mauritius, Niger, Senegal, and Togo).

2.2 *International comparisons*

The existing evidence suggests that capital flight from African countries constitutes a heavier burden compared to that of other developing regions, even though the absolute volumes are arguably lower. Chang and Cumby (1991) examined a sample of 36 African countries from 1976 to 1987 and found that with the exception of Nigeria, the absolute levels of capital flight from individual African countries were smaller than those from Latin American countries, but that relative to external debt and GDP, African

countries experienced higher capital flight than their Latin American counterparts. Hermes and Lensink (1992)³ also found that while total capital flight from sub-Saharan African countries is smaller than that from Latin American countries, the burden of capital flight (as a percent of GDP) is higher: 61% for the sub-Saharan sample compared to 22% for Latin America (also see Murinde, Hermes, and Lensink, 1996).

Empirical evidence also shows that sub-Saharan Africa has the highest ratio of private capital held abroad in the form of capital flight. Collier, Hoeffler, and Pattillo (2001) find that in 1990 about 40 percent of African private capital was held abroad, the highest ratio in the developing world. In a subsequent study, these authors find that capital flight increased in the 1990s compared to the 1980s and that Africa continues to lead other regions in capital flight (Collier, Hoeffler and Pattillo, 2004).

3. Causes of capital flight from Africa: Literature review

To devise strategies for curbing capital flight and inducing the repatriation of private wealth held outside of Africa, it is important to understand the forces that drive capital flight from the continent in the first place. In this section, we review the existing econometric evidence on the determinants of capital flight to shed light on factors that may be influenced by appropriate policy initiatives. The review is by no means exhaustive, as we limit ourselves to the findings that are most prominent (robust) and

³ The study by Hermes and Lensink (1992) covers six countries (Congo-Zaire, Côte d'Ivoire, Nigeria, Sudan, Tanzania, and Uganda) over the period 1976 to 1989. They used the somewhat narrower 'non-bank' definition of capital flight proposed by Morgan Guaranty Trust (1986), which excludes assets held abroad by domestic banks.

most closely linked to policy. For a more extensive review of the empirical evidence, see Ndikumana and Boyce (2003).

3.1 *Debt and capital flight: a two-way relationship*

Empirical evidence indicates that the annual flows of external borrowing constitute the most consistent determinant of capital flight. In a sample of 30 sub-Saharan countries over the period 1970-96, Ndikumana and Boyce (2003) found that for every dollar of external borrowing by a SSA country in a given year, on average, roughly 80 cents leave the country as capital flight. Their results also support the hypothesis that debt overhang has an independent effect on capital flight: a one-dollar increase in the stock of debt adds an estimated 3.5 cents to annual capital flight in subsequent years. Collier, Hoeffler, and Pattillo (2004) report an almost identical result, with a one dollar increase in the stock of debt leading to 3.2 cents of capital flight.

The causal relationships between capital flight and external debt can run both ways; that is, foreign borrowing can cause capital flight, while at the same time capital flight can lead to more external borrowing. Boyce (1992) distinguishes four possible causal links. First, foreign borrowing causes capital flight by contributing to an increased likelihood of a debt crisis, worsening macroeconomic conditions, and the deterioration of the investment climate. In such cases of *debt-driven capital flight*, “capital flees a country in response to economic circumstances attributable to the external debt itself” (Boyce 1992: 337). High levels of debt also may be interpreted as a signal of higher tax rates in

the future as the government seeks to service the debt. These effects will deter domestic investment while inducing capital flight.

Secondly, foreign borrowing provides the resources as well as a motive for channeling private capital abroad, a phenomenon Boyce (1992: 338) terms *debt-fueled capital flight*. In such cases, funds borrowed abroad (by the government or by private borrowers with government guarantees) are re-exported as private assets. In some cases, the funds may never even leave the creditor bank, simply being transferred into an international private banking account at the same institution (Henry 1986).

In the other two linkages, capital flight causes foreign borrowing. In the case of *flight-driven external borrowing*, capital flight drains national foreign exchange resources, forcing the government to borrow abroad.⁴ In the case of *flight-fueled external borrowing*, flight capital directly provides the resources to finance foreign loans to the same residents who export their capital, a phenomenon known as “round-tripping” or “back-to-back loans,” motivated by the desire to obtain government guarantees on foreign borrowing, or by the need to devise a pretext for unexplained wealth.

3.2 *Hysteresis in capital flight*

The evidence in the literature reveals that capital flight tends to persist over time: all else equal, past capital flight “causes” more capital flight, which suggests *hysteresis* in

⁴ Kahn (1991, p. iv) suggests that in the South African case, in some periods “the need to finance capital flight might account for all the accumulation of external debt.”

the dynamics of capital flight. Ndikumana and Boyce (2003) interpret this result as a *habit formation effect*, as private actors gain experience in smuggling capital abroad. The result may also reflect a *contagion effect*, as capital flight corrodes the legitimacy of capital controls, particularly if the flight capitalists include government authorities. At the same time, capital flight may contribute to the deterioration of the macroeconomic environment, in turn sparking further capital flight. Collier, Hoeffler, and Pattillo (2004) find that the effects of past capital flight last up to a decade, suggesting that portfolio adjustment is a slow process. This suggests that it may take a long time before countries are able to reap the dividends from policy reforms aimed at curbing capital flight.

3.3 *Good economic performance as a deterrent of capital flight*

Good economic performance, measured simply in terms of higher economic growth, is associated with lower capital flight (Ndikumana and Boyce 2003). Higher economic growth is a signal of higher expected returns on domestic investment, which induces further domestic investment and thus reduces capital flight. High and sustained economic growth also gives confidence to domestic investors about the institutional and governance environment of the country. It constitutes the most palpable evidence that the country's institutions and governance system are favorable for private economic activity, whereas stagnation and economic decline are an indication that the government has lost control over the economy.

3.4 *Political risk induces capital flight*

High political risk has played a significant role in the capital hemorrhage experienced by sub-Saharan African countries over the past decades. In a case study of South Africa, Fedderke and Liu (2002) find that both the change in political rights dispensation and an index of political instability are positively related to capital flight. In a cross-country study, Collier, Hoeffler, and Pattillo (2004) find that more durable regimes experience significantly less capital flight, while countries prone to civil wars experience higher capital flight. However, the result on the effects of regime durability should be taken with some caution given the history of political change in Africa. Frequent regime changes are typically associated with higher political instability, which discourages domestic investment and induces capital flight. It does not necessarily follow, however, that durable regimes are associated with a better political environment. Some regimes in Africa have persisted because they were able to establish an oppressive apparatus that suppressed demand for political opening. Examples include the regimes of Mobutu in the Congo and Mugabe in Zimbabwe. Such regimes are associated with high risk of expropriation and uncertainty, which deters domestic investment and induces capital flight. Moreover, under such regimes, capital flight is high as government leaders engage in smuggling the country's assets, including natural resources, borrowed funds, and official aid (for evidence on the case of the Congo, see Ndikumana and Boyce, 1998).

3.5 *Corruption induces capital flight*

Corruption has figured prominently in discussions of the problem of capital flight from sub-Saharan Africa. There are various ways to understand the effects of corruption on capital flight. First, capital flight consists of assets which often are acquired illegally domestically and channeled abroad illegally as well. Corruption facilitates both the illegal acquisition as well as the illegal transfer of private assets. Secondly, countries experience high capital flight partly as a result of its “contagious” nature. As government officials engage in capital smuggling and embezzlement of national resources, private agents are induced to engage also in illicit transfers of assets abroad as a result of the collapse of the mechanisms of control and accountability. In general, high levels of corruption are a symptom of failure of the governance system, which results in high economic risk. In such an environment, private agents cannot fully internalize the costs of corruption and choose to hold assets abroad as a means of hedging against uncertainty.

Collier, Hoeffler and Pattillo (2004) suggest that the role of corruption may explain the differential behavior of financial capital flight relative to that of human capital flight from Africa. Their study finds that “the Africa dummy” is significant for financial capital flight, but not for human capital flight. That is, Africa tends to have higher financial capital flight than predicted by their model, but that this is not the case for human capital flight. One possible explanation is that while financial capital is related to corruption as discussed above, the relationship between corruption and human capital flight is weaker.⁵

⁵ Note also that the lower human capital flight in sub-Saharan Africa is partly due to the fact that the authors consider immigration to the United States only. In practice, African migration is primarily an intra-Africa phenomenon, due not only to geographic distance but also political distance vis-à-vis the West.

3.6 *Price distortions induce capital flight*

Agents choose to hold assets abroad to shield their portfolios from the effects of changes in relative returns arising from external shocks and policy uncertainty. Empirical studies have found a significant effect of the black market premium on capital flight (see Collier, Hoeffler, and Pattillo, 2004). The black market premium constitutes an effective subsidy on assets held abroad and symmetrically a levy on assets held domestically. Market distortions therefore can have important regressive effects, disproportionately hurting the general public relative to the political and economic élites who are able to hold assets abroad.

4. External debt and capital flight: New evidence for sub-Saharan African countries

4.1 Estimation methodology

The econometric analysis in this study builds on existing research on the determinants of capital flight from sub-Saharan African countries. In particular we explore further our earlier findings that show a positive and significant relationship between capital flight and both annual flows of external borrowing and the cumulative stock of external debt, suggesting that capital flight is both *debt-fueled* and *debt-driven* (Ndikumana and Boyce 2003). In other words, external borrowing appears to provide resources for capital flight while growing indebtedness provides a motive for private

agents to export capital. Earlier evidence also shows that capital flight exhibits a high degree of *hysteresis*, or persistence. Furthermore, it is negatively related to the growth rate of per capita GDP, possibly implying that growth is a signal for returns to domestic capital so that high growth is a disincentive for exporting capital and an incentive for investing domestically.

Based on this evidence, we formulate the econometric model as follows:

$$KF_{it} = \sum_{j=1}^q \theta_j KF_{i,t-j} + \alpha_1 DEBT_{it} + \alpha_2 growth + \boldsymbol{\beta}' \mathbf{X}_{it} + \eta_i + \varepsilon_{it} \quad (2)$$

where for a country i at time t , KF is the ratio of real capital flight to GDP (and $j = 1 \dots q$ is the number of lags), $DEBT$ is alternatively the ratio of the annual inflows of debt (change in debt stock) to GDP or the ratio of the debt stock to GDP (we also run regressions with change in debt and the stock of debt simultaneously), $growth$ is real GDP growth rate, \mathbf{X} is a vector of control variables, η_i is a country-specific intercept representing unobservable individual country characteristics, and ε is a white-noise error term.

Among control variables we explore are the effects of the macroeconomic environment, interest rate differentials, financial development, natural resources, and governance. An unstable macroeconomic environment increases uncertainty over expected returns to domestic capital, which reduces incentives for investing domestically, thus inducing capital flight. We proxy macroeconomic uncertainty by inflation variability, measured as

the absolute value of the difference between actual inflation and predicted inflation⁶. Including the real interest rate differential – proxied by the real US Treasury bill rate minus the African country’s real deposit rate – permits us to test whether the conventional portfolio theory assumption that capital flight is driven by higher world interest rates relative to domestic rates. As a measure of financial development, we use bank credit to the private sector as a ratio of GDP. The natural resource endowment is included as a potential source for both exportable funds and embezzlement of exports. As a proxy for this, we use the share of fuel exports in the country’s total exports. We⁷ explore the role of governance⁸ by interacting natural resources with a polity measure. The rationale for this interaction is that a natural resource-rich country with a corrupt regime will experience more capital flight as the leaders embezzle the proceeds of exports and channel them into private assets held abroad. Summary statistics for the regression variables are provided in Table B2 in the Appendix.

In the estimation of the above equation, we pay due attention to potential causes of biases in the estimates, which especially arise in the context of panel data. In addition to country-specific fixed effects, we account for outliers by using the robust ordinary least squares estimation technique.. We also account for potential simultaneity between external borrowing and capital flight. As discussed above and more extensively in past studies (Boyce and Ndikumana 2001; Ndikumana and Boyce 2003), the relationship

⁶ Predicted inflation is obtained from a linear regression of inflation on time.

⁷ “Fuel exports” consist of “mineral fuels” (SITC Section 3) as reported in the World Bank Africa Database (and World Development Indicators).

⁸ As a proxy of governance we used the Polity2 index from Polity IV Project’s database which ranges from –10 (strongly autocratic) to +10 (strongly democratic).

between capital flight and external borrowing can run both ways. While external borrowing provides both resources and a motivation for capital flight, the latter in turn can cause more external borrowing as it drains government resources. We account for this potential source of bias by using the instrumental variable estimation technique (where debt is considered endogenous).⁹

4.2 Discussion of the results

The revolving door effects: Debt flows and capital flight

The results in Table 2 clearly indicate a positive and significant relationship between capital flight and the annual inflows of external debt (change in the stock of debt). The first column of the table contains results with robust OLS estimation, the second regression results adding country fixed effects, and the last results from the instrumental variable approach where change in debt is considered endogenous.

The results in all cases show a statistically significant and economically large effect of external borrowing on capital flight. The estimated coefficient on change in debt implies that up to 62 cents out of each dollar borrowed abroad between 1970 and 2004 has left sub-Saharan Africa in the form of capital flight. The results provide strong

⁹ We also attempted the more general instrumental method, the GMM technique, which however performed poorly for this sample of countries: diagnostic tests fail to reject the null hypothesis that the instruments are invalid and also fail to reject the hypothesis that second-order autocorrelation coefficient is significant. The results are not reproduced here.

support for the revolving door phenomenon, or debt-fueled capital flight, whereby borrowed funds are captured and converted into private assets in foreign banks.

The debt overhang effect: Debt stock and capital flight

The results reported in Table 2 also show a strong positive effect of the stock of external debt on capital flight. The results again are robust to country-specific effects and any potential two-way causation between capital flight and debt as can be seen in the regressions with the instrumental variable approach where external debt is considered endogenous (column 6).

These results also indicate that the effect of external debt on capital flight is economically meaningful. They suggest that an increase in the stock of debt by one dollar leads to 3 to 4 cents of capital flight in subsequent years. There are two related possible explanations for this effect. First, in a highly indebted country, investors may expect that future economic performance will be lower, implying lower overall returns to investment. This reduces incentives for investing domestically, encouraging capital flight. Second, private agents may expect that high future debt service obligations associated with high debt stock will force the government to raise more taxes to meet debt service commitments. Higher future taxes reduce expected after-tax returns to capital, which further reduce incentives for investing domestically, leading to higher capital flight.

In the last column of Table 2, both the debt flow and debt stock are included simultaneously in the regression. The coefficients on both the flow and the stock measures are statistically significant. This specification incorporates both the *debt-fueled* capital flight (with change in debt) and *debt-driven* capital flight (with debt stock) channels. As the results indicate, the linkages between capital flight and external borrowing in this sample of African countries operate through both channels. In the following exploration of the effects of other factors, we use this specification that includes both the flow and stock of debt and apply the fixed-effects estimation methodology.

Other factors

The regression results show that other factors also play an important role in explaining capital flight from sub-Saharan countries. Consistent with evidence in past studies (Ndikumana and Boyce 2003), the results indicate that capital flight is a phenomenon with a high tendency to persist over time. High levels of capital flight in the past are associated with high levels of capital flight in the future. This is illustrated by the large positive and significant coefficients on lagged capital flight.

Also consistent with evidence in the literature, economic growth acts as a deterrent to capital flight. This may be because investors interpret high growth performance as an indicator of high overall returns to capital in the country, thus discouraging capital flight.

Table 3 reports the results for the effects of measures of macroeconomic instability (inflation variability), the real interest rate differential, financial development (credit/GDP), natural resource endowments (fuel exports), and governance. The results indicate that the inflation effect is positive and statistically significant at the 10% level. This suggests that to some extent, macroeconomic instability plays an important role in portfolio decisions by investors. High uncertainty over inflation discourages domestic investment by raising the discount rate applied to expected profitability of investment. As a result, more savings flow into foreign assets. Investors may also interpret inflation variability as a sign of lack of control by the government over the macroeconomic policy, which reduces confidence in the performance of the local economy.

Somewhat surprisingly, the results show that the real interest rate differential does not have a statistically significant impact on capital flight. This suggests that other motivations – such as the desire to safeguard illicit wealth – have been more important than conventional portfolio investment criteria in explaining capital flight from sub-Saharan Africa.

The results indicate that financial development has no impact on capital flight. Financial development is proxied by the ratio of bank credit to the private sector over GDP. The evidence does not support the presumption that the development of the financial system, and the ease of conducting transactions that accompany it, may facilitate the export of capital. Indeed, the SSA countries with the most developed

financial systems have relatively low levels of capital flight (e.g., Kenya, Mauritius, Seychelles, South Africa).

We investigated the effects of natural resource endowment on capital flight, under the premise that natural resource exports are subject to embezzlement by leaders as well as smuggling and misinvoicing by private operators, which would lead to a high correlation between natural resource endowment and capital flight. This exercise is severely hindered by the poor quality of data on natural resource exports. We experimented with various measures of natural resource endowment, including the share of various natural resources in total exports as well as a dummy taking the value of one if the share of natural resources in total exports is greater than 75% and zero otherwise. The coefficient on the share of fuel exports in total exports is positive and statistically significant in robust OLS estimations (not reported here), but it becomes statistically insignificant (and negative) when country-specific fixed effects are included (Table 3). This is not surprising given that natural resource endowment is likely to be one of the key country fixed effects that is unaccounted for in the OLS.

One possible linkage between capital flight and natural resource endowments is that the exports proceeds are embezzled by leaders. This would imply that the link would be stronger under non-democratic regimes, suggesting that the nature of the quality of governance affects the resource-capital flight link. We explore this possibility by adding to the regression the polity index of the quality of governance and its interaction with the share of fuel exports. We expect the coefficient on the polity indicator to be negative,

implying that more democratic regimes (with a higher value of the index) experience less capital flight than more autocratic ones. Contrary to this expectation, the estimated coefficient on the polity indicator is positive and statistically significant.¹⁰ The coefficient on fuel exports and the interaction term both are statistically insignificant (Table 3).

Further robustness tests of the debt-capital flight link

One possible concern with our econometric estimates of the relationship between capital flight and external borrowing is that the results may be driven by the way in which our measure of capital flight is constructed. Given that the change in the stock of debt is one component of the capital flight measure, errors in this variable could lead to a spurious relation. To address this concern, we re-estimate the model using a proxy for capital flight that is unrelated to the data on debt. This proxy is the deposits held by non-bank African agents in Western banks (that is, the liabilities of foreign banks vis-à-vis the African non-bank private sector).¹¹ Reported holdings in Western banks represent only a fraction of capital flight; this measure omits non-bank financial holdings, real estate and other property holdings, and bank holdings for which the African identity of the depositor is concealed, as well as capital flight that was used to finance overseas consumption. Hence the proxy measure is much smaller than our measure of total capital flight. For the 40 African countries in our sample, recorded bank deposits in 2004 amounted to \$35.3

¹⁰ Again the use of country fixed effects, which mask inter-country differences in the polity index, may be part of the explanation. Summary statistics for our sample show that capital flight is lowest in countries with either the most democratic or the most autocratic regimes, and highest in countries in the intermediate range.

¹¹ These data are published by the Bank for International Settlements, available online at <http://www.bis.org/statistics/bankstats.htm>.

billion, less than 10 percent of our measure of cumulative capital flight for the 1970-2004 period (\$420 billion in 2004 dollars).¹²

The results of the regressions with the foreign bank liabilities vis-à-vis the African private sector are reported in Table 4. The results confirm the positive effects of external debt, both for annual flows and stock of debt, on capital flight, although as expected the estimated magnitude is much smaller. Considering the regression including both the flow and stock of debt, the coefficients imply that one dollar of new borrowing results in 15 cents of deposits by Africans in foreign banks and 10 extra cents in subsequent years. These results support the finding in this study and our earlier studies (see Ndikumana and Boyce 2003) that there is a clear positive and significant relationship between capital flight and external borrowing.

5. Policies to address the problem

Policy initiatives to address the problem of capital flight from sub-Saharan Africa must have two prongs. The first consists of measures to induce repatriation of private assets now held abroad by Africans. Here we must distinguish between assets that originated in legal activities and assets acquired illicitly, as different policy measures will be needed for their repatriation. The second prong consists of policies to prevent future

¹² This proxy of capital flight is positively correlated with our measure of capital flight. The correlation coefficient (using time series, i.e., including time and cross-sectional dimensions) between capital flight and foreign bank liabilities is 0.33 (significant at 1% level); the correlation of the two variables as ratios of GDP is 0.08 (significant at 10% level).

capital flight. Here a key issue is how to shut the “revolving door” between external borrowing and capital flight.

5.1 Inducing repatriation of flight capital

Private assets held abroad by Africans include legally acquired assets as well as illicitly obtained assets. Different strategies may be required to repatriate the two types of assets. Legally acquired assets are held abroad for purely portfolio choice considerations; that is, the savers choose to hold foreign assets to maximize the risk-adjusted returns. These assets will be repatriated as domestic risks diminish and domestic returns to assets rise relative to foreign returns; that is, as the domestic investment climate improves relative to the rest of the world.

Illegally acquired assets are held abroad not so much to maximize the returns on assets, but to evade the law. These assets are likely to be held predominantly by individuals directly or indirectly connected to the government, who are able to use their political power both to acquire the assets and to smuggle them abroad. Owners of these assets will be enticed by higher domestic returns only if they have some guarantees of immunity against prosecution for fraud and penalties for unpaid taxes. Such guarantees would have perverse incentive effects by rewarding malfeasance. Alternatively, these assets could be impounded and repatriated by legal action.

Repatriation of legally acquired assets: Improving the domestic investment climate

Strategies for inducing repatriation of legitimate private assets held abroad by Africans revolve around improvement of the domestic investment climate. As these are basically the same strategies recommended for attracting foreign direct investment, we can draw some lessons from the literature on the determinants of FDI in Africa. The literature on foreign direct investment in Africa has emphasized three categories of factors that have hindered capital inflows and that need to be addressed in order to improve Africa's *locational advantage* in the eyes of investors: openness to investment, the availability and efficiency of the economic infrastructure, and the quality of institutions (see Asiedu 2004a, 2004b; Asiedu and Lien 2003; Morisset 2000). Although many sub-Saharan African countries significantly improved these attributes of the domestic investment climate in recent years, progress in this respect has been much less than what has been observed in other developing regions (Asiedu 2004a). As a result, SSA countries in general have become relatively less attractive to international investors. In other words, the *locational disadvantage* of African countries with regard to foreign investment has increased.

African countries may need to make some concessions in order to attract private assets from abroad. For instance, even legally acquired assets held abroad may be liable for unpaid taxes, which may be sizeable enough to constitute a deterrent for disclosure and repatriation. One possibility is to grant tax amnesties, or at least tax breaks, to repatriated assets. Following the launching of tax amnesty scheme in favor of private foreign asset holders in 2001, Italy recorded \$30 billion of repatriated funds from Swiss

banks (Watts 2002). Although the gains may not be as large for African countries, the strategy still deserves serious consideration.

Impoundment and forcible repatriation of illicit assets

The economic policies described above aimed at creating an attractive domestic investment environment are not likely to entice the repatriation of illegally acquired assets held abroad by Africans. For this category of assets, African countries will have to use coercive methods, asserting the people's moral and legal right to recover these assets. The main problem is that such assets generally are carefully concealed with the cooperation of Western banks and individuals.

Illicit assets held abroad by Africans are to a large extent the product of the theft and smuggling of public funds, including borrowed money. While these assets benefit their private individual owners, corresponding liabilities – the debts that financed them – fall on the shoulders of the debtor country's populations. Efforts to recover and repatriate illicit private fortunes are one way in which African people and their governments can attempt to repair the disjuncture between public external debts and private external assets. This is a difficult route, however, since it places the burden of proof squarely on the African governments to locate and reclaim the money. The Stolen Asset Recovery (STAR) initiative, launched in 2007 by the World Bank and the United Nations Office of Drugs and Crime, may help improve prospects for asset recovery. Even so, forcible

repatriation efforts offer only limited possibilities for easing sub-Saharan Africa's public external debt burden.

A complementary strategy would be for African countries to repudiate debts that financed these private assets, on the ground that these debts are *odious*. This is equivalent to asset repatriation in that it blocks completion of the final step in the “revolving door” circuit between external borrowing and capital flight. For Africa, the net capital loss from debt-fueled capital flight (and from flight-fueled external borrowing) comes not from the initial two-way flows but rather from the resulting debt-service payments (both amortization and interest) in subsequent years. While African countries cannot close the stable door after the horse has bolted, they can cut their losses insofar as they haven't yet paid for the horse. As discussed below, odious debt repudiation would also help to deter future capital flight.

5.2 Preventing future capital flight

The evidence discussed in this paper and earlier studies (Boyce and Ndikumana 2001; Ndikumana and Boyce 2003) shows that sub-Saharan Africa is a net creditor to the rest of the world, in the sense that private assets held abroad exceed the continent's liabilities to the rest of the world. Then the question is, if Africa is a net creditor, why are so many of its people so poor? The answer, of course, is that the subcontinent's private external assets belong to a narrow, relatively wealthy stratum of its population, while

public external debts are borne by the people through their governments. To the extent that these private assets were accumulated using the external borrowings that were intended to develop the countries, this raises the question of the legitimacy of much of the debts owed by African countries. In other words, there is legal basis for claiming that a substantial fraction of Africa's debts are "odious."

A country's debts are considered "odious" if three conditions hold (see Sack 1927; Khalfan 2003; King 2007; and Howse 2007): (1) *absence of consent*: the debts were incurred without the consent of the people, which is typically the case when the debts were borrowed by an undemocratic regime; (2) *absence of benefit*: the borrowed funds were used not for the benefit of the people, but instead for the interests of the rulers, possibly including for repression against the same people that these funds were nominally intended to help;¹³ (3) *creditor awareness*: creditors were aware or should have been aware of conditions (1) and (2).

The doctrine of odious debt draws from both international law and domestic law, including that of the United States and United Kingdom, to whose jurisdiction dispute resolution often is assigned in loan agreements. One particularly strong backing of the doctrine is the principle of *domestic agency*, which states that "every power of making a binding commitment for another person carries with it the special responsibility of acting

¹³ A good example is the case of debt issued to the apartheid regime in South Africa which by and large was used to consolidate the oppressive regime. Since all the lenders knew very well that the regime was illegitimate and violated all human rights, the post-apartheid regime could have claimed that past debts are odious. See Walker and Natrass (2002) for a discussion of the South African case.

in the interest of that person” (Khalfan 2003: 3). Thus, while the agent (the government) has the power to make binding debt commitments in the name of the principal (the people), it also has the fiduciary obligation of doing so in the latter’s interest. When it fails to do so, there is a well-established legal basis for challenging the legitimacy of the resulting liability. Moreover, under domestic law in most countries, a third party can be held liable for assisting an agent in the breach of his obligation toward his principal. This implies that if a bank knowingly assists a government official or private citizen in robbing a country, the bank is liable for the losses incurred by the nation and its people.¹⁴

The practice of servicing external debts regardless of the uses to which the borrowed money was put gives rise to a moral hazard problem: insured against the risk of malfeasance, creditors lack adequate incentives to act to minimize this risk. One way to improve international financial governance would be to improve the institutional arrangements for repudiation of odious debts. This would encourage due diligence by creditors and curtail the phenomenon of debt-fueled capital flight in future years.

The literature on odious debts has outlined two main strategies with regard to the question of repayment of debts that are presumed odious. The first strategy is for debtor countries to repudiate past debts unilaterally. We refer to this as the *ex post* strategy. In the second strategy, odious debts are defined as loans issued to a government that has been designated as “odious” *ex ante* by an international institution. Under this scenario, governments can repudiate those debts incurred after the “odious government” status has

¹⁴ For discussion, see Jochnick (2006) and Buchheit *et al.* (2007).

been established and made public by the appropriate international institution. Here we discuss both strategies and their implications for African countries.

The ex post repudiation of odious debt

Just as in the case of private assets held abroad by Africans, it is difficult to distinguish between legitimate debts and odious debts. Putting the burden of proof on the shoulders of debtor countries to establish the “odious” nature of debts in many cases could impose insuperable transaction costs. An alternative approach would be to put the burden of proof on the creditors to demonstrate the legitimacy of the debts contracted by previous dictatorial regimes.¹⁵ Sub-Saharan African governments would inform their creditors that outstanding debts will be treated as legitimate if, and only if, the real counterparts of the debts can be identified and shown to have benefited the people of the country. If the creditors can document where the money went, and show when and how it benefited citizens of the borrowing country via investment or consumption, then the debt would be regarded as a *bona fide* external obligation of the government (and hence an external asset of the creditor bank or government). But if the fate of the borrowed money cannot be traced, then the present African governments must infer that it was diverted into private pockets associated with the former regimes, and possibly into capital flight.

In such cases, it can be argued that the liability for the debt lies not with the current

¹⁵ Referring to domestic law, Buchheit *et al.* (2007, p. 1252) write: “We believe that governmental corruption in some countries is so suffocatingly ubiquitous that a U.S. court could legitimately shift onto the plaintiff [i.e., a creditor seeking redress for non-repayment] the burden of showing that a particular transaction was *not* tainted by corruption.... Against a showing of pervasive corruption, is it unreasonable to ask the plaintiff/lender to explain how it alone had managed to preserve its virtue in dealing with the corrupt regime?”

government, but with the private individuals whose personal fortunes are the real counterpart of the debt.

In adopting such a strategy, Africans can invoke as a precedent the US government's stance a century ago toward the creditors of the erstwhile Spanish colonial regime in Cuba after the Spanish-American war: the creditors knew, or should have known, the risks they faced when they made the loans to the predecessor regime, and they "took the chances of the investment."¹⁶ Regarding the burden of proof, they can invoke the further precedent of the Tinoco Arbitration, in which U.S. Supreme Court Justice William Howard Taft ruled in favor of the Costa Rican government in a dispute over external credits that had been diverted for the personal use of the dictator Federico Tinoco and his brother: Taft required the creditor "to discharge the burden of proving that the Costa Rican governments had used the money for legitimate purposes, something which it could not do."¹⁷

In effect, this strategy would accord symmetric treatment to Africa's external assets and liabilities. On both sides of the balance sheet, the burden of proof in establishing the legitimacy of claims and realizing their face value would lie with the creditors: African governments seeking to reclaim flight capital, and banks and creditor governments seeking to collect debt-service payments. The case for symmetry is reinforced by the past complicity of sub-Saharan Africa's external creditors in sustaining

¹⁶ For discussion, see Hoeflich (1982) and Ndikumana and Boyce (1998).

¹⁷ Howse (2007, p. 15); for discussion, see also Buchheit *et al.* (2007).

the power of corrupt rulers and in helping them to spirit their ill-gotten gains abroad. As *The Financial Times* (2000) remarks, in an editorial comment on the freezing of General Abacha's Swiss bank accounts, "Financial institutions that knowingly channeled the funds have much to answer for, acting not so much as bankers but as bagmen, complicit in the corruption that has crippled Nigeria." Capital flight from Nigeria under the Abacha regime was simply a particularly egregious example of a more widespread phenomenon in the subcontinent.

One concern with debt repudiation is the potential retaliation by lenders who may refuse to lend to countries whose governments opt to exercise the odious debt doctrine. However, this concern may be exaggerated. First, many African countries currently in fact receive little in terms of net flows of debt; indeed many are experiencing negative net transfers, paying more in debt service than they receive in new money. Thus such debtor countries can easily endure the "punishment" of credit rationing. Second, the invocation of the odious debt doctrine is not equivalent to unilateral across-the-board debt repudiation. Legitimate creditors have no reason to fear, given that all legitimate loans will be duly repaid. Applying the odious debt doctrine will enforce and reward responsible lending practices by western financial centers as well as transparent and responsible debt management by leaders in the South. Thus with respect to future lending the strategy will yield in a win-win outcome for lenders and borrowers.

On the other hand, there is a risk that debtor countries would adopt an overly expansive definition of what constitutes an "odious debt" if they could repudiate such

debt unilaterally, without no recourse to legal proceedings to assess the merits of the case. Governments that abused the odious debt doctrine presumably would be denied further credit even for legitimate purposes, but this may not be a strong deterrent for the reason stated above. To address this concern, it would be useful to establish an international institution to adjudicate questions of debt legitimacy in postwar countries.¹⁸

The ex ante designation of “odious government” and “odious debt”

Under the alternative strategy, an international referee “truthfully” announces whether a regime is odious or not. Creditors may lend to a government that has been designated odious, but they do so at their own risk. Successor governments not only can repudiate any such loans, but in fact would be *required* to repudiate all debts subsequently issued to the odious government, so as to prevent new loans and aid from being squandered on servicing odious debts. Kremer and Jayachandran (2002, 2003) claim that if the referee indeed assesses the legitimacy of the government truthfully and creditors act rationally, no or little odious debt will be issued in the market. The authors also argue that this mechanism is superior to conventional economic sanctions as it is less likely to affect adversely the population in the debtor country.

¹⁸ The Norwegian government has called for the creation of an ‘international debt settlement court’ for this purpose. See the Soria Moria Declaration on International Policy, October 2005; available at <http://www.dna.no/index.gan?id=47619&subid=0>. In making a case for an *ex ante* instead of *ex post* odious debt strategy, Jayachandran and Kremer (2006, p. 83) express the worry that “any adjudicating body that had the power to declare debt void might nullify legitimate debt if it placed a high value on the welfare of the debtor country,” thereby shutting down access to legitimate loans and presumably harming the country. But actions yielding this result would seem to be a rather perverse form of favoritism.

This approach has several weaknesses as a strategy for addressing the problems of odious debt and capital flight. First and foremost, the strategy leaves the burden of past debts, a large portion of which may be odious, on the shoulders of the population of the debtor countries. On its own, this strategy would leave African countries trapped in the current debt crisis that resulted in large part from irresponsible borrowing by past regimes and complacent lending by Western financiers. The strategy therefore lets both beneficiary parties (past corrupt governments and their financiers) off the hook at no cost.

Second, this approach may increase the risk of moral hazard in the debt market. Myopic rulers may borrow excessively if they have the green light to access external debt and if lenders have been assured that their loans are safe from being regarded as odious debts. Regimes not designated as odious may also divert some borrowing to private pockets, not only impairing the ability to repay the loans but also raising the issue of the responsibility of the population at large to service the resulting debts.

Third, there may be some scope for legitimate lending even to regimes designated as odious, if such lending would benefit the people of the country. To ensure legitimacy, creditors would need to exercise due diligence, monitoring uses of the loan proceeds and suspending disbursements in case of misuse. By virtue of its all-or-nothing character, *ex ante* designation of odious governments would deter such lending; *ex post* repudiation, by contrast, could be selective.

Finally, it is difficult to find a competent and impartial institution that will assess “truthfully” the nature of existing governments. Western governments, multilateral institutions, and non-governmental organizations often have specific political interests in supporting client regimes, regardless of whether these regimes are democratic or not. Influential governments may paralyze the functioning of the referee institution by exercising their veto power when a ruling is likely to go against a client regime or when they want to enforce a particular outcome for a disfavored regime. In addition to obvious political interests, bias may arise in favor of economically powerful countries. For instance, any institution will hesitate to classify the government of a country like China or India as odious, given their importance in the international economic arena. In contrast, smaller countries, especially African countries, are likely to be disproportionately rationed out of the debt market under this approach. Consequently, such a strategy could increase the marginalization of Africa.

6. Summary and conclusion

This paper has presented new evidence on the dramatic financial hemorrhage of African economies through capital flight countries over the past four decades. The estimates indicate that for the sample of 40 countries as a whole over the period 1970-2004, real capital flight amounted to \$420 billion (in 2004 dollars). Including imputed interest, the stock of capital flight for this group of countries reached a staggering \$607 billion dollars in 2004. This exceeds the countries’ combined external debt by \$398 billion, making Africa a “net creditor” to the rest of the world. For some countries,

including Angola, Côte d'Ivoire and Nigeria, the stock of capital flight is more than four times the stock of external debt.

The paper investigated the causes of capital flight and, consistent with past studies, found strong linkages between capital flight and external borrowing. The regression results suggest that out of every dollar of new borrowing, as much as 60 cents left the country in the form of capital flight the same year. Furthermore, a one-dollar increase in the stock of debt resulted in 3 to 4 cents of capital flight in subsequent years. The evidence has clear policy implications for addressing the challenge of heavy indebtedness for African countries. It suggests that a solution to the problem includes a combination of better management of debt by African governments, prevention of capital flight, and repatriation of African assets held abroad.

The paper has advanced the strategy of challenging the legitimacy of parts of African debts based on three crucial arguments. First, the evidence of strong year-to-year correlations between external borrowing and capital flight implies that a substantial proportion of the borrowed funds ended up in private assets through debt-fueled capital flight. Thus, past borrowing practices failed the test of benefiting to the people. Second, historical evidence gives strong indications for complicity of the lenders, who in many instances were aware (or should have been aware) of the embezzlement and mismanagement of borrowed funds and the corrupt nature of the borrowing regimes. Thus, historical evidence establishes the test of creditor awareness. Third, the debts were borrowed in the name of the people without their consent, which is obvious in the case of

undemocratic regimes. These regimes only exercised their prerogatives of agents of the people in committing the nations to binding debt obligations, while renegeing on their attendant obligation of acting in the interest of the people. Thus, borrowing practices did not meet the condition of consent by the people. Consequently, much of Africa's accumulated debts may be deemed as odious and their legitimacy challenged by the people of debtor nations.

We argue that the burden of proof of legitimacy of debts must rest on the lenders. Indeed given the practices of secrecy in western financial centers, it will be impossible for African governments to locate more than a very small fraction of the stolen funds that are stashed in foreign banks or other investments. Enforcing the doctrine of odious debt will result in a win-win situation for borrowers and lenders in future years. By inducing responsible lending by Western financial institutions and accountable debt management by African governments, the strategy will both maximize the gains from external resources for African economies and minimize the risk of default, maximizing profits for western bankers. As the African continent searches for ways to reach financial stability and increase resources for development financing, we believe that the strategies outlined in this paper for addressing the problem of capital flight must feature prominently in debates at the national level as well as in the international development assistance community.

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Table 1: Total capital flight (million 2004 dollars and % of GDP), stock of accumulated capital flight (million dollars and % of debt stock) over 1970-2004 period

name	real KF	stock of KF in 2004	net foreign assets in 2004	total KF/GDP (%)	stock of KF/Debt (%)
Angola	42178.8	50950.6	41430.0	215.6	535.2
Benin	-3989.7	-7663.9	-9580.3	-98.6	-399.9
Botswana	1127.9	-1086.9	-1610.9	12.6	-207.4
Burkina Faso	3076.9	4670.6	2934.6	73.6	269.0
Burundi	2073.6	2566.6	1181.2	312.2	185.3
Cameroon	18378.9	27287.7	17791.8	116.5	287.4
Cape Verde	2190.9	2707.1	2190.1	231.1	523.6
Central African Republic	1943.8	2774.1	1696.4	148.7	257.4
Chad	1337.7	2345.6	644.3	31.1	137.9
Comoros	-176.3	-168.7	-474.5	-47.8	-55.2
Congo, Dem. Rep.	19572.5	36737.6	24896.7	295.1	310.3
Congo, Rep.	14950.4	17474.8	11645.4	344.3	299.8
Cote d'Ivoire	34349.4	54000.6	42261.2	222.0	460.0
Ethiopia	17031.5	22526.0	15951.9	175.0	342.6
Gabon	8580.8	11997.6	7847.9	118.7	289.1
Ghana	8503.7	11208.4	4173.3	98.7	159.3
Guinea	551.2	1048.9	-2489.6	14.6	29.6
Kenya	2665.4	6369.3	-456.9	16.6	93.3
Lesotho	407.4	893.4	129.8	29.8	117.0
Madagascar	7430.9	9570.8	6108.5	170.3	276.4
Malawi	2527.8	3825.4	407.5	132.9	111.9
Mali	-372.0	-425.4	-3741.8	-7.6	-12.8
Mauritania	2319.1	4006.0	1709.2	151.2	174.4
Mauritius	-962.8	650.1	-1643.8	-16.0	28.3
Mozambique	10677.7	14273.4	9622.9	180.6	306.9
Niger	-5975.7	-8732.6	-10682.6	-195.7	-447.8
Nigeria	165696.7	240781.0	204891.3	230.0	670.9
Rwanda	3366.8	5889.5	4233.8	183.5	355.7
Sao Tome and Principe	723.3	1059.1	696.9	1265.9	292.4
Senegal	-8885.0	-13077.3	-17015.7	-114.3	-332.0
Seychelles	2700.9	2986.3	2371.5	384.1	485.7
Sierra Leone	4607.7	7005.4	5282.6	424.7	406.6
South Africa	18266.0	17492.3	7552.7	8.5	176.0
Sudan	9218.7	16325.0	-3006.7	43.0	84.4
Swaziland	1263.9	1342.6	872.5	50.2	285.6
Tanzania	5185.2	9963.4	2163.9	45.8	127.7
Togo	-3481.6	-4064.6	-5876.9	-168.9	-224.3
Uganda	4982.0	6853.7	2031.4	73.0	142.1
Zambia	9769.5	19814.3	12535.5	180.2	272.2
Zimbabwe	16162.0	24556.0	19758.5	344.2	511.9
Sample total	419975.7	606733.7	398433.6	81.8	291.3

Notes: for Burkina Faso, last year where KF is available is 2003; so totals, stocks, and ratios refer to 2003
Sources: Ndikumana and Boyce 2003; series updated (1997 to 2004) and sample expanded using information from: IMF, *International Financial Statistics*; IMF, *Balance of Payments Statistics*; IMF, *Direction of Trade Statistics*; IMF, various country online information in "Selected issues and statistical appendix"; World Bank, *Global Development Finance*; World Bank, *World Development Indicators*.

Table 2 External borrowing (annual flows) and capital flight

Variables	Regressions with debt flows (change in debt)			Regressions with debt stock			Combined regression
	OLS ^a	FE	iv_(FE) ^b	OLS ^a	FE	iv_(FE) ^b	FE ^c
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Change in debt	0.606 (0.00)	0.603 (0.00)	0.451 (0.00)				0.625 (0.00)
Debt stock				0.045 (0.00)	0.044 (0.00)	0.049 (0.00)	0.033 (0.00)
1 st lag of capital flight	0.280 (0.00)	0.172 (0.00)	0.180 (0.00)	0.269 (0.00)	0.157 (0.00)	0.158 (0.00)	0.174 (0.00)
2 nd lag of capital flight	0.129 (0.00)	0.031 (0.19)	0.032 (0.20)	0.132 (0.00)	0.031 (0.26)	0.032 (0.25)	0.022 (0.36)
Lagged real GDP growth	-0.084 (0.00)	-0.066 (0.01)	-0.069 (0.01)	-0.056 (0.06)	-0.044 (0.17)	-0.039 (0.22)	-0.073 (0.00)
F (with p-value)	41.6 (0.00)	108.9 (0.00)	4.1 (0.00)	17.6 (0.00)	15.8 (0.00)	3.4 (0.00)	90.9 (0.00)
overall R-sq	0.39	0.37	0.39	0.22	0.20	0.20	0.37
between R-sq (FE)		0.71	0.77		0.69	0.67	0.60
within R-sq (FE)		0.28	0.27		0.05	0.05	0.29
Observations	1137	1137	1117	1138	1138	1137	1136

Notes:

The numbers in parentheses are p-values.

^a OLS = with robust standard errors, taking account of outliers.

^b iv_FE = instrumental-variable fixed-effects estimation where change in debt and stock of debt are considered as endogenous.

^c The combined regression includes the second lag of the stock of debt, given that by construction, the change in debt is dependent on the contemporaneous and first lag of the stock of debt.

Table 3: Capital Flight: Effects of other factors: inflation, financial development, fuel exports

Explanatory variable	Inflation differential	Interest rate differential	Credit/GDP	Fuel exports/ total exports	Fuel export share*Polity2
	(1)	(2)	(3)	(4)	(5)
Change in debt	0.644 (0.00)	0.550 (0.00)	0.531 (0.00)	0.591 (0.00)	0.494 (0.00)
Debt stock (2 nd lag)	0.043 (0.00)	0.044 (0.00)	0.049 (0.00)	0.045 (0.01)	0.029 (0.15)
1 st lag capital flight	0.121 (0.00)	0.139 (0.00)	0.110 (0.00)	0.091 (0.01)	0.241 (0.00)
2 nd lag capital flight	0.047 (0.08)	0.036 (0.22)	0.051 (0.03)	0.023 (0.51)	0.019 (0.69)
Lagged growth	-0.052 (0.05)	-0.059 (0.02)	-0.068 (0.00)	-0.072 (0.07)	-0.063 (0.09)
Inflation variability	0.015 (0.09)				
Interest rate differential		-0.0005 (0.86)			
Credit/GDP			-0.037 (0.27)		
Fuel exports				-0.019 (0.75)	-0.018 (0.79)
Polity2 index					0.39 (0.02)
Fuel exports*Polity2					-0.005 (0.28)
overall R-sq	0.39	0.26	0.22	0.21	0.30
between R-sq	0.49	0.17	0.18	0.08	0.40
within R-sq	0.40	0.28	0.25	0.29	0.29
observations	719	784	976	496	364

Notes:

The numbers in parentheses are p-values.

All equations estimated with country fixed effects.

Table 4: Regression results with an alternative proxy for capital flight (foreign bank liabilities)

Variables	Regressions with debt flows (change in debt)			Regressions with debt stock			Combined regression
	OLS ^a	FE	IV_(FE) ^b	OLS ^a	FE	IV_(FE) ^b	IV_(FE) ^b
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Change in debt	0.013 (0.00)	0.009 (0.30)	0.145 (0.00)				0.151 (0.00)
Stock of debt				0.0003 (0.00)	0.018 (0.00)	0.002 (0.62)	0.10 (0.01)
1 st lag of foreign bank liabilities	0.822 (0.00)	0.676 (0.00)	0.663 (0.00)	0.796 (0.00)	0.661 (0.00)	0.675 (0.00)	0.659 (0.00)
2 nd lag of foreign bank liabilities	0.056 (0.00)	0.072 (0.04)	0.129 (0.06)	0.061 (0.00)	0.040 (0.26)	0.065 (0.07)	0.102 (0.01)
Lagged real GDP growth	-0.016 (0.00)	- 0.001 (0.87)	0.004 (0.62)	-0.014 (0.00)	0.011 (0.17)	0.0002 (0.98)	0.0006 (0.95)
F (with p-value)	3260 (0.00)	203.3 (0.00)	1.52 (0.02)	3150 (0.00)	219 (0.00)	1.98 (0.00)	1.50 (0.03)
overall R-sq		0.754	0.681		0.710	0.752	0.65
between R-sq (FE)		0.996	0.968		0.852	0.991	0.88
within R-sq (FE)		0.469	0.342		0.488	0.474	0.65
Observations	962	962	959	963	963	962	962

Notes:

The numbers in parentheses are p-values.

^a OLS = with robust standard errors, taking account of outliers.

^b iv_FE = instrumental-variable fixed-effects estimation where change in debt is considered as endogenous.

APPENDIX A: Algorithm for the computation of capital flight

Definition of capital flight

We define capital flight as the difference between total capital inflows and recorded foreign exchange outflows. In a given year t for a country i capital flight is computed as:

$$KF_{it} = \Delta DEBTADJ_{it} + DFI_{it} - (CA_{it} + \Delta RES_{it}) \quad (A1)$$

where $\Delta DEBTADJ$ is the change in total external debt outstanding adjusted for exchange rate fluctuations (see below), DFI is net direct foreign investment, CA is the current account deficit, and ΔRES is net additions to the stock of foreign reserves.

Adjustment for exchange rate fluctuations

To correct for potential discrepancies due to exchange rate fluctuations, we adjust the change in the long-term debt stock for fluctuations in the exchange rate of the dollar against other currencies. For country i , the U.S. dollar value of the beginning-of-year stock of debt at the new exchange rates is obtained as follows:

$$NEWDEBT_{i,t-1} = \sum_{j=1}^7 (\alpha_{ij,t-1} * LTDEBT_{i,t-1}) / (EX_{jt} / EX_{j,t-1}) + \\ IMF_{i,t-1} / (EX_{SDR,t} / EX_{SDR,t-1}) + LTOTHER_{i,t-1} + LTMULT_{i,t-1} + \quad (A2)$$

$$LTUSD_{i,t-1} + STDEBT_{i,t-1}$$

where $LTDEBT$ is the total long-term debt; α_{ij} is the proportion of long-term debt held in currency j , for each of the seven non-US currencies;¹ EX is the end-of-year exchange rate of the currency of denomination against the dollar (expressed as units of currency per U.S. dollar); $IMFCR$ is the use of IMF credit; $LTOTHER$ is long-term debt denominated in other unspecified currencies; $LTMULT$ is long-term debt denominated in multiple currencies; $LTUSD$ is long-term debt denominated in U.S. dollars; and $STDEBT$ is short-term debt.

The exchange rate adjustment is obtained as:

$$ERADJ_t = NEWDEBT_{t-1} - DEBT_{t-1} \quad (A3)$$

We then obtain the adjusted change in debt as:

$$\Delta DEBTADJ_t = \Delta DEBT_t - ERADJ_t \quad (A4)$$

Since $\Delta DEBT_t = DEBT_t - DEBT_{t-1}$, it follows that (4) is equivalent to:

$$\Delta DEBTADJ_t = DEBT_t - NEWDEBT_{t-1} \quad (A4')$$

Adjustment for debt write-offs

We adjust the change in debt to account for debt write-offs, given that they reduce the stock of debt although they have no corresponding flow of debt service. Hence, they lead to an overstatement of debt service and an understatement of the change in debt obtained as the change in annual debt stocks over consecutive years. We add the value of

¹ The seven currencies are the euro (from 2000); French franc and the Deutsche mark (up to 2000); Swiss franc, Yen, SDR, and British pound.

debt write-offs (absolute value, in 2004 dollars) to the estimated capital flight in equation (A1).

Adjustment for trade misinvoicing

We estimate trade misinvoicing by comparing the country's export and import data to those of its trading partners.² We assume that the trade data from industrialized countries are relatively accurate, and interpret the discrepancy between these and the data from their African trading partners as evidence of misinvoicing. For an individual African country i in year t , export discrepancies with the industrialized countries ($DXIC$) are computed as follows:

$$DXIC_{it} = PXIC_{it} - (XIC_{it} * CIF_t) \quad (A5)$$

where $PXIC$ is the value of the industrialized countries' imports from the African country as reported by the industrialized trading partners, XIC is the African country's exports to industrialized countries as reported by the African country, and CIF is the c.i.f./f.o.b factor, representing the costs of freight and insurance.³ A positive sign on $DXIC$ indicates export underinvoicing.

Import discrepancies with the industrialized countries ($DMIC$) are computed as:

$$DMIC_{it} = MIC_{it} - (PMIC_{it} * CIF_t) \quad (A6)$$

² The trade misinvoicing adjustment could not be calculated in the case of South Africa due to lack of consistent data.

³ The series for the c.i.f./f.o.b. factor reported in the IMF's *Direction of Trade Statistics Yearbooks* are in some cases anomalous both in terms of absolute values and year-to-year variations. For example, the reported c.i.f./f.o.b. factor for Congo-Zaire is higher than that of land-locked Burundi. Hence we use the average factor for each year for Africa as a whole in our computations.

where MIC is the African country's imports from industrialized countries as reported by the African country, and $PMIC$ is the industrialized countries' exports to the African country as reported by the industrialized trading partners. A positive sign on $DMIC$ indicates net overinvoicing of imports; a negative sign indicates net underinvoicing.

To obtain global totals, we multiply these discrepancies by the inverse of the average shares of industrialized countries in the African country's exports ($ICXS$) and imports $ICMS$.⁴ We obtain total trade misinvoicing as the sum of export discrepancies and import discrepancies:

$$MISINV_{it} = \frac{DXIC_{it}}{ICXS_i} + \frac{DMIC_{it}}{ICMS_i} \quad (A7)$$

Adding trade misinvoicing to the initial estimate of capital flight from equation (A1) we obtain adjusted capital flight as:

$$ADJKF_{it} = KF_{it} + MISINV_{it} \quad (A8)$$

Adjustment for underreporting of remittances

A number of sub-Saharan African countries receive substantial inflows of remittances from their citizens who are working in Europe and, to a lesser extent, the United States and other industrialized countries. These inflows are often underreported in the African countries' official balance-of-payments (BoP) statistics. Officially recorded

⁴ In some cases, the data reported in the IMF *Direction of Trade Statistics Yearbooks* show occasional wide, unexplained fluctuations in the shares of industrialized countries in some African countries' exports and imports. In our calculations, we use the average shares for each country over the 1970-2004 period, except for the 30 countries contained in the Boyce and Ndikumana (2003) for which the average shares is for the 1997-2004 period (given that capital flight series for 1970-96 are taken from Boyce Ndikumana (2003) and only converted into 2004 dollars).

remittances enter into the BoP statistics primarily under three headings: “workers’ remittances, compensation of employees, and migrant transfers.”⁵ Econometric analysis suggests that underreporting in the BoP statistics is particularly large in Africa, with unrecorded remittances accounting for more than half of total remittance flows (World Bank, 2006: 92).

Unrecorded remittance inflows have an effect on capital flight estimates analogous to that of unrecorded export earnings: the amount of foreign exchange entering the African country is greater than what is captured in the official BoP. This foreign exchange could be used to finance (recorded or unrecorded) imports, or it could enter the formal banking system and ultimately add to the central bank’s official reserves, or it could go into capital flight. Regardless of its actual use, omitting these inflows from residual-based estimates of capital would lead to underestimation of its true magnitude.

Alternative estimates of remittance inflows have been reported by the International Fund for Agricultural Development (IFAD, 2007). These were derived by combining data on total numbers and locations of migrant workers in 2006 with survey data, for various host-origin country pairs, on the percentage of migrants who send remittances and the average amount of these remittances. In general, these estimates

⁵ Summary BoP measures of remittance inflows and outflows for the years 1970-2006 are available from World Bank (2007). For discussion of the methodology by which these measures were extracted from the BoP accounts, see World Bank (2006, pp. 105-108). The World Bank (2006, p. 91) speculates that the share of formal (recorded) as opposed to informal (unrecorded) remittances rose in response tightened financial regulations after September 11, 2001. On the other hand, IFAD (2007, p. 7) suggests that by increasing the cost of using formal channels, the same regulatory changes may have led to greater reliance on informal remittance networks. In the absence of direct evidence on this matter, we assume no overall change in the share of unrecorded remittances.

support the view that the official BoP data understate the true magnitude of remittance flows, at times substantially. The IFAD estimate of the remittance inflows from industrialized countries to Nigeria in 2006 amounted to \$5.4 billion, for example, compared to the BoP measure of \$3.3 billion. In Angola, to take another example, the IFAD estimate shows an inflow of \$969 million whereas the BoP data report no remittances whatsoever.

The IFAD estimates include remittance inflows from all countries, including intra-African transfers. The data on number of migrants and their remittance behavior appears to be less reliable for intra-African flows. Accordingly, we estimate the volume of unreported remittances by comparing estimated inflows from industrialized countries to the total inflows recorded in the official BoP statistics.⁶ In principle, the latter should be larger because it is meant to include remittances from the entire world, not only from the industrialized countries. Where, instead, the former estimates exceed the latter, we take this as strong evidence of underreporting. We calculate the discrepancy based on 2006 data (the year for which the alternative estimates are available), and extrapolate from this to estimate discrepancies for earlier years based on the trend in overall African remittance inflows reported in the BoP statistics:

$$RID_{it} = (ARI_{i,2006} - BPRI_{i,2006}) * BPRI_t / BPRI_{2006} \quad (A9)$$

where RID_{it} = remittance inflow discrepancy in country i in year t ; $ARI_{i, 2006}$ and $BPRI_{i, 2006}$ are the alternative and BoP measures, respectively, of remittance inflows in country i

⁶ We are grateful to Dr. Manuel Orozco of the Inter-American Dialogue in Washington, DC, for providing us with the African remittance inflow estimates prepared for the IFAD study, disaggregated and cross-tabulated by sending countries.

in the year 2006; and $BPRI_t$ and $BPRI_{2006}$ are the BoP measures of remittance inflows to African countries as a whole in years t and 2006, respectively.

Adding these estimated discrepancies to the adjusted estimate of capital flight from equation (A8) we obtain corrected capital flight as:

$$CADJKF_{it} = ADJKF_{it} + RID_{it} \quad (A10)$$

Inflation adjustment

To make annual capital flight estimates comparable over an extended period of time, we convert nominal flows to constant dollars, using the US producer price index for this purpose. Real capital flight (adjusted for trade misinvoicing) is calculated as:

$$RADJKF_{it} = CADJKF_{it} / PPI_t \quad (A11)$$

where PPI is the US producer price index (base 2004=1.00).

Adjustment for interest earnings

We compute the stock of interest-earnings adjusted capital flight ($SADJKF$) as follows:

$$SADJKF_{it} = SADJKF_{i,t-1}(1 + TBILL_{it}) + CADJKF_{it} \quad (A12)$$

where $TBILL$ is the interest rate on short-term US Treasury bills.

Appendix B: Tables

Table B1: Real capital flight (million 2004 \$) for 40 sub-Saharan African countries, 1970-2004

YEAR	1970	1971	1972	1973	1974	1975	1976	1977	1978
Angola									
Benin					81.1	-4.6	-178.7	-94.7	-161.4
Botswana						-131.4	-129.6	-45.9	-375.2
Burkina Faso	58.2	57.5	17.8	22.9	140.9	-51.5	-14.3	124.7	197.3
Burundi									
Cameroon	-88.6	-26.7	-298.2	-537.3	-16.8	194.0	-95.0	588.7	225.0
Cape Verde									
Central African Republic	-16.0	21.9	26.4	89.1	-3.6	-3.0	42.2	-18.7	-14.0
Chad								136.5	174.0
Comoros									
Congo, Dem. Rep.	936.9	321.1	992.7	2204.7	1778.4	166.0	592.0	-1695.7	2445.6
Congo, Rep.		-48.0	-2.5	143.7	-256.4	-535.7	-944.0	-2.4	382.1
Cote d'Ivoire	310.3	356.1	449.5	555.4	283.8	992.5	674.6	2284.2	1645.4
Ethiopia	47.3	-0.2	-598.4	100.0	-102.1	-54.6	-212.3	-61.5	113.3
Gabon									531.8
Ghana	-41.7	-317.1	385.2	443.0	-683.3	215.2	-356.1	257.5	128.7
Guinea									
Kenya	49.0	111.7	104.0	479.9	611.7	539.8	423.2	143.8	282.8
Lesotho						6.6	-74.9	-0.8	40.9
Madagascar	37.4	1601.3	322.3	-84.6	763.7	244.5	-1484.5	1711.5	-1243.6
Malawi	15.1	104.1	-38.5	187.9	166.8	229.2	193.1	194.7	80.5
Mali	70.0	-98.8	61.8	94.5	60.6	-62.1	-140.4	-20.8	24.0
Mauritania				351.6	471.7	-239.2	274.0	82.0	108.5
Mauritius							177.2	135.9	154.8
Mozambique									
Niger	63.4	71.8	95.4	119.6	-207.7	-222.9	-368.2	-369.5	1.2
Nigeria	-521.3	-610.4	755.5	4206.5	1696.8	2249.3	4910.0	10595.5	4981.9
Rwanda	-119.8	37.6	30.6	41.5	42.0	84.7	96.2	150.7	351.2

Sao Tome and Principe									29.5
Senegal					-379.1	-77.7	-255.8	73.2	-117.4
Seychelles									
Sierra Leone	55.2	278.0	43.8	348.6	218.5	-12.1	127.8	144.6	57.0
South Africa		-2285.0	-1724.2	-509.2	-1069.3	-4479.3	-1355.2	1634.4	1618.3
Sudan	52.0	123.3	-260.5	133.0	774.2	311.1	353.3	237.0	-248.1
Swaziland					96.0	68.1	48.2	63.6	65.3
Tanzania							608.9	605.6	698.7
Togo					184.5	-211.0	32.7	314.6	108.5
Uganda	244.9	78.0	7.1	157.0	73.7	-26.8	59.5	-351.9	-104.3
Zambia	1597.4	1534.0	125.3	304.1	-447.1	136.6	115.6	729.2	570.0
Zimbabwe								188.6	567.7
Total	2749.7	1310.2	494.9	8852.0	4279.0	-674.5	3119.5	17734.5	13320.3

Table B1: (Continued)

YEAR	1979	1980	1981	1982	1983	1984	1985	1986	1987
Angola							3085.2	1103.7	3564.3
Benin	-187.0	-683.3	-606.8	-882.0	-105.7	-107.9	-195.2	-64.4	-63.5
Botswana	-89.5	-205.2	-167.5	-188.1	-220.8	-108.1	-73.9	-100.0	427.5
Burkina Faso	46.8	166.0	104.7	96.3	70.0	61.2	-49.2	65.6	48.2
Burundi							116.3	140.5	235.4
Cameroon	-365.7	358.8	335.3	454.5	816.5	2275.3	-199.7	2571.6	1563.2
Cape Verde				77.0	74.3	71.1	17.9	64.7	81.4
Central African Republic	3.2	5.7	167.0	86.1	66.3	76.1	47.9	16.9	70.1
Chad	104.1	92.6	-0.7	-20.9	54.2	-23.3	16.5	48.5	91.3
Comoros		-1.3	3.3	-1.7	3.7	-10.6	6.9	9.5	5.3
Congo, Dem. Rep.	1043.9	1221.4	2117.0	747.7	503.1	75.0	1041.4	570.1	780.1
Congo, Rep.	370.0	613.2	-183.1	804.9	560.3	900.4	885.4	-280.1	1139.6
Cote d'Ivoire	332.4	1557.3	363.5	1143.1	246.6	279.6	836.2	1198.2	2013.5
Ethiopia	-20.2	-83.2	982.4	1985.6	823.0	322.5	909.4	581.8	1662.7
Gabon	790.9	473.4	66.9	270.0	366.9	-37.8	42.7	-321.9	311.5
Ghana	316.2	552.9	-558.7	283.3	691.7	734.6	89.8	-382.9	672.7
Guinea								159.5	277.6
Kenya	25.7	164.5	-316.0	-80.4	353.6	-421.5	783.6	-231.8	735.8
Lesotho	40.0	61.7	35.0	82.7	39.8	16.5	22.6	9.6	117.5
Madagascar	14.8	-224.4	-364.7	16.7	-57.7	338.8	89.2	212.7	496.4
Malawi	-382.6	-48.9	-14.7	13.9	125.6	-79.5	182.7	192.5	229.6
Mali	-235.8	98.7	108.1	60.5	128.2	262.6	-139.6	-297.0	-104.1
Mauritania	-98.7	30.4	-11.0	114.1	143.0	172.4	117.4	-47.9	31.9
Mauritius	125.7	204.2	421.1	164.8	53.6	42.9	25.7	-0.4	-209.7
Mozambique				-369.3	-18.6	1060.3	1671.9	234.8	217.1
Niger	-549.9	101.3	-212.6	-419.0	33.8	56.4	17.2	-106.1	-241.1
Nigeria	-359.7	2776.0	10997.1	-280.6	3634.7	758.4	3131.1	7035.3	7032.7
Rwanda	389.8	279.8	-8.6	67.2	60.2	110.7	122.6	171.1	202.1

Sao Tome and Principe	43.9	51.1	13.8	3.5	23.8	26.9	21.8	28.3	34.5
Senegal	-581.4	-156.2	-210.4	-319.4	-155.5	-145.5	-500.7	-185.5	-60.0
Seychelles			-34.0	63.9	-3.9	49.3	100.0	109.1	88.6
Sierra Leone	91.7	127.9	136.7	-131.1	153.5	98.0	15.5	119.8	175.1
South Africa	3960.3	2926.0	-4554.4	-3806.2	-1674.5	-562.9	3394.3	4274.0	3240.4
Sudan	626.5	1154.5	348.9	-210.0	-111.5	1615.3	457.4	-186.0	688.1
Swaziland	-22.8	-177.1	-7.4	-129.9	-118.0	-138.2	10.6	88.9	156.5
Tanzania	-29.2	857.8	702.6	494.2	847.2	648.3	2483.6	-6800.4	55.3
Togo	184.8	-58.0	-109.6	-282.3	-436.4	-228.1	-103.5	-158.3	-96.1
Uganda	373.7	80.9	251.6	227.2	205.1	299.8	40.2	87.8	378.7
Zambia	1136.2	-261.0	1097.6	-521.6	102.7	381.6	363.3	1312.3	1014.7
Zimbabwe	-22.6	395.9	1130.1	1224.0	730.8	561.1	279.9	668.6	1275.4
Total	7075.3	12453.5	12022.4	838.7	8009.6	9432.0	19164.1	11912.7	28339.8

Table B1: (Continued)

YEAR	1988	1989	1990	1991	1992	1993	1994	1995	1996
Angola	944.5	1619.2	1202.5	2688.1	2579.5	2113.7	2135.3	2182.4	5003.5
Benin	-111.3	343.4	-83.5	-203.5	-16.8	-191.6	129.3	173.8	-28.9
Botswana	-213.1	-19.6	-307.6	-24.7	-257.1	-249.0	119.2	209.7	-29.5
Burkina Faso	-2.4	278.8	102.7	-26.8	169.5	111.3	183.1	570.9	284.0
Burundi	50.0	63.6	155.1	76.6	118.5	136.5	87.4	282.7	-1.0
Cameroon	591.0	1676.0	1365.2	1080.6	1957.3	628.8	1706.0	598.7	489.7
Cape Verde	72.7	38.4	130.2	128.8	111.1	99.1	61.2	149.4	55.7
Central African Republic	51.7	-2.5	93.9	108.5	-74.8	-2.6	75.5	569.6	281.3
Chad	169.8	19.3	160.3	93.3	87.6	9.3	54.8	56.3	76.5
Comoros	-0.6	3.9	-0.3	21.8	-1.2	16.1	75.5	-7.9	1.5
Congo, Dem. Rep.	-490.9	-23.6	1483.4	869.3	752.4	532.0	335.5	973.4	-961.1
Congo, Rep.	-331.7	363.0	-77.2	56.1	577.5	210.4	-140.7	455.7	-1430.8
Cote d'Ivoire	1226.2	1654.4	3211.4	2065.4	1566.4	1858.0	-118.7	2029.6	735.5
Ethiopia	-422.2	-202.3	702.3	584.8	685.5	484.7	675.6	228.3	79.3
Gabon	-122.6	329.0	486.6	204.6	-120.6	-50.7	480.7	131.8	323.7
Ghana	-163.6	604.9	436.9	-24.8	489.6	47.8	487.1	350.4	691.8
Guinea	81.9	24.5	228.7	64.8	34.6	317.6	105.8	8.0	-71.0
Kenya	-275.5	255.6	558.4	169.5	-146.6	-110.1	-142.4	75.3	-735.9
Lesotho	46.4	96.6	162.7	126.1	54.2	-2.0	93.3	-105.3	-125.7
Madagascar	4.2	24.4	296.7	635.5	548.2	556.1	479.1	668.7	-41.8
Malawi	189.1	417.1	155.3	-176.6	-170.0	-90.5	-310.3	392.0	121.9
Mali	-322.6	-153.8	114.7	-54.8	363.3	-7.8	49.1	118.2	-96.8
Mauritania	2.6	-31.2	252.1	49.0	-241.2	261.9	109.5	192.7	202.3
Mauritius	-139.3	-197.4	86.8	-28.9	26.8	-134.3	-123.7	50.4	-125.8
Mozambique	-227.7	-150.9	1792.0	563.2	1010.1	584.5	2731.4	571.4	496.4
Niger	-151.2	-281.6	51.2	-285.8	65.7	-63.0	-66.3	-132.5	-454.9
Nigeria	2887.1	3390.5	6663.7	10263.0	9873.0	5266.8	3753.1	2267.7	5272.3
Rwanda	201.2	125.2	180.0	147.5	38.9	-0.6	-15.2	121.9	112.8

Sao Tome and Principe	26.6	48.6	7.0	37.7	39.5	32.2	12.6	25.3	-7.3
Senegal	-630.9	-183.4	-138.7	-587.1	-602.0	-688.8	-229.0	-40.2	-506.1
Seychelles	193.4	-237.7	99.6	167.7	50.3	-42.9	129.8	114.4	-58.4
Sierra Leone	92.3	84.7	88.9	326.3	488.1	222.8	148.8	-162.7	178.9
South Africa	3304.0	635.9	2164.5	2358.4	2720.9	4763.7	1300.3	-1727.4	2146.3
Sudan	70.7	2521.1	971.9	-229.6	140.8	177.6	94.9	-228.2	-1350.9
Swaziland	133.8	138.0	53.1	149.9	-76.4	86.8	84.6	10.8	-36.5
Tanzania	874.4	110.8	50.7	-207.1	-4.3	93.1	286.3	299.6	134.4
Togo	-63.6	216.4	-139.9	-349.7	-51.9	-173.7	63.7	189.0	-54.3
Uganda	-238.1	-11.8	227.4	47.7	97.4	231.8	296.6	75.4	-26.8
Zambia	1008.1	2010.2	1096.5	174.7	42.5	-593.6	883.0	-434.6	-170.2
Zimbabwe	347.3	946.1	535.5	682.4	1462.8	733.2	70.4	751.5	630.8
Total	8661.7	16543.7	24620.5	21741.7	24389.0	17174.3	16152.2	12056.2	11004.8

Table B1: (Continued)

YEAR	1997	1998	1999	2000	2001	2002	2003	2004
Angola	-98.6	1840.3	788.5	910.8	1882.3	2525.5	3345.3	2763.1
Benin	-39.5	-230.6	-227.5	-74.5	118.4	-17.3	-148.1	-127.4
Botswana	169.1	200.5	223.8	211.6	431.6	630.2	759.5	681.0
Burkina Faso	22.8	227.5	98.4	-215.9	-39.0	-6.1	155.2	
Burundi	68.5	119.7	33.9	71.9	-58.3	240.8	224.0	-88.6
Cameroon	2404.2	826.6	-213.9	454.1	-1464.6	-155.8	-848.5	-471.6
Cape Verde	261.7	74.1	88.3	56.7	96.9	111.2	210.6	58.6
Central African Republic	30.5	43.6	-5.6	-67.2	-19.4	266.5	-65.1	-4.0
Chad	52.9	14.3	2.9	-54.7	34.4	-612.7	54.7	446.2
Comoros	-193.3	-196.3	-10.8	14.9	44.1	41.0	-8.8	8.9
Congo, Dem. Rep.	-581.2	432.8	-660.8	-143.8	-1394.7	412.3	1092.1	1104.1
Congo, Rep.	1087.7	1065.8	1202.3	1172.2	347.3	769.4	2343.9	3732.2
Cote d'Ivoire	1600.8	22.2	-633.8	-457.0	-506.0	976.5	3052.6	543.8
Ethiopia	375.8	375.5	-596.9	457.6	1153.6	2437.5	1857.2	1759.9
Gabon	701.2	358.4	294.5	725.4	34.6	522.2	358.0	1429.7
Ghana	-107.4	430.2	-379.1	235.8	425.7	985.6	753.7	808.4
Guinea	151.2	107.6	-191.8	-357.3	-212.4	45.8	-139.2	-84.7
Kenya	179.7	660.8	-475.9	-179.9	-1270.1	424.0	250.8	-331.3
Lesotho	-182.9	-143.7	-24.2	-63.9	-289.5	199.1	79.2	89.7
Madagascar	290.0	515.3	568.2	-100.8	-180.8	592.2	509.3	-323.1
Malawi	-314.9	461.3	210.2	-113.2	17.9	41.3	156.0	189.8
Mali	243.3	-131.4	-241.5	-394.2	-148.8	294.5	-20.5	146.6
Mauritania	187.9	-78.0	247.3	-7.6	-211.0	329.9	-122.4	-324.7
Mauritius	174.1	235.3	-322.9	-614.8	236.7	-348.0	-399.7	-634.1
Mozambique	1137.3	948.2	-1960.7	-133.1	852.4	368.3	-138.4	-562.7
Niger	-270.3	-124.5	-192.9	-445.7	-455.2	-416.1	-236.0	-379.8
Nigeria	1583.3	1495.4	4693.1	9668.2	3991.9	5101.4	20769.1	5768.2
Rwanda	22.5	76.6	32.0	63.4	9.6	59.6	31.2	50.8

Sao Tome and Principe	8.0	50.5	88.5	21.9	3.3	37.2	-6.2	21.2
Senegal	-347.6	136.8	-329.9	-971.7	206.7	190.9	-351.9	-740.7
Seychelles	104.7	182.5	253.3	318.0	98.8	424.5	259.4	270.6
Sierra Leone	259.3	323.3	108.7	-86.6	-51.7	143.8	174.7	219.8
								-
South Africa	-2826.0	-2087.5	-398.6	2035.7	12307.8	2426.6	1825.7	11711.7
Sudan	-1286.6	-384.8	-763.8	167.6	-308.2	-245.3	1121.1	2891.9
Swaziland	157.5	-122.4	75.7	-54.1	8.8	239.7	182.2	228.9
Tanzania	-62.2	843.0	516.8	4.5	-643.9	319.3	590.6	806.4
Togo	-178.7	-45.2	-166.3	-449.4	-398.6	-280.9	-564.5	-176.0
Uganda	210.0	-14.1	-115.0	540.4	-69.9	651.2	835.6	162.1
Zambia	-444.4	512.6	-384.2	-337.1	-1603.9	-1325.3	-473.1	517.4
Zimbabwe	1885.6	1875.1	1035.8	268.0	-125.1	-686.9	-1278.3	28.3
Total	6436.0	10897.0	2265.8	12076.0	12851.7	17713.4	36190.9	8767.0

Sources: Ndikumana and Boyce 2003; series updated (1997 to 2004) and sample expanded using information from: IMF, *International Financial Statistics*; IMF, *Balance of Payments Statistics*; IMF, *Direction of Trade Statistics*; IMF, various country online information in "Selected issues and statistical appendix"; World Bank, *Global Development Finance*

Table B2: Regression variables: Summary statistics and sources

<i>Variable</i>	<i>N</i>	<i>Mean</i>	<i>Std. Dev</i>	<i>Min</i>	<i>Max</i>	<i>Source</i>
Capital flight/GDP (%)	1218	7.16	22.53	-158.67	188.66	Authors' calculations (see Appendix A)
Total debt/GDP (%)	1287	106.61	88.75	.79	806.16	Global Development Finance (CDROM); IFS for South Africa
Change in debt/GDP (%)	253	8.04	16.28	-143.60	162.13	Authors' calculations from total debt adjusted for exchange rate fluctuations
Real GDP growth (%)	1268	7.58	17.53	-74.35	139.56	World Development Indicators (WDI), CDROM
Inflation variability	820	28.08	111.53	.12	1392.39	Authors' computation using data from WDI as the absolute value of the difference between actual inflation and predicted inflation (obtained from a linear regression of inflation on time).
Private credit/GDP (%)	1096	25.34	21.91	-77.38	144.25	WDI
Interest rate differential	862	14.91	162.97	-19.07	4000.07	Computed using data from WDI as: (real US Tbill rate) – (real deposit rate for the African country)
Fuel exports (% of total exports)	584	16.46	28.11	.00007	99.66	World Bank Africa Database (“mineral fuels”, SITC Section 3)
Polity2 index	847	-2.26	5.97	-10	10	Polity IV Project database
Non-bank private deposits in foreign banks (% of GDP)	1047	8.91	8.11	0	82.35	Bank for International Settlements: http://www.bis.org/statistics/bankstats.htm .