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Abstract

This paper describes the nature of capital flight, the methodologies used to measure it, and its drivers. The paper presents updated estimates of the magnitude of capital flight from 39 African countries for which adequate data are available for the period 1970-2010. It gives a global context of the problem of capital flight from Africa by providing comparative indicators on capital flight and related flows for other developing regions. The paper undertakes a detailed econometric analysis of the drivers of capital flight from African countries. It explores empirically the role of domestic and external factors in driving capital flight, including structural factors, the macroeconomic environment, governance, risk and returns to investment, capital account openness, and financial development. The first objective of the study is to contribute to the literature by providing the most comprehensive analysis of capital flight from Africa that takes into account economic as well as non-economic dimensions, and recognizes the importance of both the domestic and global contexts. The second objective is to contribute to the policy debate on capital flight both in Africa and globally.

Key Words: Capital flight; Africa; sub-Saharan Africa; balance of payments; residual method; trade misinvoicing; odious debts; revolving door; current account; capital account openness.

JEL Classifications: G11; O16; O55; F32

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1. Introduction

The past decades have witnessed growing attention in academia and in policy circles to the issue of capital flight from developing countries in general and from African countries in particular. Researchers are intrigued by the stunning paradox posed by large-scale capital flows both to and from Africa. While the continent receives a substantial amount of capital inflows in the form of official development assistance, external borrowing and foreign direct investment, it also suffers a heavy financial hemorrhage through capital flight.

The evidence in the literature indicates that the problem of capital flight is not unique to Africa; it is prevalent in other developing regions as well (UNDP, 2011). Moreover, the problem is not new and it is not abating (Boyce and Ndikumana, 2001; Ndikumana and Boyce, 2003, 2011a, 2011b). However, the problem of capital flight from African countries deserves serious attention today for a number of important reasons. First, while Africa is the most capital-starved continent, it also suffers a relatively larger flight of private capital than other regions. As of 1990, cumulative capital flight from Africa over 1970-90 represented 40 percent of private wealth, which was four times higher than for Latin America, even though the latter had seventeen times more private capital per worker than Africa (Collier et al., 2001). A more recent study by the Tax Justice Network (Henry, 2012) found that unrecorded outflows from Africa represented 39.5 percent of GDP as of 2010, compared to 12 percent in East and South Asia. Second, the economic cost of capital flight is relatively higher for Africa than other regions. Collier et al. (2001) estimated that as of 1990 Africa had incurred a 16% loss in output due to capital flight. This loss in output in Africa was four times higher than in Latin America, and eight times higher than in East and South Asia. Third, the loss of capital and the resulting loss of output are particularly damaging in a continent that faces relatively higher levels of poverty and continues

to trail behind other regions in most measures of human development (UNDP, 2013; United Nations, 2012). Capital flight implies less spending on social services such as education and health, and this, too, undermines human development (Ndikumana and Boyce, 2011a). The evidence calls for attention by researchers and policy makers to the causes of capital flight from Africa and its impact on the region's economic development.

In this context, this paper discusses the nature of capital flight from African countries and its drivers. It reviews the various approaches used to measure capital flight and presents updated estimates of capital flight from a representative sample of 39 countries, including four from North Africa and the rest from sub-Saharan Africa.[1] Although the terms 'capital flight' and 'illicit financial flows' are sometimes used interchangeably in the literature, we note that the two concepts are different. Illicit financial flows encompass not only capital flight but also other financial flows such as payments for smuggled imports and the use of transfer pricing for tax evasion, some of which are discussed in various chapters in Ajayi and Ndikumana (2014).

Using our updated estimates, this paper investigates econometrically the determinants of capital flight from African countries. It explores a range of factors related to the macroeconomic environment, the political and governance regime, risk and returns to investment, endowment in natural resources and capital account regulation. The analysis aims at providing fresh empirical insights that can shed light on possible policies and strategies to stem capital flight.

[1] This sample of 39 countries represents 92 percent of the continent's GDP and 91 percent of the total population (based on 2010 values).

2. Understanding and measuring capital flight

2.1. Financial flows and the Balance of Payments

Economic exchanges between countries generate inward and outward financial flows, which are normally recorded in the Balance of Payments (BoP). Inflows are recorded with a positive sign, outflows with a negative sign. The first broad category of flows consists of current account transactions, associated with trade in goods and services as well as current transfers. The second broad category consists of capital account transactions. The key flows in this category are debt flows and private investment flows. Debt flows comprise new borrowing as inflows and debt payment (amortization) as outflows.[2] Private investment flows consist of foreign direct investment and portfolio investment. In most African countries, the dominant form of external private investment is foreign direct investment, given the underdeveloped level of equity and bond markets. In addition, the BoP records additions to (or subtractions from) the country's official foreign exchange reserves.[3]

If all the transactions were adequately recorded, the balance on the current account would be symmetrically equal (with an opposite sign) to the balance on the capital account plus changes in reserves. In other words, the country's inflows (sources of foreign exchange) would match its outflows (uses of foreign exchange). In practice, however, discrepancies can arise for a variety of reasons, and these are reported in the BoP as 'net errors and omissions' to balance the BoP as a whole. If these discrepancies were purely a result of random statistical errors – for example, end-

[2] Interest payments, the other component of debt service, are recorded in the current account as payment for the 'services' of capital.
[3] Additions to reserves are treated as 'uses' of foreign exchange and hence carry a negative sign in the BoP. Subtractions are 'sources' of foreign exchange and hence carry a positive sign. This signing convention makes intuitive sense when we note that the official reserves of African countries are typically held in London, Paris or New York.

of-the year differences in the recording of inflows and outflows – net errors and omissions could be expected to be fairly small, fluctuating from year to year around a mean of approximately zero.

In African countries, however, we find that country BoP records often exhibit substantial negative discrepancies between the sources of foreign exchange and their uses, indicating the presence of unrecorded movements of funds from the country to the rest of the world. The discrepancies often grow even larger once the BoP data on exports, imports, and debt flows are corrected using other official data sources. Unrecorded financial outflows are referred to as capital flight. The remainder of this section reviews the methodologies used to measure capital flight.

2.2. Measurement of capital flight

A. Direct and indirect measures of capital flight

The literature has offered various approaches to measuring capital flight, which have been refined over time in a number of important ways. There are two broad approaches: the direct 'hot money' approach and the indirect 'residual' approach. The 'hot money' approach relies solely on the official BoP data in attempting to identify flows that constitute capital flight. Capital flight is viewed as outflows of short-term capital in response to political and economic risks, expectations of currency devaluation, tax hikes, and other risks.[4] 'Hot money' measures of capital flight begin with the 'net errors and omissions' of the BoP and then add 'other short-term capital' associated

[4] This view is in the tradition of Kindleberger who viewed capital flight as abnormal resource outflows motivated by uncertainty (Kindleberger, 1937).

with 'other sectors' (i.e., excluding the official sector and banks), which are taken to represent 'speculative capital exports' (see Cuddington, 1986, 1987).

The residual approach to measuring capital flight takes the view that recorded flows should not be considered as capital flight. It therefore defines capital flight as a residual, the difference between recorded inflows and recorded uses of foreign exchange (Cuddington, 1986, 1987; Erbe, 1985; World Bank, 1985). If BoP data were the sole source of information used, this would simply mean 'net errors and omissions.' Because debt inflows very often are under-reported in the BoP accounts, however, researchers obtain information on these flows from other official sources – typically the World Bank's *Global Development Finance* database – and recalculate the residual on this basis. This is the approach that is most prominently used in the literature.[5] We discuss this method in detail in the remainder of this section.

B. Capital flight as a Balance of Payments residual

The residual measure of capital flight was originally developed by researchers at the World Bank in the mid-1980s.[6] In the wake of the developing countries' debt crisis that began earlier in that decade, observers discovered substantial imperfections in the official BoP statistics, especially the data on external debt where inflows were often under-reported. The World Bank assembled more detailed and accurate data on external debts, and these were published in the *World Debt Tables* (subsequently incorporated in the *Global Development Finance* database). Under this approach, estimating capital flight entails attempting to track down flows that ought to have been recorded in the BoP, but which in practice were not recorded.

[5] A detailed inventory of studies on capital flight indicating the methodology used in each study is available on the project's webpage on the AERC website at http://www.aercafrica.org/index.php/capital-flight.
[6] See Lessard and Williamson (1987b) for a review.

Capital flight was then estimated as the difference between inflows and outflows of foreign exchange, with all data taken from a country's BoP statistics except for external borrowing, for which the more complete data were substituted. The difference was referred to as the residual measure of capital flight (Erbe, 1985; World Bank, 1985).

The residual measure of capital flight is computed as follows:

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

where for country i in year t, $\Delta DEBTADJ$ is the change in the stock of external debt outstanding adjusted for exchange rate fluctuations, *FDI* is net foreign direct investment, *CA* is the current account deficit, and ΔRES is net additions to the stock of foreign reserves.

Only a minor fraction of the 'leakages' revealed by this calculation can be attributed to statistical errors (Lane and Milesi-Ferrett, 2007). Statistical discrepancies would be expected to be randomly distributed with a mean of zero; they would not systematically reveal net outflows or inflows. In Africa, most of the unrecorded flows typically are outflows resulting from illicit transactions pursued for a variety of motives discussed below, including money laundering, tax evasion and tax avoidance. These outflows have been impacted by the increasing complexity of financial transactions resulting from globalization, the increasing sophistication of operations of multinational corporations with multiple domiciles across the globe, and the expansion of the 'offshore interface between illicit and licit economies' (Christiansen, 2009); see also Baker (2005) and Henry (2012)).

Two important refinements have been made to the debt data used in the original version of the simple residual measure. First, the end-of-year debt stock is adjusted to account for exchange

rate fluctuations during the year in the calculation of the change in debt $\Delta DEBTADJ$ (Boyce and Ndikumana, 2001). A detailed description of the algorithm is provided in Annex A1. Second, the change in debt is adjusted to account for debt write-offs, given that they are reported as a reduction in the stock of debt even though they have no corresponding outflow of debt repayment.

C. Trade misinvoicing

Data on external borrowing are not the only numbers that are systematically misreported in official BoP statistics. Official measures of exports and imports can be distorted by trade misinvoicing. Using data from bilateral trade partners, the simple residual estimate of capital flight can be adjusted to correct for these errors.

Misinvoicing of international trade transactions occurs for several reasons. On the export side, operators may underinvoice exports (by understating their quantity, price, or both) so as to conceal their actual earnings and keep the difference in foreign accounts. This can be an important conduit for capital flight, as our results will illustrate. On the import side, businesses may overinvoice their import bills in order to obtain extra foreign currency from banking authorities, again stashing the difference abroad in private accounts or other assets – an analogous mechanism of capital flight. On the other hand, imports may be underinvoiced or not recorded at all so as to circumvent customs duties, phenomena known as 'technical smuggling' and 'pure smuggling,' respectively. Imports must be paid for regardless of whether they are

reported in full to the authorities or not. Payments for smuggled imports can be considered another type of illicit financial flow, distinct from capital flight.[7]

The amount of trade misinvoicing is estimated by comparing a country's declared imports and exports to those of its trading partners. For example, exports by Gabon to France, as reported in Gabon's official trade statistics, should equal France's imports from Gabon, as reported by France in its trade statistics, after adding the cost of freight and insurance to the value declared by Gabon. Gabon's imports from France can be compared to France's exports to Gabon in a similar fashion. The relevant data for both trading partners are reported in the IMF's *Direction of Trade Statistics*.

Assuming the trade statistics reported by advanced economies to be more reliable, trade misinvoicing of African countries relative to this group is used as a benchmark to compute overall trade misinvoicing. For an African country *i* in year *t,* export discrepancies with industrialized countries (*DXIC*) are computed as follows:

$$DXIC_{it} = PXIC_{it} - (XIC_{it} * CIF_t) \quad (2)$$

where *PXIC* is the value of 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.[8]

[7] While export misinvoicing and import misinvoicing can be estimated separately from the IMF *Direction of Trade Statistics,* we cannot use these aggregate data to separate out import overinvoicing and import underinvoicing. Only their net effect can be calculated, which is what matters in estimating total capital flight.

[8] South Africa is the only SSA country that publishes imports at both c.i.f. and f.o.b. in the Direction of Trade Statistics (DOTS), making it possible to compute the c.i.f./f.o.b. factor. For other countries, the factor may be

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

$$DMIC_{it} = MIC_{it} - (PMIC_{it} * CIF_t) \quad (3)$$

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.

We scale up the derived value of trade misinvoicing by the inverse of the share of advanced economies in the country's total exports (ICXS) and total imports (ICMS) to obtain a global measure of import and export misinvoicing as follows:[9]

$$MISINV_{it} = \frac{DXIC_{it}}{ICXS_{it}} + \frac{DMIC_{it}}{ICMS_{it}} \quad (4)$$

Total trade misinvoicing (*MISINV*) is the sum of misinvoicing of exports and misinvoicing of imports. A positive sign on export misinvoicing indicates a net outflow (export underinvoicing), while a negative sign indicates a net inflow (export overinvoicing). In most cases, we expect export underinvoicing to dominate export overinvoicing.[10] A positive sign on import misinvoicing again indicates a net outflow (overinvoicing of imports), while a negative sign

derived using the two values of total imports reported in the DOTS labeled IFS World Total and DOTS World Total. The ratio of the two should be equal or close to 1.10, given that the former series is obtained by applying a 10% factor to the latter according to the IMF's *Guide to Direction of Trade Statistics*. However, the derived ratios are at times less than 1 and they can fluctuate substantially from one year to another. In our past estimates of capital flight we used the average factor for Africa obtained from IMF's printed DOTS reports, but this information is no longer published. In this report, we use a 1.10 factor for all countries except for South Africa where we use the actual ratio of imports c.i.f to imports f.o.b calculated from DOTS data.

[9] In past editions of our capital flight series, we used the country's average ICMS and ICXS shares over the sample period. In this edition we use the actual annual value. As the time period increases, averaging out these shares implies substantial loss of information. Furthermore, using the actual annual ratio will make it easier for any interested user to update the capital flight series.

[10] Export overinvoicing is relatively uncommon, but it can be motivated by particular policies such as export incentives.

indicates a net inflow (underinvoicing as a result of import smuggling). In many cases, smuggling dominates import overinvoicing, resulting in negative net import misinvoicing adjustments. When this effect is large enough to outweigh net export underinvoicing as well, the overall effect of the trade misinvoicing adjustment is to reduce estimated capital flight below the simple residual measure. This is because some of the 'missing money' was used to fund the deficit in illicit trade transactions, rather than being counted as an unrecorded capital outflow. Conversely, where export underinvoicing and import overinvoicing outweigh smuggling, the net effect of the trade misinvoicing adjustment is to increase estimated capital flight above the amount given by the simple residual measure.

Since the misinvoicing adjustment is based on discrepancies between the values of exports and imports recorded by African countries and their trading partners, it does not capture the related but distinct phenomenon of 'transfer pricing' in which the same values are recorded by both the exporting country and the importing country at anomalous prices. This practice is often used in intra-firm trade by multinational enterprises with the aim of booking profits in low-tax (or tax-free) jurisdictions so as to minimize the firm's overall tax liability. This corporate (mis)behavior, driven by the motive of avoiding or evading taxes, can be regarded as a first cousin to capital flight.

D. Unrecorded workers' remittances

Another flow that is often underreported in the BoP is worker remittances to developing countries. This has the same effect as the underreporting of export earnings. We estimate unrecorded remittances by comparing the country's officially recorded remittances as reported in the BoP to survey-based estimates compiled by the International Fund for Agricultural

Development (IFAD) for the year 2006.[11] In comparing the two measures, we consider only the IFAD estimates of remittances from industrialized countries as these data are likely to be more reliable. In principle, the BoP value should be larger because it includes remittances from the entire world, not only from the industrialized countries. When the IFAD estimate exceeds the BoP value, we take this as evidence of underreporting and calculate the discrepancy. We then extrapolate the discrepancy based on IFAD's data for the year 2006 to estimate discrepancies for earlier and subsequent years, based on the trend in overall African remittance inflows reported in the BoP statistics. The formula is as follows:

$$RID_{it} = (ARI_{i,2006} - BPRI_{i,2006}) * BPRI_t / BPRI_{2006} \quad (5)$$

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

The total magnitude of capital flight, adjusted for trade misinvoicing and unrecorded remittances, in a given year t for a country i, is then obtained by summing the above components as follows:

$$\boldsymbol{ADJKF_{it} = \Delta DEBTADJ_{it} + FDI_{it} - (CA_{it} + CRES_{it}) + MISINV_{it} + RID_{it}} \quad (6)$$

E. Real capital flight and stock of capital flight

To facilitate analysis of capital flight over time, the annual flows are converted into constant 2010 dollars using the US GDP deflator. In addition, an estimate of the accumulated stock of

[11] See Ndikumana and Boyce (2011a) for details.

capital flight is calculated by imputing interest earnings using the United States short-term Treasury bill rate. Of course, not all the capital flight from African countries was invested at this rate of return. Some was squandered on extravagant consumption, some may have earned lower returns, and some may have earned higher returns than the rather conservative T-bill benchmark. Regardless, the estimated stock of capital flight provides a measure of opportunity costs to the source country; that is, the benefits foregone by virtue of the loss of capital that could have been invested in infrastructure, health, education, or other productive uses.

2.3. Data, sources and limitations

The data used in the computation of capital flight are from the IMF's *Balance of Payments Statistics* (BoP), *Direction of Trade Statistics* (DOTS), and *International Financial Statistics* (IFS); and the World Bank's *World Development Indicators* (WDI) and *Global Development Finance* (GDF). A detailed list of the variables used in the computation of capital flight as well as the data sources is provided in **Error! Reference source not found.** in the appendix.

The electronic DOTS database contains trade data from 1980 onwards only. The data for the 1970s were obtained from printed editions of the DOTS Yearbook. BoP data are reported sparsely in the early years of the 1970s for most countries in the online and CDROM versions of this database. Hence, printed versions of the BoP were used to fill in the missing data. Up to 1983, the values in the printed editions of the BoP were reported in Special Drawing Rights (SDRs). The values for this period were converted into US dollars (USD) using the USD/SDR exchange rate. For some countries, data were missing in the BoP in some years over the 1980-2010 period. We used the IMF's online country staff reports to fill these gaps. The concerned years are shown in **Error! Reference source not found.** in the appendix.

For some countries, the currency composition of long-term debt reported in GDF appears to be incomplete, as the sum of the shares of the components does not add up to 100% in some years. In those years, we retained the unadjusted change in debt stock in lieu of $\Delta DEBTADJ$. These countries and the relevant years are also shown in **Error! Reference source not found.** in the appendix.[12]

2.4. Capital flight and illicit financial flows

There is a tendency in the literature to use the terms 'capital flight' and 'illicit financial flows' interchangeably. By definition and in practice, the two are different. Using the conventional measures described above, illicit financial flows include more than what is captured as capital flight. In particular, the measure of illicit financial flows developed by researchers at Global Financial Integrity (GFI) include some payments for unrecorded imports (AfDB and GFI, 2013; Kar, 2010; Kar and Cartwright-Smith, 2010; UNDP, 2011).[13] While such payments are illicit, they are not capital flight: the money is not parked abroad, but rather it is spent on goods that return to the country. In other words, while all capital flight (as the term is used here, and as measured in equation 6) can be considered illicit, not all illicit financial flows are capital flight. Illicit financial flows are a broader category that includes payments for smuggled imports, payments arising from trade in narcotics and other contraband, laundered money that flows through officially recorded banking channels, and the effects of intra-firm transfer pricing. The

[12] For South Africa, the data on debt and the currency composition of long-term debt are available in WDI/GDF only starting from 1994. We obtained debt stock data for the previous years from the South African Reserve Bank (online database: http://www.resbank.co.za/Research/Statistics/Pages/OnlineDownloadFacility.aspx.). No adjustment for exchange-rate fluctuation for these years was made due to the lack of data on the currency composition of long-term debt.

[13] As noted above, trading partner data comparisons using *Direction of Trade Statistics* can only reveal net import misinvoicing arising from both underinvoicing for tariff evasion and overinvoicing for capital flight. When the former exceeds the latter, the GFI measure of illicit financial flows does not subtract net import underinvoicing, whereas this is subtracted from our measure of capital flight.

techniques for measuring illicit financial flows are still evolving. For discussion, see the various chapters in Reuter (2012).

It is not possible to ascertain precisely what fraction of capital flight originated as licit or illicit capital, just as it is not possible to determine its ultimate destinations and uses. Presumably, some of the unrecorded movements of capital across borders may be funds that were honestly acquired. All capital outflows that evade official recording can be considered illicit, however, by virtue of their clandestine transfer.[14] Much of the funds that 'go missing' may be illicit, however, by virtue of the acquisition of funds and the illicit holding of funds abroad, as well as by virtue of the transfer of funds. Some, if not all, capital flight is therefore illicit in all three respects:

(i) *Funds acquired illegally:* Capital outflows are illicit when the funds were acquired illegally. Funds may be acquired illegally through the embezzlement of public resources (tax revenue, loans, export proceeds of public enterprises, etc.), bribes and extortion on public projects, tax evasion, and the proceeds of criminal activities such drug and human trafficking (Baker, 2005). Funds acquired by such illegal means will often be hidden abroad for the sake of evading legal scrutiny on their origins.

(ii) *Funds transferred abroad illegally*: Capital outflows are illicit when they are transferred into foreign assets (liquid assets such as bank deposits, or physical assets such as real estate) without the required declaration of the transaction with the relevant regulatory authorities (central bank, customs authorities, etc.). This can involve actual, undeclared movement of funds from the country to foreign entities and locations, or the

[14] An exception would be outflows that are declared to the authorities, but nevertheless fail to appear in official BoP data due to bureaucratic error. The extent of such errors is a topic on which future research would be helpful.

manipulation of trade invoices to overstate or understate the value of transactions in order to transfer or keep some of the funds abroad.

(ii) *Funds held abroad illegally:* The illicit nature of capital flight may also arise from the failure by the owners to report or declare these assets to the national authorities. This is motivated either by the desire to conceal the origin of the funds (if these were illicitly acquired or illicitly transferred abroad) or to avoid taxation. The illicit transfer and holding of assets abroad has been facilitated over the past decades by the explosion of the offshore financial system and bank secrecy jurisdictions or 'safe havens' (Shaxson, 2011).

3. Estimates of capital flight from African countries, 1970-2010

This section provides estimates of capital flight from 39 African countries, including four from North Africa and 35 from Sub-Saharan Africa, over the period 1970-2010. Detailed country time series are available online at the Political Economy Research Institute's website.[15]

3.1. Trend and magnitude of capital flight

Two facts clearly emerge from the data: capital flight from African countries is a chronic problem, and the problem is getting worse. The continent has experienced capital flight from as far back as 1970, although measurement and analysis of the scale of Africa's capital flight dates only from the 1990s (Ajayi, 1997; Ajayi and Khan, 2000; Chang and Cumby, 1991; Hermes and Lensink, 1992; Kahn, 1991; Murinde et al., 1996; Wood and Moll, 1994). Between 1970 and 2010, capital flight from the 39 African countries for which we have data amounted to $1.3

[15] Available at: http://www.peri.umass.edu/300/#c2324

trillion (in constant 2010 dollars). Between 2005 and 2010 alone this group of countries lost $289 billion (Figure 1).

Capital flight has accelerated since 2000, a period that coincides with the commodity-driven growth resurgence in the continent. The explosion of capital flight is particularly evident among oil-exporting countries, where it rose to a total of $423 billion during 2000-10 from $118 billion during 1990-99 (Figure 2). The group of oil-exporting countries here comprises eleven countries: Algeria, Angola, Chad, Cameroon, Republic of Congo, Democratic Republic of Congo, Côte d'Ivoire, Egypt, Gabon, Nigeria and Sudan. These countries rank at or near the top of the list in terms of the volume of capital flight, as can be seen in Table 1. Nigeria, Algeria and Angola lead the pack with $311 billion, $267 billion, and $77.5 billion (in constant 2010 dollars), respectively. Egypt and Côte d'Ivoire follow with $59.7 billion and $56 billion, respectively.

If we assume that past capital flight accumulated (or could have accumulated) interest earnings at the modest rate of the 3-month US Treasury bill, the stock of capital flight by 2010 amounts to $1.68 trillion for the group of 39 countries. This vastly exceeds the stock of debt of $283 billion owed by these countries in 2010, which implies that the region is a 'net creditor' to the rest of the world. In other words, if this group of countries could recoup a modest fraction of their stolen assets – about 17 percent – they could go debt free at the stroke of a pen.

The magnitude of capital flight is large in both absolute and relative terms. For the group of the 39 countries as a whole, cumulative capital flight over this period (in 2010 dollars) represents 82 percent of their combined GDP in 2010 (Table 1). For eighteen of the countries, cumulative capital flight is greater than GDP. In the DRC, for example, capital flight amounted to $513 per capita, compared to an annual per capita income of $199.

3.2. Magnitudes of trade misinvoicing and unrecorded workers' remittances

As indicated earlier, the simple residual measure of capital flight often captures only part of unrecorded capital outflows from African countries. Table 2 shows the effects of the adjustments for trade misinvoicing and unrecorded remittances. For the 39 countries as a group, the simple residual measure amounted to $790 billion (in 2010 dollars) over the 1970-2010 period. Net trade misinvoicing contributed a total of $309 billion more: $859 billion of export underinvoicing minus $550 billion in net import underinvoicing (i.e., the surplus of payments for smuggled imports over any import overinvoicing). Unrecorded remittances added another $174 billion to total capital flight.

The data in Table 2 show substantial cross-country variations in the relative importance of these various components of measured capital flight. We can identify four main patterns in the trade misinvoicing data:

1. Substantial export underinvoicing and import overinvoicing, both resulting in net capital outflows (positive sign), as in the cases of Algeria, Côte d'Ivoire, Tunisia and Zimbabwe.
2. Substantial export underinvoicing (net outflows) coupled with import underinvoicing (net inflows), with the balance resulting either in a net outflow, as in the case of Morocco and Sudan, or a net inflow, as in the cases of Egypt, Ethiopia and Ghana.
3. Export overinvoicing (net inflows) coupled with import overinvoicing (net outflows), as in the case of Zambia.
4. Little net misinvoicing of either imports or exports, as in the case of Angola.

Unrecorded worker remittances also contribute a substantial amount to total capital flight in a number of countries. That is, the actual remittance inflows appear to be substantially higher than what is recorded in the Balance of Payments. In Algeria, the country with the largest remittance adjustment, the discrepancy amounted to nearly $70 billion over the 1970-2010 period. In some cases, comparisons with other official sources indicate even larger discrepancies than those we have estimated here. In the case of Ethiopia, for example, the amount reported in the BoP in 2009 was about half the volume reported for the same year by the Central Bank, which was over $700 million (World Bank and African Development Bank, 2011, p. 51). Based on the Ethiopian migrant population, the true amount of remittance flows to Ethiopia could reach one billion dollars or more.[16] If so, this would suggest that our estimates of capital flight are conservative.

3.3. Capital flight relative to other flows

The volumes of capital flight also are large relative to other cross-border flows, such as foreign direct investment and foreign aid. It is commonly believed that African countries are heavily dependent on international development assistance. The group of 39 African countries considered in this study received cumulative aid of $875 billion (again in constant 2010 dollars) over the 1970-2010 period (Table 3). This is substantially less than the $1.3 trillion of capital flight over the same period. The group attracted a total of $459 billion in foreign direct investment in the same period, with 37 percent of this going to the eleven major oil exporters. For the 39 countries as a whole, capital flight is equivalent to 95 percent of the combined amount of foreign aid and foreign direct investment. For the oil exporters group, the ratio is 176 percent.

[16] See for example http://bendixenandamandi.com/wp-content/uploads/2010/08/World-Bank-Ethiopia-Presentation.pdf.

The data clearly show that the heralded recent rise of capital inflows into the continent in the form of foreign aid and foreign direct investment has been outpaced by unrecorded outflows of capital (Figure 3). At the same time, many African countries, faced with heavy burdens of external debt, have been paying to the rest of the world more in debt service than they have been receiving in new loans. As can be seen in

Figure 4, net transfers on external debt (new borrowing minus debt service payments on previous loans) declined systematically throughout the 1980s, turning negative in the 1990s. They increased after 2005 thanks to debt relief programs. As we have discussed in our earlier work, and as we document with the new empirical evidence in this paper, a substantial fraction of Africa's external debt fueled capital flight rather than financing economic development, a phenomenon referred to as the 'revolving door' (Ndikumana and Boyce, 2003, 2011b).

3.4. Capital flight from Africa in global perspective

As noted in the beginning of this paper, the problem of capital flight is not unique to Africa, but it is a more urgent problem for the continent relative to other developing regions. According to existing estimates at the regional level, capital flight from Africa is lower in absolute dollar amounts compared to that from Latin America and Asia (Beja, 2006; Collier et al., 2001; Henry, 2012; Pastor, 1990; UNDP, 2011). However, capital flight represents a relatively larger burden on African economies. Table 4 presents comparative statistics for Africa and other developing regions. A number of points emerge from these data:

- First, as noted above, Africa has a much lower private capital stock compared to other regions. In 1990, private capital per worker was the lowest of all regions at $1,062, compared to more than $17,000 in Latin America. At the same time, 40 percent of Africa's private capital was held abroad in the form of capital flight, the highest ratio of all developing regions (Collier et al., 2001).
- Second, relative to the size of their economies, capital flight represents a larger drain on Africa compared to other regions, according to both the estimate of foregone output by Collier et al. (2001) and the estimate of capital flight-to-GDP ratios by (Henry, 2012).

- Third, the evidence indicates that while all developing regions are net creditors to the rest of the world, in the sense that the accumulated capital flight exceeds the stock of external debt, Africa has a much larger relative net external position, with the stock of capital flight representing three times the stock of debt in 2010.

Capital flight from Africa is a symptom of a structural problem: the severe concentration of wealth in the hands of very few individuals. Indeed, capital flight contributes to worsening the problem of inequality, as it allows wealthy individuals to hide stolen assets, evade taxes, and avoid the adverse impacts of currency depreciation. According to the *World Wealth Report* (Capgemini and RBC Wealth Management, 2012; Knight Frank, 2013), African high net worth individuals (HNWIs) owned $1.1 trillion in 2011, equivalent to 64 percent of the continent's GDP (Table 5). This wealth belonged to only 0.1 million people, or 0.01 percent of the continent's population. By comparison, the HNWIs in North America, who owned $11.4 trillion, or 78 percent of GDP, represented 0.64 percent of the population. This suggests that Africa's capital flight is an important corollary of the accumulation of extravagant private wealth.

4. Drivers of capital flight

In addition to measurement, understanding the motivation and drivers behind capital flight also presents a challenge. This section reviews the key factors, which, *a priori*, may lie behind the levels and patterns of capital flight from developing countries. The factors can be grouped into domestic drivers and external drivers. We discuss these in turn below.

4.1. Domestic drivers of capital flight

Domestic conditions that drive capital flight are mainly related to structural features of the economy, the macroeconomic environment, risk and returns to investment, economic governance including the management of external borrowing, and political factors. The empirical evidence on the strength of the relationship between these factors and capital flight is mixed.[17]

(i) Structural factors

Certain characteristics of a country's economy may make it relatively more prone to capital flight than others. One such factor is natural resource abundance. The exploration, exploitation and export of these resources present opportunities for embezzlement, theft, and trade misinvoicing. The evidence shows that many African countries that are rich in oil and minerals (Angola, Côte d'Ivoire, Cameroon, the Democratic Republic of Congo, the Republic of Congo, Gabon and Nigeria) have experienced relatively high levels of capital flight (Boyce and Ndikumana, 2012; Ndikumana and Boyce, 2011a, 2012). However, a country's endowment in natural resources *per se* does not necessarily make it prone to capital flight. Rather it is poor governance and the lack of management capacity – together with natural resource endowment – that exposes countries to high levels of capital flight. Botswana, with a good governance record, has low levels of capital flight despite its rich endowment in diamonds.

(ii) Macroeconomic environment

The macroeconomic environment may induce, facilitate, or discourage capital flight in several ways. First, in the eyes of savers and investors, strong economic performance, as reflected in high economic growth and high domestic investment, may signal favorable future returns to

[17] A detailed inventory of studies on the determinants of capital flight is available online on the AERC Capital Flight project at http://www.aercafrica.org/index.php/capital-flight.

domestic investment, which would reduce capital flight. Second, high and variable inflation may encourage capital flight as investors arbitrage between domestic and foreign assets. Third, fiscal policy may influence capital flight, although the empirical evidence on this point is mixed.[18]

(iii) Risk and returns to private investment and portfolio choice

A number of studies have modeled capital flight as outflows responding to asymmetric risk on domestic assets relative to foreign assets. Domestic assets may face higher risk arising from currency depreciation, devaluation, inflation, and financial instability (Dornbusch, 1985), risk of expropriation (Kant, 2002; Khan and Haque, 1985), expectations of higher taxation, and lower public guarantees on private debts (Eaton, 1987). If risk-adjusted returns to investment are lower at home than abroad, agents will prefer to hold wealth abroad. Following this line of reasoning, key factors would include: the real interest rate differential between a country and the rest of the world; changes in the real exchange rate; the quality of infrastructure, human capital, and other features of the domestic economy that affect trade and production costs; and the business and legal environment in general.

Investment risk and return considerations are likely to be most relevant in the case of honestly acquired wealth, whose owners make portfolio management decisions to maximize expected returns to investment. These considerations are likely to be less relevant in the case of stolen money or proceeds from illegal activities that owners seek to hide abroad, or in the case of capital flight motivated by tax evasion and tax avoidance. In fact, holders of assets in banking secrecy jurisdictions sometimes receive negative interest rates on their deposits, implying that

[18] Studies on Bangladesh found that corporate taxation and fiscal deficits are important drivers of capital flight (Alam et al., 1995; Alam and Quazi, 2003), and research on Bolivia found that fiscal budget surpluses are negatively related to capital flight (Schneider, 2003). A study on India, however, found no evidence of an impact of fiscal deficits on illicit financial flows (Kar, 2010).

they are willing to pay 'a premium for security' (Australian banker Erhard Fürst quoted in Lessard and Williamson, 1987a, p. 83). 'If confidentiality has value,' Walter (1987, p. 107) pointed out, 'then asset holders engaging in capital flight should be willing to pay for it.' Confidentiality has particularly high value to those with something to hide.

The empirical evidence on the portfolio-choice view of capital flight from Africa is at best mixed. Some studies interpret the accumulation of private capital outside of the continent as *prima facie* evidence of the preference for foreign assets (Collier et al., 2001; Collier et al., 2004). However, econometric analysis attempting to link directly capital flight to measures of risk-adjusted returns to investment has failed to find conclusive evidence for the portfolio-choice motive (Ndikumana and Boyce, 2003, 2011b).

(iv) Capital account regime and financial regulation

The capital account regime, and the regulation of the financial system in general, may also have implications for capital flight, although their impact cannot be determined *a priori*. It may be argued, on the one hand, that the absence of capital controls (or ineffective capital controls) makes it easier to shift funds abroad, thus facilitating capital flight. If so, financial openness would be correlated with higher capital flight. On the other hand, one may also argue that capital account openness reduces incentives for capital flight, as it makes it easier to conduct international transactions and thereby lessens the need to smuggle funds abroad, in which case we might expect a negative correlation between financial openness and capital flight. Even in the presence of capital controls, agents may find ways to circumvent them by taking advantage of increasing financial and trade integration (Auguste et al., 2002). As Wood and Moll (1994, p.28) remark in a study on South Africa: 'wherever exchange controls are in force, people have an

incentive to evade them.' The relationship between capital account openness and capital flight is investigated econometrically in the next section.

Liberalization of the financial system more generally may also have implications for capital flight, but as in the case of capital account openness, the impact cannot be determined *a priori*. On the one hand, financial liberalization can be expected to reduce the rate-of-return differential between economies as a result of increased capital mobility. This would reduce simple profit-driven capital flight. On the other hand, financial liberalization may open additional opportunities for unrecorded financial transactions, which could increase capital flight. An empirical study on nine African countries found that, to the extent that financial liberalization affects capital fight, its impact was quite small (Lensink et al., 1998), with the results being sensitive to the indicator used to measure financial liberalization.

(v) Governance

Capital flight can be characterized as an outcome of the failure of economic governance. As discussed above, an unstable macroeconomic environment or a regulatory stance that discourages private investment may induce capital flight. More directly, poor governance, manifested in corruption, abuse of political power, and lax regulation, is likely to be correlated with capital flight. Poor economic governance facilitates and encourages theft of public funds, embezzlement of national resources, trade misinvoicing, and smuggling of goods and capital across borders. The evidence shows that African countries on the top of the list in terms of capital flight – such as Angola, Côte d'Ivoire, Cameroon, the Democratic Republic of Congo, the Republic of Congo, Gabon and Nigeria – also tend to have a weak governance record (Boyce and Ndikumana, 2012; Ndikumana and Boyce, 2011a, 2012).

(vi) External borrowing

The embezzlement of externally borrowed funds provides a means of financing capital flight, a phenomenon referred to as 'debt-fueled' capital flight or the 'revolving door'. High levels of debt may also push capital out of the country, as private investors are wary of risks of higher taxation to pay for debt service, or as they interpret high indebtedness as an indication of a general loss of control by the government over the economy, a phenomenon referred to as 'debt-driven' capital flight.

Causal links may also operate in the reverse direction. Capital flight may induce external borrowing as it depletes government revenues, both directly through theft and embezzlement and indirectly through foregone tax revenue, a phenomenon that can be termed 'flight-driven external borrowing.' In addition, individuals may seek to conceal the source of their funds by using capital flight hidden offshore as collateral for foreign loans. Such money laundering via back-to-back loans can be termed 'flight-fueled external borrowing,' and is another variant of the revolving door phenomenon.

The empirical evidence supports the prediction of a close relationship between capital flight and external borrowing (Collier et al., 2004; Ndikumana and Boyce, 2003, 2011b). In the case of sub-Saharan Africa, about half of each dollar borrowed flees the continent in the same year, a tight relationship that suggests the presence of substantial debt-fueled capital flight (Ndikumana and Boyce, 2011b). Studies on other regions find similar results. Beja (2007) finds that about 55 cents out of each borrowed dollar financed capital flight in Indonesia and Malaysia over the

1970-2002 period, consistent with the 'revolving door' phenomenon.[19] New evidence on this phenomenon in the case of African countries is provided in the next section.

(vii) Political factors

The political environment of a country can influence capital flight in many ways. An unstable political environment raises the risk of loss of private wealth through expropriation of assets or their destruction by violence. Indeed, some of the African countries with high capital flight have experienced severe political instability in the past (e.g., Angola, Democratic Republic of Congo). Empirical studies on African countries find evidence of a correlation between political instability and war on the one hand, and capital flight and war on the other (Collier et al., 2004; Davies, 2008; Fedderke and Liu., 2002). Evidence from other regions corroborates this linkage, too. A study on Bangladesh, for example, concludes that political instability was the single most important determinant of capital flight (Alam and Quazi, 2003).

vii) Hysteresis and habit formation

Evidence in the empirical literature shows that capital flight tends to persist, suggesting that the effects of the drivers discussed above tend to persist over time. One explanation for the persistence of capital flight is what we refer to as 'habit formation,' whereby capital flight actors acquire, so to speak, the skills as well as the inclination to transfer funds abroad illegally. Given that these actors generally are part of the political and economic elite, they are able to circumvent, or even obstruct, financial laws and regulations. At the same time, financial crime committed by the top leadership trickles down, thus corroding the integrity of the bureaucracy

[19] Beja (2007) finds a weaker relationship between capital flight and external borrowing for the case of Thailand: 10 cents of each borrowed dollar flee the country in the same year.

and business sector. As a result, embezzlement and capital flight become more the norm than the exception, with the actors enjoying a high degree of impunity. In other words, the conditions that drive capital flight are exacerbated by the corrosive effects of capital flight over time. Thus capital flight is to a large extent a systemic problem.

4.2. External drivers of capital flight

It has been argued that the mobility of capital serves as a restraint on the powers of governments by providing wealth holders an opportunity to move their money if they are not satisfied with their governments (Crystal, 1994). Montesquieu claimed that the advent of movable capital meant that 'rulers had been compelled to govern with greater wisdom than they themselves might have intended.'[20] Extending this argument, McKenzie and Lee (1991, pp. xi, 12) argue that increased capital mobility in the context of globalization implies that governments across the world 'have lost the vestiges of unchecked economic sovereignty' and that they 'must concede to the implied threats of quicksilver capital'.[21] The point is that globalization and the attendant free movement of capital, combined with lack of transparency in the international financial system, may induce and facilitate capital flight from African countries and other developing regions. Poor domestic governance exacerbates these external effects.

Capital flight is inherently an international phenomenon that involves actions by domestic actors as well as external actors. Given that capital flees Africa towards foreign destinations, conditions in those destinations serve as pull factors for capital flight. The global financial system makes it fairly easy to move money across borders and conceal it out of the regulator's sight. The culture and practice of banking secrecy in western financial centers helps individuals transfer and hold

[20] Cited in Hirschman (1981, p. 255).
[21] Quoted in Crystal (1994, p. 131).

funds abroad, whether they are legally or illegally acquired. The expansion of offshore finance in so-called safe havens and secrecy jurisdictions facilitates unrecorded financial transaction across countries (Shaxson, 2011).

The external environment can also facilitate illicit acquisition of money via international transactions, including natural resource exports and foreign borrowing. Capital flight is associated, for example, with corrupt practices by international corporations that engage in the bribery of national authorities in the exploitation of oil and minerals. Much of the wealth acquired through these forms of corruption can be expected to be illegally transferred out of the country towards safe havens.

International geopolitics and the strategic interests of dominant nations may also help to drive capital flight. The embezzlement of borrowed funds and the plunder of national natural resources are perpetuated by lax enforcement of national and international legislation on banking and corporate responsibility. Such lax enforcement often reflects national strategic interests that induce political leaders in western nations to turn a blind eye to the corruption and embezzlement by political leaders in developing countries. Dictators such as Mobutu Sese Seko of ex-Zaïre (Ndikumana and Boyce, 1998), Ferdinand Marcos of the Philippines (Boyce, 1992, 1993), and others were able to accumulate massive private wealth by plundering their nations because at some point they served – or were thought to serve – vital strategic interests of western governments. Geopolitical strategic interests along with opaque practices in the international financial system thus constitute important factors that perpetuate an external environment conducive to capital flight.

4.3. New evidence on the drivers of capital flight from African countries

4.4. Methodology

In this section we present new econometric results on the determinants of capital flight using the data on 39 African countries for the years 1970 to 2010. The model specification and estimation draw on the existing empirical literature. We specifically allow for the persistence of capital flight over time and the revolving door phenomenon, whereby some fraction of external borrowing fuels capital flight, in a dynamic formulation of the econometric model (Ndiaye, 2009; Ndikumana and Boyce, 2003, 2011b). The estimation equation is therefore specified as follows:

$$\mathrm{KF}_{it} = \boldsymbol{\beta_0} + \boldsymbol{\beta_1}\mathrm{KF}_{i,t-1} + \boldsymbol{\beta_2}\mathrm{CDEBT}_{it} + \boldsymbol{\beta_3}\mathrm{SDEBT}_{i,t-1} + \mathbf{X}_{it}\boldsymbol{\Gamma} + \boldsymbol{\varepsilon}_{it} \qquad (7)$$

where for country *i* in year *t*, KF is capital flight, CDEBT is the change in the debt stock or net annual borrowing, SDEBT is the stock of debt, and all three variables are expressed as ratios of GDP. The vector **X** contains control variables and ε is the error term, which potentially includes country fixed effects.

We include the following categories of control variables, in line with the discussion in Section 4 on the drivers of capital flight: the macroeconomic environment, proxied by lagged GDP growth and inflation; financial development, measured by bank credit to the private sector as a ratio of GDP; the returns to investment, measured by the real interest rate differential (adjusted for inflation) between the African country and the United States (using the US Treasury bill rate),[22] and alternatively with the exchange rate adjusted interest rate differential; natural resource endowment, measured by fuel exports as a share of total exports; governance, measured by the

[22] The real interest rate differential is obtained as the domestic deposit interest rate (adjusted for domestic inflation) minus the 3-month US Treasury bill rate (adjusted for US inflation).

Polity2 index from the Polity IV project database[23] and the political environment measured by the political and civil liberty index from Freedom House;[24] and capital account regulation measured by an index of capital account openness.[25] The definitions of the regression variables and the data sources are given in **Error! Reference source not found.** in the appendix.

The estimation of the model in equation (7) accounts for potentially important but omitted country-specific effects by using the panel fixed-effects regression method, and for possible endogeneity of regressors, notably change in debt, by using the generalized method of moments (GMM). We also use the iteratively reweighted least squares (IRLS) as an additional robustness check to account for possible outliers. To minimize noise arising from annual fluctuations in key variables, including capital fight, we organize the data into pooled cross-sections comprising 5-year non-overlapping averages.[26] The data are unbalanced due to missing information for some variables. The results of the estimations are discussed below.

4.5. Discussion of Regression Results

Evidence of a 'capital flight trap'

There is strong evidence of persistence of capital flight, as indicated by the positive and significant coefficient on the lagged dependent variable. This result suggests that a high level of capital flight in a given country is a predictor of continued capital flight in the future. In a sense,

[23] The Polity score is computed by subtracting the AUTOC score ('institutionalized autocracy') from the DEMOC score ('institutionalized democracy'); the resulting scale ranges from +10 (strongly democratic) to -10 (strongly autocratic). The Polity2 score is a version of the original Polity score obtained by converting instances of 'foreign invasion', 'interregnum', and 'transition (coded in Polity as -66, -77, and -88) to conventional polity scores (i.e., within the range, -10 to +10). Available at: http://www.systemicpeace.org/polity/polity4.htm

[24] The data are available at: http://www.freedomhouse.org.

[25] Data constructed by Hiro Ito and Menzie Chinn, available at: http://www.ssc.wisc.edu/~mchinn/research.html. Detailed information on the construction of the data is provided in various publications by the authors (Chinn and Ito, 2005; Ito and Chinn, 2006, 2008, 2012).

[26] The last cross-section covers six years from 2005 to 2010.

countries are caught in a 'capital flight trap.' The persistence of capital flight is the result of both actions by economic agents and institutional developments, as noted above. On the one hand, this result may be attributed to habit formation, whereby actors develop both the taste and the skills to embezzle national resources as well as circumvent capital account regulation and other rules on financial transactions to smuggle capital out of the country. On the other hand, as these practices become entrenched in the country, this weakens financial regulation and mechanisms of accountability, causing progressive decay of national institutions, which further induces and facilitates capital flight over time.

The revolving door: links between external debt and capital flight

The results reported in Table 6 enable us to test the proposition that capital flight may be driven by external borrowing. Here we use a baseline equation that controls for lagged GDP growth. We include both the annual debt flow (the change in debt) and the lagged stock of debt. The results show that capital flight is positively and significantly related to both debt variables. The positive coefficient on the annual flows is consistent with the hypothesis that some of the external borrowing financed capital flight. The results suggest that 63 to 73 cents out of each dollar borrowed in a five-year period were siphoned out as capital flight. In addition, each dollar added to the stock of external debt was associated with 6 to 9 cents of additional capital flight in the subsequent five-year period.

Impacts of the macroeconomic environment and financial development

The GMM results reported in Table 6 also indicate that lagged economic growth is negatively and significantly related to capital flight. This result suggests that strong economic growth may serve as a signal of high returns to domestic investment as well as good policy performance, both of which may deter capital flight. This result is at odds with the observation that capital flight has

accelerated over the past decade, during which African countries experienced a surge in growth. Note, however, that the result does not hold when we account for country-specific effects (fixed-effects regressions) in the baseline specification reported in Table 6 or for potential outliers (IRLS) in the specifications reported subsequently. This suggests that other drivers of capital flight dominate the potential deterrent effects of growth on capital flight.

The results reported in Table 7 show the linkage beween capital flight and inflation, measured alternatively by the inflation rate and the variability of inflation. The results vary substantially depending on the estimation method. The coefficient on the inflation rate is positive and statistically significant in the iteratively reweighted linear regression that controls for outliers, but it is statistically insignificant in the regressions that control for country-specific fixed effects and it turns negative and statistically significant in the GMM regression results. The evidence is therefore inconclusive. With regard to the inflation variability, the estimated coefficient is counter-intuitively negative, and significant only in the GMM results. The results suggest that there is no robust empirical evidence of the impact of inflation or its variability on African capital flight.

To test for the impact of financial development, we use bank credit to the private sector as a ratio to GDP. It may be argued that increased availability of bank credit provides resources that can be illegally transferred abroad as capital flight. Moreover, cross-border financial transactions become easier as the financial system develops. This would suggest a positive relationship between capital flight and credit to the private sector. On the other hand, financial development is associated with an increase in opportunities for profitable saving domestically, which would reduce incentives for capital flight. As can be seen in Table 8, the results show no significant

effect of the credit to GDP ratio on capital flight, suggesting that financial development has on balance neither facilitated nor deterred capital flight from African countries.

Risk and returns to investment

We test the conjecture that capital flight may be driven by standard portfolio considerations of risk-adjusted returns to investment by analyzing the relation between capital flight and the interest rate differential between the country and the rest of the world. We use alternatively the interest rate differential corrected for inflation and the interest rate differential corrected for exchange rate depreciation. The results are reported in Table 9. There is no robust evidence for a relationship between capital flight and these measures of returns to investment. The coefficients on the interest rate differentials are negative (the expected sign) and significant only in the GMM regressions. But when country-specific fixed effects and outliers (IRLS regressions) are controlled for, the coefficients are no longer significant, implying that the GMM results may be driven by these factors. The portfolio choice explanation for capital flight thus does not hold consistently for this group of African countries, suggesting that capital flight is driven by factors other than interest rate arbitrage.

Political and governance factors

The results in Table 10 show the estimated effects of political stability and the quality of economic governance on capital flight. In the GMM regressions, the polity measure (Polity2), the index of political freedom, and the duration of the political regime have significant coefficients. The results suggest that capital flight is lower in better governed regimes, but that it increases with regime duration. But again, the coefficients are not statistically significant when we account for omitted country-specific fixed effects or for outliers (the IRLS results are not

reported here for reason of space), suggesting that these effects are not robust to potential outlier and omitted variable bias.

Natural resource endowment

The regression results do not show conclusive evidence of a link between natural resource endowment, as measured by oil exports, and capital flight (see Table 11). To explore whether the link may be conditional on the political environment and the governance regime, we interact fuel exports with the Polity2 index. The results are statistically insignificant in the regressions controlling for country fixed effects (columns 1 and 2) as well as possible outliers (not reported here). However, in the GMM regression results, the coefficients on fuel exports and the interaction term between fuel exports and polity are statistically significant. Specifically, the GMM results suggest that higher resource endowment makes a country more prone to capital flight, but that a good polity score reduces this effect. These results are consistent with the hypothesis that resource endowment *per se* does not necessarily predispose a country to high capital flight. The effect depends on the country's political and governance regimes, which determine the manner in which resources are managed. In other words, resource endowment need not be a curse.

Capital account openness

Finally, the results of the tests for the relationship between capital account openness and capital flight are reported in Table 12. The results vary depending on the specification and estimation technique used. The GMM regression results show a positive effect of capital account openness on capital flight, suggesting that current account and capital account liberalization, which is aimed to facilitate international transactions, also opens up avenues for unrecorded capital outflows. This result suggests that capital controls may help stem capital flight.

Note, however, that the positive link between capital flight and openness is not robust to alternative specifications and estimation methods. It is not statistically significant in regressions controlling for country-specific fixed effects or outliers. We explored whether the relationship may be conditional on governance by interacting the index of capital account openness with the Polity2 index. The results remain statistically significant only in the GMM regressions, where capital account openness is positively related to capital fight, and the relation grows stronger as governance becomes more democratic.

4.6. The results in international perspective

The empirical results in this study from a sample of 39 African countries are largely consistent with the evidence in the literature on other developing regions. The dynamics of capital flight are characterized by strong hysteresis, with high past capital flight leading to high present capital flight. In this sense, countries may be caught in a capital flight trap. This has also been found in studies on Asian countries (Beja, 2007) and Latin America (Pastor, 1990). The revolving door phenomenon found in the African sample is prevalent in other regions as well (see (Beja, 2006, 2007) for evidence on Asian countries).

The finding of a negative relationship between GDP growth and capital flight is also consistent with the evidence in the literature. However, the evidence on the impact of other indicators of the macroeconomic environment and financial development remains mixed. There is no robust effect of budget deficits, inflation, or measures of financial deepening on capital flight (Collier et al., 2001; Kar, 2010). In the case of African countries, we find no robust effect of financial openness or current account openness on capital flight. However, studies on Asian countries found that capital controls had some beneficial effects in stemming capital flight especially in the wake of

the Asian financial crisis (Beja, 2006, 2007). The lack of precision in the measures of financial openness that are used in cross-sectional studies may be one reason for the weak empirical results. Country-specific studies may be more informative on this issue.

The results on the role of returns to investment are also consistent with evidence from other regions. The interest rate differential between a country and the rest of the world (measured by interest rates in the United States) does not have a robust effect on capital flight in the Asian countries analyzed (Beja, 2006, 2007). In a study covering countries in Asia and Latin America, Dooley (1988, p. 422) concluded that 'capital flight was not related to international yield differentials between source countries and the rest of the world, or to any other determinants of net international capital movements.' The evidence generally does not support the view that capital flight is a result of portfolio decisions by profit-maximizing individuals.

The African sample is also similar to other regions with regard to the role of governance indicators. No robust relationship seems to emerge from econometric analyses in studies including countries from other regions, either (Collier et al., 2001). The results should be taken with caution, however, especially given the uncertain quality of the indicators used to measure governance.

5. Conclusion

Although it is difficult to measure capital flight precisely, estimates with existing methods suggest that the phenomenon is widespread. While the problem of capital flight is not unique to Africa, it imposes a relatively higher economic burden on the economies of the continent compared to other regions.

In African countries, capital flight appears to be a chronic problem, and it has exploded since the turn of the century in a period marked by a resource boom and resurgence of growth in the continent. There are substantial variations across countries, however. Oil-rich countries top the list, led by Nigeria, Algeria, and Angola. But in many countries, capital flight is large relative to the size of the economy. For eighteen out of the 39 countries, the accumulated capital flight by 2010 exceeded GDP. Capital flight is also large relative to official development aid, foreign direct investment, and external debt. Indeed, contrary to the perception that Africa is heavily indebted to the rest of the world, the evidence presented in this paper demonstrates that the continent is a 'net creditor' to the rest of the world in the sense that accumulated private assets through capital flight exceed the continent's liabilities. Accumulated capital flight also exceeds total aid received by the continent over the past four decades, casting doubts on the conventional view that African countries are necessarily aid dependent.

Our analysis provides insights on the drivers of capital flight. The econometric results are more conclusive for some of these drivers than for others. The results strongly suggest that capital flight from African countries was partly fueled by external borrowing. On average, 63 to 73 cents out of each dollar borrowed by African countries in a five-year period exited in the same period in the form of capital flight. Moreover, each dollar added to the stock of debt led to up to 9 cents of capital flight in the subsequent period. The results also confirm that capital flight is highly persistent, suggesting that capital flight is habit-forming and unlikely to be reversed quickly. The evidence also provides some indication that positive economic performance in the form of strong economic growth may serve as a deterrent to capital flight.

The empirical results are less conclusive with regard to other potential drivers of capital flight. We find no robust evidence of a relationship between capital flight and inflation, financial

development, measures of the polity and regime duration, or capital account openness. The results suggest that, to the extent that there is a relationship between capital flight and natural resource endowment (oil exports), it is conditional on political contexts and governance structures. Specifically, high endowment in oil in the context of autocratic governance appears to make a country more prone to capital flight. This result suggests that the resource curse is not inevitable.

The linkages between capital flight and its potential drivers are likely to vary across countries. This implies that policies aimed at preventing capital flight need to address specific factors that make countries prone to capital flight and that these policies need to be tailored to country circumstances. There are nonetheless broader issues that require coordinated efforts at national and international levels to address the problem of capital flight. These are discussed in detail in Boyce and Ndikumana (2014).

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Table 1: Cumulative Capital flight and net external asset position by country, 1970-2010

Country	Total capital flight, (billion 2010 $)	Total capital flight / GDP 2010 (%)	Total capital flight per capita (2010 ($))	Stock capital flight (billion $)	Debt stock 2010 (billion $)	Net assets (billion $)
Nigeria	311.4	158.2	1965.8	381.1	7.9	373.2
Algeria	267.2	165.0	7533.4	355.3	7.2	348.1
Morocco	87.7	96.6	2744.9	108.6	26.3	82.3
Angola	77.5	93.9	4060.4	86.1	18.6	67.5
Egypt	59.7	27.3	736.0	110.1	36.4	73.7
Côte d'Ivoire	56.0	244.4	2838.3	81.3	11.4	69.9
South Africa	49.2	13.5	984.0	76.2	45.2	31.0
Tunisia	39.0	88.1	3695.7	45.2	22.0	23.1
Sudan	38.4	57.3	1142.9	42.7	21.8	20.9
Congo, Dem. Rep.	33.9	258.4	513.4	50.6	5.8	44.8
Gabon	25.5	192.9	16911.3	31.9	2.3	29.5
Ethiopia	24.9	83.8	299.9	29.9	7.1	22.8
Cameroon	20.0	89.0	1020.8	31.3	3.0	28.3
Congo, Rep.	19.9	165.5	4916.6	20.6	3.8	16.9
Mozambique	19.8	214.7	845.2	25.1	4.1	21.0
Zimbabwe	18.3	244.2	1452.5	25.3	5.0	20.3
Zambia	17.3	106.7	1336.6	25.6	3.7	21.9
Tanzania	14.7	64.0	327.1	26.9	8.7	18.3
Ghana	12.4	38.4	506.5	15.5	8.4	7.1
Madagascar	11.7	134.1	564.4	17.7	2.3	15.4
Sierra Leone	10.0	523.6	1704.2	13.8	0.8	13.0
Rwanda	9.3	165.6	876.9	18.0	0.8	17.2
Uganda	8.4	49.0	252.1	10.3	3.0	7.3
Burundi	6.9	339.4	820.7	7.6	0.5	7.1
Kenya	4.9	15.2	120.7	10.6	8.4	2.2
Seychelles	4.4	460.4	51236.9	6.4	1.5	4.9
Botswana	3.8	25.2	1872.0	1.7	1.7	0.0
Cape Verde	3.5	211.5	7072.8	4.0	0.9	3.1
Mauritania	3.1	86.4	902.7	3.9	2.5	1.5
Central African Republic	2.7	137.3	619.2	4.0	0.4	3.6
Togo	1.7	52.5	278.3	0.6	1.2	-0.7
Chad	1.6	19.2	146.0	2.5	1.7	0.8
Guinea	1.6	33.0	156.5	2.7	2.9	-0.2

Guinea-Bissau	1.6	195.1	1075.7	1.7	1.1	0.6
Burkina Faso	1.5	17.5	93.7	3.2	2.1	1.2
Malawi	1.4	27.3	92.7	3.3	0.9	2.4
Lesotho	1.0	45.8	459.4	1.5	0.7	0.7
Sao Tome and Principe	1.0	520.3	6323.7	1.3	0.2	1.2
Swaziland	1.0	26.9	941.1	1.1	0.6	0.5
TOTAL	1273.8	81.9	1376.1	1685.2	283.0	1402.3

Source: Authors' computations.

Table 2: Trade misinvoicing and unrecorded workers' remittances, 1970-2010: Some examples (billion, constant 2010 $)

Country	Total capital flight	Unadjusted residual measure	Export mis-invoicing	import mis-invoicing	Total trade misinvoicing	Unrecorded workers' remittances
Algeria	267.2	56.1	103.0	38.2	141.3	69.9
Angola	77.5	64.1	0.0	-0.1	-0.1	13.5
Côte d'Ivoire	56.0	42.8	10.0	1.4	11.5	1.8
Egypt	59.7	174.5	237.9	-352.8	-114.8	0.0
Ethiopia	24.9	25.9	2.5	-9.5	-7.1	6.0
Ghana	12.4	4.2	1.7	-4.4	-2.8	10.9
Morocco	87.7	47.9	86.2	-46.3	39.9	0.0
Sudan	38.4	18.7	67.0	-47.3	19.7	0.0
Tunisia	39.0	8.8	14.5	15.7	30.1	0.0
Zambia	17.3	22.6	-13.5	6.5	-7.0	1.7
Zimbabwe	18.3	-5.1	5.3	11.5	16.8	6.5
Total for 39 countries	1273.8	790.2	859.2	-550.1	309.2	174.3

Source: Authors' computations.

Table 3: Capital flight, FDI and ODA: total by decade (billion, constant 2010 $)

Period	FDI	ODA	Net transfers on debt	Capital flight	
	billion $	billion $	billion $	billion $	percent of FDI+ODA
1970-79	29.8	128.0	172.6	225.2	142.8
1980-89	39.1	182.8	67.0	307.4	138.5
1990-99	73.9	246.5	-81.6	230.3	71.9
2000-10	316.3	317.5	-54.1	510.9	80.6
1970-2010	459.1	874.8	104.0	1273.8	95.5
Of which oil exporting countries					
Amount	168.1	352.7	-16.3	917.6	176.2
Percentage of total	36.6	40.3		72.0	

Source: Capital flight data are from authors' computations; ODA, FDI, and net transfers on debt are from the World Bank's Global Development Finance.

Table 4: Unrecorded capital outflows,[a] as of 1990 and 2010, Africa and other regions.

	As of 1990			As of 2010				
Region	Private capital per worker ($)	Capital flight/ Private asset ratio (%)	Output loss (%)	Total outflows ($ bn)	Stock of outflows ($ bn)	Stock Debt ($ bn)	Net external assets ($ bn)	Total outflows/ GDP (%)
SSA	1062	0.40	0.16	361.7	683.3	204	479	31.9
Africa				495.4	925.4	300	625.4	39.5
Latin America	17439	0.10	0.04	1375.5	2058.3	1013.4	1044.9	39.7
Middle East	3708	0.39	0.16	829.8	1306.5	554.7	751.8	42.6
East Asia	9704	0.06	0.02	1265.5	1783.3	832.6	950.7	14.4
South Asia	1804	0.05	0.02	60.7	103.2	393.6	-290.4	3.0
East and South Asia				1326.2	1886.5	1226.2	660.3	12.2

Source: The statistics on capital flight and external debt for 2010 are from Henry (2012); the statistics for capital flight for 1990 are from Collier et al. (2001); data on GDP used to calculate the ratios are from the World Bank's World Development Indicators.

Note: Relative to the estimates presented in this study, the estimated unrecorded outflows in Tax Justice Network's report (Henry, 2012) do not include trade misinvoicing and adjustments of the BoP residuals to account for unrecorded remittances. The estimates in this study also include more complete series for the 1970s using data collected from printed versions of the Balance of Payment Statistics and Direction of Trade Statistics.

Table 5: Wealth of High Networth Individuals by region

	High Networth Individuals, 2011[a]					Ultra-High Networth Individuals, 2012-2022[b]		
Region	Number (million) 2011	Change # HNWIs 2010-11	Total wealth 2011 ($ trillion)	# of HNWIs/pop (%) 2011	Wealth/ GDP (%) 2011	Number, 2012	Number, 2022	% change 2012-22
Africa	0.1	3.9	1.1	0.01	64.2	2488	4197	69
Asia	3.4	1.6	10.7	0.08	79.9	43726	82369	88
Latin America	0.5	5.4	7.1	0.13	142.0	15230	26628	88
Middle East	0.5	2.7	1.7	0.23	98.0	4675	7378	58
Europe	3.2	1.1	10.1	0.43	65.6	54170	70864	31
North America	3.4	-1.1	11.4	0.64	78.4	65579	86865	32

Source: Capgemini and RBC Wealth Management (2012); Knight Frank (2013); Data on GDP and population are from the World Bank's World Development Indicators.

[a,b] Note: High Networth Individuals (HNWIs) and Ultra-High Networth Individuals UHNWIs) are individuals with at least $1 million and $30 million of disposable investable assets, respectively.

Table 6: Capital flight: tests for the 'revolving door'

VARIABLES	Fixed effects	GMM
Change in debt	0.633***	0.731***
	(0.000)	(0.000)
Stock of debt (lagged)	0.060***	0.093***
	(0.003)	(0.000)
Lagged capital flight	0.189***	0.296***
	(0.000)	(0.000)
GDP growth (lagged)	-0.255	-0.261***
	(0.199)	(0.000)
Constant	-1.016	-4.533***
	(0.643)	(0.000)
Observations	237	198
Overall R-squared	0.312	
Within R-squared	0.184	
Between R-squared	0.230	
Test for 1-st order autocorrelation		-3.439
		(0.00)
Sargan test (H_0: instruments are valid)		34.516
		(0.715)
Number of countries	39	38

Robust p-values in parentheses; *** p<0.01, ** p<0.05, * p<0.1. The dependent variable is capital flight as a ratio of GDP. Two-step GMM results are reported, as one-step results show significant autocorrelation in the first-difference.

Table 7: Capital flight and inflation

	IRLS		Fixed effects		GMM	
VARIABLES	Inflation	Inflation variability	Inflation	Inflation variability	Inflation	Inflation variability
Change in debt	0.309***	0.293***	0.651***	0.644***	0.629***	0.595***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Stock of debt (lagged)	0.013*	0.016**	0.045**	0.045**	0.053***	0.056***
	(0.053)	(0.025)	(0.043)	(0.044)	(0.000)	(0.000)
Lagged capital flight	0.252***	0.256***	0.192***	0.192***	0.284***	0.289***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
GDP growth (lagged)	-0.188	-0.154	-0.281	-0.265	-0.301***	-0.264***
	(0.124)	(0.217)	(0.191)	(0.216)	(0.000)	(0.000)
Inflation (lagged)	0.007*		-0.002		-0.003***	
	(0.062)		(0.201)		(0.000)	
Inflation variability (lagged)		-0.005		-0.012		-0.020***
		(0.244)		(0.127)		(0.000)
Constant	2.394***	2.578**	0.822	1.466	-0.331	0.731
	(0.010)	(0.013)	(0.729)	(0.553)	(0.577)	(0.170)
Observations	213	211	215	212	177	174
Overall R-squared	0.286	0.263	0.266	0.266		
Within R-squared			0.195	0.200		
Between R-squared			0.271	0.284		
Test for 1-st order autocorrelation					-3.127	-3.103
					(0.000)	(0.000)
Sargan test (H_0: instruments are valid)					34.811	34.023
					(0.703)	(0.735)
Number of countries		38	38	38	37	37

Robust p-values in parentheses; *** p<0.01, ** p<0.05, * p<0.1. The dependent variable is capital flight as a ratio of GDP. Two-step GMM results are reported, as one-step results show significant autocorrelation in the first-difference up to second order.

Table 8: Capital flight and bank credit to the private sector

VARIABLES	IRRLS	Fixed effects	GMM
Change in debt	0.339***	0.678***	0.761***
	(0.000)	(0.000)	(0.000)
Stock of debt	0.017**	0.057***	0.088***
(lagged)	(0.013)	(0.005)	(0.000)
Lagged capital flight	0.232***	0.187***	0.285***
	(0.000)	(0.000)	(0.000)
GDP growth (lagged)	-0.110	-0.268	-0.243***
	(0.348)	(0.194)	(0.000)
Private credit (lagged)	0.012	-0.050	-0.030
	(0.604)	(0.509)	(0.117)
Constant	1.523	0.090	-3.660***
	(0.150)	(0.973)	(0.000)
Observations	230	231	192
Overall R-squared	0.258	0.227	
Within R-squared		0.194	
Between R-squared		0.257	
Test for 1-st order autocorrelation			-3.370
			(0.000)
Sargan test (H_0: instruments are valid)			31.960
			(0.813)
Number of countries		39	38

Robust p-values in parentheses; *** p<0.01, ** p<0.05, * p<0.1. The dependent variable is capital flight as a ratio of GDP. Two-step GMM results are reported, as one-step results show significant autocorrelation in the first-difference up to second order.

Table 9: Capital flight and interest differential

	IRLS		Fixed effects		GMM	
VARIABLES	Interest differential	Exchange rate adjusted interest differential	Interest differential	Exchange rate adjusted interest differential	Interest differential	Exchange rate adjusted interest differential
Change in debt	0.318***	0.386***	0.475***	0.537***	0.497***	0.678***
	(0.000)	(0.000)	(0.002)	(0.000)	(0.000)	(0.000)
Stock of debt (lagged)	0.011	0.012*	0.037	0.039	0.045***	0.067***
	(0.119)	(0.090)	(0.187)	(0.114)	(0.000)	(0.000)
Lagged capital flight	0.218***	0.217***	0.213***	0.211***	0.299***	0.301***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
GDP growth (lagged)	-0.089	-0.093	-0.178	-0.210	-0.233***	-0.160***
	(0.502)	(0.462)	(0.425)	(0.308)	(0.000)	(0.000)
Interest rate differential	-0.005		-0.002		-0.002*	
	(0.216)		(0.861)		(0.087)	
Adjusted interest rate differential		-0.004		-0.001		-0.001***
		(0.220)		(0.939)		(0.005)
Constant	2.259**	1.950**	0.754	0.514	-0.451	-2.722***
	(0.023)	(0.039)	(0.789)	(0.837)	(0.528)	(0.000)
Observations	176	189	177	190	139	151
Overall R-squared	0.247	0.270	0.278	0.290		
Within R-squared			0.178	0.198		
Between R-squared			0.328	0.294		
Test for 1-st order autocorrelation					-2.884	-2.966
					(0.004)	(0.000)
Sargan test (H_0: instruments are valid)					24.628	30.429
					(0.973)	(0.863)
Number of countries		37	36	37	34	35

Robust p-values in parentheses; *** p<0.01, ** p<0.05, * p<0.1. The dependent variable is capital flight as a ratio of GDP. Two-step GMM results are reported, as one-step results show significant autocorrelation in the first-difference up to second order.

Table 10: Capital flight and political factors

	Fixed effects			GMM		
VARIABLES	Polity2	Politically free	Regime duration	Polity2	Politically free	Regime duration
Change in debt	0.582***	0.616***	0.630***	0.738***	0.729***	0.748***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Stock of debt (lagged)	0.079***	0.064***	0.070***	0.094***	0.094***	0.098***
	(0.000)	(0.002)	(0.000)	(0.000)	(0.000)	(0.000)
Lagged capital flight	-0.046	0.180***	-0.048	0.117***	0.290***	0.116***
	(0.504)	(0.000)	(0.488)	(0.000)	(0.000)	(0.000)
GDP growth (lagged)	-0.143	-0.251	-0.173	-0.126***	-0.272***	-0.181***
	(0.448)	(0.205)	(0.363)	(0.001)	(0.000)	(0.000)
Polity2	-0.308			-0.117**		
	(0.103)			(0.039)		
Politically free		-0.989			-0.217**	
		(0.253)			(0.016)	
Regime duration			0.085			0.059***
			(0.195)			(0.000)
Constant	-2.224	0.768	-1.880	-4.407***	-4.240***	-4.831***
	(0.322)	(0.775)	(0.401)	(0.000)	(0.000)	(0.000)
Observations	231	237	231	194	198	194
Overall R-squared	0.112	0.216	0.149			
Within R-squared	0.153	0.189	0.149			
Between R-squared	0.124	0.264	0.124			
Test for 1-st order autocorrelation				-3.609	-3.456	-3.259
				(0.000)	(0.000)	(0.001)
Sargan test (H_0: instruments are valid)				25.406	31.986	28.514
				(0.965)	(0.813)	(0.912)
Number of countries	37	39	37	37	38	37

Robust p-values in parentheses; *** p<0.01, ** p<0.05, * p<0.1. The dependent variable is capital flight as a ratio of GDP. Two-step GMM results are reported, as one-step results show significant autocorrelation in the first-difference up to second order.

Table 11: Capital flight and fuel exports

VARIABLES	Fixed effects results	GMM results
Change in debt	0.611***	0.537***
	(0.000)	(0.000)
Stock of debt (lagged)	0.054**	0.071***
	(0.014)	(0.000)
Lagged capital flight	-0.074	0.077***
	(0.353)	(0.000)
GDP growth	-0.133	-0.290***
(lagged)	(0.552)	(0.000)
Fuel exports	0.009	0.055*
	(0.896)	(0.082)
(Fuel exports)	-0.001	-0.005***
x(Polity2)	(0.843)	(0.001)
Constant	0.222	-2.475***
	(0.929)	(0.006)
Observations	198	160
Overall R-squared	0.071	
Within R-squared	0.115	
Between R-squared	0.041	
Test for 1-st order autocorrelation		-2.596
		(0.009)
Sargan test (H_0: instruments are valid)		29.353
		(0.893)
Number of countries	35	35

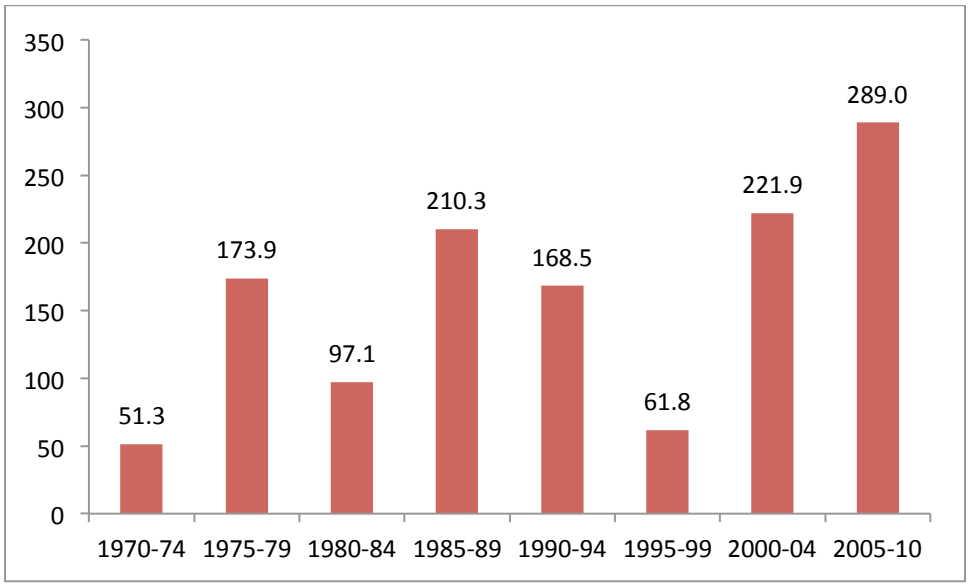
Robust p-values in parentheses; *** p<0.01, ** p<0.05, * p<0.1. The dependent variable is capital flight as a ratio of GDP. Two-step GMM results are reported, as one-step results show significant autocorrelation in the first-difference up to second order.

Table 12: Capital flight and capital controls

	IRLS		Fixed effects		GMM	
VARIABLES	Capital controls	Capital controls & Polity2	Capital controls	Capital controls x Polity2	Capital controls	Capital controls x Polity2
Change in debt	0.331***	0.340***	0.660***	0.620***	0.759***	0.771***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Stock of debt (lagged)	0.017**	0.015**	0.061***	0.076***	0.089***	0.103***
	(0.013)	(0.040)	(0.003)	(0.000)	(0.000)	(0.000)
Lagged capital flight	0.225***	0.270***	0.183***	-0.053	0.275***	0.079***
	(0.000)	(0.000)	(0.000)	(0.452)	(0.000)	(0.000)
GDP growth (lagged)	-0.145	-0.148	-0.255	-0.131	-0.219***	-0.129***
	(0.219)	(0.213)	(0.204)	(0.493)	(0.000)	(0.001)
Capital account	-0.002	0.174	1.161	1.022	2.060***	2.257***
openness	(0.997)	(0.745)	(0.239)	(0.283)	(0.000)	(0.001)
(Capital account		-0.047		0.209		0.211***
openness)x(Polity2)		(0.509)		(0.120)		(0.000)
Constant	1.995**	2.236**	-0.185	-1.018	-2.192***	-2.989***
	(0.047)	(0.032)	(0.937)	(0.657)	(0.001)	(0.000)
Observations	233	228	234	228	195	191
Overall R-squared	0.257	0.281	0.229	0.106		
Within R-squared			0.190	0.156		
Between R-squared			0.326	0.104		
Test for 1-st order					-3.442	-3.221
autocorrelation					(0.000)	(0.001)
Sargan test (H_0:					30.079	26.071
instruments are valid)					(0.873)	(0.956)
Number of countries		37	39	37	38	37

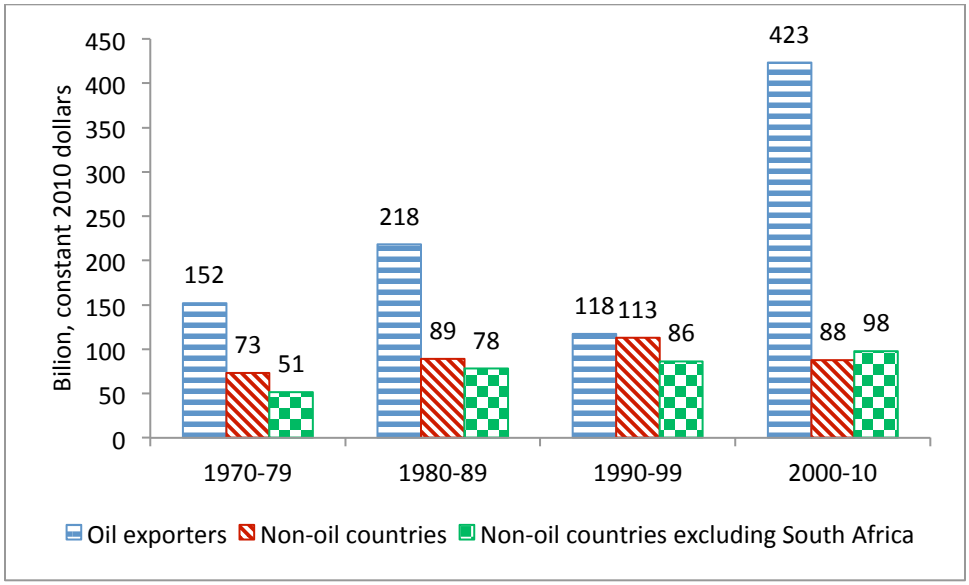
Robust p-values in parentheses. *** p<0.01, ** p<0.05, * p<0.1. The dependent variable is capital flight as a ratio of GDP. Two-step GMM results are reported, as one-step results show significant autocorrelation in the first-difference up to second order.

Figure 1: Capital flight from 39 African countries, 5-year cumulative net flows (billion, constant 2010 dollars)



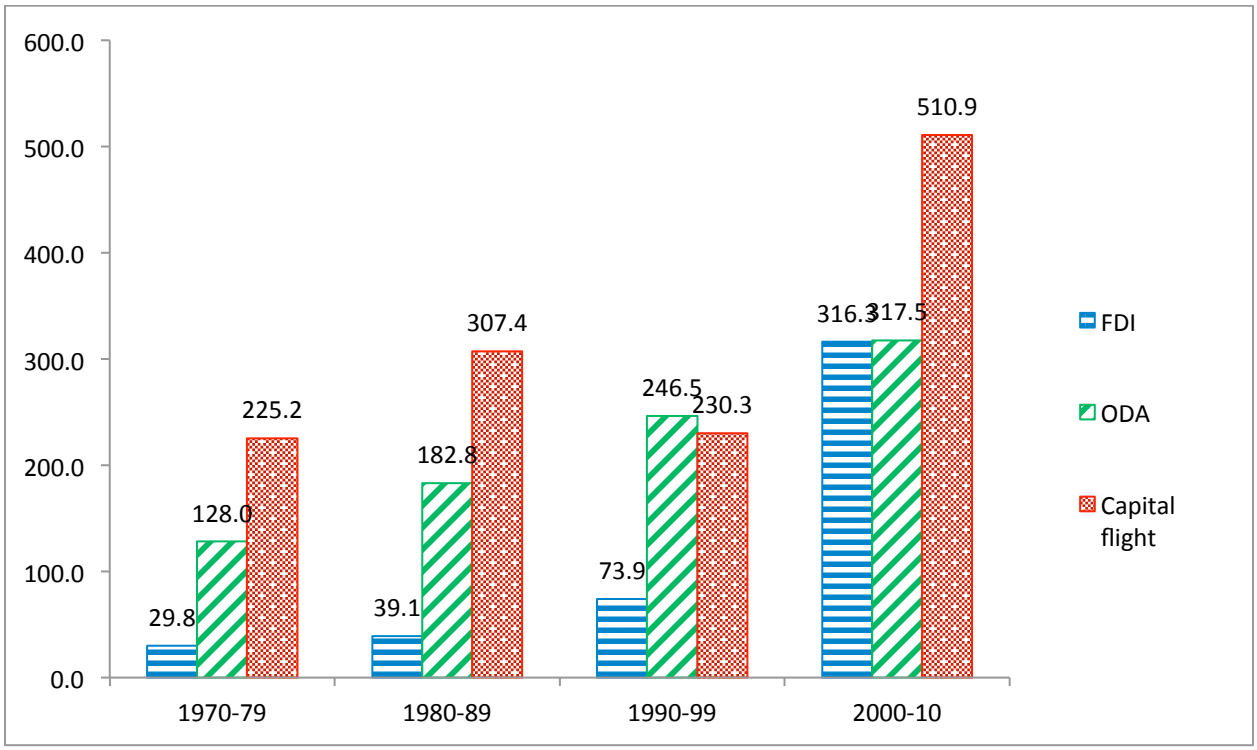
Source: Authors' computations.

Figure 2: Capital flight: oil exporters vs. non-oil exporters (billion, constant 2010 dollars)



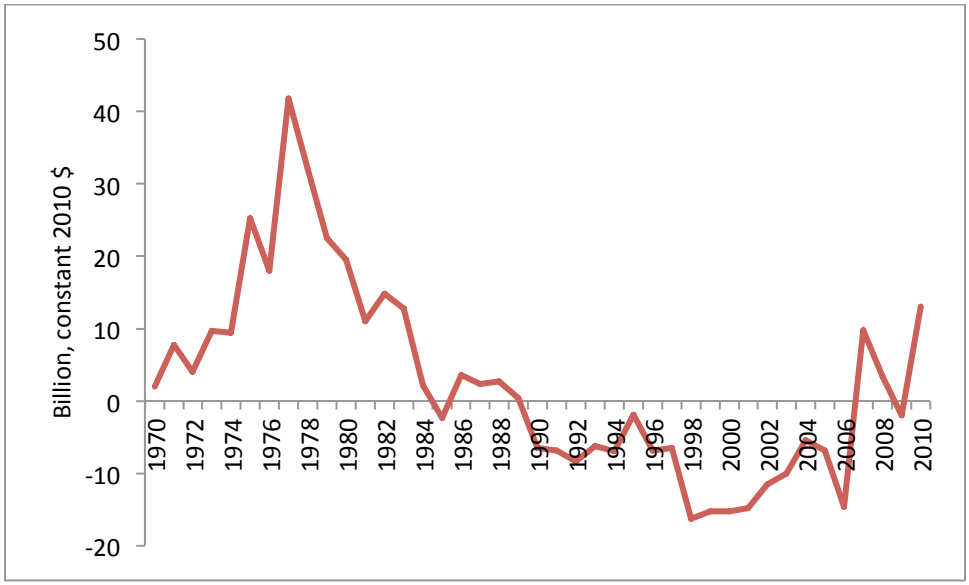
Source: Authors' computations.

Figure 3: Capital flight, FDI, and ODA flows to 39 African countries, 10-year cumulative flows (billion, constant 2010 dollars)



Source: Capital flight data are from authors' computations; FDI and ODA are from World Development Indicators. Nominal values are deflated using the US GDP deflator (base 2010=100).

Figure 4: Net transfers on debt for 39 African countries (billion, constant 2010 dollars)



Source: World Bank's *Global Development Finance*.

Annex A1: Adjustment of debt stock values for exchange rate fluctuations

This excerpt is extracted from Ndikumana and Boyce (2010) with slight editorial modifications. The change in the long-term debt stock is adjusted for fluctuations in the exchange rate of the dollar against the currencies of denomination of the country's debts to correct for discrepancies in the value of the end-of-year stock of debt. 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:

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

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;[29] *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:

$$ERADJ_t = NEWDEBT_{t-1} - DEBT_{t-1} \quad \text{(A2.2)}$$

The adjusted change in debt is:

$$\Delta DEBTADJ_t = \Delta DEBT_t - ERADJ_t \quad \text{(A2.3)}$$

Since $\Delta DEBT_t = DEBT_t - DEBT_{t-1}$, it follows that (A2.3) is equivalent to:

$$\Delta DEBTADJ_t = DEBT_t - NEWDEBT_{t-1} \quad \text{(A2.4)}$$

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

Table A.1: Variables used in the computation of capital flight and data sources

DEBT Total external public debt outstanding
- Printed source: *World Debt Tables*
- Electronic source: BOP CDROM; IFS CDROM; WDI Online

CA Current account deficits
- Printed source: *Balance of Payment Statistics Yearbook,* Table 1
- Electronic source: BOP CDROM; IFS CDROM; WDI Online

DFI Direct foreign investment
- Printed source: *Balance of Payment Statistics Yearbook,* Table 1
- Electronic source: BOP CDROM; IFS CDROM; WDI Online

CRES Change in reserves and related items
- Printed source: *Balance of Payment Statistics Yearbook,* Table 1
- Electronic source: BOP CDROM; IFS CDROM; WDI Online

XTOT Total exports to the world
- Printed source: *Direction of Trade Statistics Yearbook*, part B
- Electronic source: DOTS CDROM

XIC Exports to industrialized countries as reported by the African country
- Printed source: *Direction of Trade Statistics Yearbook*, part B
- Electronic source: DOTS CDROM

MTOT Total imports from the world
- Printed source: *Direction of Trade Statistics Yearbook*, part B
- Electronic source: DOTS CDROM

MIC The LDC's imports from industrialized countries as reported by the African country
- Printed source: *Direction of Trade Statistics Yearbook*, part B
- Electronic source: DOTS CDROM

PMIC The LDC's imports from industrialized countries as reported by industrialized countries
- Printed source: *Direction of Trade Statistics Yearbook*, part A
- Electronic source: DOTS CDROM

PXIC The LDC's exports to industrialized countries as reported by industrialized countries
- Printed source: *Direction of Trade Statistics Yearbook*, part A
- Electronic source: DOTS CDROM

CIF_FOB CIF/FOB factor
Either calculated using import data (DOT) or assumed to be 1.10

USGDPD: US GDP deflator:
- Printed source: *International Financial Statistics Yearbook*
- Electronic source: IFS CDROM

TBILL: US Treasury Bill rate
- Printed source: *International Financial Statistics Yearbook*
- Electronic source: IFS CDROM

Exchange rates of the French franc, Deutsche mark, Swiss franc, Pound sterling, Yen, and SDR against the dollar:
- Printed source: *International Financial Statistics Yearbook*
- Electronic source: IFS CDROM

Table A.2: Capital flight data availability

Country	Period covered	BoP variables from printed BoP	BoP variables from IMF Country Staff Report	No exchange rate adjustment of long-term debt
Algeria	1971-2009	1971-76	1992-2004	1971-2000
Angola	1986-2010	1970-76		
Botswana	1975-2010	1974		
Burkina Faso	1970-2010	1970-73	1995-99	
Burundi	1985-2010			1970-2000
Cameroon	1970-2010	1970-76		1970-2000
Cape Verde	1982-2010			1970-2000
Central African Republic	1970-2010	1970-76	1995-96, 2009-10	
Chad	1977-2008			1970-2000
Congo, Dem. Rep.	1970-2010	1970-76	2009-10	
Congo, Rep.	1970-2009	1970-77		
Cote d'Ivoire	1970-2010	1970-74	2010	
Egypt	1970-2010			1970-2000
Ethiopia	1970-2010	1970-76		
Gabon	1978-2010	1970-77	2009-10	
Ghana	1970-2010	1970-74		
Guinea-Bissau	1982-2010			1982-2000
Guinea	1986-2010			
Kenya	1970-2010	1970-74		1970-2000
Lesotho	1975-2010			1970-2000
Madagascar	1970-2008	1970-73		
Malawi	1970-2009	1970-76		
Mauritania	1973-2010	1970-73	2009-10	1970-2000
Morocco	1970-2010	1970-75		1970-2000
Mozambique	1985-2010			1970-2000
Nigeria	1970-2010	1970-76		
Rwanda	1970-2010	1970-75		
Sao Tome and Principe	1978-2010			
Seychelles	1981-2010			
Sierra Leone	1970-2010	1970-76		
South Africa	1973-2010			1970-2010
Sudan	1970-2010	1970-73		
Swaziland	1974-2010			
Tanzania	1970-2010	1970-75		

Togo	1974-2010			1976-2000
Tunisia	1970-2010	1970-75		1970-2000
Uganda	1970-2010	1970-79		
Zambia	1970-2010	1970-77	1993-96	
Zimbabwe	1977-2010	1970-76	1995-2010	

Table A.3: Regression variables: definition and sources

Variable	Definition and measurement	Data source
Capital flight	Capital flight, as a ratio of GDP	http://www.peri.umass.edu/300/#c2324
Change in debt	Change in the debt stock, as a ratio of GDP	World Development Indicators
Stock of debt	Debt stock, as a ratio of GDP	World Development Indicators
GDP growth	Growth rate of real GDP	World Development Indicators
Inflation variability	Absolute difference (in %) between the actual inflation rate and the fitted value from a regression of inflation on time and its lag	World Development Indicators
Interest rate differential	African country's deposit interest rate minus US 3-month Treasury bill rate	World Development Indicators
Exchange-rate adjusted interest rate differential	Interest rate differential minus the % change of the exchange rate (measured as amount of local currency per unit of US dollar)	World Development Indicators
Private sector credit (% of GDP)	Bank credit to the private sector, as a ratio of GDP	World Development Indicators
Fuel exports	Exports of fuels as percentage of total exports of merchandise exports	World Development Indicators
Polity2 index	Revised combined Polity Score computed by subtracting the AUTOC score from the DEMOC score; measured on a scale from +10 (strongly democratic) to -10 (strongly autocratic).	Polity IV database: http://www.systemicpeace.org/polity/polity4.htm
Political freedom	Index of political freedom = average of Freedom House's	Freedom House: www.freedomhouse.org

index	index of political freedom and civil liberties; measured on a scale of 1 (perfectly free) to 10 (not free). The series entered in the regressions are modified (10 minus the original value) so that a high value indicates more political freedom.	
Regime durability	The number of years since the most recent regime change (defined by a three point change in the POLITY score over a period of three years or less) or the end of transition period defined by the lack of stable political institutions (denoted by a standardized authority score).	Polity IV database: http://www.systemicpeace.org/polity/polity4.htm