

HOT MONEY, HOT SPOTS?: IS CAPITAL FLIGHT IN SUB-SAHARAN AFRICA AN  
INDICATOR OF POLITICAL INSTABILITY?

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# **Hot Money, Hot Spots?: Is Capital Flight in Sub-Saharan Africa an Indicator of Political Instability?**

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## **ABSTRACT**

Insider trading, or the leveraging of material, non-public information for private gain, frequently is illegal in nations with a stable rule of law. During periods preceding a collapse of government control, however, it is possible that political and economic elites will engage in behavior that is similar to that of insider traders, and will transfer private funds in increased volumes out of their country of origin. This paper reviews capital flight as a proxy for the historic transfer of private funds preceding the onset of political instability in Sub-Saharan Africa. It concludes that capital flight is indeed positively and significantly correlated with the onset of state failure.

## **Acknowledgements**

There is a well known aphorism about the parentage of successes and failures. In either case, this paper owes its development to a large number of people beyond its current author. First, I would especially like to thank Richard Cumby for suggesting that I use capital flight as my proxy and then graciously fielding many subsequent questions. I would also like to extend a special thanks to Monty Marshall at the Political Instability Task Force (PITF) for likewise making a number of key substantive suggestions and for allowing me a copy of a forthcoming manuscript that was instrumental in developing this paper's model. I would further cite the numerous, well-answered methodological questions that I presented to Michael Bailey as evidence that his patience is beyond reproach; his contributions along with those belonging to Eric Gardner were essential to testing my model properly. I would also like to thank Gerald Epstein and Edsel L. Beja, Jr. for answering questions and suggesting future avenues of research, as well as Jacob Ward, Monica Toth, Henry Hensley, Holly Sun, Chris Paulk, Emma Ferneyhough and Lisa Xu for their various suggestions. Finally, but certainly not least, I would like to thank John Christian for shepherding this project to completion and for providing measured advice throughout. I take exclusive credit only for any oversights among the following pages.

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## **Introduction**

International news is replete with fresh references to political instability and its consequences. At the time of this writing, violent conflict is taking place in several locations throughout the world, while many additional nations are either hosts to active insurgencies or witnesses to the recent conclusion of civil war.

This thesis contributes to emerging policy literature that examines quantitative indicators of political instability. Its core premise is that the behavior of government actors in states marked by such political instability is not so different from that of corporate insider traders. In theory, both groups can be expected to utilize information that is not available to a general public in order to maximize private gains.

In the case of insider trading, principals leverage information about a given company or industry that is not available to the general public in order to unfairly benefit from the sale or purchase of stock. In the case of growing government instability, political and economic elites might be expected to shift private funds out of a country of interest.

However, because it is difficult to obtain access to the private financial records of such individuals, this thesis employs domestic capital flight—or the flow of assets and/or money out of a country—as a proxy for the transfer of individual, private funds. This proxy is a surprisingly robust approximation of private capital transfers. As Boyce

and Ndikumana (2001, p. 5) note, “individuals who engage in capital flight generally are members of the [African] subcontinent’s economic and political elites, who take advantage of their privileged position to acquire and channel funds abroad.”

This paper focuses on the African continent for many of the reasons that the Political Instability Task Force ([PITF], 2003) lists. The continent, they note is exceptional in many ways, from the relative infancy of nearly all its states to the depth and persistence of its poverty and the toll levied by a host of endemic infectious diseases. At the same time, Africa also contains a tremendous array of social, cultural, economic, and political forms that mirrors the scope of diversity in the world as a whole.

There is also a final statistical rationale for focusing on Sub-Saharan Africa. Due to its disproportionately large rate of state failure across the examined time period, Sub-Saharan Africa provides a better opportunity to examine the relationship between government collapse and capital flight than do other regions.

Capital flight is therefore a promising potential indicator for the onset of state failure, and the African continent contains an ideal and manageable subset of nations for examining its effects. Indeed, if the phenomenon that this paper hypothesizes is in fact taking place in Africa, it seems a fair conclusion that it may be taking place globally as well.

## **Policy Relevance**

As the 2002 and 2006 editions of the National Security Strategy (NSS) of the United States (U.S.) establish, political instability is not only highly detrimental for a country of interest, but also a source of instability for other nations both near and far. Although the impact that civil conflict has upon any country's economic or demographic health provides an important moral argument for its minimization, an attendant strategic rationale exists as well.

Terrorist organizations frequently seek out nations with a collapsed rule of law as safe havens for their activities. The long-term interests of the United States are thus generically aligned against continued political instability, even for those conflicts in which it might not otherwise hold a direct stake. It is therefore in the security interests of the United States both to be able to understand the causes of state failure and also, where possible, to predict its onset.



## **Literature Review**

This paper aims to extend prior literature that investigates quantitative indicators of state failure, although it is also informed by prior discussions of capital flight. This section will review prior investigations into political instability, topics regarding the measurement of capital flight, and recent literature that estimates the magnitude of capital flight in Sub-Saharan Africa.

### **Prior Findings: Political Instability, Civil War, State Failure**

Monty G. Marshall, the co-custodian of the PITF dataset used in this paper, provides an excellent survey of various investigations into risk factors that are associated with forms of political instability, an umbrella term for “situations...that have the potential to seriously disrupt conventional, political processes within and among states populating the global state system” (Marshall, working paper, p. 7). As Marshall later notes, “there is no consensus on what constitutes a weak, failing, failed, or fragile state and, as such, there are varying accounts of the numbers of states that should be considered for special treatment” (Marshall, working paper, p. 11), although he elsewhere notes that the PITF dataset has converged on a stable definition for state failure (discussed in the Research Design segment of this paper).

Marshall identifies a set of “conditional and causal factor models” that

are intended to establish evidence of temporal association and are not designed to be predictive of actual onsets of violent conflict or identify specific countries with risk of such onsets. They are important, however, in establishing the validity of indicators and ... help to establish the veracity of predictive models (Marshall, working paper, p. 21).

Most of these models focus on the onset of civil war rather than on state failure. Collier (2000) argues that the primary systematic explanation for rebellion in the aggregate is its economic viability, rather than the magnitude of the grievance attached to it. He examined civil war globally between 1965-1999 and concluded that the most powerful risk factors are associated with countries that have: (a) a substantial share of Gross Domestic Product (GDP) arising from the exportation of primary commodities, (b) a population with a high geographic dispersal, (c) a history of recent conflict, (d) a low degree of educational and economic opportunity and (e) a dominant ethnic group that represents between 45% and 90% of the population.

Collier and Hoeffler (2001) subsequently employed a revised data set concerning civil wars between 1960 and 1999. They reinforced the conclusion that economic opportunity rather than magnitude of grievance tended to determine the outbreak of civil war. They also attempted to develop proxies both for the economic viability of civil war as well as for political grievances and concluded (a) that the

above factors (excepting ethnic or religious tension) remained significant, (b) that the presence of a diaspora in another country substantially increased the risk of repeat conflict, (c) that the absence of democracy (i.e. the presence of repression) increased conflict risk and that, generally speaking, (d) the proxies for economic viability tended to provide more explanatory power than those for grievance.

Fearon and Laitin (2003) provided one response to the above findings. They found that ethnic and religious characteristics tended not to provide explanatory power for civil war outbreak. Broadly speaking, two of their indicators explained the outbreak of civil conflict: the presence of financially and bureaucratically weak states (denoted through indicators of poverty); and those conditions that favored rebel recruitment, including (a) nations with a history of previous political instability, (b) rough terrain, and (c) large populations.

In contrast with conditional and causal factor models that focus on the likelihood of an outbreak of civil war, Marshall also describes a set of predictive models, that are “designed very specifically to maximize their ability to identify target outcomes (effectiveness) and for their compatibility with the prevailing political culture of intelligence and policy in applied settings (usefulness)” (Marshall, working paper, p. 23). Such models tend to focus on state failure exclusively.

Although a global model that converges on “regime type, infant mortality, armed conflict in neighboring countries and state-led (political) discrimination” (Marshall, working paper, p. 25) as key indicators of state failure accompanies the PITF dataset, this same dataset also contains a sub-model that focuses on the Sub-Saharan African region. Key indicators of state failure that arise from the African context include: (a) regime type, (b) state-led discrimination, (c) “colonial history, (d) leader’s tenure in office and (e) a large majority (greater than 65%) of population from a single religious group” (Marshall, working paper, p. 26). Repressive regime types as well as the presence either of inexperienced leaders with four years of rule or less or of weaker, longstanding leaders whose age foments political competition among lower ranks represent especially high risk factors under this model.

Another predictive framework that focuses on the region is the African Instability model (Marshall, 2006). In addition to classifying the forms of instability faced by African nations, this model includes a list of potential explanatory variables for conflict and instability. Among these are: (a) dependency on foreign aid; (b) societal polarization; (c) population density; (d) instability during state formation, (e) high percentage of forest cover and (f) large land area (c, d, g, and h are grouped together as *unmanageability*); (g) states politically dependent on key figures; (h)

conflict in neighboring states and (i) the presence of Muslim populations exceeding forty percent of a country's population.

Control variables for the econometric model used in the current paper are derived from the above models and also account for two major constraints. First, this paper follows Marshall's (working paper, p. 23) recommendation to include at least one *dynamic* indicator—that is, an indicator that is subject to abrupt change—in order to assist with measuring the imminence of risk. Additionally, Marshall (personal communication, January 11, 2008) recommends that all quantitative models include at least one explanatory variable from each of the following categories in order to control for unmeasured effects: security, political, economic and social. Table I below is adopted from Marshall (working paper, Table 1) and contains a summary of the indicator variables referenced in the current section, sorted by category.

**Table I**  
*Key Indicator Variables from Literature Review*

		Model Type						Dynamic?	
		Conditional			Predictive				
		Collier and Hoeffler - Greed model	Collier and Hoeffler - Grievance model	Fearon and Laitin	PITF-Global	PITF-Sub-Saharan Africa	Marshall - African Instability model		
<b>Key Indicator Variables</b>	Security	Armed conflict in neighboring countries				x	x	x	x
		Governance in neighboring countries						x	x
		History of armed conflict	x	x	x				
		Type of terrain	x	x	x			x	
	Political	Colonial history					x		
		State formation instability						x	
		Diaspora	x						
		Leader's tenure					x	x	
		Regime duration/instability	x		x				
		Regime type	x	x	x	x	x	x	
		Group discrimination			x	x	x	x	x
		Factionalism				x	x	x	x
	Transitional regime				x				
	Trade	Trade openness				x	x		
	Economic	GDP growth rate	x						x
		GDP per capita	x		x				x
		Inequality	x						
		Oil exporter			x				
	Social/Demographic	Infant mortality				x			
		School enrollment/completion	x						
		Ethnic diversity		x	x				
		Religious diversity		x	x				
		Muslim countries					x	x	
		Population	x	x					
		Population density						x	x
Population distribution/dispersion		x	x	x					

## **What Is Capital Flight?**

Capital flight is a challenging concept to define. Broadly speaking, it is the tendency for forms of capital to flee developing countries in search of higher rates of return elsewhere. As Epstein (2005) aptly summarizes,

When people hear the term ‘capital flight’ they think of money running away from one country to a money ‘haven’ abroad, in the process doing harm to the home economy and society. People probably have the idea that money runs away for any of a number of reasons: to avoid taxation; to avoid confiscation; in search of better treatment, or of higher returns somewhere else. In any event, people have a sense that capital flight is in some way illicit, in some way bad for the home country, unless, of course, capital is fleeing unfair discrimination, as in the case of the Nazi persecution. These commonsense ideas are roughly what we mean by capital flight. It turns out, however, that it is quite difficult to transform this commonsense meaning into rigorous, economic definitions, data and analysis (Epstein, 2005, p. 3).

Cumby and Levich (1987) echo this final sentiment, noting that “economic principles do not guide us to a unique or natural definition of the term” (p. 29). However, they do

provide a productive starting point, by reviewing a number of different quantitative models for capital flight, identifying potential sources of measurement error, and providing a short list of policy implications.

Models of capital flight rely on the identification of discrepancies in the international balance of payments, a historical record of financial transactions between a given country and the remainder of the world. As Cumby and Levich (2002) detail, this record contains data that signals changes in the gross and net movement of (a) merchandise trade, (b) service trade, (c) private financial flows, or (d) official reserve flows. National accounts are created using a double-entry bookkeeping system where every transaction gives rise to both a credit and a debit entry in the accounts. Credits represent the demand for currency or the sources of funds, whereas debits represent the supply of currency or the uses of funds. Simply put, forms of exportation are rendered as credits, forms of importation are debits, and forms of currency payment carry the opposite sign of the import or export for which they are used to pay. For instance, the export of a U.S. aircraft to a foreign country would be a credit item (+) for the U.S. because it generates local demand for U.S. dollars, whereas the payment for the aircraft would be considered a debit item (–) because it generates a local supply of currency. Alternatively, the importation of Taiwanese computer boards by the U.S. would be recorded as a debit item (–), whereas payment for it would represent a credit (+).



In theory, because the balance of payments includes both debit and credit components, it should always balance. In practice, however, this balancing is only an accounting equality, since local prices and exchange rates tend to alter results. In addition, as Cumby and Levich (1987), Boyce and Ndikumana (2001) and Beja (2005) note, balance of payments data is frequently either of poor quality or reflects systematic trade misinvoicing, resulting in biased data. Methods to correct for such imbalances exist, and will be addressed later in this review.

Capital flight can thus be measured using balance of payments records, since financial transactions invariably result in the acquisition of financial claims by domestic residents against non-residents. As both Cumby and Levich (1987) and Beja (2005) note, this presents a methodological problem: which financial transactions should be classified as capital flight rather than as normal capital outflows? Cumby and Levich (1987) emphasize that a distinction between these two categories will involve arbitrary, subjective choices, although Beja (2005) does present a series of three criteria: volume, motive, and direction of capital outflows. Capital outflows can thus be considered to be operating either at a normal volume that reflects a well-diversified portfolio or at an abnormal volume that likely reflects capital flight. Outflows can also be ascribed to ordinary economic motives, which do not constitute capital flight, or to the desire to evade government control or detection, which would constitute flight.

Dooley (1986) defines capital flight as “motivated by the desire of residents to obtain financial assets and earnings on those assets which remain outside the control of domestic authorities” (Dooley, p. 15). Capital flows that are sanctioned by law and recorded without systematic misinvoicing are generally outside the purview of those seeking to define capital flight. Finally, according to Dooley, capital flows that are unipolar rather than bidirectional are likely to trigger presumptions of abnormality.

### **Prior Findings: Capital Flight in Sub-Saharan Africa**

Proper measurements of capital flight are therefore sensitive to (a) changes, especially rapid changes, in volume of capital transfers; (b) direction of such transfers; and/or (c) motivations for such transfers. Largely owing to differences in data, however, estimates for capital flight in Africa have varied. Chang and Cumby (1991) provide early estimates of capital flight for Sub-Saharan Africa using the residual or broad definition of capital flight, which does not contain any specification for volume or for motive, but does specify the direction of capital flows. This model includes not only unrecorded capital outflows, which would suggest motive if measured alone, but also net economic resources that are lost from the domestic economy.

This paper adopts measurements described by Boyce and Ndikumana (2001) and Ndikumana and Boyce (2002). They use a methodology that is similar to Chang

and Cumby's. Their model, which will be covered in greater depth in the next section of this paper, contains three important adjustments. Many Sub-Saharan African nations have debt stocks in French francs, and since currency appreciations or depreciations against the U.S. dollar can generally introduce upward or downward biases into measured capital flight, the Boyce and Ndikumana model corrects for shifting exchange rates. Additionally, the official IMF data on trade exports and imports does not take systematic misinvoicing into account, and therefore, measurements dependent upon its trade statistics might result in over- or under-estimations of capital flight. Boyce and Ndikumana correct for this issue by comparing a country's import and export statistics with those of its trading partners. Finally, their model adjusts for inflation, since the real value of capital flight in 1970 is not the same as capital flight that fled ten years afterward.

### **Prior Findings: Capital Flight and State Failure**

To date, one quantitative study has focused on capital flight and its relationship to state failure. Lensink, Hermes and Murinde (1998) differ from this paper because they adopted a worldwide data set and investigated the effect of state failure on capital flight. Their finding, that increased political risk leads to capital flight, underscores the importance of verifying that lags in the capital flight variable also significantly impact

state failure, lest one mistakenly reverse the causal relationship between the two variables. Additionally, Le and Zak (2001) provided both a theoretical model hypothesizing that financial, political and policy risk affect capital flight and empirical evidence in support of Lensink, Hermes and Murinde's results. Their conclusion was that all three types of risk had a statistically significant impact on capital flight, but that political risk was the most important factor causing capital flight.

## Conceptual Model

The ideal model for this paper's original research question would represent the likelihood of state failure as a function of private financial transfers, control variables ( $\Gamma Z$ ) and time-series ( $\alpha$ ) controls:

$$State\ Failure_{i,c,t} = \beta_0 + \beta_1 Private\ Assets_{i,c,t} + \Gamma Z_{i,c,t} + \alpha_c + \varepsilon_{i,c,t} \quad (1)$$

## Capital Flight

Due to obvious difficulties in accurately measuring private funds, this paper adopts the Boyce and Ndikumana (2001) model for capital flight as a proxy for a direct measurement of private funds. For every country  $i$  in year  $t$ , capital flight is computed as follows:

$$KF = \Delta DEBTADJ_{it} + DFI_{it} - (CA_{it} + \Delta RES_{it}) + MISINV_{it} \quad (2)$$

where  $DFI - (CA + \Delta RES)$  is a variant of the residual measurement of capital flight as defined by the World Bank (1985) and the other two variables are post hoc adjustments.  $DFI$  in this context represents net direct foreign investment,  $CA$  is the current account deficit, and  $\Delta RES$  is the change in the stock of international reserves.

$\Delta DEBTADJ$  is a post hoc adjustment for change in a country's stock of external debt in order to take into account that such debt is frequently denominated in various other currencies first, such as the French franc, and then aggregated in U.S. dollars; this adjustment controls for cross-currency exchange rate fluctuations. The *MISINV* variable is a similar post hoc adjustment for systematic trade misinvoicing<sup>1</sup>. Boyce and Ndikumana finally convert nominal values of annual capital flight to real values using the U.S. Producer Price Index (with the year 1996 set as 100). This paper investigates the effects of both real capital flight [KF] on state failure as well as the logarithmic value of real capital flight [ $\log(KF)$ ].

## Control Variables

This paper adopts the following control variables, drawn from previous research:

$$\begin{aligned} \Gamma Z = & \textit{Regime Type} + \textit{Number of Bordering Conflicts} + \textit{Population} + \\ & \textit{Leader's Tenure} + \textit{GDP Per Capita} \end{aligned} \quad (3)$$

---

<sup>1</sup> For a comprehensive breakdown of the adjustments used in this model, see Boyce and Ndikumana (2001).

These control variables were selected based upon a number of criteria. First, as highlighted below by Table II (an abbreviated version of Table I above), prior research found each variable to be correlated with the onset of state failure.

**Table II**  
*Control Variables Used*

			Model Type						Dynamic?
			Conditional			Predictive			
			Collier and Hoeffler - Greed model	Collier and Hoeffler - Grievance model	Fearon and Laitin	PITF-Global	PITF-Sub-Saharan Africa	Marshall - African Instability model	
Key Indicator Variables	Security	Number of bordering conflicts				x	x	x	x
	Political	Leader's tenure					x	x	
		Regime type	x	x	x	x	x	x	
	Economic	GDP per capita	x		x				x
	Social/Demographic	Population	x	x					

Additionally, as Marshall (personal communication) recommends, this model also includes at least one variable from each of the four following variable categories: (a) security, (b) political, (c) economic and (d) social or demographic. In addition, both the *GDP per capita* and the *Number of bordering conflicts* variables satisfy Marshall's

(working paper, p. 23) recommendation that a predictive model include at least one dynamic indicator subject to abrupt change.

Those control variables from the literature review that were found to be significant most often in both predictive and conditional models were selected for inclusion first. Since the model that this paper employs is predictive, priority for selection was then given to those variables that were found to be significant in predictive models alone. Variables that were found to be significant in conditional models alone were selected last. Further, each variable was selected based upon the likely improbability of its correlation with the capital flight model, thus limiting issues of multicollinearity.

Following Marshall's recommendation (personal communication), two control variables have been re-coded from ordinal-ratio into dummy variables in order to better illustrate relationships. These include (a) *Regime type*, which was re-coded from the *Polx* variable (as used in the State Failure Task Force data set) to a dummy variable reflecting whether or not a country of interest was or was not an *Autocracy* as well as (b) *Leader's tenure* (as used in the State Failure Task Force data set), which was re-coded into a set of dummy variables reflecting *0-4 years*, *5-14 years* and *Greater than 14 years* of rule, respectively. Finally, per Marshall's recommendation (personal communication), all control variables have been lagged by one year, since those which



are measured in the same year as state failure can sometimes fail to reflect prior effects, leading to issues of causality.

## Final Models

The final models, with appropriate proxy substitutions made, are therefore:

$$\text{State Failure}_{i,c,t} = \beta_0 + \beta_1 KF_{i,c,t} + \Gamma Z_{i,c,t-1} + \alpha_c + \varepsilon_{i,c,t} \quad (4)$$

and

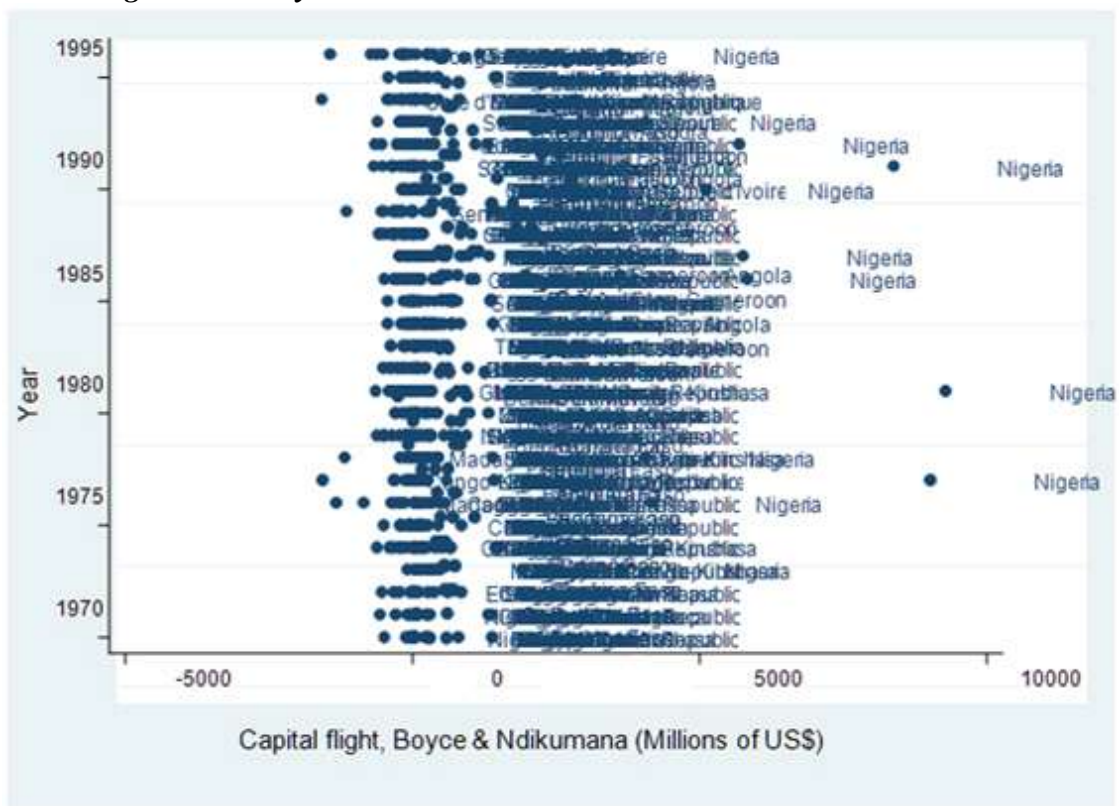
$$\text{State Failure}_{i,c,t} = \beta_0 + \beta_1 \log(KF)_{i,c,t} + \Gamma Z_{i,c,t-1} + \alpha_c + \varepsilon_{i,c,t} \quad (5)$$

This paper employs a logit regression model, where the dependent variable is the probability of state failure and the coefficient on the independent variable captures the marginal effect of capital flight on that probability. In order to present the effects of the independent variables, however, output in the Findings section of this paper has been converted into a logistic model. Although these two models are algebraically interchangeable—a coefficient in a logistic model is merely  $e$  raised to the power of its corresponding logit model coefficient—it is possible to interpret logistic coefficients directly, unlike logit model equivalents. Logistic model coefficients are also known as

*odds ratios*, which represent either an associated increase in probability (if larger than one) or decrease (if less) caused by a one-unit change in the measured variable.

This paper also employs fixed effects controls over time in order to better account for by-year variation. The data range across 23 countries in 26 years, from 1970 through 1996, inclusive. Although Ndikumana and Boyce (2002) include 24 countries originally, it was necessary to exclude Nigeria from this paper’s analysis.

Figure I  
*Nigeria as a Key Outlier*



As seen in Figure I, Nigeria consistently had such large capital flight during the 26-year time period that it introduced significant bias into this paper's original results. It was therefore considered an outlier and excluded from analyses in the Findings section of this paper.

Finally, this paper will also conduct causal verification by lagging the capital flight variable by one and two years in order to discern the nature of the relationship between capital flight and the state failure variable:

$$State\ Failure_{i,c,t} = \beta_0 + \beta_1 KF_{i,c,t-1} + \Gamma Z_{i,c,t-1} + \alpha_c + \varepsilon_{i,c,t} \quad (6)$$

and

$$State\ Failure_{i,c,t} = \beta_0 + \beta_1 KF_{i,c,t-2} + \Gamma Z_{i,c,t-1} + \alpha_c + \varepsilon_{i,c,t} \quad (7)$$

Equations 6 and 7 are nearly identical to Equations 4 and 5, except that they represent capital flight (KF) values lagged by an appropriate number of years, as denoted in the subscript values for each.

## **Data and Methods**

The data used in this paper is amalgamated from two sources: (a) Table A3 from Ndikumana and Boyce (2002) and (b) the State Failure Task Force Report that is maintained by the Political Instability Task Force, a consortium of scholars from Arizona State, Columbia, George Mason, Harvard, Maryland, Minnesota, Stanford, and Texas universities assembled at the request of senior policymakers in the U.S. Government.

### **Ndikumana and Boyce (2002)**

Ndikumana and Boyce (2002) provide estimates of capital flight from 30 sub-Saharan African countries—including 24 countries classified as severely indebted and low-income—from 1970 to 1996, inclusive. Their methodology is outlined in the Literature Review and Conceptual Model sections of this paper, and is described in greater detail in Boyce and Ndikumana (2001).

### **State Failure Task Force Report**

Much of the State Failure Task Force data set was drawn from existing databases provided by the World Bank, the United Nations, the U.S. Census Bureau,

and other organizations and independent scholars, although the Task Force also generated new data specifically for the data set.

Among the most important data generated especially for the report is the list of 114 state-failure events that began between 1955 and 1998. This list indicates the starting and ending dates for all serious cases of four different kinds of internal political crisis—revolutionary wars, ethnic wars, adverse regime changes, and genocides—that occurred in independent states with populations of at least 500,000.

The Task Force used a number of different techniques to generate data and identify factors most closely associated with state failure, including logistic regression analysis, neural network analysis, and expert surveys. All of these methods converged on a fairly stable and robust set of results. The core of the Task Force’s method is random case-control comparisons.

Such a technique examines a number of conditions in failed countries two years before the onset of failure and compares these with conditions in a randomly selected set of control countries, matched by year and by region, that did not fail in the ensuing years. This comparison allows the PITF to identify those conditions most closely associated with state failure and to estimate the impact of differences in those conditions on the risk of failure. This technique is considered particularly appropriate for analysis of rare events, where analysis of time-series, cross-sectional data tends to

produce biased estimates and may overstate the significance of variables that fluctuate over time.

## **Assembly**

Assembling the final data set involved combining the Ndikumana and Boyce (2002) capital flight estimates and State Failure Task Force's Phase III data set's GDP per capita variable with the Task Force's Phase IV data set. Further data preparation involved deleting data reflecting years and countries that did not appear in Ndikumana and Boyce (2002). Finally, modified control and lag variables were created as outlined in the Conceptual Model section of this paper.

## Findings

Results of the logistic regression model are displayed in Table III . These results describe the probability of state failure as a function of capital flight and accompanying control variables. Table III contains two specifications, for real capital flight and its log, respectively, both of which show a positive and statistically significant effect upon the probability of state failure. Specification (i) models state failure as a function of capital flight normalized to 1996 U.S. dollars, while specification (ii) models state failure as the logarithm of the real capital flight variable.

**Table III**  
*Logistic Results: Variables of Interest*

	(i)		(ii)	
	Odds ratio	p-value	Odds ratio	p-value
Capital flight ( 100 mil. real 1996 U.S. \$)	1.087	0.003		
log(Capital flight)			1.521	0.016
Autocracy*	0.235	<0.001	0.106	<0.001
Number of neighboring conflicts*	0.964	0.776	1.188	0.338
Population (millions)*	1.090	<0.001	1.056	0.053
Leader's Tenure				
1-4 years in office*	4.116	0.002	6.345	0.002
5-14 years in office*	3.485	0.002	3.651	0.015
GDP per capita (1987 U.S. \$)*	0.998	<0.001	0.998	<0.001

\* control variable has been lagged by 1 year

Since the table represents a logistic analysis, each number in the odds ratio column represents an associated increase in probability (if larger than one) or decrease (if it is less) caused by a one-unit change in a given variable. For instance, an increase in capital flight of \$100 million 1996 dollars would represent an odds increase of about 1.087 (about  $[1.087-1] * 100 = 8.7\%$  ). Similarly, a one dollar per-capita increase in GDP would represent a corresponding odds decrease of 0.998 (or about  $[1-0.998] * 100 = 0.2\%$  ) .

Both capital flight and GDP per capita carry the expected sign and significance, as do all other variables with the exceptions of (a) number of neighboring conflicts, which is frequently highly significant in prior literature, and (b) leader's tenure from 5 to 14 years. This latter variable is ordinarily an impeding factor upon state failure in prior literature, especially compared to the base case, which represents a leader with a tenure greater than 14 years. As the PITF notes (2003), because neighboring conflicts tend to spill across borders, they are frequent causes of impending state failure. It is surprising, therefore, that the results of this paper have consistently found this variable not to be statistically significant. It is possible that other independent variables or the one-way fixed effects model used by this paper are masking its effects although it is difficult to see where.



Additionally, as the PITF notes (2003), because leaders in office fewer than 5 years tend to face increased competition and those with tenure greater than 14 years tend to have succession issues, both groups are frequently positively associated with state failure as well. It is also surprising, therefore, to see a coefficient greater than one for the leader's tenure from 5 to 14 years variable. It should be negative compared to the base case of a leader's tenure greater than 14 years, although again it is possible that other independent variables are masking its effect.

Logistic analysis can sometimes be difficult to interpret, especially when including logarithmic models. This paper, therefore, also includes an additional descriptive statistical format to assist in interpreting the variables of interest. By holding all variables at their mean amount in a model without fixed effects and then increasing capital flight and its log, respectively, by one standard deviation, it is possible to provide a rough sense for the relative effect that an increase in capital flight would have on the probability of state failure. As seen in Table IV, a standard deviation increase in capital flight from the mean—roughly \$947 million in 1996 dollars—would correspond to an increase in the probability of state failure by a factor of roughly  $0.047/0.017 = 2.76$ , whereas a standard deviation increase in the log of capital flight from the mean would correspond to an increase in the probability of state failure by a factor of roughly  $0.081 / 0.027 = 3$ .

**Table IV**  
*Variables of Interest Plus One Standard Deviation*

	(i)	(ii)
	Capital flight (million real 1996 U.S. \$)	log(Capital flight)
Mean	0.017	0.027
Mean + std dev	0.047	0.081

Finally, logistic results for real capital flight, lagged one and two years respectively with one-way fixed effects, are seen in Table V. Both specification (iii), which corresponds to a one-year lag, and specification (iv), which corresponds to a two-year lag, are positive, significant and roughly as substantively related to the state failure variable as the non-lagged model. It therefore seems reasonable to conclude that capital flight is indeed a cause of state failure rather than the reverse.

**Table V**  
*Logistic Results: Lagged Capital Flight Variables*

	(iii)		(iv)	
	Odds ratio	p-value	Odds ratio	p-value
Capital flight, lagged 1 year*	1.00087	0.002		
Capital flight, lagged 2 years*			1.000795	0.005
Autocracy**	0.2647382	0.001	0.2815882	0.001
Number of neighboring conflicts**	0.9684949	0.802	0.9785612	0.864
Population (million)**	1.087626	<0.001	1.086906	<0.001
Leader Tenure				
1-4 years in office**	4.068044	0.002	3.760669	0.003
2-14 years in office**	3.610278	0.002	3.428975	0.003
GDP per capita (1987 U.S. \$)**	0.9981641	<0.001	0.998181	<0.001

\* in millions of 1996 U.S. dollars, \*\* control variable has been lagged by 1 year

## Conclusions and Implications

From these findings, it is reasonable to conclude that capital flight is indeed a substantive predictor of state failure. These findings support this paper's original hypothesis, that the financial behavior of political and economic elites predicts the onset of failing states in Sub-Saharan Africa. Such elites do appear to behave in a similar fashion to corporate insider traders, utilizing private knowledge for private gain via the public domain. This paper's results also argue for the inclusion of capital flight among the list of causal factors that should concern those portions of the U.S. government addressing the onset of international state failures.

This paper, having identified a relationship between lagged capital flight and subsequent state failure, also provides an argument for the reevaluation of literature that argues in favor of the reverse causal relationship. Similar future analyses would benefit from examining the relationship between lagged political instability events and present capital flight. Additionally, the findings in this paper bear retesting both as more and better data emerges over time and in a larger, global context outside of Sub-Saharan Africa.

Finally, it should be noted that there are potential issues of autocorrelation for this paper's independent variables. Ndikumana and Boyce (2002) did identify capital flight as displaying a large degree of *persistence*, or correlation with past and future

capital flight. However, due to the panel nature of the data, it was not easy to test for possible autocorrelation. In order to use those commands in the STATA software suite that tested for autocorrelation, it was necessary to identify both by-country and by-year variables, instead of just the by-year variable alone. Doing so caused the model to rapidly lose power, and produced a highly counterintuitive result that not only identified all of the control variables as autocorrelated, but also suggested that many of these were statistically insignificant as well. For this reason, these results were disregarded.

Were any of the independent variables to be affected by autocorrelation, it would not change their coefficients or odds ratios, although it would potentially affect their levels of significance. If real capital flight and its logarithm were in fact both positively autocorrelated to a significant degree, it is possible that their effects would be incorrectly identified as significant. Additionally, the presence of such autocorrelation would potentially contradict this paper's findings on the causal relationship between capital flight and state failure.

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