

## **DETERMINANTS OF CAPITAL FLIGHT AND CAPITAL MOVEMENT THROUGH TRADE MISPRICING: THE AFRICAN CASE**

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### **ABSTRACT**

This study attempts to accomplish two things. First, it tries to establish the determinants of capital flight and capital movement through trade misinvoicing from selected African countries in order to ascertain whether the same factors could explain both types of capital movement. Second, it attempts to determine whether Granger causation exists between capital movement through trade misinvoicing and capital flight. Data for selected countries were combined into geographical, economic, and monetary regions. For 1990–2005, the amount of capital flight from the African Continent was estimated to be \$499.8 billion and \$438.9 billion for the Sub-Saharan region. Using 21 explanatory variables, the results showed that variables that explain capital flight do not always explain capital movement and vice versa. The independent variables tended to explain the dependent variables in a few cases, implying that the reason for capital flight and capital movement was other than for investment purposes. Overall causality was found to exist between the dependent variables, mostly in the form of feedback. Yet, the relationship was mostly transitory with a long-term relationship existing in only few cases. African governments need to establish stronger trade policies and create incentives for individuals and institutions not to move the desperately needed capital out of the continent.

**Key words:** capital flight, capital movement, trade mispricing, Africa, causality

**JEL Codes:** F14, F49

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## **I. INTRODUCTION**

Literature on capital movement from the African continent has revealed that capital flight, as well as any outward movement of capital from African countries, has a harmful effect on the economy of African countries where capital flight has existed since the 1970s. Although there is no generally accepted definition of capital flight, the literature has postulated three major reasons for its existence: (1) investment, (2) money laundering, and/or (3) tax evasion. For capital flight to be accredited to money laundering, the sources of funds or the money moved has to be illegal in origin. Few studies, mainly those of Walker (2002) and Unger et al. (2006), were able to determine the sources of funds. Of the studies that included tax rates in their study (e.g., Dooley, 1986; Dooley and Kletzer, 1994), none were able to conclude that capital was moved from a country to avoid paying taxes.

Even though researchers have long recognized trade misinvoicing as a major channel for illegal flows of money through the over-invoicing or under-invoicing of imports or exports, research has not determined whether such activity constitutes a component of capital flight (Ajayi, 1992, 1997; Ndikumana and Boyce, 1998; Patnaik and Vasudevan, 2000; Almounsor, 2005; Salisu, 2005; Beja, Junvith, and Ragusett 2005; Zhu, Li, and Epstein, 2005), a cause of capital flight (Claessens and Naudé, 1993; Rustomjee, 1991), or simply a means to evade taxes. Although Chang and Cumby (1991, p. 167) estimated that \$12 billion from the Sub-Saharan region and \$17 billion from other African countries was moved to the U.S. between 1976 and 1987 through trade misinvoicing, they argued that “the systemic underreporting of trade figures in both directions to avoid trade barriers seems to overwhelm any discernible capital flight through misinvoicing.”

Gibson and Tsakalotos (1993, p. 150) made the argument that trade misinvoicing “may be unrelated to the phenomenon of capital flight,” which was supported by Hermes, Lensink, and Murinde (2002). Cerra, Rishi, and Saxena (2005, p. 7) found that trade misinvoicing “as a mechanism of capital flight, appears to behave differently from other components of flight.” However, which area of research is correct? The enormous differences in the definition of capital flight and the difficulty in determining an accurate measure of trade misinvoicing prevents an easy answer.

This study adds to current literature in that it attempts to find answers to some of these questions. Given the enormous divergence in the definition of capital flight, as well as the arguments of Hermes et al. (2002) and Gibson and Tsakalotos (1993), this study is divided into three areas.

The first estimates the amount of capital flight from selected African countries between 1990 and 2005. The second establishes the determinants of capital flight and capital movement through trade misinvoicing (or trade mispricing) from Africa to the U.S. (henceforth capital movement) in order to ascertain whether the same variables can explain both. For this purpose, capital flow, macroeconomic, risk and return, financial development, and financial policy variables will be utilized as possible determinants. The third determines whether capital movement explains capital flight.

The estimation of capital flight from African countries and/or regions of Africa has been covered in prior studies. However, the process is replicated in order to compare the estimates of capital flight to the amounts of capital movement for the years 1990 through 2005. No prior study presents the estimates of capital flights for these years.

## **II. LITERATURE REVIEW**

### **A. Prior Studies on the Estimation and Determinants of African Capital Flight**

Studies by Chang and Cumby (1991), Hermes and Lensink (1992), Ojo (1992), Nyatepe-Coo (1994), Ajayi (1997), Ndikumana and Boyce (1998, 2003), Boyce and Ndikumana (2001), and Mohamed and Finnoff (2004) concentrated on the estimation of capital flight from different African countries. Chang and Cumby (1991) studied 36 African countries during 1976–1987 and found that the amount of capital flight in terms of gross domestic product (GDP) exceeded that of Latin America countries. The amount of capital flight was calculated by Hermes and Lensink (1992) for the period between 1976 and 1989 for six African countries. They concluded that Nigeria experienced the largest amount of capital flight with most of it taking place via public external borrowing. Ojo (1992) calculated the amount of capital flight from Côte d'Ivoire, Morocco, and Nigeria for 1975–1991 and attributed it to changes in external reserves and governmental budget deficits. Capital flight from 1970 to 1992 was estimated by Nyatepe-Coo (1994) for seven sub-Saharan African countries. The results showed that the amount of capital flight from Nigeria, Ghana, Congo-Zaire, and Zambia were 91, 58, 35, and 32 percent of external borrowing, respectively. This study linked the results to the unreliability of the governments' actions, macroeconomic volatility and political flux.

Ajayi (1997) estimated the magnitude of capital flight from 21 heavily indebted African countries within the sub-Saharan region for the years 1980 through 1991 and determined that a relationship failed to exist between external debt and capital flight but that one did exist between the real growth of the economy and debt overhang. Ndikumana and Boyce (1998) determined that capital flight from Zaire was close to \$12 billion between 1968 and 1990, and they stipulated that capital flight was stimulated by reckless debt management, multilateral depository and financial institutions that were too lenient in their lending practices, as well as by the misappropriation of export revenues.

Boyce and Ndikumana (2001) estimated the amount of capital flight from 25 low-income African countries within the sub-Saharan region for 1970 to 1996. The amount estimated when adjusted for trade misinvoicing totaled more than \$193 billion. A later study by Ndikumana and Boyce (2003) uncovered the prevalence of a positive connection between external debt and capital flight and a negative link between differential growth rates and capital flight.

Mohamed and Finnoff (2004) presented estimates of capital flight from South Africa between 1980 and 2000 and reported that the average capital flight

per GDP was 6.6 percent a year with the largest amount of capital flight occurring during 1980–1985 and 1994–2000. They gave as possible explanations the increase in the amount of short-term bank lending and the large portfolio of capital.

#### **B. Prior Studies on the Estimation of Capital Flight from Africa**

Trade misinvoicing can be an important factor in the calculation of capital flight. Rustomjee (1991), Wood and Moll (1994), Boyce and Ndikumana (2001), Mohamed and Finnoff (2004), and Almounsor (2005) estimated and included trade misinvoicing in their calculations of capital flight from Africa with different results.

Rustomjee (1991) estimated that between 1970 and 1988 South Africa under-invoiced its imports and exports by four and 20 percent on average, respectively. Wood and Moll (1994) concluded that the amount of under-invoiced exports reported in previous studies was to a great extent overestimated even though they estimated the amount of under-invoiced exports to the U.S. to exceed \$720 million. Boyce and Ndikumana (2001) suggested that smuggling was occurring in the whole region because their findings showed that imports tended to be mostly under-invoiced.

Mohamed and Finnoff (2004) showed that the introduction of the General Export Incentive Scheme (GEIS) in 1990 caused exports and imports to be over-invoiced. Prior to 1990 and subsequent to the phasing out of such schemes in 1994, the under-invoicing of exports and the over-invoicing of imports either behaved erratically or increased, depending on the year under study.

### **III. DATA AND METHODOLOGY**

This study estimated the amount of capital flight from 48 African countries between 1990 and 2005. Annual data for countries in this study were combined into five geographical, 15 economic, and three monetary areas. Table 2 shows the capital flight and capital movement through trade mispricing to the U.S. from Africa for the different areas.

For purposes of this study, the World Bank Residual Method of estimating capital flight was utilized. The Residual Method estimates net unrecorded capital outflows by considering both sources and uses of funds. Its estimation includes changes in the net external position of the official sectors, net Foreign Direct Investment (FDI) flows, net equity flows, financing of the current account, and the change in foreign exchange reserves. All data used to estimate capital flight under this method and capital flight as a percentage of the country's GDP were obtained from the 2007 World Bank's *World Development Indicators*.

The annual amount of capital movement was obtained from Dr. Simon J. Pak at Penn State University, Great Valley, who used U.S. customs data at its most disaggregate level. His analysis was based on the U.S. Export and Import of Merchandise statistics. For more details on the data and methodology utilized, please refer to de Boyrie, Pak, and Zdanowicz (2004).

In order to establish the determinants of capital flight and capital movement, the work of Ndikumana and Boyce (2002) was followed, and an OLS regression was performed. The 21 determinants used were divided into five groups. These included three capital flow variables, eight macroeconomic indicators, five risk and return measures, two financial development variables, and three fiscal policy variables. Table 4 shows the percentage of countries under study for which each variable explains capital flight and capital movement through mispricing as a percentage of GDP.

All data were obtained from the World Bank's *2007 World Development Indicators* online with the exception of Official Rate – End of Period and Period Average, Overall Balance, Government Expenditure, Import and Export to the World, the Producer Price Index, and the T-Bill rate for the U.S., which were obtained from the 2007 IMF's *International Financial Statistics* online.

To identify the time-series properties of capital flight and capital movement, the order of integration was determined using the augmented Dickey-Fuller (ADF) test, as presented in Dickey and Fuller (1979). To test the null hypothesis of a unit root, the *t*-statistic and the asymptotic critical values were taken from Davidson and MacKinnon (1993).

The Phillips and Perron (1988) *t*-test for a unit root was also employed. As an option to the addition of lag terms to allow for serial correlation, this test included a nonparametric correction for serial correlation. The critical values were the same as that of the ADF tests, although the Newey and West (1994) method was used to construct an estimate of the error variance from the estimated residuals. A constant and deterministic time trend was included in the equation.

Cointegration tests were also performed on the data in order to uncover any possible long-run relationship between the estimates of capital flight and capital movement. In order to test the null hypothesis of nonstationarity, the ADF and Phillips-Perron cointegration tests were also applied.

Linkages between the estimates of capital flight and capital movement can be seen within the same period or after a lag. This lagged impact can cause a causal relationship between capital flight and capital movement, which can be identified using the Granger causality F-test. The test of a null hypothesis of noncausality was obtained by testing for zero restrictions on the coefficients of the bivariate VAR (p) process. The equation used to test Granger causality was initially estimated with lag lengths of up to seven. The Akaike Information Criterion (AIC) tends to select a lag length that seldom exceeds four when it is used; therefore, the lag length of four was used in the estimation.

#### **IV. EMPIRICAL RESULTS**

This study differs from prior ones in that it attempts to establish the determinants of capital movement and to find out whether a causal relationship exists between capital flight and capital movement in the case of Africa.

Due to the availability of data, capital flight (CF) was estimated for 28 countries. Because the amount of capital movement (TM) was estimated using data from the U.S. Census Bureau's Shipper's Export Declarations and Customs

Service Entry Summary forms, estimates were available for a larger number of countries, 48 in total. The names of the countries under study as well as the estimates of capital flight and capital movements are shown in Table 1.

**Table 1 Capital Flight and Capital Movement from Africa per Country to the U.S. through Trade Mispricing**

Countries	Regions	CF	TM	CF	TM
		In millions of US\$		As a % of GDP	
Algeria*	North Africa, Arab League, UMA	-	1,294.57	-	0.14%
Angola	ECCAS, SADC, COMESA	21,122.67	1,070.37	12.69%	0.64%
Benin	West Africa, ECOWAS, EUMOA, WAEMU	3,703.17	32.55	9.41%	0.08%
Botswana	South Africa, SADC, SACU	984.34	41.57	1.06%	0.04%
Burkina-Faso	West Africa, ECOWAS, EUMOA, LGA, CEAO, WAEMU	-	3.75	-	0.01%
Burundi	Central Africa, ECCAS, CEPGL, COMESA	1,421.82	3.13	10.27%	0.02%
Cameroon	Central Africa, ECCAS, CEMAC, CAEMC	-	50.59	-	0.03%
Cape Verde	West Africa, ECOWAS	1,489.24	1.64	16.73%	0.02%
Central Africa	Central Africa, ECCAS, CEMAC, CAEMC	-	3.49	-	0.02%
Chad	Central Africa, ECCAS, CEMAC, CAEMC	-	55.74	-	0.16%
Comoros	East Africa, COI, COMESA, Arab League	-	2.49	-	0.06%
Dem Rep Congo	Central Africa, ECCAS, SADC, CEPGL	-	272.08	-	0.26%
Rep Congo	Central Africa, ECCAS, CEMAC	6,488.45	197.10	14.00%	0.43%
Cote d'Ivoire	West Africa, ECOWAS, EUMOA, CEAO, WAEMU	4,768.61	121.91	2.51%	0.06%
Egypt*	North Africa, COMESA, Arab League	8,631.61	2,817.86	0.76%	0.25%
Ethiopia	East Africa, IGAD, COMESA	-	163.66	-	0.11%
Gabon	Central Africa, ECCAS, CEMAC, CAEMC	-	358.93	-	0.41%
Gambia	West Africa, ECOWAS	-	3.29	-	0.05%
Ghana	West Africa, ECOWAS	12,197.96	534.29	11.15%	0.49%
Guinea	West Africa, ECOWAS	-	59.68	-	0.11%
Kenya	East Africa, IGAD, COMESA,	6,235.92	182.38	3.32%	0.10%
Lesotho	South Africa, SADC, SACU, COMESA, CMA	4,785.95	80.81	24.94%	0.42%
Liberia	West Africa, ECOWAS, MRU	-	36.17	-	0.63%
Madagascar	East Africa, SADC, COI, COMESA	5,438.16	89.62	8.92%	0.15%
Malawi	East Africa, SADC, COMESA	-	43.29	-	0.17%
Mali	West Africa, ECOWAS, EUMOA, LGA, CEAO, WAEMU	6,741.64	6.40	14.11%	0.01%
Mauritania	West Africa, Arab League, UMA, CEAO	-	3.47	-	0.02%
Mauritius	East Africa, SADC, COI, COMESA	3,517.83	184.77	5.27%	0.28%
Morocco*	North Africa, Arab League, UMA	21,359.79	26.81	3.80%	0.00%
Mozambique	East Africa, SADC, COMESA	11,999.51	26.81	21.15%	0.05%
Namibia	South Africa, SADC, SACU, COMESA	-	53.77	-	0.09%
Niger	West Africa, EUMOA, LGA, CEAO, WAEMU	3,235.17	11.89	9.21%	0.03%
Nigeria	West Africa, ECOWAS, CEAO	(17,773.24)	2,753.34	2.66%	0.41%
Rwanda	Central Africa, ECCAS, CEPGL, COMESA	2,548.39	6.80	8.91%	0.02%
Sao Tome & Principe	West Africa, ECCAS	-	0.23	-	-
Senegal	West Africa, ECOWAS, EUMOA, CEAO, WAEMU	-	29.53	-	0.03%
Seychelles	East Africa, SADC, COI, COMESA	1,955.92	3.12	21.72%	0.03%
Sierra Leone	West Africa, ECOWAS, MRU	2,197.13	54.02	16.34%	0.40%
Somalia	East Africa, IGAD, Arab League	-	1.08	-	-
South Africa	South Africa, SADC, SACU, CMA	-	5,588.40	-	0.24%
Sub Sahara		294,471.64	12,309.52	5.07%	0.21%
Sudan	North Africa, IGAD, COMESA, Arab League,	27,658.58	23.88	13.51%	0.01%

Countries	Regions	CF	TM	CF	TM
		In millions of US\$		As a % of GDP	
Swaziland	South Africa, SADC, SACU, COMESA	937.71	32.64	4.15%	0.14%
Tanzania	East Africa, SADC, COMESA	16,302.01	72.32	13.41%	0.06%
Togo	West Africa, ECOWAS, EUMOA, WAEMU	3,313.78	14.39	13.45%	0.06%
Tunisia*	North Africa, Arab League, UMA	34,199.54	165.51	11.01%	0.05%
Uganda	East Africa, IGAD, COMESA	9,920.09	21.52	11.33%	0.02%
Zambia	East Africa, SADC, COMESA	-	15.76	-	0.03%
Zimbabwe	East Africa, SADC, COMESA	-	44.23	-	0.03%
<b>All Countries</b>		<b>\$499,853.40</b>	<b>\$28,971.18</b>	<b>5.79%</b>	<b>0.34%</b>
<b>Sub-Sahara**</b>		<b>\$438,976.23</b>	<b>\$24,680.82</b>	<b>7.56%</b>	<b>0.43%</b>

Countries with \* do not belong to the Sub-Saharan region. \*\*Estimate since data are not available for all Sub-Saharan countries. Data to estimate capital flight were obtained from the 2007 World Bank's *World Development Indicators* and the 2007 IMF's *International Financial Statistics* online. Trade Mispricing values were obtained from Dr. Simon J. Pak (Penn State University, Great Valley).

For the years 1990–2005, the total amount of capital flight estimated was \$499.8 billion (5.79 percent of GDP) for all countries and \$24.7 billion (7.56 percent of GDP) for the Sub-Saharan region. The amount of capital movement was estimated to be \$28.9 billion (0.34 percent of GDP) and \$24.7 billion (0.43 percent of GDP) for all countries and the Sub-Saharan region, respectively. Nigeria was the only country with unrecorded capital inflows (negative capital flight).

A country-by-country analysis shows that Tunisia had the highest (\$34.1 billion) and Swaziland the lowest (\$937.7 million) amount of capital flight. As a percentage of GDP, Egypt presented the least degree of capital flight (0.76 percent of GDP), whereas Lesotho presented the highest at 24.94 percent of GDP.

The total amount of money estimated to have moved between 48 of the African countries and the U.S. totaled \$1.8 billion per year, on average, along with \$1.5 billion per year, on average, for the Sub-Saharan region. Of the countries under study, the largest amount of capital moved was between South Africa and the U.S. (\$5.6 billion) followed by Egypt (\$2.8 billion) and Nigeria (\$2.7 billion). In relation to GDP, the biggest mover was Angola (0.64 percent).

Table 2 presents the summary results of the amount of capital flight and capital movement from the African continent by region and area. Table 3 presents a summary of Tables 1 and 2.

**Table 2 Capital Flight and Capital Movement through Trade Mispricing: Geographic, Economic, and Monetary Areas**

Countries		CF	TM	CF	TM
		In millions of US\$		As a % of GDP	
<b>Geographic Area</b>					
Central Africa	All Countries	\$3,970.21	\$341.24		
	Avg. per Country	\$1,985.10	\$68.25	14.34%	0.49%
South Africa	All Countries	\$5,943.77	\$5,782.43		
	Avg. per Country	\$1,981.26	\$1,156.49	9.86%	0.17%
East Africa	All countries	\$55,369.44	\$ 851.05		
	Avg. per Country	\$7,909.92	\$ 65.47	32.65%	0.23%
North Africa	All Countries	\$91,849.52	\$4,328.63		
	Avg. per Country	\$22,962.38	\$865.73	7.27%	0.09%
West Africa	All Countries	\$19,873.46	\$3,666.33		
	Avg. per Country	\$2,208.16	\$244.42	14.52%	0.25%
<b>Economic Area</b>					
Economic Community of Central African States (ECCAS)	All Countries	\$31,216.64	\$2,058.12		
	Avg. per Country	\$6,243.33	\$205.81	15.43%	0.68%
CEMAC	All Countries	\$6,488.45	\$725.53		
	Avg. per Country	\$1,622.11	\$145.11	14.00%	0.24%
Southern African Development Community (SADC)	All Countries	\$67,103.28	\$7,604.80		
	Avg. per Country	\$7,455.92	\$506.99	12.62%	0.17%
Southern African Customs Union (SACU)	All Countries	\$6,767.18	\$5,782.43		
	Avg. per Country	\$2,255.73	\$1,156.49	10.15%	0.17%
Intergovernmental Authority on Development (IGAD)	All Countries	\$43,814.59	\$392.52		
	Avg. per Country	\$14,604.86	\$78.50	9.39%	0.08%
Indian Ocean Commission (COI)	All Countries	\$10,911.91	\$280.00		
	Avg. per Country	\$3,637.30	\$70.00	17.96%	0.26%
Economic Community of the Great Lakes Countries (CEPGL)	All Countries	\$3,970.21	\$282.00		
	Avg. per Country	\$1,985.10	\$ 94.00	9.59%	0.10%
Common Market for Eastern and Southern Africa (COMESA)	All Countries	\$122,535.35	\$5,196.56		
	Avg. per Country	\$8,752.53	\$247.46	7.83%	0.22%
Arab League	All Countries	\$91,849.52	\$4,335.67		
	Avg. per Country	\$22,962.38	\$541.96	7.27%	0.09%
Arab Maghreb Union (UMA)	All Countries	\$55,559.33	\$1,490.37		
	Avg. per Country	\$27,779.67	\$372.59	7.41%	0.05%
Economic Community of West African States (ECOWAS)	All Countries	\$19,873.46	\$3,662.86		
	Avg. per Country	\$2,208.16	\$261.63	11.95%	0.16%
West African Economic and Monetary Union (UEMOA)	All Countries	\$21,762.36	\$220.42		
	Avg. per Country	\$4,352.47	\$31.49	9.74%	0.06%
Liptako-Gourma Authority (LGA)	All Countries	\$9,976.80	\$22.04		
	Avg. per Country	\$4,988.40	\$7.35	11.66%	0.02%
Mano River Union (MRU)	All Countries	\$2,197.13	\$90.19		
	Avg. per Country	\$1,098.57	\$45.10	2.04%	0.07%
West African Economic Community (CEAO)	All Countries	(\$3,027.82)	\$2,926.83		
	Avg. per Country	(\$756.96)	\$418.12	7.12%	0.09%



Countries		CF	TM	CF	TM
		In millions of US\$		As a % of GDP	
<b>Monetary Area</b>					
Central African Economic and Monetary Union (CAEMC)	All Countries	\$6,488.45	\$665.85		
	Avg. per Country	\$1,622.11	\$133.17	14.00%	0.17%
Common Monetary Union (CMA)	All Countries	\$5,782.84	\$5,687.09		
	Avg. per Country	\$2,891.42	\$1,421.77	14.70%	0.36%
African Economic and Monetary Union (WAEMU)	All Countries	\$21,762.36	\$220.42		
	Avg. per Country	\$4,352.47	\$31.49	9.74%	0.04%

Data to estimate capital flight were obtained from the 2007 World Bank's *World Development Indicators*. Trade Mispricing values were obtained from Dr. Simon J. Pak (Penn State University, Great Valley).

**Table 3 Countries and Areas with the Highest/Lowest Amount of Capital Flight and Capital Movement through Trade Mispricing**

Country	In millions of US\$		As a % of GDP	
	Highest Level	Lowest Level	Highest Level	Lowest Level
Capital Flight	Tunisia (\$34,199.54)	Swaziland (\$937.71)	Lesotho (24.74%)	Egypt (0.76%)
Capital Movement	South Africa (\$5,588.40)	Sao Tome & Principe (\$0.23)	Angola (0.64%)	Burkina-Faso, Mali and Sudan (0.01%)
<b>Geographic Area</b>				
Capital Flight	North Africa (\$91,849.52)	Central Africa (\$3,970.21)	East Africa (32.65%)	North Africa (7.27%)
Capital Movement	South Africa (\$5,782.43)	Central Africa (\$341.24)	Central Africa (0.49%)	North Africa (0.09%)
<b>Economic Area</b>				
Capital Flight (All Countries)	COMESA (\$122,535.35)	MRU (\$2,197.13)		
Capital Flight (Avg. per Country)	UMA (\$27,779.67)	CEPGL (\$1,985.10)	COI (17.96%)	MRU (2.04%)
Capital Movement (All Countries)	SADC (\$7,604.80)	LGA (\$22.04)		
Capital Movement (Avg. per Country)	SACU (\$1,156.49)	LGA (\$7.35)	ECCAS (0.68%)	LGA (0.02%)
<b>Monetary Area</b>				
Capital Flight (All Countries)	WAEMU (\$21,762.36)	CMA (\$5,782.84)		
Capital Flight (Avg. per Country)	WAEMU (\$4,352.47)	CAEMC (\$1,622.11)	CMA (14.70%)	WAEMU (9.74%)
Capital Movement (All Countries)	CMA (\$5,687.09)	WAEMU (\$220.42)		
Capital Movement (Avg. per Country)	CMA (\$1,421.77)	WAEMU (\$31.49)	CMA (0.36%)	WAEMU (0.04%)

COMESA = Common Market for Eastern and Southern Africa; CEPGL = Economic Community of the Great Lakes Countries; SADC = Southern African Development Community; SACU = Southern African Customs Union; MRU = Mano River Union; LGA = Liptako-Gourma Authority;

UMA = Arab Maghreb Union; COI = Indian Ocean Commission, ECCAS = Economic Community of Central African States; WAEMU = African Economic and Monetary Union; CAEMC = Central African Economic and Monetary Union; CMA = Common Monetary Union. Data to estimate capital flight were obtained from the 2007 World Bank's *World Development Indicators*. Trade Mispricing values were obtained from Dr. Simon J. Pak (Penn State University, Great Valley).

Even though North Africa had the largest level of capital flight recorded when looking at millions of US\$, Table 3 illustrates that it had the lowest level of both capital flight and capital movement when these measurements were taken as a percentage of GDP. South Africa had the largest amount of capital movement when looking at millions of US\$, whereas the Central African region had the lowest level of capital outflow using either measure. Nonetheless, this last region had the highest level of capital movement when measured as a percentage of GDP.

The Common Market for Eastern and Southern Africa (COMESA) and the Arab Maghreb Union (UMA) had the highest level of capital flight both for all countries and on an average per country basis. However, the Southern African Development Community (SADC) and the Southern African Customs Union (SACU) had the highest level of capital movement. This is of no surprise because South Africa and the South African region tended to have the highest level of capital movement.

In the monetary regions, the African Economic and Monetary Union (WAEMU) had the highest level of capital flight, and the Common Monetary Union (CMA) the highest level of capital movement. The opposite was found when measuring capital flight and capital movement as a percentage of GDP: capital flight and capital movement were largest for the CMA and lowest for the WAEMU regions.

Table 4 presents a summary of the results obtained when establishing the determinants of capital flight and capital movement. As evidenced by the results, most of the 21 variables studied explained either capital flight or capital movement, or both. The exceptions were GDP growth differential and government expenditure when regressed against capital flight and trade and tax revenue when regressed against capital flight and capital movement.

**Table 4 Variables that Explain Capital Flight and Capital Movement through Trade Mispricing**

Variable	Percentage of Country Under Study for which Variable Explains:	
	Capital Flight as a % of GDP	Capital Movement as a % of GDP
<b>Capital Flow Variables</b>		
Net Foreign Direct Investment	42% (11/26)	15% (4/27)
External Debt	41% (11/27)	18% (8/44)
Aid	39% (10/26)	19% (8/42)
<b>Macroeconomic Variables</b>		
Inflation Rate Differential	9% (2/22)	16% (6/37)
Change in Inflation	10% (2/21)	11% (4/36)
Exports of Goods and Services	4% (1/23)	8% (3/40)
GDP Growth Differential	0% (0/30)	19% (8/43)
Trade	0% (0/0)	0% (0/1)
Trade Openness	12% (3/26)	19% (8/42)
Gross Fixed Capital Formation	13% (3/24)	10% (4/40)
Gross Domestic Savings	20% (5/25)	20% (8/40)
<b>Risk and Return Variables</b>		
Deposit Interest Rate	28% (5/18)	25% (8/32)
Financial Incentive for Capital Flight (Pastor, 1989, 1990)	28% (5/18)	24% (8/33)
Financial Incentive for Capital Flight (Dooley)	22% (4/18)	24% (8/33)
Interest Rate Spread	7% (3/14)	33% (8/24)
Real Effective Exchange Rate	20% (2/20)	28% (5/18)
<b>Financial Development Variables</b>		
Domestic Credit to Private Sector	27% (7/26)	24% (10/42)
Liquid Liabilities	12% (3/26)	26% (11/42)
<b>Fiscal Policy Variables</b>		
Tax Revenue	0% (0/3)	0% (0/3)
Overall Balance	42% (11/26)	23% (7/31)
Government Expenditure	0% (0/22)	25% (8/32)

Data to estimate capital flight was obtained from the 2007 World Bank's *World Development Indicators*. Trade Mispricing values were obtained from Dr. Simon J. Pak (Penn State University, Great Valley). Results represent the author's estimates. The numbers in parenthesis represent the number of countries for which a variable explains either capital flight or capital movement out of the total of countries studied. For example, (11/26) means that for 11 out of 26 countries a given independent variable explains the dependent variable(s).

Even though all five sets of variables appear to explain capital flight or capital movement, they only do so for a limited number of countries. Of all the variables, the capital flow variables (FDI, external debt, and aid) seem to be the ones that explain better capital flight, much like the overall balance variable. Nevertheless, each of these variables only explains capital flight for 39 to 42 percent of the countries under study. The risk and return, financial development, and fiscal policy variables seem to explain capital movement better, although they only do so for less than one-third of the countries.

In prior studies, the variables under study were used to explain investment as the rationale for capital flight. Given that these variables only explain capital flight and capital movement for a few of the countries under study, it was not difficult to determine that the reason for capital flight and capital movement from most of the African countries was other than the traditionally proposed investment incentive. Because of the lack of data, econometric analysis was only applied to regional data.

The first part of the analysis focused on examining whether the data were stationary or not. For this purpose, a test of the unit root was performed. Only after it is determined that the variables are nonstationary can cointegration tests be applied to find evidence of a possible long-run relationship between the estimates of capital flight and capital movement. In order to preserve space, the numerical results have been omitted but are available from the author upon request.

The amount of capital flight and capital movement appear to be stationary in nature, suggesting that they are mostly transitory in nature. When examining the data as a percentage of GDP, the results showed nonstationarity of data for eight regions and for seven when analyzing the capital movement data.

For all regions in which the data were shown to be nonstationary, the tests of cointegration were performed. The results indicate that, even though there were several regions where the results were shown to have a unit root, only in a few cases did a long-term relationship exist between capital flight and capital movement. Cointegration only existed in the case of the East African and the Southern African Development Community (SADC) regions.

Slightly different results were revealed when analyzing the data as a percentage of GDP. According to the ADF test of cointegration, there existed a long-term relationship between capital movement and capital flight for West Africa and the Arab Maghreb Union (UMA) regions.

The correlation coefficients were calculated to determine the simultaneous comovements between the estimates of capital flight and the estimates of capital movement. The significance of the coefficients was determined through their p-value, which matched the results obtained using the Granger Causality test.

Overall, the correlation coefficients tended to be low. For those geographic, economic, and monetary regions whose correlation coefficients were significant at a 10 percent level or less, a Granger Causality test was performed. The results are provided in Table 5. The first number in each row is the Joint F-test statistic, whereas the number in parenthesis represents the p-value. The Joint F-test statistic under CF (capital flight) represents the results of the test of the null hypothesis that CF does not Granger-cause TM (capital movement through trade mispricing), although the Joint F-tests statistic under TM represents the test statistics for the test of the null that TM does not Granger-cause CF.

**Table 5 Results of Granger Causality Tests**

Region	CF	TM	CF	TM
As a % of GDP				
<b>Geographic</b>				
Central Africa	0.73 (0.578)	0.19 (0.936)	<b>2.81 (0.055)</b>	0.94 (0.459)
East Africa	1.80 (0.135)	0.68 (0.607)	0.18 (0.947)	1.13 (0.345)
North Africa	<b>8.10 (0.000)</b>	<b>2.15 (0.088)</b>	1.03 (0.403)	1.78 (0.147)
South Africa	<b>3.94 (0.010)</b>	0.57 (0.681)	1.24 (0.327)	0.69 (0.607)
Sub-Sahara	0.18 (0.999)	0.00 (1.000)	0.01 (1.000)	0.02 (0.998)
West Africa	<b>15.5 (0.000)</b>	<b>5.25 (0.001)</b>	<b>0.94 (0.018)</b>	0.59 (0.667)
All Countries	<b>4.79 (0.001)</b>	<b>8.76 (0.000)</b>	0.36 (0.833)	0.37 (0.828)
<b>Economic</b>				
ECCAS	<b>7.58 (0.000)</b>	<b>3.10 (0.023)</b>	<b>3.01 (0.026)</b>	2.03 (0.104)
CEMAC	n/a	n/a	n/a	n/a
COMESA	<b>2.26 (0.064)</b>	<b>4.77 (0.001)</b>	0.50 (0.733)	0.57 (0.683)
CEPGL	0.19 (0.936)	0.73 (0.578)	<b>2.81 (0.055)</b>	0.94 (0.459)
COI	<b>2.50 (0.060)</b>	2.00 (0.117)	0.20 (0.935)	<b>1.03 (0.040)</b>
IGAD	-	-	-	-
Arab League	<b>8.10 (0.000)</b>	<b>2.15 (0.088)</b>	1.03 (0.403)	1.78 (0.147)
UMA	0.35 (0.835)	<b>5.27 (0.005)</b>	0.13 (0.969)	<b>3.16 (0.038)</b>
SADC	<b>6.67 (0.000)</b>	<b>4.35 (0.003)</b>	0.17 (0.950)	0.52 (0.720)
SACU	<b>5.07 (0.006)</b>	<b>3.23 (0.035)</b>	1.24 (0.327)	0.69 (0.607)
ECOWAS	<b>13.5 (0.000)</b>	<b>4.77 (0.001)</b>	1.97 (0.940)	0.59 (0.667)
UEMOA	1.81 (0.138)	0.39 (0.811)	0.67 (0.614)	0.89 (0.470)
LGA	1.16 (0.359)	1.72 (0.186)	0.60 (0.664)	0.81 (0.534)
MRU	n/a	n/a	n/a	n/a
CEAO	<b>3.93 (0.007)</b>	<b>15.4 (0.000)</b>	<b>2.34 (0.067)</b>	0.51 (0.729)
<b>Monetary</b>				
CAEMC	n/a	n/a	n/a	n/a
CMA	<b>2.36 (0.090)</b>	0.29 (0.881)	n/a	n/a
WAEMU	1.81 (0.138)	0.39 (0.811)	0.67 (0.614)	0.89 (0.470)

Data to estimate capital flight was obtained from the 2007 World Bank's *World Development Indicators*. Trade Mispricing values were obtained from Dr. Simon J. Pak (Penn State University, Great Valley). Results represent the author's estimates using SHAZAM Professional Edition.

For a large number of the areas studied, there existed some sort of Granger causality. These are highlighted in Table 5. Feedback existed between capital flight and capital movement for three of the seven geographic areas and seven out of 15 economic areas. One-way causality between capital flight and capital movement also existed for one geographic area, two economic areas, and one monetary area.

## V. CONCLUSION

This paper establishes the determinants of capital flight and capital movement and examines the linkage between capital flight from Africa and capital movement through trade mispricing from various African countries to the U.S. Annual data for countries covered in this study were combined into geographic, economic, and monetary regions.

An interesting point is that economic blocs seem to have smaller amounts of capital flight than economic regions. These economic blocs are not participants in the African Economic Community, but their country members can, and tend to be, part of other regional economic blocs or areas that do participate.

As evidenced by the results, the variables that tend to explain capital flight do not tend to always explain capital movement from African countries to the U.S. via trade misinvoicing and vice versa. A future study may include both political variables and variables that could explain tax evasion to determine whether they can better explain capital flight and/or capital movement. It would also be interesting to study the relationship between capital flight and capital movement from Africa to Europe because this is where most of the money is moved to from Africa. However, that is beyond the scope of this paper.

Although the correlation coefficients between capital flight and capital movement through trade mispricing tend to be low, feedback exists between the estimates of capital flight and capital movement through trade mispricing from Africa to the U.S. However, the results of the stationarity tests are mostly mixed, and overall causality exists between capital flight and capital movement through trade mispricing, although mostly in the form of feedback. The relationship shown to exist is mostly transitory with a long-term relationship existing in only a few cases.

These findings can be of importance to governments, governmental institutions, and academics for they clearly point out the countries and areas from which most of the money is moved out of Africa as well as the rational for doing so. The results further show that the true reason for such movement goes beyond the desire for better investment opportunities. Governments in the countries and regions under study need to establish stronger trade policies to impede capital movement through trade mispricing and create incentives for individuals and institutions not to move the needed capital out of the country or region. Stable governmental regimes as well as trustworthy market systems would greatly support domestic investment within the region.

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