Capital Flight from the Franc Zone: Exploring the Impact on Economic Growth

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1. Introduction

The investigation into the implications of capital flight for economic growth has received increasing attention from several researchers. In recent years, considerable interest has arisen in the extent to which capital flight has a detrimental impact on economic development (UNDP, 2011). According to Ajayi (1995), the sluggish economic growth and persistent balance of payment deficits in most developing countries have been attributed to capital flight. Indeed, the high levels of capital flight pose serious challenges for domestic resource mobilization in support of investment and growth in Africa (Fofack and Ndikumana, 2009 and 2010). In addition, the UNDP (2011) argues that the magnitude of capital flight is a major hindrance to the mobilization of domestic resources for development, implying that capital flight aggravates resource constraints and contributes to undermining long-term economic growth (Beja, 2007).Therefore, the size of capital flight from developing countries is assuming a serious dimension that poses a huge threat to sustainable growth, especially in Africa (Ayadi, 2008). According to Boyce and Ndikumana (2001), many poor countries are losing more resources via capital flight than through debt servicing. By taking part in the debate on this issue, this paper aims to test the impact of capital flight on economic growth.

Theory of capital flight suggests that this phenomenon is driven both by private actors and public authorities (Ndikumana and Boyce, 2003, 2008 and 2011b; Ajayi, 2007; Ndiaye, 2009a and 2011). First, according to these authors, capital flight is driven by private actors due to macroeconomic uncertainty, political and institutional instability, less developed financial system, and higher rate of return differentials abroad.[1] In a context of portfolio choice (Collier et al, 2004), all these factors lead to increasing risks of losses in the real value of domestic assets of private agents, forcing them to shift their portfolio in favour of foreign assets. Therefore, private agents hold their savings abroad, which reduces private investment. Consequently, by decreasing the level of private investment, capital flight can reduce economic growth.

Second, public authorities can also contribute to capital flight under conditions of poor governance and bad institutional quality (Ajayi, 1992; Awung, 1996; Loungani and Mauro, 2000; Ndikumana and Boyce, 2003; Le and Rishi, 2006; Cerra et al, 2008; Ndiaye, 2009a and 2011). In such a context, corrupt public authorities take advantage of their favourable position to amass a personal fortune abroad (Boyce and Ndikumana, 2001). As these resources held overseas are domestic public resources, capital flight operated by public authorities leads to a decline in public resources, thereby inducing a fall in public investment and, therefore, a decrease in growth.

This study aims to analyze the impact of capital flight on economic growth in the FZ. The motivation of this study is related to the fact that capital flight reduces resources that

could have been invested to create wealth in the originating countries. Therefore, capital flight has a potentially negative effect on economic growth. The issue of investigating the impact of capital flight on the economic growth of the FZ countries deserves serious attention for several reasons. First, one of the characteristics of the FZ is the existence of a fixed exchange rate between the franc CFA and the euro. This fixed exchange rate means the FZ countries are unable to adjust the exchange rate, resulting in a higher sensitivity of economic growth to real shocks (Savvides, 1996), a circumstance that promotes capital flight. Moreover, capital flight puts pressure on the exchange rate by increasing the demand for foreign currency to funnel wealth abroad (Ndikumana, 2003). Capital flight then increases the likelihood of a devaluation of the national currency (Ndikumana and Boyce, 2011a), a factor that leads to capital flight by inducing investors to shift their portfolio composition in favour of foreign assets (Cuddington, 1986 and 1987). A second characteristic of the FZ is the principle of free circulation of capital. This capital account openness increases the FZ countries' vulnerability to fluctuations in capital flows, especially by providing legal channels of capital flight (Ariyoshi et al, 2000). The free circulation of capital in the FZ, therefore, facilitates capital flight.

Third, these two characteristics of the FZ, namely the fixed exchange rate and the capital account openness, influence positively capital flight from this zone, which is found to be increasing and massive. The most recent measures of capital flight show that in the period 1970 to 2010, capital flight from the FZ countries[2] comprised a remarkable magnitude of approximately US$127.2 billion, representing 123.7% of GDP (Boyce and Ndikumana, 2012).[3] At the same time, estimations from Boyce and Ndikumana (2012) reveal that this capital flight from the FZ countries is significantly important compared to capital flight from other sub-Saharan African countries. According to Boyce and Ndikumana (2012), three FZ countries are in the top 10 sub-Saharan African countries with the highest capital flight in the period 1970 to 2010: the third country is Côte d'Ivoire (US$56 billion or 244.4% of GDP); seventh is Gabon (US$25.5 billion or 192.9% of GDP); and tenth is Cameroon (US$20 billion or 89% of GDP). Congo is ranked eleventh, with US$19.9 billion of capital flight, representing 165.5% of GDP.

In the literature, authors are unanimous in recognizing econometrically the adverse impact of capital flight on economic growth through several channels: Lessard and Williamson (1987); Boyce (1992); Ajayi (1995 and 1997); Chipalkatti and Rishi (2001); Fedderke and Liu (2002); Greene (2002); Menbere (2003); Cervena (2006); Beja (2007); Ayadi (2008); Forgha (2008); Cerra et al.(2008); Lan (2009); Gusarova (2009); Ndikumana (2003 and 2009); Ndiaye (2009b); Fofack and Ndikumana (2009 and 2010); Yalta (2010);Bakare (2011); Ndikumana and Boyce (2011a). Looking at these studies, the contribution of the present research to the literature is twofold. Firstly, it provides the most updated measures of capital flight from the Franc Zone (FZ) countries available in the literature. Secondly, it contributes to a better understanding of the role of capital flight in explaining poor performance in terms of economic growth in the FZ.

The rest of the paper is organized as follows: Section 2 reviews the literature on the link between capital flight and growth, and indicates the conceptual and analytical frameworks for capital flight. Section 3 analyzes stylized facts on capital flight and economic growth in the FZ, and estimates econometrically the effect of capital flight on economic growth in this zone. Section 4 concludes the paper and indicates some policy implications.

2. Capital Flight: Link with Economic Growth, Conceptual and Analytical Frameworks

This section discusses the relationship between capital flight and economic growth in the literature, defines capital flight and provides the measurement of this phenomenon.

Link between capital flight and economic growth: What the literature says

The size of capital flight from developing countries is assuming a serious dimension and is posing a huge threat to sustainable growth, especially in Africa (Ayadi, 2008). According to Boyce and Ndikumana (2001), many poor countries are losing more resources via capital flight than through debt servicing. The UNDP (2011) indicates that capital flight, where it occurs, is a major hindrance to the mobilization of domestic resources for development, implying that capital flight aggravates resource constraints and contributes to undermining long-term economic growth (Beja, 2007).

In the literature, authors unanimously recognize the adverse effect of capital flight on economic growth, as shown in empirical studies (see Table A1 in Appendix A). Bakare (2011) indicates that capital flight limits economic growth in Nigeria. Beja (2007) finds that capital flight contributes to the lowering of the quality of long-term economic growth in the Philippines. Cervena (2006) finds that capital flight has detrimental effects on long-term economic growth for African countries, Latin American countries, Asian countries and East European countries. The empirical results from Lan (2009) support the evidence that capital flight plays a crucial role in influencing economic growth in the Association of Southeast Asian Nations (ASEAN). Forgha (2008) reveals that capital flight has a negative impact on economic growth in Cameroon. Finally, Gusarova (2009) indicates that capital flight has a negative impact on economic growth for a sample of 139 countries.

There are several channels through which capital flight affects economic growth, for instance: investment; imports; tax base; capital inflows; balance of payments difficulties; financial system; and corruption.

The investment channel

The phenomenon of capital flight takes place through transferring abroad a portion of domestic private savings. The persistence of this phenomenon can lead to a decline in

domestic savings, resulting in fewer resources available for the financing of domestic investment and for the promotion of economic growth. Ndikumana (2009) asserts that capital flight reduces domestic investment by decreasing the volume of savings channelled through the domestic financial system, hence retarding economic growth.

The high levels of capital flight pose serious challenges for domestic resource mobilization in support of investment and growth in Africa (Fofack and Ndikumana, 2009 and 2010), suggesting that capital flight leads to a fall in domestic investment (Lawanson, 2007). Boyce and Ndikumana (2001) reveal that low investment levels in Africa were attributed to capital flight. According to the UNDP (2011), capital flight significantly reduces the volume of resources available for investment in the Millennium Development Goals (MDG) and productive capacities. Therefore, by decreasing investment, capital flight can affect economic growth negatively. In that sense, Pastor (1990) argues that growth is reduced partly because investment has been diverted abroad as capital flight. Kosarev and Grigoryev (2000) also assert that capital flight worsens the possibility of investments and prospects for further development of the economy.

The empirical literature supports the evidence of a negative influence of capital flight on growth through the channel of investment. Fedderke and Liu (2002) reveal that capital flight from South Africa negatively affects the economy of this country by reducing private investment. Greene (2002) asserts that, during the period before 1997, capital outflows from the Asian countries in crisis had been the basis of low investment in these countries. Using the Generalized Method of Moments (GMM), Fofack and Ndikumana (2009 and 2010) show that capital flight significantly reduces total domestic investment and private investment in sub-Saharan African countries, while its impact on public investment is found to be insignificant, thus suggesting that the negative effect of capital flight on domestic investment operates more through private investment than via public investment. With the same econometric estimation technique, Ndiaye (2009b) also finds the same results for the FZ countries. Using the Vector Autoregressive Model approach, Bakare (2011) indicates that capital flight crowds out investment and worsens capital formation in Nigeria. This result is also supported by Ayadi (2008) for the same country.[4] In the case of emerging markets, Yalta (2010) finds that capital flight dramatically reduces private investment, but does not have any effect on public investment. These low investment rates are the main cause of the weak performance in terms of economic growth recorded in Africa (Barro and Lee, 1994; Collier and Gunning, 1999).

Tax base, imports and capital inflows channels

Researchers also note the importance of the tax base erosion channel (Pastor, 1990) as one of the negative consequences of capital flight. Ndikumana (2009) indicates that capital flight affects the government budget balance by shrinking the tax base through reduced domestic economic activity. According to Ajayi (1997), capital flight leads to the erosion of the tax base, inducing a fall in government revenue and, consequently, a decline in public investment that, in turn, can lower private investment and growth.The erosion of the tax base by capital flight occurs because funds taken outside the country cannot be taxed (Forgha, 2008) as they are not within the reach of the tax authorities of the originating country (Cervena, 2006). Ayadi (2008) argues that capital flight poses a

great danger to any nation as it causes, among other things, a reduction in a country's tax base. Ndikumana and Boyce (2011a) have shown empirically that countries with higher capital flight tend to have lower tax revenues.

With respect to imports, if scarce foreign exchanges in developing countries, particularly in Africa, are used to finance capital flight, they will not be available for financing imports that may be crucial for economic growth (Lessard and Williamson, 1987). If capital flight money had been invested in the production of either domestically-produced intermediates or export goods that could finance imports, the import constraint on growth could have been relaxed (Pastor, 1990).

Concerning capital inflows as a channel for capital flight, empirical evidence has shown that capital flight increases significantly the needs for external debt and foreign aid (Boyce, 1992; Chipalkatti and Rishi, 2001; Cerra, Rishi and Saxena, 2008). According to Ndikumana (2009), capital flight forces the government to increase its borrowing from abroad, which further increases the debt burden and worsens the fiscal balance. However, an important part of external debt and foreign aid is re-exported overseas in the form of capital flight, as shown in several studies (Bauer, 1981; Cuddington, 1987; Duwendag, 1989; Hermes and Lensink, 1992 and 2001; Boyce, 1992; Henry, 1996; Lensink et al, 2000; Chipalkatti and Rishi, 2001; Ndikumana and Boyce, 2003; Quazi, 2004; Salisu, 2005; Beja, 2006; Ljungwall and Wang, 2008; Cerra et al, 2008; Ndikumana and Boyce, 2008, 2011a and 2011b ; Ndiaye, 2009a and 2011). As external debt and foreign aid are supposed to contribute to the financing of domestic investment, this implies that the more the phenomenon of capital flight increases, the less the resources from external debt and foreign aid are used to finance investment. Therefore, through external debt and foreign aid, capital flight can lead to a fall in domestic investment, and in economic growth.

Balance of payments difficulties, financial system, and corruption channels

According to Ajayi (1995), the persistent balance of payment deficits in most developing countries has been attributed to capital flight. Capital flight may negatively contribute to economic growth by exacerbating the balance of payments problems (Menbere, 2003).

Capital flight can also reduce growth by destabilizing the financial system, as sudden outflows of large resources would call for an adjustment in interest and exchange rates policies (Menbere, 2003). The phenomenon of capital flight occurs through transferring abroad a part of domestic private savings. The persistence of this phenomenon can thus lead to a decline in domestic savings. Therefore, banks will receive less resource in the form of savings, which may induce a fall in their provision of credit to the private sector. Consequently, capital flight can lower the volume of financial intermediation, thereby negatively affecting economic growth. According to Ndikumana (2003), capital flight contributes to increasing macroeconomic uncertainty, which depresses lending and investment.

Moreover, capital flight can affect economic growth through corruption. Indeed, high capital flight is symptomatic of an environment characterized by corruption (Ndikumana and Boyce, 2011a). This can hurt economic performance by reducing private investment through adversely affecting the quantity and quality of public infrastructures, by lowering tax revenues and by declining human capital accumulation (Ndikumana, 2006).

Defining capital flight

Following Erbe (1985), World Bank (1985), and Morgan Guaranty Trust Company (1986 and 1988), this paper defines capital flight as normal and abnormal capital outflows. Indeed, what really matters is that for countries confronted with great deficits of their current account and with the payments of their external debt (and which are thus in need for foreign capital), both normal and abnormal outflows increase their difficulties to finance their net imports and the payments of their external debts (Hermes, Lensink and Murinde, 2002a). Therefore, this study considers the phenomenon of capital flight to be related to concerns of residents to diversify their portfolio, to activities of domestic commercial banks aiming at acquiring or extending their assets overseas, and to an extremely high risk and uncertainty with respect to returns on domestic assets of residents.

However, the fact that it is private individuals who engage in capital flight does not imply that capital flight is a purely private matter. The funds that leave African countries in the form of private assets under capital flight could be primarily public funds such as debt, aid and revenues from natural resources exports, as shown in several studies (Bauer, 1981; Cuddington, 1987; Duwendag, 1989; Hermes andLensink, 1992 and 2001; Boyce, 1992; Henry, 1996; Lensink et al, 2000;Chipalkatti and Rishi, 2001; Ndikumana and Boyce, 2003; Quazi, 2004; Salisu, 2005; Beja, 2006; Ljungwall and Wang, 2008; Cerra et al, 2008; Ndikumana and Boyce, 2008, 2011a and 2011b; Ndiaye, 2009a and 2011). Consequently, the phenomenon of capital flight is also related to the flows of capital flight stemming from the need of corrupt leaders to stash looted assets away from the domestic economy. Corrupt leaders can, indeed, take advantage of their favourable position to amass a personal fortune abroad (Boyce and Ndikumana, 2001).

Measuring capital flight

Several measures of the magnitude of capital flight from the FZ countries are available in the literature (see Table B1 in Appendix B). These measures vary depending on the method of estimation used, on the period considered, and on the sample chosen. As in Ndiaye (2009a, 2009b and 2011), and referring to the above definition of capital flight, this paper uses two versions of the residual method: the World Bank (1985) version and that of Morgan Guaranty (1986).These two versions are both adjusted for exchange rate fluctuations, for trade misinvoicing and for inflation (Boyce and Ndikumana, 2001).[5]

Adjustment for exchange rate fluctuations

The World Bank's debt data are reported in a common currency: the US Dollar. Yet countries hold debts denominated in a variety of currencies. Table 1 shows the currency composition of the 15 FZ countries' long-term debt in 10 currencies: Deutsche Mark, Euro, French Franc, Japanese Yen, UK Pound Sterling, Swiss Franc, IMF Special Drawing Rights, US Dollar, multiple currencies, and other currencies.

Table 1: Currency composition of FZ countries' long-term debt, various currencies (%), 1970–2010

Countries	Deutsche Mark	Euro	French Franc	Japanese Yen	UK Pound	Swiss Franc	SDR	US Dollar	Multiple currencies	Other currencies
Benin	1.1	1.0	18.2	0.5	0.5	0.2	1.1	31.6	7.0	26.9
Burkina Faso	4.0	0.4	19.9	0.0	2.2	0.0	1.3	32.7	10.5	17.0
Cameroon	9.1	7.7	20.9	0.3	1.7	0.5	0.1	18.6	10.7	18.4
Central African Republic	3.8	0.8	17.0	0.3	0.3	2.7	3.6	35.4	10.4	13.7
Chad	2.3	0.56	10.1	0.0	0.2	0.0	0.2	31.9	13.7	29.0
Comoros	0.0	1.7	25.9	0.0	0.0	0.0	0.8	21.9	4.2	33.5
Congo	2.0	5.3	26.5	0.1	3.4	0.5	0.4	19.3	4.1	26.4
Côte d'Ivoire	3.8	3.8	24.1	0.6	0.6	2.1	0.3	30.4	11.7	10.6
Equatorial Guinea	2.0	3.6	2.9	0.0	0.0	0.0	0.0	25.0	6.3	48.1
Gabon	4.7	6.7	33.3	0.8	3.0	0.5	0.0	21.4	5.3	12.3
Guinea-Bissau	0.2	1.4	2.5	0.0	0.0	5.2	0.0	25.6	15.0	25.8
Mali	1.8	1.9	18.0	0.8	8.3	3.4	0.1	17.1	9.6	26.9
Niger	3.1	2.3	35.8	0.9	0.6	0.1	1.4	24.4	0.4	18.9
Senegal	5.3	2.1	20.5	1.1	0.2	0.3	0.5	29.3	7.1	21.5
Togo	11.4	2.2	11.8	2.0	3.1	6.4	0.5	30.0	4.1	16.5
Franc Zone	3.6	2.8	19.2	0.5	1.6	1.5	0.7	26.3	8.0	23.0

Source: Author's computations using data from World Bank, *Global Development Finance 2011*

Note: Figures are the average value of annual data on the currency composition of FZ countries' long-term debt in various currencies over the period 1970 to 2010.

In the World Bank data, debt stocks are converted to dollars using the end-of-year exchange rate. The exchange rate fluctuations lead to a change in the debt stock, and thus a variation in the capital flight measure. To correct for these potential discrepancies, Boyce and Ndikumana (2001) adjust the change in long-term debt stock for fluctuations in the exchange rate of the dollar against other currencies as follows:

$$\Delta DETAJU_t = DET_t - NOUDET_{t-1} \quad (1)$$

Where $\Delta DETAJU_t$ is the adjusted change in debt for fluctuations in the exchange rate of the dollar against other currencies; DET_t is the stock of the debt of year t measured by the exchange rate at the end of year t; and $NOUDET_{t-1}$ is the stock of the debt of year t-1 measured by the exchange rate at the end of year t. $NOUDET_{t-1}$ is computed as follows:

$$NOUDET_{i,t-1} = \sum_{j=1}^{7} (\alpha_{ij,t-1} * DETLT_{i,t-1})/(TC_{jt}/TC_{j,t-1}) + CRFMI_{i,t-1}/(TC_{DTS,t}/TC_{DTS,t-1}) + AUTRELT_{i,t-1} + MULTLT_{i,t-1} + DETLTEU_{i,t-1} + DETCT_{i,t-1} \quad (2)$$

Where DETLTis the total long-term debt; α_j is the proportion of long-term debt held in currency j (j = French Franc, Deutsche Mark, Japanese Yen, Swiss Franc, IMF Special Drawing Rights, UK Pound Sterling, and the Euro[6]); TC is the end-of-year exchange rate of the currency of denomination against the dollar (expressed as units of currency per US Dollar); CRFMI is the use of IMF credit denominated SDR; AUTRELT is long-term debt denominated in other unspecified currencies; MULTLT is long-term debt denominated in multiple currencies; DETLTEU is long-term debt denominated in US dollars; and DETCT is short-term debt.

Adjustment for trade misinvoicing

Following Ajayi (1997) and Boyce and Ndikumana (2001), I estimate trade misinvoicing between the FZ countries and their industrialized country trading partners. Total trade misinvoicing (FALSCOM) is computed as:

$$FALSCOM_{it} = \frac{DEX_{it}}{PMEX_{t}} + \frac{DIM_{it}}{PMIM_{t}} \quad (3)$$

Where DEX is the export discrepancies between FZ countries and the industrialized countries; DIM is the import discrepancies between FZ countries and the industrialized countries; PMEX is the average shares of the industrialized countries in FZ countries' exports; and PMIM is the average shares of industrialized countries in FZ countries' imports. DEX and DIM are computed as follows:

$$DEX_{it} = IMPI_{it} - (EXPAZF_{it}{}^{*}CAF_{t}) \quad (4)$$

$$DIM_{it} = IMPAZF_{it} - (EXPI_{it}{}^{*}CAF_{t}) \quad (5)$$

Where IMPI is the value of the industrialized countries' imports from FZ countries as reported by the industrialized trading partners; IMPAZF is FZ countries' imports from the industrialized countries as reported by FZ countries; EXPAZF is FZ countries' exports to the industrialized countries as reported by FZ countries; EXPI is the industrialized countries' exports to FZ countries as reported by the industrialized trading partners; CAF is the factor representing the cost of freight and insurance (c.a.f/f.a.b).

Inflation adjustment

Given that all data are in dollars, I used the US producer price index to adjust capital flight for inflation. The resulting data are useful in examining the year-to-year changes in real capital flight. Real capital flight is calculated as follows:

$$FCR(BM)_{it} = \frac{(\Delta DETAJU_{it} + INDE_{it}) - (CC_{it} + \Delta RES_{it}) + FALSCOM_{it}}{IPPEU_{t}} \quad (6)$$

$$FCR(MG)_{it} = FCR(BM)_{it} - \frac{\Delta ABD_{it}}{IPPEU_{t}} \quad (7)$$

Where FCR(BM) is real capital flight calculated using the World Bank (1985) version of the residual method adjusted for exchange rate fluctuations, trade misinvoicing and inflation; FCR(MG) is real capital flight calculated using the Morgan Guaranty (1986) version of the residual method adjusted for exchange rate fluctuations, trade misinvoicing and inflation; ABD indicates the assets held overseas by the domestic banks; and IPPEU is the US producer price index.

3. Link between Capital Flight and Economic Growth: An empirical investigation

The research sample includes all 15 countries in the FZ: Benin, Burkina Faso, Cameroon, Central African Republic, Chad, Comoros, Congo, Côte d'Ivoire, Equatorial Guinea, Gabon, Guinea-Bissau, Mali, Niger, Senegal and Togo. The time period is 1970–2010 for all countries, except for Comoros (1980–2010)[7], Congo (1971–2010), Equatorial Guinea (1987–2010) that became a member of the FZ on 1 January 1985[8], Gabon (1970–2010), Guinea-Bissau (1998–2010) that became a member of the FZ on 2 May 1997, and for Mali (1985–2010) as this country became a member of the FZ on 1 June 1984.

Stylized facts on capital flight and economic growth

Tables C1 and D1 in Appendix C and D, respectively, indicate annual values of real capital flight for the 15 countries in the sample of the FZ. These data reveal that capital flight is not solely a phenomenon resulting from the onset of the debt crisis of the 1980s. For several countries in the sample, the magnitude of capital flight before 1980 is higher than those of 1980.

Table 2 reports the total and mean annual real capital flight in the FZ in the period 1970 to 2010 and compares its magnitude with GDP and with domestic investment. This table reveals contrasted capital movements across the FZ countries, as illustrated also in Figures 1 and 2. Capital flight is found to be positive for 10 countries: Burkina Faso, Cameroon, Central African Republic, Chad, Congo, Côte d'Ivoire, Equatorial Guinea, Gabon, Guinea-Bissau, and Togo, implyingthat these countries recorded net capital outflows in the period. One potential explanation for positive capital flight may be related to the fact that these countries produce oil and other natural resources, and have experienced episodes of political instability, circumstances that both promote capital flight (Dornbush, 1986; Smit and Mocke, 1991; Nyatepe-Coo, 1994; Lensink et al, 1998; Lensink et al, 2000; Hermes and Lensink, 2001; Fedderke and Liu, 2002; Alam and Quazi, 2003; Ndikumana and Boyce, 2003; Quazi, 2004; Fielding, 2004; Collier et al, 2004 ; Le and Zak, 2006; Davies, 2008). Among these 10 countries, four experienced a massive capital flight with a magnitude exceeding US$10 billion. Topping the list are Côte d'Ivoire (with US$41.2 or US$40.6 billion of capital flight, representing respectively 352.9% or 347.8% of GDP, and 2171.2% or 2139.6% of investment), Gabon (with US$23.0 or US$22.6 billion of capital flight, representing respectively 366.5% or 359.7% of GDP, and 1259.5% or 1236.3% of investment), Congo (with US$20.1 or US$19.6 billion of capital flight, representing respectively 397.3% or 386.6% of GDP,

and 1595.3% or 1552.3% of investment), and Cameroon (with US$11.4 or US$10.6 billion of capital flight, representing respectively 82.2% or 76.6% of GDP, and 499.8% or 465.6% of investment). The six remaining countries recorded a magnitude of capital flight ranging from US$1.1 billion to US$8.0 billion (World Bank method) or between US$0.5 billion and US$7.8 billion (Morgan Guaranty method).

Capital flight is found to be negative for 5 countries: Benin, Comoros, Mali, Niger, and Senegal, suggesting that these countries benefited from net capital inflows in the period. One potential explanation for negative capital flight may be more related to trade misinvoicing. In the period 1970 to 2010, the computations show that, except for Mali, these countries experienced negative amounts of trade misinvoicing, implying negative capital flight, as follows: US$ -13 billion for Senegal; US$ -3.3 billion for Niger; US$ -2.6 billion for Benin; and US$ -0.1 billion for Comoros.

As a whole, in the period 1970 to 2010, real capital flight for the 15 FZ countries is found to be positive and massive with a magnitude that stands at roughly US$86.8 billion or US$80.1 billion, representing respectively US$153.7 million or US$141.6 million annually, 122.1% or 112.6% of GDP, and 528.0% or 487.2% of domestic investment. Therefore, the group of 15 countries in the FZ experienced net capital outflows in the period of the study. Empirical evidence has shown that capital flight in the FZ is also caused by businesses (through trade misinvoicing operated by exporters and importers), and by individuals (via external debt and foreign aid which are in part channelled overseas as capital flight by corrupt leaders) (see Ndiaye, 2009a and 2011).

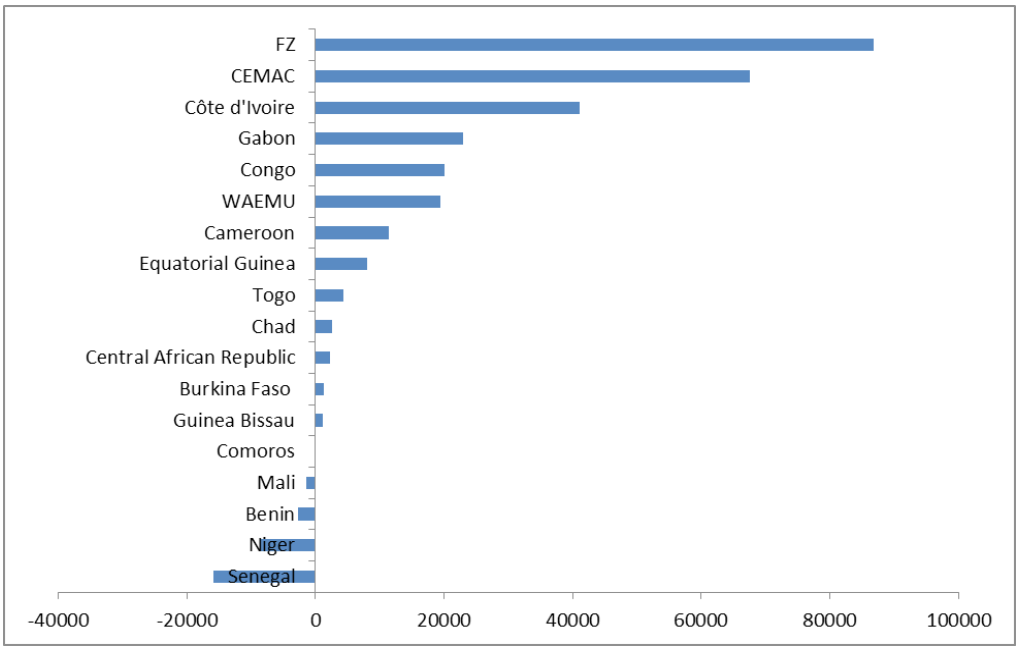
Table 2: Real capital flight in FZ, 1970–2010[a] (million 2000 US$, % of GDP and % of investment)

	Real capital flight, World Bank[b]				Real capital flight, Morgan Guaranty[c]			
Countries	**Total**	**Mean**	**% GDP**	**% investment**	**Total**	**Mean**	**% GDP**	**% investment**
Benin	-2678.2	-65.3	-80.3	-311.3	-3410.8	-83.2	-102.2	-396.4
Burkina Faso	1330.6	32.5	29.3	397.7	465.1	11.3	10.2	356.7
Cameroon	11435.7	278.9	82.2	499.8	10652.7	259.8	76.6	465.6
Central African Republic	2272.7	55.4	215.6	1487.1	2206.7	53.8	209.3	1463.6
Chad	2594.7	63.3	83.8	227.6	2435.1	59.4	78.6	213.6
Comoros	-68.8	-2.2	-27.8	-229.2	-183.6	-6.3	-74.3	-611.7
Congo	20132.6	503.3	397.3	1595.3	19590.6	489.8	386.6	1552.3
Côte d'Ivoire	41170.4	1004.2	352.9	2171.2	40572.3	989.6	347.8	2139.6
Equatorial Guinea	8007.9	333.7	132.2	335.8	7844.2	326.8	129.5	329.0
Gabon	23041.9	562.0	366.5	1259.5	22617.4	551.6	359.7	1236.3
Guinea-Bissau	1104.4	85.0	451.9	5140.9	1051.5	80.9	430.2	4894.5
Mali	-1473.4	-56.7	-35.5	-141.4	-2228.2	-85.7	-53.7	-213.8
Niger	-8595.4	-209.6	-307.7	-2123.1	-8839.8	-215.6	-316.4	-2183.5
Senegal	-15867.9	-387.0	-227.7	-727.6	-16742.7	-408.4	-240.2	-767.7
Togo	4436.1	108.2	258.0	1421.8	4089.2	99.7	237.8	1310.6
Franc Zone	86843.5	153.7	122.1	528.0	80119.6	141.6	112.6	487.2

Source: Author's computations using data from World Bank, *Global Development Finance 2011*; World Bank, *World Development Indicators 2011*; World Bank, *Africa Development Indicators 2011*; IMF, *International Financial Statistics 2011*; IMF, Balance of Payments Statistics 2011; IMF, *Direction of Trade Statistics 2011*; IMF, *Selected Issues and Statistical Appendix*.

a. The time period is 1970–2010 for all countries, except for Comoros (1980–2010), Congo (1971–2010), Equatorial Guinea (1987–2010), Gabon (1970–2010), Guinea-Bissau (1998–2010), and Mali (1985–2010).
b. Capital flight is measured using the World Bank (1985) version of the residual method adjusted for exchange rate fluctuations, trade misinvoicing and inflation (Boyce and Ndikumana, 2001).
c. Capital flight is measured using the Morgan Guaranty (1986) version of the residual method adjusted for exchange rate fluctuations, trade misinvoicing and inflation (Boyce and Ndikumana, 2001).

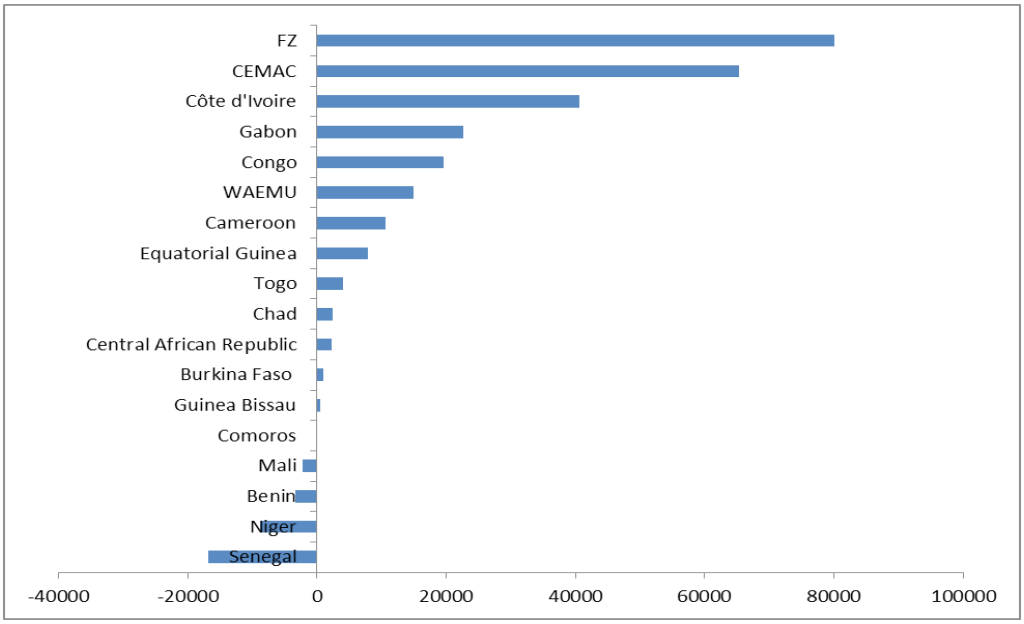
Figure 1: Real capital flight by country, 1970–2010, (million $ US 2,000), World Bank Method



Source: Author's computations using data from World Bank, *Global Development Finance 2011*; World Bank, *World Development Indicators 2011*; World Bank, *Africa Development Indicators 2011*; IMF, *International Financial Statistics 2011*; IMF, *Balance of Payments Statistics 2011*; IMF, *Direction of Trade Statistics 2011*; IMF, *Selected Issues and Statistical Appendix*.

The time period is 1970–2010 for all countries, except for Comoros (1980–2010), Congo (1971–2010), Equatorial Guinea (1987–2010), Gabon (1970–2010), Guinea-Bissau (1998–2010), and Mali (1985–2010).

Figure 2: Real capital flight by country, 1970–2010, (million $ US 2,000), Morgan Guaranty Method



Source: Author's computations using data from World Bank, *Global Development Finance 2011*; *World Bank, World Development Indicators 2011*; World Bank, *Africa Development Indicators 2011*; IMF, *International Financial Statistics 2011*; IMF, *Balance of Payments Statistics 2011*; IMF, *Direction of Trade Statistics 2011*; IMF, *Selected Issues and Statistical Appendix*.

The time period is 1970–2010 for all countries, except for Comoros (1980–2010), Congo (1971–2010), Equatorial Guinea (1987–2010), Gabon (1970–2010), Guinea-Bissau (1998–2010), and Mali (1985–2010).

As reported in Table 3, during the same period (1970–2010) the FZ countries experienced low investment rates of 21.2% for total investment, 12.8% for private investment and 7.7% for public investment, and a low economic growth rate of 3.9%. In addition, Table 4 reveals high volatility of total investment, private investment, public investment, economic growth, and capital flight, with coefficients of variation of respectively 108.8%, 100.7%, 106.8%, 206.4%, and 442.3% or 486.1%. Figures 3, 4 and 5 highlight the high volatility of capital flight (Figure 3), of total investment, private investment and public investment (Figure 4), and of economic growth (Figure 5). Figure 3 shows an irregular evolution of capital flight. Between 1970 and 1980, capital flight stood at US$12.2 billion or US$11.8 billion. Between 1981 and 1990, capital flight increased and amounted to US$20.3 billion or US$19.7 billion. This increase may be explained by the debt crisis in several developing countries. Capital flight decreased between 1991 and 2000 and stood at US$16.7 or US$15.7 billion, then increased between 2001 and 2010, amounting to US$37.6 billion or US$32.9 billion.

Table 3: Domestic investment and its private and public components, and economic growth rate in the FZ, 1970–2010 (million 2,000 US$ and % of GDP)

Countries	Investment		Private investment		Public investment		Growth rate
	Total	% PIB	Total	% PIB	Total	% PIB	%
Benin	10529.6	16.9	5996.1	10.4	3846.3	7.5	3.5
Burkina Faso	12527.3	19.2	5957.5	11.7	4603.2	9.4	4.4
Cameroon	68809.1	19.6	39413.4	16.1	10572.4	4.2	3.8
Central African Republic	3838.9	11.5	1346.1	5.2	1288.8	5.1	1.4
Chad	13578.1	17.9	5789.8	9.9	3593.2	7.1	3.7
Comoros	1096.5	19.2	364.1	6.2	563.6	10.3	2.1
Congo	29767.2	28.0	13503.7	15.8	7181.7	8.3	4.5
Côte d'Ivoire	53000.4	15.5	32007.9	9.4	20476.9	6.1	2.6
Equatorial Guinea	16946.9	51.5	10319.6	41.4	5084.7	9.8	16.4
Gabon	61152.2	32.7	38254.9	23.0	14013.1	8.7	4.0
Guinea-Bissau	168.2	11.5	19.7	1.3	165.2	10.0	-0.2
Mali	13230.9	22.3	7338.3	13.5	4553.1	9.3	4.0
Niger	7546.9	13.5	1732.1	3.8	3397.0	8.1	2.1
Senegal	30396.3	17.6	21520.3	13.6	8572.4	5.0	3.0
Togo	9239.8	20.9	3520.4	11.5	1832.1	6.2	2.6
Franc Zone	331828.7	21.2	187083.9	12.8	89743.8	7.7	3.9

Source: Author's computations using data from World Bank, *World Development Indicators 2011*; World Bank, *Africa Development Indicators 2011*.

Note: The time period is 1970–2010 for all countries, except for Comoros (1980–2010), Congo (1971–2010), Equatorial Guinea (1987–2010), Gabon (1970–2010), Guinea-Bissau (1998–2010), and Mali (1985–2010).

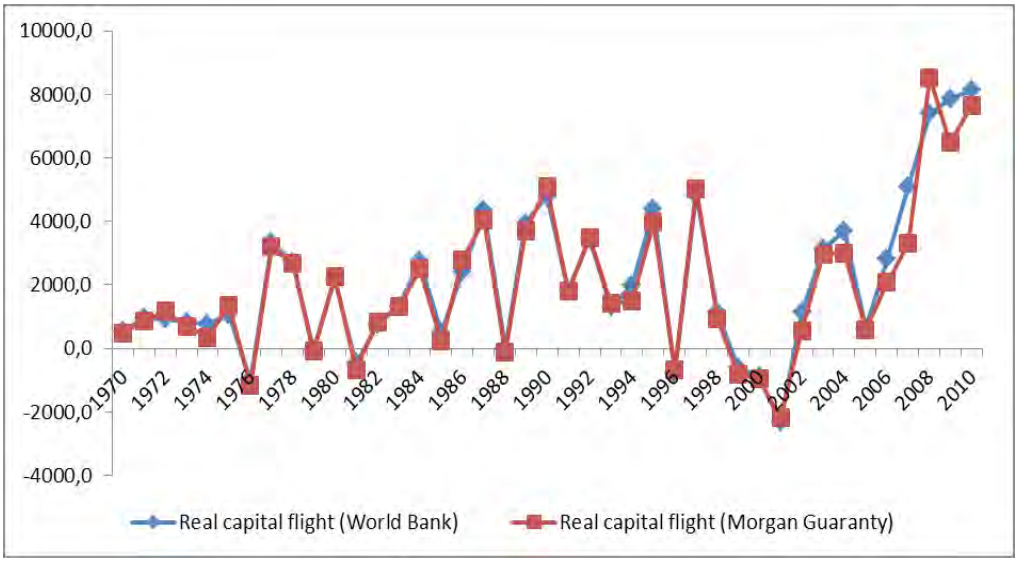
Table 4: Descriptive statistics of capital flight, domestic investment and its private and public components, and economic growth in the FZ, 1970–2010 (million 2000 US$)

Indicators	Real capital flight		Investment			Growth rate
	World Bank	Morgan Guaranty	Total	Private	Public	
Mean	159.6	147.8	608.6	438.6	210.5	3.7%
Minimum	-3934.3	-4043.6	10.2	-13.7	5.5	-28.1%
Maximum	4023.1	4188.5	3729.1	2204.4	1785.2	71.2%
Standard deviation	706.0	718.6	662.1	441.7	224.8	7.6%
Coefficient of variation	442.3%	486.1%	108.8%	100.7%	106.8%	206.4%
Observations	544	542	553	427	429	588

Source: Author's computations using data from World Bank, *Global Development Finance 2011*; World Bank, *World Development Indicators 2011*; World Bank, *Africa Development Indicators 2011*; IMF, *International Financial Statistics 2011*; IMF, *Balance of Payments Statistics 2011*; IMF, *Direction of Trade Statistics 2011*; IMF, *Selected Issues and Statistical Appendix*.

The time period is 1970–2010 for all countries, except for Comoros (1980–2010), Congo (1971–2010), Equatorial Guinea (1987–2010), Gabon (1970–2010), Guinea-Bissau (1998–2010), and Mali (1985–2010).

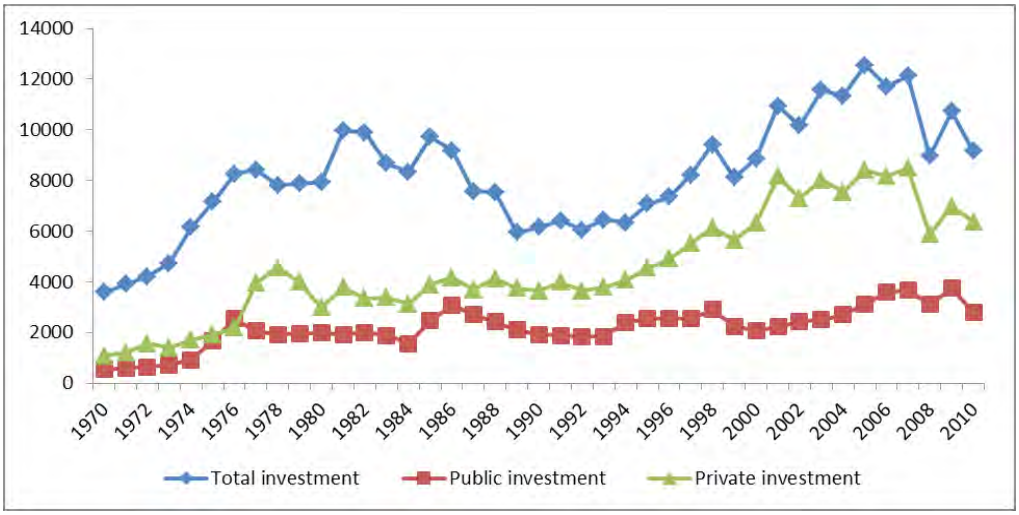
Figure 3: Evolution of real capital flight in the FZ, 1970–2010, (million US$ 2,000)



Source: Author's computations using data from World Bank, *Global Development Finance 2011*; World Bank, *World Development Indicators 2011*; World Bank, *Africa Development Indicators 2011*; IMF, *International Financial Statistics 2011*; IMF, *Balance of Payments Statistics 2011*; IMF, *Direction of Trade Statistics 2011*; IMF, *Selected Issues and Statistical Appendix*.

The time period is 1970–2010 for all countries, except for Comoros (1980–2010), Congo (1971–2010), Equatorial Guinea (1987–2010), Gabon (1970–2010), Guinea-Bissau (1998–2010), and Mali (1985–2010).

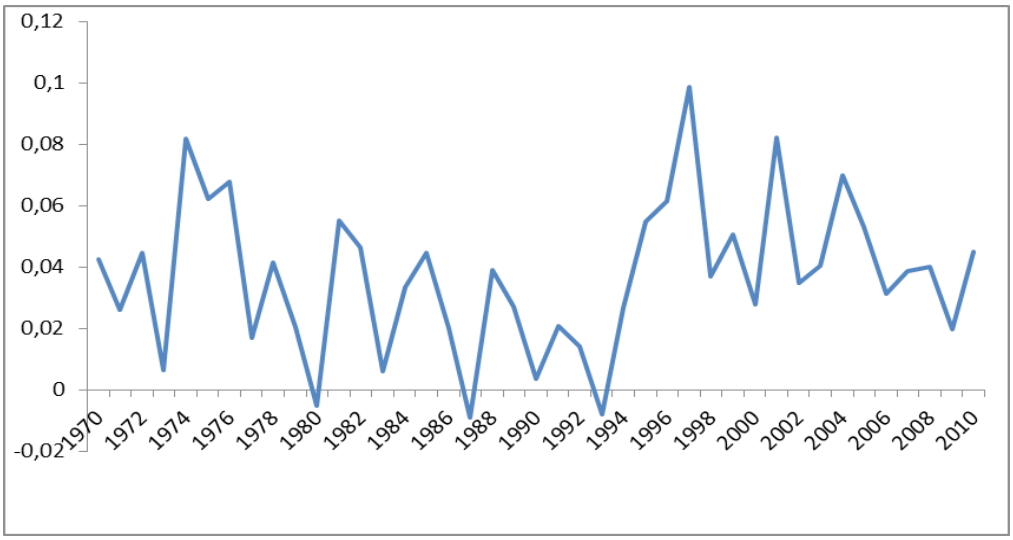
Figure 4: Evolution of total investment, private and public investments in the FZ, 1970–2010, (million US$2,000)



Source: Author's computations using data from World Bank, *Global Development Finance 2011*; World Bank, *World Development Indicators 2011*; World Bank, *Africa Development Indicators 2011*; IMF, *International Financial Statistics 2011*; IMF, *Balance of Payments Statistics 2011*; IMF, *Direction of Trade Statistics 2011*; IMF, *Selected Issues and Statistical Appendix*.

The time period is 1970–2010 for all countries, except for Comoros (1980–2010), Congo (1971–2010), Equatorial Guinea (1987–2010), Gabon (1970–2010), Guinea-Bissau (1998–2010), and Mali (1985–2010).

Figure 5: Evolution of economic growth rate in the FZ, 1970–2010

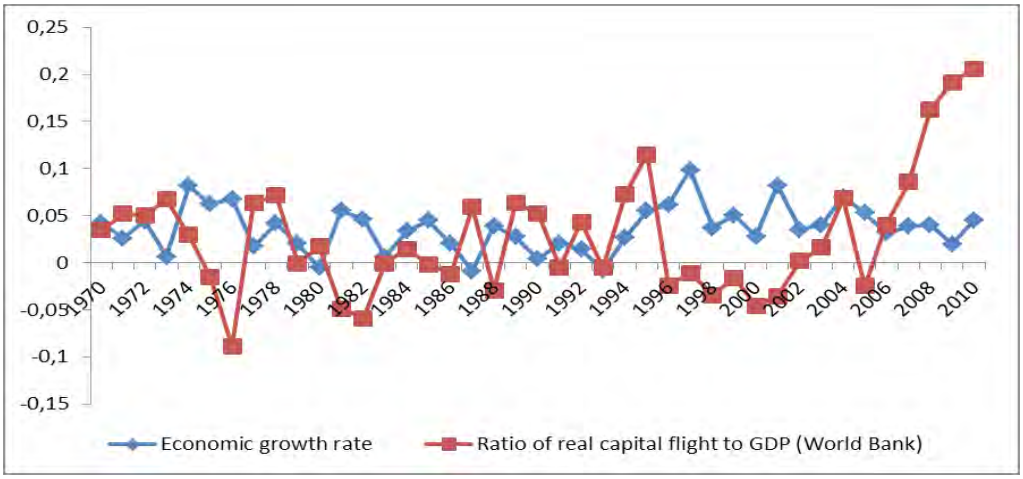


Source: Author's computations using data from World Bank, *Global Development Finance 2011*; World Bank, *World Development Indicators 2011*; World Bank, *Africa Development Indicators 2011*; IMF, *International Financial Statistics 2011*; IMF, *Balance of Payments Statistics 2011*; IMF, *Direction of Trade Statistics 2011*; IMF, *Selected Issues and Statistical Appendix*.

The time period is 1970–2010 for all countries, except for Comoros (1980–2010), Congo (1971–2010), Equatorial Guinea (1987–2010), Gabon (1970–2010), Guinea-Bissau (1998–2010), and Mali (1985–2010).

Theory explaining capital flight suggests that this phenomenon is driven both by private and public actors (Ndikumana and Boyce, 2003, 2008 and 2011b; Ajayi, 2007; Ndiaye, 2009a and 2011), which implies that an increase in capital flight would reduce private and public investments, hence economic growth. The results from Table 2 show that capital flight accounts for 5.3 times or 4.9 times domestic investment in the FZ, implying that the magnitude of capital flight exceeds the level of domestic investment in this zone. Therefore, the higher the magnitude of capital flight, the less the FZ countries have resources that can be mobilized to finance their investment needs and, consequently, to promote their economic growth. Figures 6 and 7 show the link between capital flight and economic growth. These figures indicate a negative evolution between these two variables in the period 1970 to 2010; whenever capital flight increases, the economic growth rate declines, and inversely.

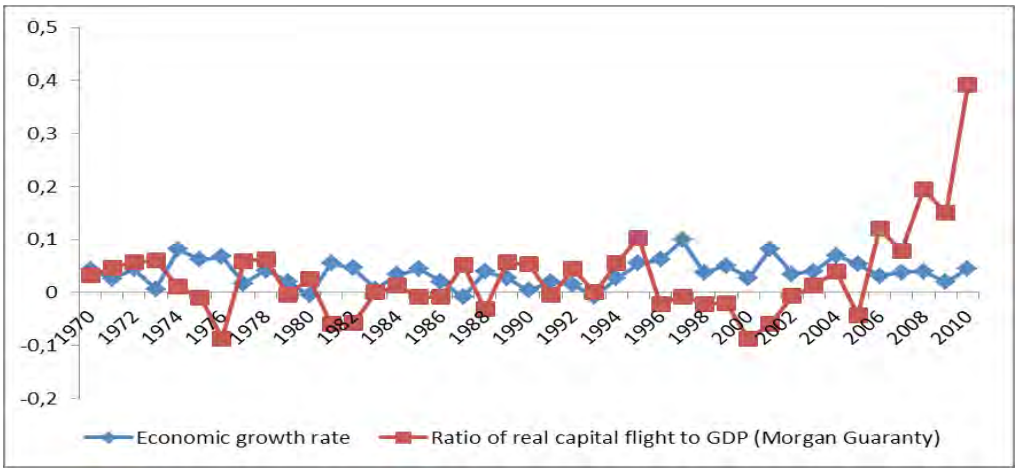
Figure 6: Comparing the evolution of economic growth rate and of the ratio of real capital flight to GDP in the FZ, 1970–2010, World Bank Method



Source: Author's computations using data from World Bank, *Global Development Finance 2011*; World Bank, *World Development Indicators 2011*; World Bank, *Africa Development Indicators 2011*; IMF, *International Financial Statistics 2011*; IMF, *Balance of Payments Statistics 2011*; IMF, *Direction of Trade Statistics 2011*; IMF, *Selected Issues and Statistical Appendix*.

The time period is 1970–2010 for all countries, except for Comoros (1980–2010), Congo (1971–2010), Equatorial Guinea (1987–2010), Gabon (1970–2010), Guinea-Bissau (1998–2010), and Mali (1985–2010).

Figure 7: Comparing the evolution of economic growth rate and of the ratio of real capital flight to GDP in the FZ, 1970–2010, Morgan Guaranty Method

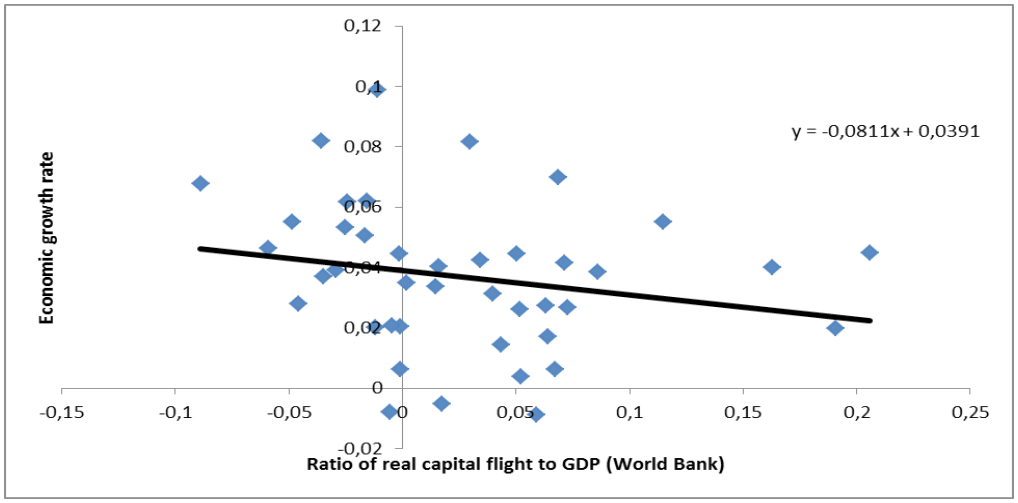


Source: Author's computations using data from World Bank, *Global Development Finance 2011*; World Bank, *World Development Indicators 2011*; World Bank, *Africa Development Indicators 2011*; IMF, *International Financial Statistics 2011*; IMF, *Balance of Payments Statistics 2011*; IMF, *Direction of Trade Statistics 2011*; IMF, *Selected Issues and Statistical Appendix*.

The time period is 1970–2010 for all countries, except for Comoros (1980–2010), Congo (1971–2010), Equatorial Guinea (1987–2010), Gabon (1970–2010), Guinea-Bissau (1998–2010), and Mali (1985–2010).

The negative relationship between capital flight and economic growth by year is shown in Figures 8 and 9, which reveal that a rise in capital flight is associated with a fall in the economic growth rate.

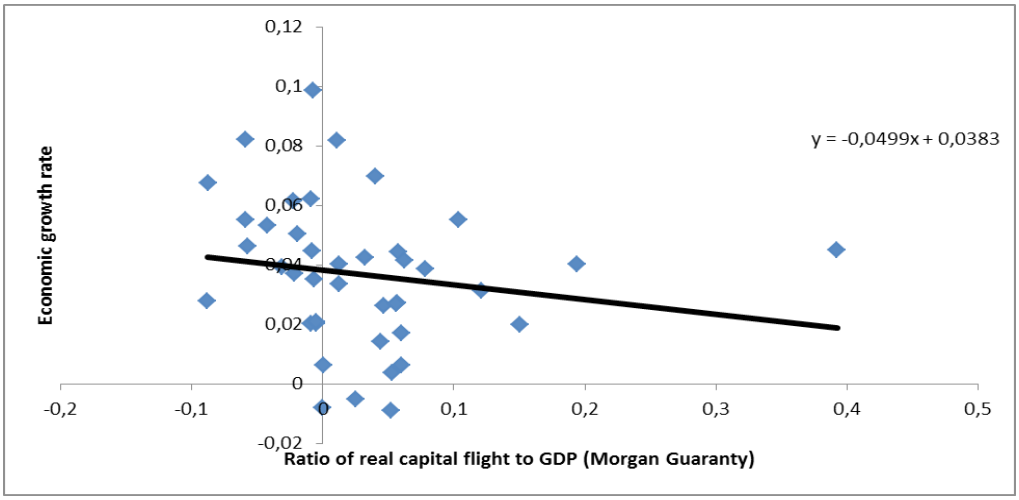
Figure 8: Relation between real capital flight and economic growth rate by year in the FZ, 1970–2010, World Bank Method



Source: Author's computations using data from World Bank, *Global Development Finance 2011*; World Bank, *World Development Indicators 2011*; World Bank, *Africa Development Indicators 2011*; IMF, *International Financial Statistics 2011*; IMF, *Balance of Payments Statistics 2011*; IMF, *Direction of Trade Statistics 2011*; IMF, *Selected Issues and Statistical Appendix*.

The time period is 1970–2010 for all countries, except for Comoros (1980–2010), Congo (1971–2010), Equatorial Guinea (1987–2010), Gabon (1970–2010), Guinea-Bissau (1998–2010), and Mali (1985–2010).

Figure 9: Relation between real capital flight and economic growth rate by year in the FZ, 1970–2010, Morgan Guaranty Method

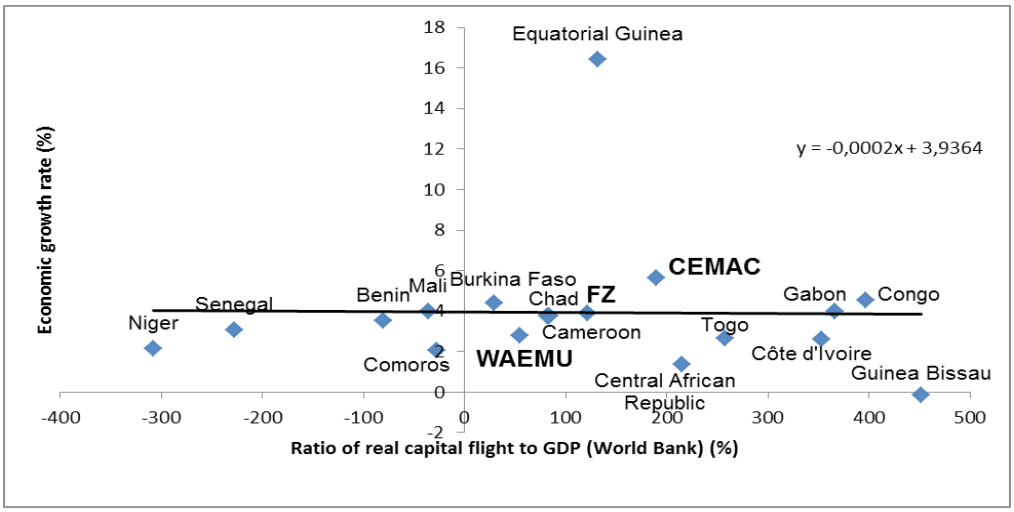


Source: Author's computations using data from World Bank, *Global Development Finance 2011*; World Bank, *World Development Indicators 2011*; World Bank, *Africa Development Indicators 2011*; IMF, *International Financial Statistics 2011*; IMF, *Balance of Payments Statistics 2011*; IMF, *Direction of Trade Statistics 2011*; IMF, *Selected Issues and Statistical Appendix*.

The time period is 1970–2010 for all countries, except for Comoros (1980–2010), Congo (1971–2010), Equatorial Guinea (1987–2010), Gabon (1970–2010), Guinea-Bissau (1998–2010), and Mali (1985–2010).

Figures 10 and 11 indicate the negative relationship between capital flight and economic growth by country. These figures also reveal that an increase in capital flight is associated with a decline in the economic growth rate.

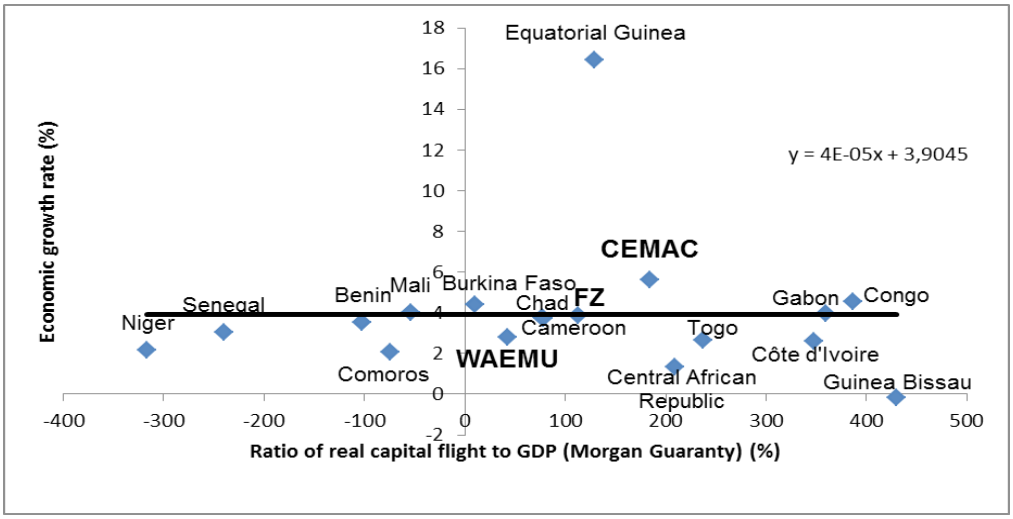
Figure 10: Relation between real capital flight and economic growth rate by country in the FZ, 1970–2010, World Bank Method



Source: Author's computations using data from World Bank, *Global Development Finance 2011*; World Bank, *World Development Indicators 2011*; World Bank, *Africa Development Indicators 2011*; IMF, *International Financial Statistics 2011*; IMF, *Balance of Payments Statistics 2011*; IMF, *Direction of Trade Statistics 2011*; IMF, *Selected Issues and Statistical Appendix*.

The time period is 1970–2010 for all countries, except for Comoros (1980–2010), Congo (1971–2010), Equatorial Guinea (1987–2010), Gabon (1970–2010), Guinea-Bissau (1998–2010), and Mali (1985–2010).

Figure 11: Relation between real capital flight and economic growth rate by country in the FZ, 1970–2010, Morgan Guaranty Method



Source: Author's computations using data from World Bank, *Global Development Finance 2011*; World Bank, *World Development Indicators 2011*; World Bank, *Africa Development Indicators 2011*; IMF, *International Financial Statistics 2011*; IMF, *Balance of Payments Statistics 2011*; IMF, *Direction of Trade Statistics 2011*; IMF, *Selected Issues and Statistical Appendix*.

The time period is 1970–2010 for all countries, except for Comoros (1980–2010), Congo (1971–2010), Equatorial Guinea (1987–2010), Gabon (1970–2010), Guinea-Bissau (1998–2010), and Mali (1985–2010).

The following section examines econometrically the effect of capital flight on economic growth.

Econometric analysis of capital flight's effect on economic growth

The baseline equation of the economic growth rate is specified as follows:

$$TCPT_{it} = \alpha_1 TCPT_{i,t-1} + \alpha_2 FCRP_{it} + \alpha_3 X_{it} + \alpha_4 Y_{it} + u_i + v_t + \varepsilon_{it} \quad (8)$$

Where TCPT is the growth rate of real GDP per capita; FCRP is the ratio of real capital flight to GDP (capital flight is measured using Equations 6 and 7); X is the vector of macroeconomic variables of control including: the ratio of domestic investment to GDP, the inflation rate measured as the annual change in the consumer price index (CPI), the ratio of credit to the private sector to GDP, the ratio of external debt to GDP, the ratio of savings to GDP; Y is the vector of institutional variables of control comprising the quality of institutions measured using the constraints on the executive power that take values ranging from 1 (unlimited executive authority) to 7 (executive parity or subordination) (sourced from Polity IV Project database); *u* is the country-specific fixed effect; *v* is the time-specific fixed effect; and ε is the error term. The definition and the sources of these variables are indicated in appendix E.

Capital flight can be endogenous in the economic growth model (equation 8). Indeed, capital flight can affect growth, but expectations of slow growth may also affect the level of capital flight (Morgan Guaranty, 1988; Pastor, 1990; Mikkelsen, 1991; Ajayi, 1992; Muscatelli and Hallet, 1992; Harrigan et al, 2002; Alam and Quazi, 2003; Quazi, 2004; Ljungwall and Wang, 2008; Ndikumana and Boyce, 2008 and 2011b). Therefore, we use the Generalized Method of Moments (GMM) to correct for endogeneity problems.

The results, presented in Tables 5 (for the adjusted World Bank capital flight measure) and 6 (for the adjusted Morgan Guaranty capital flight measure), support the expected negative coefficient of capital flight, which is also significant. This result implies that capital flight significantly reduces economic growth in the FZ. Therefore, capital flight poses a huge threat to high and sustainable economic growth in the FZ.

The results also show a negative and statistically significant coefficient of the interactions between capital flight and investment, between capital flight and credit to the private sector, between capital flight and the quality of institutions, and between capital flight and domestic savings, while the interaction between capital flight and external debt is found to be insignificant. This suggests that by decreasing domestic investment, the credit to the private sector, the quality of institutions and domestic savings, capital flight reduces economic performance.Consequently, domestic investment, credit to the private sector, the quality of institutions, and domestic savings play an important role in explaining the influence of capital flight on economic growth in the FZ, and are therefore the most important channels through which capital flight affects growth.

However, these results hold variably true after controlling for other variables and after taking account of a given capital flight measure (adjusted World Bank capital flight measure or adjusted Morgan Guaranty capital flight measure).

Table 5: Effect of capital flight on economic growth in the FZ, 1970–2010, World Bank method, Generalized Method of Moments (GMM)

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Ratio of real capital flight to GDP	-0.0372***	-0.108*	-0.00933	-0.0427	-0.0885	-0.0372	-0.157*	-0.0752
	(0.00900)	(0.0603)	(0.0195)	(0.0448)	(0.109)	(0.0830)	(0.0807)	(0.0522)
Dependent variable: 1st lag	0.0400	0.135	0.126	0.329	0.583	0.184	0.270*	0.124
	(0.173)	(0.267)	(0.140)	(0.303)	(0.487)	(0.146)	(0.161)	(0.164)
Ratio of investment to GDP		0.231	0.255	0.295				
		(0.453)	(0.243)	(0.366)				
Inflation		-0.0537		-0.0959				
		(0.0425)		(0.193)				
Ratio of credit to the private sector to GDP		0.318		0.664	0.115			
		(0.569)		(0.449)	(0.357)			
Quality of institutions		0.000305*		0.000216		4.80e-05		
		(0.000181)		(0.000159)		(0.000181)		
Ratio of external debt to GDP							-0.0188	
							(0.0176)	
Ratio of domestic savings to GDP								0.0232
								(0.0667)
Interaction between capital flight and investment			-0.654*	-0.542**				
			(0.334)	(0.221)				

continued next page

Table 5 Continued

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Interaction between capital flight and credit to the private sector					-1.764***			
					(0.615)			
Interaction between capital flight and quality of institutions						-0.00418*		
						(0.00253)		
Interaction between capital flight and external debt							-0.00497	
							(0.0396)	
Interaction between capital flight and domestic savings								-0.448*
								(0.252)
Constant	0.00663	-0.123	0.0606	0.225	0.0327	0.00460	0.0169	0.000794
	(0.00488)	(0.200)	(0.0490)	(0.145)	(0.0507)	(0.00425)	(0.0115)	(0.00794)
Observations	379	300	433	355	452	513	363	357
Countries	15	14	15	14	15	15	15	15
AR(1) test	0.040	0.059	0.076	0.182	0.086	0.025	0.014	0.002
AR(2) test	0.380	0.457	0.267	0.471	0.732	0.326	0.290	0.124
Hansen test	0.459	0.431	0.395	0.480	0.526	0.640	0.533	0.271

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
Note: See Appendix E for the definition and the sources of these variables.

Table 6: Effect of capital flight on economic growth in the FZ, 1970-2010, Morgan Guaranty method, Generalized Method of Moments (GMM)

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Ratio of real capital flight to GDP	-0.0313*	-0.136**	-0.0326	-0.0432	-0.0684*	-0.0757	-0.159*	-0.0787**
	(0.0166)	(0.0607)	(0.0389)	(0.0483)	(0.0352)	(0.0644)	(0.0813)	(0.0373)
Dependent variable: 1st lag	0.137	0.0676	0.222	0.346	0.175	0.0486	0.287	0.346
	(0.128)	(0.259)	(0.151)	(0.280)	(0.595)	(0.117)	(0.175)	(0.256)
Ratio of investment to GDP		0.280	0.0594	0.338				
		(0.437)	(0.217)	(0.363)				
Inflation		-0.0509		-0.0839				
		(0.0404)		(0.185)				
Ratio of credit to the private sector to GDP		0.456		0.679	0.325			
		(0.566)		(0.432)	(0.693)			
Quality of institutions		0.000287*		0.000233		0.000181*		
		(0.000163)		(0.000153)		(0.000108)		
Ratio of external debt to GDP							-0.0204	
							(0.0194)	
Ratio of domestic savings to GDP								0.0853
								(0.134)
Interaction between capital flight and investment			-0.0857	-0.540***				
			(0.373)	(0.200)				

continued next page

Table 6 Continued

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Interaction between capital flight and credit to the private sector					-0.465			
					(0.584)			
Interaction between capital flight and quality of institutions						-0.00263**		
						(0.00120)		
Interaction between capital flight and external debt							-0.00637	
							(0.0432)	
Interaction between capital flight and domestic savings							-0.525*	
								(0.276)
Constant	0.00332	-0.154	-0.00462	0.230*	0.0590	0.00388	0.0187	0.00841
	(0.00236)	(0.194)	(0.0426)	(0.137)	(0.106)	(0.00574)	(0.0126)	(0.0148)
Observations	235	300	431	355	467	319	362	341
Countries	14	14	15	14	15	14	15	14
AR(1) test	0.029	0.067	0.043	0.182	0.032	0.006	0.016	0.009
AR(2) test	0.313	0.560	0.284	0.455	0.861	0.222	0.297	0.064
Hansen test	0.416	0.622	0.586	0.443	0.624	0.618	0.701	0.827

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

4. Conclusion and policy implications

This study examined the effect of capital flight on economic growth in the FZ. In the period 1970 to 2010, real capital flight from the 15 FZ countries is found to be positive and massive with a magnitude that stands at roughly US$86.8 billion or 80.1 billion, representing 122.1% or 112.6% of GDP, and 5.3 times or 4.9 times domestic investment. At the same time, the FZ countries experienced low and very volatile investment and growth rates during the research period. Theory explaining capital flight suggests that this phenomenon is driven both by private and public actors; this implies that an increase in capital flight would affect private and public investments, then economic growth. By testing econometrically this hypothesis, the results show that capital flight significantly reduces economic growth in the FZ. Therefore, capital flight poses a huge threat to high and sustainable economic growth in the FZ. This result is consistent with previous findings in the literature (Bakare, 2011; Lan, 2009; Gusarova, 2009; Forgha, 2008; Beja, 2007; Cervena, 2006), as shown in Table A1.

The econometric analysis also reveals that domestic investment, credit to the private sector, the quality of institutions, and domestic savings play an important role in explaining the influence of capital flight on economic growth in the FZ, and are therefore the most important channels through which capital flight affects growth in this zone.

The key implication of these results is that capital flight repatriation contributes to a significant increase in the volume of investment in the FZ, credit to the private sector, the quality of institutions, and domestic savings, implying that this can help these countries sustainably increase their economic growth. Capital flight repatriation requires the minimization of uncertainty with respect to the macroeconomic and institutional environment in order to reduce risks of losses in the real value of the domestic assets of private investors. Moreover, efforts to improve governance, to strengthen institutional quality, and to promote a stable political environment are necessary to repatriate fled capital. In that sense, capital flight repatriation calls for the governments of FZ countries to behave more responsibly, particularly in managing public resources, and for foreign banks to be morally responsible in the repatriation of public funds that are supposed to be used in financing the social sectors in the FZ, namely education, health, and infrastructure.

Notes

1. The phenomenon of capital flight may occur simply because returns on assets are higher overseas, compared with assets held domestically (Pastor, 1990; Ajayi, 1992; Vos, 1992; Boyce, 1992 and 1993; Fedderke and Liu, 2002; Hermes et al, 2002b; Alam and Quazi, 2003; Ndikumana and Boyce, 2003; Ndiaye, 2009a and 2011).

2. The sample in Boyce and Ndikumana (2012) includes only seven countries in the FZ: Burkina Faso, Cameroon, Central African Republic, Chad, Congo, Côte d'Ivoire, and Gabon.

3. Boyce and Ndikumana (2012) have used the World Bank version of the residual method adjusted for exchange rate fluctuations, for debt write-offs, for trade misinvoicing, for underreporting of remittances and for inflation. Other recent measures, from the UNDP (2011), show that illicit capital flight from 11 countries in the FZ amounts to roughly $30.7 billion, in the period 1990 to 2008. The method of estimation used by the UNDP (2011) is then more restrictive as it considers only illicit capital flight, as opposed to Boyce and Ndikumana (2012) who take account of a larger method of estimation.

4. Other authors who have found an insignificant effect of capital flight on domestic investment in Nigeria are: Adesoye et al (2012); Adetiloye (2012).

5. In addition to those three adjustments, Boyce and Ndikumana (2001) also took into account an adjustment for imputed interest earnings. However, these authors assert that adjustment for inflation is useful in examining the causes and consequences of capital flight, while adjustment for imputed interest earnings permits more appropriate comparisons of capital flight to other aggregates, such as the stock of debt. Since the objective of this study is to analyse the effect of capital flight on economic growth, adjustment for imputed interest earnings is thus not appropriate. Therefore, I take into account only adjustments for exchange rate fluctuations, trade misinvoicing and inflation.

6. Euro (from 2001); Deutsche Mark and French Franc (up to 2000).

7. To estimate capital flight from Comoros, I consider the period 1980–2010 with respect to the World Bank method. However, regarding the Morgan Guaranty method, the period considered is 1982–2010 because assets held overseas by domestic banks in Comoros are available only from 1982 to 2010.

8. But data with which capital flight from this country is computed are available only for the period 1987 to 2010.

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Appendix A

Table A1: Selected empirical studies on the effect of capital flight on economic growth

Authors	Countries	Period	Estimation techniques	Results
Bakare (2011)	Nigeria	1988–2010	Autoregressive vector model	Negative and significant effect
Lan (2009)	Association of Southeast Asian Nations (ASEAN)	1972–2005	ARDL 'Bounds test' approach to cointegration	Negative and significant effect
Gusarova (2009)	139 developing countries	2002–2006	Ordinary Least Squares method and fixed and random effects	Negative and significant effect
Forgha (2008)	Cameroon	1970–2005	Two-Stage Least Squares method	Negative and significant effect
Beja (2007)	Philippines	1970–1999	Computations using ICOR	Sluggish growth with capital flight
Cervena (2006)	Countries in Africa, Latin America, Asia and East Europe	1990–2003	Generalized Least Squares method	Negative and significant effect

Annexure B

Table B1: Selected studies on the measures of capital flight in FZ countries (millions 2000 US$)

Countries	Ojo (1992)		Ajayi (1997)					Hermes, Lensink and Murinde (2002)				Ndikumana and Boyce (2008) and (2011b)	
	BM[a]	Period	BM[a]	MG[b]	AdjustedBM[c]	Adjusted MG[d]	Period	BM[a]	Period	BM[a]	Period	Adjusted BM[e]	Period
Benin	NA		NA	NA	NA	NA		NA		NA		-3457.4	1974-2004
Burkina Faso	NA		NA	NA	NA	NA		NA		NA		1265.5	1970-2003
Cameroon	NA		NA	NA	NA	NA		480	1983-1989	460	1990-1998	13099.4	1970-2004
Central African Republic	NA		91.8	146.97	692.33	747.5	1980-1991	NA		NA		250.2	1970-2004
Chad	NA		NA	NA	NA	NA		NA		NA		931.1	1977-2004
Comoros	NA		NA	NA	NA	NA		NA		NA		-176.4	1980-2004
Congo	NA		NA	NA	NA	NA		NA		NA		12195.5	1971-2004
Côte d'Ivoire	10900	1975-1991	3397.1	2914.5	9438.71	8956.11	1980-1991	296	1983-1989	-346	1990-1998	33029.6	1970-2004
Gabon	NA		NA	NA	NA	NA		NA		NA		7834.6	1978-2004
Guinea-Bissau	NA		269.56	270.28	229.16	229.88	1980-1991	NA		NA		NA	
Mali	NA		644.1	1229.5	-302.56	273.84	1980-1991	NA		NA		-1642.5	1970-2004
Niger	NA		274.8	377.5	1815.67	1918.37	1980-1991	NA		NA		-5970	1970-2004
Senegal	NA		NA	NA	NA	NA		NA		NA		-8962.8	1974-2004
Togo	NA		NA	NA	NA	NA		NA		NA		-3210.3	1974-2004
Franc Zone	10900		4677.4	4938.7	11873.3	12125.7		776		114		49851	

a. World Bank version of the residual method
b. Morgan Guaranty version of the residual method
c. World Bank version of the residual method adjusted for trade misinvoicing
d. Morgan Guaranty version of the residual method adjusted for trade misinvoicing
e. World Bank version of the residual method adjusted for exchange rate fluctuations, trade misinvoicing and inflation

Table B1 (Continued): Selected studies on the measures of capital flight in the FZ countries (millions 2000 US$)

	United Nations Development Programme (UNDP) (2011)		Ndikumana and Boyce (2011a)	
Countries	**Illicit capital flight***	**Period**	**Adjusted BM****	**Period**
Benin	264	1990–2008	NA	1970–2008
Burkina Faso	2900	1990–2008	1134	1970–2008
Cameroon	NA	1990–2008	24042	1970–2008
Central African Republic	1020	1990–2008	NA	1970–2008
Chad	15400	1990–2008	2035	1970–2008
Comoros	159	1990–2008	2400	1970–2008
Congo	NA	1990–2008	23899	1970–2008
Côte d'Ivoire	NA	1990–2008	45450	1970–2008
Equatorial Guinea	6500	1990–2008	NA	1970–2008
Gabon	NA	1990–2008	18159	1970–2008
Guinea-Bissau	847	1990–2008	NA	1970–2008
Mali	1600	1990–2008	NA	1970–2008
Niger	1010	1990–2008	NA	1970–2008
Senegal	334	1990–2008	NA	1970–2008
Togo	678	1990–2008	NA	1970–2008
Franc Zone	30712		117119	

* World Bank version of the residual method adjusted for trade misinvoicing. Illicit capital flight involves the cross-border transfer of the proceeds of corruption, trade in contraband goods, criminal activities and tax evasion.

** World Bank version of the residual method adjusted for exchange rate fluctuations, for debt write-offs, for trade misinvoicing, for underreporting of remittances and for inflation.

Appendix C

Table C1: Annual real capital flight from the FZ countries (million 2000 US$), 1970–2010, adjusted World Bank method

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
Benin	5.5	-5.2	-19.0	5.8	76.4	-5.6	-147.4	-97.5	-174.7	-189.7	-661.1	-585.0	-868.0	-142.8
Burkina Faso	44.8	50.7	17.7	4.9	137.7	-33.1	-12.2	113.3	198.3	48.5	159.6	93.2	80.3	52.2
Cameroon	-105.1	-30.3	-304.3	-527.9	-22.2	176.2	-117.2	548.8	135.6	-473.9	283.9	277.7	373.6	751.9
Central African Republic	-9.2	14.5	27.7	98.6	-18.2	-3.1	80.8	-24.9	-23.9	-10.0	-8.6	146.9	100.3	96.1
Chad	67.4	164.8	169.8	170.7	73.1	315.5	43.0	121.4	151.6	90.4	71.1	-10.6	-26.2	38.1
Comoros	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	-3.4	3.4	-1.5	3.6
Congo	NA	-44.5	-22.6	124.9	-242.1	-528.3	-958.3	-47.0	309.8	257.4	484.3	-302.5	732.9	472.7
Côte d'Ivoire	318.0	380.9	443.6	528.9	285.5	993.2	660.4	2250.5	1599.9	337.8	1511.9	363.0	1117.6	228.2
Equatorial Guinea	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Gabon	192.3	352.6	587.7	385.4	865.7	629.7	0.1	481.8	531.8	792.3	441.9	56.5	257.3	370.3
Guinea-Bissau	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mali	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Niger	43.3	75.3	89.8	111.0	-204.1	-224.7	-334.2	-355.3	-1.6	-532.3	108.0	-211.4	-401.0	20.5
Senegal	-57.8	-36.1	-72.5	-155.1	-370.8	-49.1	-252.7	46.4	-119.5	-570.4	-158.9	-200.5	-329.6	-151.1
Togo	41.4	27.0	5.7	81.8	186.1	-203.2	45.6	296.7	99.9	190.9	-40.0	-98.7	-283.4	-422.7
WAEMUa	395.2	492.7	465.2	577.3	110.8	477.4	-40.6	2254.1	1602.2	-715.2	919.5	-639.4	-684.2	-415.7
CEMACb	145.3	457.0	458.1	251.6	656.2	590.1	-951.6	1080.1	1104.9	656.1	1272.6	168.1	1437.9	1729.1
Franc Zone	540.5	949.7	923.3	828.9	766.9	1067.6	-992.2	3334.1	2707.1	-59.1	2188.8	-467.9	752.3	1317.0

Source: Author's computations using data from World Bank, *Global Development Finance 2011*; World Bank, *World Development Indicators 2011*; World Bank, *Africa Development Indicators 2011*; IMF, *International Financial Statistics 2011*; IMF, *Balance of Payments Statistics 2011*; IMF, *Direction of Trade Statistics 2011*; IMF, *Selected Issues and Statistical Appendix*.

a. WAEMU: Benin, Burkina Faso, Côte d'Ivoire, Guinea-Bissau, Mali, Niger, Senegal and Togo.
b. CEMAC: Cameroon, Central African Republic, Chad, Congo, Equatorial Guinea and Gabon.

Table C1 (Continued): Annual real capital flight from the FZ countries (million 2000 US$), 1970–2010, adjusted World Bank method

	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Benin	-141.2	-180.6	-39.3	-51.8	-124.4	333.0	-116.9	-204.0	-17.1	-183.7	120.6	155.8	-43.7	-67.2
Burkina Faso	34.8	-41.3	61.7	52.9	-6.2	270.4	69.4	-29.6	161.4	112.2	166.7	541.3	259.9	12.7
Cameroon	2184.3	-292.3	2487.5	1477.3	486.8	1561.9	1268.5	977.1	1827.5	500.4	1628.0	483.7	376.3	2300.2
Central African Republic	45.1	89.9	6.3	45.9	29.9	-14.2	51.3	78.8	-94.5	-15.5	34.3	524.1	240.8	-4.4
Chad	-31.8	5.7	35.0	62.4	131.7	5.7	183.8	69.6	56.2	-1.5	41.0	27.6	48.0	52.4
Comoros	-9.9	5.8	8.1	3.7	-0.6	2.8	-1.8	16.6	-1.3	4.0	67.8	-6.2	2.6	-161.0
Congo	814.1	805.9	-332.7	1031.8	-448.9	302.4	-164.6	-105.6	450.3	90.4	-230.0	414.2	-1513.2	909.5
Côte d'Ivoire	225.5	809.1	1170.5	1956.0	1191.1	1606.9	3155.0	2058.1	1516.5	1790.6	-182.4	1968.8	691.5	1554.2
Equatorial Guinea	NA	NA	NA	46.4	26.9	17.2	9.8	45.1	32.8	51.8	62.8	20.1	32.9	20.5
Gabon	-41.5	33.8	-312.4	285.7	-139.9	314.7	468.1	157.8	-134.2	-66.6	468.6	126.2	294.1	948.3
Guinea-Bissau	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mali	NA	-161.3	-290.7	-187.4	-339.0	-182.5	72.5	-61.1	285.4	-61.3	11.2	100.9	-124.7	152.6
Niger	34.1	21.8	-78.3	-238.3	-147.1	-306.3	35.9	-279.8	39.0	-53.3	-62.2	-132.7	-434.3	-285.7
Senegal	-163.5	-505.1	-173.2	-59.2	-622.1	-184.5	-126.3	-574.7	-603.4	-675.0	-214.7	-15.9	-565.2	-423.3
Togo	-212.1	-79.9	-129.9	-80.0	-48.8	223.2	-119.8	-340.0	-52.5	-181.4	79.3	184.1	-43.3	-153.8
WAEMUa	-222.4	-137.3	520.8	1392.2	-96.5	1760.1	2969.8	568.9	1329.3	747.9	-81.6	2802.3	-259.9	789.5
CEMACb	2970.2	642.9	1883.7	2949.5	86.6	2187.8	1816.8	1222.9	2138.0	558.8	2004.7	1595.9	-521.1	4226.5
Franc Zone	2737.9	511.5	2412.6	4345.4	-10.5	3950.7	4784.8	1808.3	3466.0	1310.8	1990.9	4392.0	-778.4	4855.0

Source: Author's computations using data from World Bank, *Global Development Finance 2011*; World Bank, *World Development Indicators 2011*; World Bank, *Africa Development Indicators 2011*; IMF, *International Financial Statistics 2011*; IMF, *Balance of Payments Statistics 2011*; IMF, *Direction of Trade Statistics 2011*; IMF, Selected *Issues and Statistical Appendix*.

a. WAEMU: Benin, Burkina Faso, Côte d'Ivoire, Guinea-Bissau, Mali, Niger, Senegal and Togo.
b. CEMAC: Cameroon, Central African Republic, Chad, Congo, Equatorial Guinea and Gabon.

Table C1 (End): Annual real capital flight from the FZ countries (million 2000 US$), 1970–2010, adjusted World Bank method

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Benin	-286.3	-274.7	-98.1	127.4	-29.7	-170.6	-206.8	-403.8	60.9	377.1	613.2	567.5	414.9
Burkina Faso	210.2	81.6	-231.2	-70.2	-22.2	136.4	-157.8	-324.5	-1259.6	29.8	190.2	357.1	-231.6
Cameroon	394.4	-354.6	440.9	-1279.1	-110.3	-1050.7	-433.6	-955.9	-3934.3	38.1	114.3	273.3	59.2
Central African Republic	50.9	-8.1	-29.5	-39.5	228.5	-75.3	-39.1	61.2	130.2	68.1	292.6	-169.2	317.3
Chad	-32.2	-56.6	-96.5	-17.1	-645.8	24.3	430.1	515.5	48.0	56.5	23.1	882.8	-663.1
Comoros	-154.0	-8.1	5.4	27.8	23.6	-6.4	21.8	-9.3	-7.1	1.8	-15.7	-45.7	164.4
Congo	899.2	1002.7	1332.3	354.4	493.1	2146.0	4023.1	636.4	1852.1	92.5	1695.2	1319.7	2025.7
Côte d'Ivoire	-10.6	-670.1	-496.1	-538.1	934.0	2979.0	346.9	1366.1	3273.2	1790.7	419.4	-977.9	2223.1
Equatorial Guinea	32.5	-6.3	-67.5	51.8	47.9	127.6	-136.6	-623.5	2052.7	2170.7	1615.3	1654.6	722.5
Gabon	78.5	596.9	724.7	67.7	447.5	143.5	1026.4	2399.1	1670.0	321.1	3141.5	1858.5	2218.6
Guinea-Bissau	38.1	1.7	-157.9	-79.7	7.0	1.2	-35.7	-69.5	326.1	76.9	119.6	91.0	785.7
Mali	-114.9	-257.0	-405.7	-303.6	264.6	-87.9	74.3	-406.4	606.2	-26.8	-252.8	-1.7	223.6
Niger	-92.5	-165.4	-419.1	-434.1	-413.2	-210.1	-389.7	-187.5	-2169.4	187.0	-345.5	-87.9	-163.7
Senegal	172.8	-332.3	-964.4	184.2	148.5	-328.5	-723.7	-624.0	-382.9	-595.8	-1910.4	-905.7	-2221.9
Togo	-48.2	-153.1	-430.5	-374.4	-245.3	-501.5	-101.4	-751.8	554.0	511.4	1697.7	3052.9	2254.6
WAEMU[a]	-131.4	-1769.3	-3203.1	-1488.6	643.6	1818.0	-1193.9	-1401.5	1008.4	2350.4	531.4	2095.3	3284.6
CEMAC[b]	1423.5	1174.0	2304.4	-861.8	461.0	1315.4	4870.2	2032.7	1818.7	2747.1	6882.0	5819.7	4680.2
Franc Zone	1138.0	-603.5	-893.3	-2322.6	1128.2	3126.9	3698.2	621.9	2820.0	5099.3	7397.7	7869.2	8129.2

Source: Author's computations using data from World Bank, *Global Development Finance 2011*; World Bank, *World Development Indicators 2011*; World Bank, *Africa Development Indicators 2011*; IMF, *International Financial Statistics 2011*; IMF, *Balance of Payments Statistics 2011*; IMF, *Direction of Trade Statistics 2011*; IMF, *Selected Issues and Statistical Appendix*.

a. WAEMU: Benin, Burkina Faso, Côte d'Ivoire, Guinea-Bissau, Mali, Niger, Senegal and Togo.
b. CEMAC: Cameroon, Central African Republic, Chad, Congo, Equatorial Guinea and Gabon.

Appendix D

Table D1: Annual real capital flight from the FZ countries (million 2000 US$), 1970–2010, adjusted Morgan Guaranty method

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
Benin	-4.1	-13.6	-5.6	1.8	54.9	-111.9	-31.9	-99.5	-171.8	-187.9	-658.2	-588.3	-863.9	-161.0
Burkina Faso	44.8	38.2	32.0	-11.9	146.2	-33.9	-8.1	108.0	197.7	53.3	151.2	97.9	81.3	49.7
Cameroon	-91.7	-34.5	-295.8	-551.2	1.7	178.3	-136.4	520.4	125.2	-470.9	280.8	118.8	480.4	674.9
Central African Republic	-28.8	14.6	26.3	81.9	11.1	-3.0	63.8	-15.8	-32.0	-16.5	-12.2	150.9	108.4	91.5
Chad	58.0	164.9	168.3	160.8	82.7	308.7	36.2	126.5	135.4	88.3	73.8	-5.9	-24.0	40.7
Comoros	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	-4.6	4.6
Congo	NA	-60.9	-15.5	122.8	-246.4	-524.2	-963.9	-49.1	296.0	254.3	487.3	-319.3	741.4	480.6
Côte d'Ivoire	267.0	355.1	668.8	483.9	-9.4	1285.9	499.5	2176.6	1653.8	377.8	1511.8	355.0	1088.5	258.6
Equatorial Guinea	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Gabon	193.1	343.9	574.8	387.2	855.8	627.4	-41.0	491.8	544.7	768.3	464.2	39.3	251.8	385.2
Guinea-Bissau	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mali	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Niger	47.0	63.9	84.9	107.8	-210.8	-218.4	-344.4	-379.3	9.8	-564.2	135.1	-208.1	-392.2	10.5
Senegal	-63.5	-33.3	-81.7	-167.4	-380.4	-57.7	-283.9	28.2	-120.4	-581.6	-165.5	-180.8	-345.9	-137.5
Togo	63.8	28.4	14.1	84.7	47.4	-91.6	29.0	284.9	30.6	182.0	-11.2	-126.1	-276.9	-398.6
WAEMU[a]	355.1	438.8	712.5	498.8	-352.2	772.4	-139.8	2118.9	1599.6	-720.6	963.3	-650.4	-709.1	-378.3
CEMAC[b]	130.6	428.0	458.0	201.6	704.9	587.2	-1041.3	1073.8	1069.3	623.5	1293.9	-16.1	1557.9	1673.0
Franc Zone	485.7	866.8	1170.5	700.4	352.7	1359.6	-1181.1	3192.7	2668.9	-97.2	2257.2	-666.5	844.2	1299.3

Source: Author's computations using data from World Bank, *Global Development Finance 2011*; World Bank, *World Development Indicators 2011*; World Bank, Africa *Development Indicators 2011*; IMF, *International Financial Statistics 2011*; IMF, *Balance of Payments Statistics 2011*; IMF, *Direction of Trade Statistics 2011*; IMF, *Selected Issues and Statistical Appendix*.

a. WAEMU: Benin, Burkina Faso, Côte d'Ivoire, Guinea-Bissau, Mali, Niger, Senegal and Togo.
b. CEMAC: Cameroon, Central African Republic, Chad, Congo, Equatorial Guinea and Gabon.

Table D1 (Continued): Annual real capital flight from the FZ countries (million 2000 US$), 1970–2010, adjusted Morgan Guaranty method

	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Benin	-138.4	-178.9	-52.5	-48.4	-121.8	344.3	-136.3	-234.8	-39.5	-209.9	68.1	54.2	-84.7	-52.8
Burkina Faso	33.3	-45.4	60.0	21.2	-1.3	255.4	56.3	-11.1	150.2	107.1	53.9	437.0	302.2	59.8
Cameroon	1992.5	-487.0	2889.4	1281.1	341.5	1461.5	1655.5	941.8	1912.3	512.3	1575.9	488.4	418.8	2284.6
Central African Republic	44.4	74.1	-1.8	43.7	50.4	-11.0	48.9	82.5	-94.1	-13.0	29.2	529.5	242.8	-5.0
Chad	-44.8	-6.6	48.4	60.2	135.2	2.3	139.8	99.4	56.3	23.5	38.2	28.9	47.4	29.7
Comoros	-8.0	1.2	10.3	5.9	-6.9	4.7	-1.8	14.3	0.4	5.8	70.5	-8.5	2.8	-163.2
Congo	805.0	791.4	-330.9	1021.8	-458.4	310.8	-175.7	-107.7	430.7	73.8	-184.4	423.0	-1513.2	915.1
Côte d'Ivoire	165.5	772.7	1180.4	1924.6	1237.2	1622.6	3099.7	2087.8	1467.5	1824.4	-210.5	1808.7	778.9	1555.9
Equatorial Guinea	NA	NA	NA	39.4	31.0	18.1	7.8	44.5	32.3	54.0	60.9	20.8	33.0	23.1
Gabon	-31.6	19.7	-334.3	290.3	-141.7	265.1	460.5	159.5	-104.3	-57.2	436.5	133.2	207.5	1046.5
Guinea-Bissau	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mali	NA	-149.9	-303.0	-190.6	-329.3	-234.9	63.0	-48.3	308.5	-45.6	-90.6	53.1	-96.7	172.4
Niger	42.4	26.2	-85.6	-237.4	-157.6	-305.1	33.8	-284.9	37.1	-50.1	-80.7	-133.6	-427.7	-291.7
Senegal	-157.5	-506.9	-170.7	-58.9	-645.2	-215.8	-87.8	-592.4	-610.4	-670.3	-283.9	-46.3	-551.5	-428.1
Togo	-212.4	-84.2	-121.0	-107.1	-66.4	176.5	-81.6	-350.4	-46.0	-148.5	22.8	182.6	-32.4	-118.1
WAEMU[a]	-267.2	-166.5	507.6	1303.4	-84.2	1643.0	2947.2	565.8	1267.4	807.2	-521.1	2355.7	-111.9	897.5
CEMAC[b]	2765.4	391.6	2270.9	2736.5	-42.0	2046.8	2136.8	1220.0	2233.1	593.5	1956.4	1623.8	-563.6	4294.1
Franc Zone	2490.1	226.3	2788.8	4045.8	-133.2	3694.5	5082.2	1800.2	3500.9	1406.5	1505.9	3971.0	-672.7	5028.3

Source: Author's computations using data from World Bank, *Global Development Finance 2011*; World Bank, *World Development Indicators 2011*; World Bank, *Africa Development Indicators 2011*; IMF, *International Financial Statistics 2011*; IMF, *Balance of Payments Statistics 2011*; IMF, Direction of Trade Statistics 2011; IMF, *Selected Issues and Statistical Appendix*.

a. WAEMU: Benin, Burkina Faso, Côte d'Ivoire, Guinea-Bissau, Mali, Niger, Senegal and Togo.
b. CEMAC: Cameroon, Central African Republic, Chad, Congo, Equatorial Guinea and Gabon.

Table D1 (End): Annual real capital flight from the FZ countries (million 2000 US$), 1970–2010, adjusted Morgan Guaranty method

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Benin	-311.8	-237.7	-58.4	102.2	-62.1	-182.2	-251.0	-362.6	-17.0	263.1	619.9	432.2	327.2
Burkina Faso	210.3	12.4	-210.9	-46.6	-36.6	92.1	-180.2	-267.6	-1303.8	-73.4	195.7	134.6	-486.2
Cameroon	375.6	-397.5	441.2	-1269.2	-206.9	-1116.7	-500.7	-978.7	-4043.6	-129.5	40.9	203.2	166.1
Central African Republic	50.0	-12.9	-26.9	-36.1	227.2	-75.8	-45.1	64.7	121.3	42.4	305.3	-191.0	322.8
Chad	-23.5	-73.0	-84.4	-31.8	-644.5	26.8	429.4	506.3	27.6	-6.8	35.1	884.5	-682.6
Comoros	-151.6	-14.5	7.8	24.8	25.6	-4.1	23.2	-13.0	-15.0	3.1	-11.5	-154.0	168.0
Congo	897.9	997.4	1225.7	471.9	382.8	2230.8	3982.5	586.1	1730.4	24.1	1820.6	1159.7	1876.3
Côte d'Ivoire	-58.1	-713.0	-396.7	-508.2	789.9	3050.5	291.6	1314.0	3227.0	1734.1	397.6	-1052.8	2208.1
Equatorial Guinea	15.8	-28.9	-55.6	37.9	-17.3	159.0	-169.8	-660.3	2066.5	2043.0	1526.1	1699.4	863.3
Gabon	71.1	593.3	559.9	173.8	464.1	94.7	813.3	2335.9	1655.3	-531.2	4188.5	1572.6	2389.9
Guinea-Bissau	38.0	4.5	-143.6	-81.2	2.0	-1.6	-37.3	-61.6	313.3	74.7	93.7	79.1	771.4
Mali	-123.0	-247.9	-429.3	-357.8	269.8	-115.7	19.8	-378.8	521.5	-131.7	-183.7	-216.0	36.3
Niger	-89.3	-172.1	-416.2	-446.4	-407.9	-226.5	-403.7	-192.1	-2172.6	152.8	-357.9	-86.7	-247.8
Senegal	99.2	-372.3	-927.0	165.3	25.3	-452.4	-818.5	-552.7	-561.5	-676.7	-1794.1	-982.0	-2297.8
Togo	-51.3	-143.5	-451.9	-380.2	-261.9	-515.9	-149.9	-746.2	535.0	508.7	1658.3	2995.3	2218.5
WAEMU[a]	-286.1	-1869.7	-3034.0	-1553.0	318.5	1648.3	-1529.1	-1247.7	542.0	1851.6	629.5	1303.5	2529.8
CEMAC[b]	1386.9	1078.4	2059.7	-653.5	205.3	1318.8	4509.4	1853.9	1557.6	1442.0	7916.6	5328.5	4935.6
Franc Zone	949.2	-805.8	-966.4	-2181.6	549.4	2963.1	3003.5	593.3	2084.6	3296.7	8534.6	6478.0	7633.5

Source: Author's computations using data from World Bank, *Global Development Finance 2011*; World Bank, *World Development Indicators 2011*; World Bank, *Africa Development Indicators 2011*; IMF, International Financial Statistics 2011; IMF, *Balance of Payments Statistics 2011*; IMF, *Direction of Trade Statistics 2011*; IMF, *Selected Issues and Statistical Appendix*.

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b. CEMAC: Cameroon, Central African Republic, Chad, Congo, Equatorial Guinea and Gabon.

Appendix E

Table E1: Definition and sources of variables

Variables	Definition	Sources
Dependent variable: Economic growth (TCPT)	Growth rate of real GDP per capita	World Bank, *World Development Indicators 2011*
	Independent variables	
Variable of impact: Capital flight (FCRP)	Ratio of real capital flight to GDP (capital flight is estimated using Equations 6 and 7)	Author's computations using data from World Bank, *Global Development Finance 2011*; World Bank, *World Development Indicators 2011*; World Bank, *Africa Development Indicators 2011*; IMF, *International Financial Statistics 2011*; IMF, *Balance of Payments Statistics 2011*; IMF, *Direction of Trade Statistics 2011*; IMF, *Selected Issues and Statistical Appendix*
Control variable: Investment (INVP)	Ratio of domestic investment to GDP	World Bank, *World Development Indicators 2011* and *World Bank, Africa Development Indicators 2011*
Control variable: Inflation (INF)	Annual change in the consumer price index (CPI)	World Bank, *Africa Development Indicators 2011*
Control variable: Credit to the private sector (CPP)	Ratio of credit to the private sector to GDP	World Bank, *World Development Indicators 2011* and *World Bank, Africa Development Indicators 2011*
Control variable: Quality of institutions (QINS)	Constraints on the executive power, these constraints taking values ranging from 1 (unlimited executive authority) to 7 (executive parity or subordination)	Polity IV Project Database
Control variable: External debt (DETP)	Ratio of external debt to GDP	World Bank, *World Development Indicators 2011*
Control variable: Domestic savings (EPAP)	Ratio of domestic savings to GDP	World Bank, *World Development Indicators 2011*

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Abstract

This paper examines the effect of capital flight on economic growth in the Franc Zone (FZ). For the period 1970 to 2010, real capital flight from these countries is found to be positive and massive with a magnitude of roughly US$86.8 billion or US$80.1 billion, representing 122.1% or 112.6% of GDP, and 5.3 times or 4.9 times domestic investment. At the same time, the FZ countries experienced low and very volatile investment and growth rates. The econometric analysis shows that capital flight significantly reduces economic growth in the FZ. Capital flight thus poses a huge threat to high and sustainable economic growth in the FZ. The results also reveal that domestic investment, credit to the private sector, the quality of institutions, and domestic savings play an important role in explaining the influence of capital flight on economic growth in the FZ, and are therefore important channels that affect the growth effect of capital flight in this zone. The key implication of these results is that capital flight repatriation helps to raise significantly the volume of investment in the FZ, credit to the private sector, the quality of institutions, and domestic savings, implying that this can help FZ countries sustainably increase their economic growth.

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