Impact of Capital Flight on Domestic Investment in the Franc Zone*

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Abstract

Capital flight is a major phenomenon in the Franc Zone. It can affect the level of investment in the countries. The need to examine the impact of its occurrence can not be overemphasised. Using the residual method, adjusted for exchange rate fluctuations, trade misinvoicing, and inflation, the estimated capital flight from these countries amounted to between $53.1billion and $49.7billion over the 1970 to 2005 period. Our estimations indicate contrasted capital movements within the Franc Zone. These are of a higher magnitude in the Economic and Monetary Community of Central Africa (CEMAC) zone than in the West African Economic and Monetary Union (WAEMU), representing 81.2 percent or 84 percent of total capital outflows. Based on the Generalised Method of Moments (GMM) and the ordinary least square (OLS) method, the econometric analysis indicates that capital flight affects domestic investment in different ways. We found that the negative influence, which is more evident in private investment than public investment, is chiefly due to capital outflows from the CEMAC zone than from the WAEMU zone. Given these results, capital flight repatriation can help raise the level of domestic investment. The study proposes some policy implications for capital flight repatriation.

Keywords: Capital Flight; Domestic Investment; Private Investment; Public Investment; CEMAC; WAEMU; Franc Zone

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1. Introduction

Since the Latin American debt crisis in the early 1980s, economists have been searching for a method of estimating the scale of capital flight.

Several studies maintain that normal capital outflows must not be treated as capital flight (Deppler and Williamson 1987; Walter 1987; Kindleberger 1987). These studies indicate that normal capital outflows are driven by the portfolio diversification needs of residents or their domestic banking activities aimed at spreading their assets abroad, whereas capital flight is a result of uncertainty and a high risk on domestic assets of residents, who subsequently leave the country in order to avoid depreciation of their wealth.

However, at the empirical level, it is extremely difficult to distinguish normal capital outflows from abnormal ones (Gordon and Levine 1989). Several authors hold the view that a distinction should not be made between capital flight and normal capital outflows (Erbe 1985; World Bank 1985; Morgan Guaranty 1986 and 1988). They argue that for countries confronted with major current account deficits and payments on their external debt (and are therefore in need of foreign capital), any capital outflow increases the challenges of financing their net imports and their debt payments (Hermes *et al.* 2002).

From the latter concept of capital flight, we may define the phenomenon as any normal or abnormal capital flight. Indeed, any capital flight, be it normal or otherwise, deprives the economy of resources needed to finance its development. This seems to be a fair definition.

Based on this analysis, this paper aims to answer the following question: How does domestic investment react to a context of massive capital flight? The impact of capital flight on investment can be best assessed in relation to the theoretical framework of national income accounting. Indeed, the accounting identity of national income shows that the counterparties of domestic investment are domestic and external savings[1]. Capital flight stems from the transfer of part of private domestic savings abroad. This decreases resources available for the financing of domestic investment. Consequently, capital flight can influence domestic investment.

In the Franc zone (FZ) countries, the issue of capital outflow existed even before the debt crisis of the early 1980s. Data in the literature show a significant level of the phenomenon in the 1970s (Boyce and Ndikumana 2001; Ndikumana and Boyce 2003 and 2007). The need to undertake the mentioned research study in the FZ countries can be justified at several levels.

First, recent estimates indicate that over the 1970-2004 period, 13 FZ countries have recorded massive capital flight amounting to $50 billion

1. The accounting identity of national revenue stipulates that national revenue plus imports is equal to consumption plus investments plus exports. External saving is the opposite of the current account balance.

(Ndikumana and Boyce 2007). According to these authors, the countries belong to sub-Saharan Africa, where for each dollar of the external debt contracted during this period, about 60 cents are channelled overseas in the form of capital flight. Since the debt is supposed to partly finance investment, with such massive capital outflows, less of the debt is actually used to cover domestic investment needs.

Secondly, the FZ is more affected by the problem of scarcity of capital than the rest of sub-Saharan Africa. Indeed, from the World Bank's Africa Database (2005), it is clear that over the 1965–2003 period, the ratio of savings to GDP was lower in the FZ countries (17.7 percent) than in other African countries (23.3 percent). Besides, compared to the rest of sub-Saharan Africa, the FZ is more concerned by the decreased foreign private capital inflows since the mid 1980s (Bhattacharya *et al.* 1996).

The literature on capital flight in FZ countries is quite vast. However, with the exception of Ndikumana and Boyce (2003 and 2007) and Cerra *et al.* (2005), most of the authors did not cover the vast majority of FZ countries. Their studies cover a sample of countries, including only a few FZ states (Ojo 1992; Ajayi 1997; Hermes *et al.* 2002; Collier *et al*. 2003).

Consequently, the added value of our review of the economic literature is two-tiered. First, the study draws up an empirical framework for assessing and analysing the scale of capital flight for all FZ countries. In this regard, our paper provides a good cross analysis of the problem of capital flight in FZ countries. Second, to our knowledge, no past empirical study has taken into account capital flight as an empirical determinant of investment in the case of a sample made up exclusively of all the FZ countries. Thus, the research contributes to a better understanding of the role of capital flight in domestic investment.

The rest of the study is organised as follows: Chapter 1 examines domestic investment in FZ and its theoretical relationship with capital flight. Chapter 2 outlines the method used for measuring capital flight and provides the empirical results. Chapter 3 gives an econometric estimation of the impact of capital flight on domestic investment, provides the results, and highlights the attendant political implications.

2. Analysis of Investment and its Theoretical Relationship with Capital Flight

The aim of this chapter is primarily to provide a statistical analysis of domestic investment in the FZ, and subsequently determine the impact of capital flight on it.

2.1. Statistical analysis of domestic investment

Over the 1970-2005 period, the FZ countries received varying levels of investments, with some receiving much higher levels than others (*Table 1 measures domestic investment by gross capital formation*). Three countries received massive investment flows. These were led by Cameroon with about $64.2 billion, corresponding to $1783 million annually. It was followed by Gabon (with $52.7 billion, equivalent to $1464 million annually), and Côte d'Ivoire (with $46 billion, which worked out to $1278.9 million per annum).

The capital invested in four other countries, though on a lesser scale, was also significant, ranging between $10 billion and $25 billion. They were Congo (with $24.3 billion, equivalent to $674.6 million per annum), Senegal (with $21 billion, representing $584.6 million per annum), Mali (with $15.3 billion, translating to $424.9 million per annum), and Burkina Faso (with $10.6 billion, representing $310.6 million annually).

For the eight remaining countries, the amount of investments received over the period did not reach $10 billion. Equatorial Guinea, Chad, and Togo topped the group with $9.8 billion ($656.6 million per annum) for Equatorial Guinea, $9.7 billion ($312.9 million per annum) for Chad, and $9.2 billion ($256.7 million annually) for Togo. These countries were followed in order of investments importance by Niger, Benin, Central African

Table 1. ***Domestic Investment in FZ US$ million, 2000)***

COUNTRY	Total Investment	Average Investment	Investment in % of GDP
Benin	6822,2	189,5	16,2
Burkina Faso	10561,4	310,6	19,4
Cameroon	64192,6	1783,1	20,0
CAR	3229,7	97,9	12,3
Comoros	983,7	37,8	20,5
Congo	24285,8	674,6	28,4
Côte d'Ivoire	46040,9	1278,9	16,1
Gabon	52703,7	1464,0	33,9
Guinea Bissau	835,4	23,2	24,1
Equatorial Guinea	9848,7	656,6	42,4
Mali	15295,1	424,9	19,3
Niger	7547,0	209,6	13,5
Senegal	21046,6	584,6	15,4
Chad	9701,2	312,9	16,6
Togo	9239,8	256,7	20,9
WAEMU	117388,6	409,8	18,1
CEMAC	163961,6	831,5	25,6
Total	282333,9	553,7	21,3

Source: Estimates by the author based on World Bank data in *Africa Development Indicators 2007* (CD-ROM Edition).
NB: In the table, domestic investment is measured by gross capital formation (World Bank, Africa Development Indicators, 2007).

Table 2. ***Descriptive Statistics of Domestic Investment in FZ***

Statistical Indicators	Domestic investment
Average	553.7
Minimum	10.173
Maximum	3729.1
Standard deviation	642.4
Coefficient of variation	116.02%
Observations	499

Source: Calculations by the author based on data from World Bank, *Africa Development Indicators 2007* (CD-ROM Edition).
NB: In the table, domestic investment is measured by gross capital formation (World Bank, *Africa Development Indicators*, 2007).

Republic, where investments ranged between $3 billion and $8 billion, and Comoros and Guinea Bissau, with investments worth less than $1 billion).

On the whole, the investments were higher in the CEMAC zone than in the WAEMU zone. Indeed, for the entire study period, capital invested in the CEMAC zone amounted to $164 billion (representing 58.1 percent of the total amount invested in the FZ), compared with $117.4 billion for the WAEMU zone. The difference can be accounted for by the productive structure of the CEMAC countries. They are mainly rent economies, and can therefore attract more investments. For the entire FZ, the total volume of investments received amounted to $282 billion, representing an annual average of $553.7 million.

The preponderance of investment in the CEMAC zone compared to the WAEMU zone is also confirmed by the investment-to-GDP ratio of 25.6 percent, compared to 18.1 percent for the WAEMU. For the FZ, investment represents 21.3 percent of GDP. Taken individually, it appears that the investment rate is not higher in countries with the highest levels of investment.

Differences in volumes of investments received by the FZ countries can also be assessed through descriptive statistics (Cf. Table 2). Indeed, it should be noted that the lowest level of investment during the period under examination was $10.2 million, whereas the highest amount was $3729.1 million. Guinea Bissau recorded this low level in 1975, while the largest volume was invested in Gabon in 1976. These figures show a high variability of domestic investment with a coefficient of variation of 116.02 percent.

However, the role of investment as a key factor of economic growth has often been recognised in literature for a long time. In fact, Keynesian analysis has always considered investment to be the fundamental variable of economic growth. Consequently, this volatility in domestic investment can slow down economic growth and result in macroeconomic instability in this zone.

The domestic investment variability in FZ can also be represented through a representative curve of its trend over the 1970-2005 period (Cf. Chart 1). The chart shows that the FZ is marked by irregular levels of

Chart 1: ***Trend of Franc Zone Domestic Investment: 1970-2005 (US$ million, 2000)***

Source: World Bank, *Africa Development Indicators 2007* (CD-ROM Edition)
NB: On this chart, domestic investment is measured by gross capital formation (World Bank, *Africa Development Indicators*, 2007).

investment, with the low periods outstripping high periods. Indeed, for the entire FZ, from 1970 to 2000, domestic investment did not exceed the $9.9 billion level since 1981. There was an improvement between 2001 and 2005 with $10.9 billion and $11.7 billion respectively.

This decline in investment since 1981 (until 2000) can be partly explained by the external debt crisis in developing countries in the early 1980s. In fact, at that time, the situation of the capital account of African countries was paradoxical, since it was marked by the simultaneous emergence of a high level of accumulated external debt and a severe financial haemorrhage in the form of capital flight (Ajayi 1992 and 1997; Ndikumana 2005). The FZ countries also form part of African countries whose capital account shows a distressing paradox. Some of the capital that fled the FZ came from loans to countries in the zone. Indeed, according to Bank of France estimates (1987), over the 1973-1987 period, the share of the external debt leaving the FZ countries as capital flight was 28 percent. Other studies show that for each dollar of external debt contracted by an FZ country, about 75 to 90 cents (Hermes and Lensink 1992) or 80 cents (Ndikumana and Boyce 2003) or

60 cents (Ndikumana and Boyce 2007) are re-exported abroad in the form of capital flight.

These various estimates show that the external debt is a significant source of increased capital flight. And yet, one of the functions of the external debt is to help finance domestic investment. Therefore, the longer the phenomenon of capital flight persists, the scarcer the external debt resources for investment. Consequently, through the external debt, capital flight can result in reduced domestic investment. The following section examines an analysis of the relationship between capital flight and investment.

2.2. Theoretical Analysis of the Impact of Capital Flight on Investment

Capital flight could lead to a decline in domestic investment in several ways:

Private domestic savings

Capital flight stems from the transfer abroad of part of private domestic savings. Hence it results in a decrease in savings and banks collecting less saving deposits. This can compel them to grant fewer credits, and leads to the dwindling of available resources for the financing of domestic investment.

Government Revenue

Capital flight leads to an erosion of the tax base (Ajayi 1997), resulting in reduced government revenue. The consequence of this is decreased public investment, which, in return, can affect private investment.

Furthermore, reduced public revenue can compel the government to increase seignorage thereby leading to a hike in inflation tax. This can encourage investors to flee the domestic environment in order to avoid the depreciation of the real value of their domestic assets brought about by the effects of the increased inflation tax. They are therefore compelled to explore investment opportunities abroad, in accordance with the Portfolio Selection Theory (Collier *et al.* 2004).

Uncertainty of Government Policies

Increased capital flight can raise uncertainty about the government's capacity to finance its budget deficit or its debt. Continued budget deficits increase government financing needs, resulting in inflationary tensions. This situation increases the risks of erosion of domestic assets held by private investors. It implies a reduction in private investment.

From another angle, continued budget deficits can render the debt unsustainable. This can result in two situations. The first is related to a risk of bankruptcy of private enterprises (in the case of domestic debt). If this

happens, it will impede private investment. The second is the risk of deterioration of the quality of government signature. This situation sends a poor signal to the financial market. In other words, if the government issued public bonds, investors could shy from subscribing to them.

Furthermore, persisting debt can compel investors to anticipate increased taxes by the government to address this situation. This can increase risks of depreciation of the actual value of domestic assets of private investors, compelling them to modify the composition of their portfolio in favour of foreign assets.

Speculative Bubbles

With the phenomenon of capital flight, there is less control over outflows. And yet, unregulated capital outflows increase speculative bubbles that fuel macroeconomic uncertainty, leading to increased risks of loss of private domestic assets. This results in a decline in private investments, since residents will flee the domestic environment together with their assets in order to avert losing their wealth.

Capital Inflows

As indicated previously, the external debt is a channel through which capital flight could result in reduced investment. Apart from the external debt, there is another source of capital inflow, which also represents a potential channel, namely aid. Indeed, Bauer (1981) states that development aid could be used to finance capital flight. Empirical evidence supports this assumption, according to which part of aid is re-exported in the form of capital flight (Hermes and Lensink 2001, and Lensink *et al.* 2000). To the extent that one of the functions of aid is to finance domestic investment, persistent capital flight renders aid less available for the financing of domestic investment.

Corruption

Generally, it is political leaders who cause capital flight. They profit from their privileged position to acquire and transfer funds abroad (Boyce and Ndikumana 2001). Indeed, according to Burns *et al.* (1997), Mobutu Sese Seko, who served as president of Zaïre (present Democratic Republic of Congo) from 1965 to 1997, accumulated $4 billion as external private assets in the mid-1980s. Moreover, Onishi (1999) reveals that the Swiss bank accounts of the family of General Sani Abacha, who was Nigeria's Head of State for five years, contained not less than $2 billion. An investigation conducted by the US Senate in the same period shows that the Abacha family also held bank accounts worth several million dollars in Citibank branches in London and New York (Gerth 1999; O'Brien 1999).

These examples show the key role of corruption in aggravating capital flight. In other words, the persistence of the phenomenon can reflect a high level of corruption in the domestic environment. This does not encourage investors to explore domestic investment opportunities.

We have shown that capital flight can account for a decline in domestic investment. Before determining from the econometric perspective, the proportions by which capital flight reduces investment, we shall attempt to describe the method for assessing the scale of the phenomenon.

3. Capital Flight using the Residual Method: Significant but Contrasting Capital Flows

In view of the lack of consensus on the definition of capital flight, measuring this concept is not a simple task. Indeed, economic literature provides several methods for measuring capital flight: The residual method, the Dooley method, the "hot money" method, and the assets method (Claessens and Naudé 1993; Murinde *et al.* 1996; Hermes *et al.* 2002; Ajayi 2007).

Estimates on capital flight from FZ countries available in the literature are given in annex (Cf. table A.1 in Annex 2). These estimates differ in terms of methods, the period covered and the sample used.

3.1. Method for Estimating Capital Flight

This study provides estimated capital flight from all the 15 FZ countries, namely Benin, Burkina Faso, Cameroon, Central African Republic, Comoros, Congo, Côte d'Ivoire, Gabon, Guinea Bissau, Equatorial Guinea, Mali, Niger, Senegal, Chad, and Togo. In view of the lack of data and the year of entry by some countries into the FZ, the period of the study is not the same for all the countries:

– 1970-2005 for Benin, Burkina Faso, Cameroon, Central African Republic, Côte d'Ivoire, Niger, Senegal, Chad and Togo;

– 1980-2005 for Comoros[2]; 1971-2005 for Congo; 1970-2004 for Gabon;

– 1998-2005 for Guinea Bissau which joined the WAEMU on May 2 , 1997;

– 1987-2005 for Equatorial Guinea, which joined the WAEMU on January 1, 1985;

– 1985-2005 for Mali, which signed up to the WAMU Treaty on 1 June 1984.

We shall use the residual method to measure capital flight. The choice of this method is justified by the fact that, according to Hermes *et al.* (2002), the

2. The 1980-2005 period was used for the World Bank method. But for the Morgan Guaranty method, the 1982-2005 period was used since assets held abroad by Comorian domestic banks are available for the 1982- 2005 period only.

other methods have serious limitations. They argue that the Dooley (1986) and the "hot money" methods are flawed to the extent that empirically, it is impossible to make a distinction between normal and abnormal capital. They also consider the assets method to be unduly restrictive.

According to the residual method, capital flight in year *t* for country *i* is equal to (*see Annex 1 for a definition of other methods, in particular those of Dooley, "hot money" and assets*):

$$FC_{rit} = (\Delta DET_{it} + INDE_{it}) - (CC_{it} + \Delta RES_{it}) \quad (1)$$

FC_r is capital flight using the residual method. ΔDET is the change in the external debt given in the World Bank data, while INDE is net foreign direct investment. CC is the current account balance and ΔRES is the change in foreign exchange reserves.

The residual method was developed by the World Bank (1985) and Erbe (1985). Morgan Guaranty (1986) uses this method but adds another point: Fluctuation in foreign assets held by domestic banks (ΔABD). Thus, according to the Morgan Guaranty method (1986) (FC_m), capital flight is:

$$FC_{rit} = (\Delta DET_{it} + INDE_{it}) - (CC_{it} + \Delta RES_{it}) - \Delta ABD_{it} \quad (2)$$

In this study, we shall use the two versions of the residual method. Furthermore, following the Boyce and Ndikumana (2001), and Ndikumana and Boyce (2003 and 2007) approach, we shall adjust the two versions of the residual method successively for foreign exchange fluctuations, trade misinvoicing, and inflation[3].

3.1.1. Adjustment for Foreign Exchange Fluctuations

The World Bank data on debt are in a common currency (US dollar). However, countries contract debts in different currencies. The long term debt of the 15 FZ countries is in 10 different currencies, including the German Deutsche Mark, Euro, French Franc, Japanese Yen, British Sterling Pound, the Swiss Franc, the IMF Special Drawing Rights (SDR), the US Dollar, multiple currency and other unspecified currencies (Cf. tableau 3).

The World Bank data on the debt is converted into dollars using the end-of-year exchange rate. Exchange rate fluctuations will lead to changes in debt levels. To correct the unstable nature of the debt, Boyce and Ndikumana

3. In addition to these three adjustments, Boyce and Ndikumana (2001) had made a fourth one — revenues less interests. As the two authors indicate, adjustment for inflation helps to adequately analyse the causes and effects of capital flight, whereas revenue less interest adjustment enables a comparison of capital flight with other aggregates, such as the external debt. However, since our study aims to analyse the effect of capital flight on investment, we only consider adjustment for inflation.

Table 3. ***Composition of the Long-Term Debt of FZ Countries in Different Currencies (%)***

COUNTRY	Deutsch Mark	Euro	French Franc	Japanese Yen	Pound Sterling	Swiss Franc	SDR	US Dollar	Multiple Currencies	Other Currencies
Bénin	1,3	1,1	20,7	0,6	0,6	0,2	1,2	35,9	7,9	30,5
Burkina Faso	4,6	0,5	22,6	0,0	2,5	0,0	1,5	37,2	11,9	19,3
Cameroon	10,3	8,6	23,8	0,3	2,0	0,5	0,1	21,2	12,2	21,0
CAR	4,3	0,9	19,3	0,3	0,4	3,1	4,1	10,2	11,8	15,6
Comoros	0	1,9	29,5	0	0	0	0,9	24,9	4,7	38,1
Congo	2,3	6,0	30,2	0,1	3,8	0,6	0,4	21,9	4,7	30,0
Côte d'Ivoire	4,3	4,3	27,4	0,7	0,7	2,3	0,3	34,6	13,3	12,1
Gabon	5,3	7,5	38,0	0,9	3,4	0,6	0,0	24,2	6,0	14,0
Guinea Bissau	0,2	1,6	2,9	0,0	0,0	6,0	0,0	29,0	17,0	29,4
Equatorial Guinea	2,3	4,1	3,3	0,0	0,0	0,0	0,0	29,0	17,0	29,4
Mali	2,1	2,2	20,5	1,0	9,4	3,8	0,1	19,4	10,9	30,6
Niger	3,5	2,6	40,8	1,0	0,7	0,1	1,6	27,8	0,5	21,4
Senegal	6,0	2,3	23,4	1,2	0,2	0,4	0,6	33,3	8,0	24,5
Chad	2,6	0,64	11,5	0	0,2	0	0,2	36,3	15,6	33,0
Togo	13,0	2,4	13,4	2,2	3,6	7,3	0,5	34,0	4,6	18,8
Sample	4,1	3,1	21,8	0,6	1,8	1,7	0,8	29,9	9,1	26,2

Source: Computations by the author using World Bank data, *Global Development Finance 2007* (Edition CD-ROM).
NB: The data represent the average of annual data on the composition of the long term debt of FZ countries in various currencies over the 1970-2005 period.

(2001) adjust long term debt variations for foreign exchange fluctuations as follows:

$$\Delta DETAJU_t = DET_t - \text{NOUDET}_{t-1} \quad (3)$$

ΔDETAJU is the debt variation adjusted for foreign exchange fluctuations. DET_t is the debt stock for year *t* using the end-of-year *t* exchange rate. NOUDET_{t-1} is the debt stock for year t-1 adjusted for end-of-year *t* exchange rate. NOUDET_{t-1} is calculated as follows:

$$NOUDET_{i,t-1} = \sum_{j=1}^{7}(\alpha_{ij,t-1} * DETLT_{i,t-1})/(TC_{jt}/TC_{j,t-1}) +$$
$$CRFMI_{i,t-1}/(TC_{DTS,t}/TC_{DTS,t-1}) + AUTRELT_{i,t-1} + MULTLT_{i,t-1} \quad (4)$$

DETLT is the long term debt and α_{ij} is the proportion of long term debt held in currency j (j = French Franc, German Mark, Yen, Swiss Franc, SDR, Pound Sterling, Euro[4]). TC denotes the end-of-year exchange rate of the currency of the debt in relation to the dollar (expressed in units of this currency per dollar). CRIMF represents the IMF credit in SDR, while AUTRELT stands for the long-term debt in "other currencies". MULTLT is the long-term debt in "multiple currencies", and DETLTEU is the long-term debt in US dollars. DETCT is the short-term debt.

Thus, taking into account this adjustment and two versions of the residual method (1985) of the World Bank and Morgan Guaranty (1986), the equations for capital flight are as follows:

$$FC(BM)_{TCit} = (\Delta DETAJU_{it} + INDE_{it}) - (CC_{it} + \Delta RES_{it}) \quad (5)$$

$$FC(MG)_{TCit} = (\Delta DETAJU_{it} + INDE_{it}) - (CC_{it} + \Delta RES_{it}) - \Delta ABD_{it} \quad (6)$$

$\text{FC(BM)}_{\text{TC}}$ denotes capital flight computed on the basis of the World Bank(1985) residual method adjusted for fluctuations in exchange rate. $\text{FC(MG)}_{\text{TC}}$ is calculated capital using the residual method version of Morgan Guaranty (1986), adjusted for exchange rate fluctuations.

3.1.2. Adjustment for trade misinvoicing

Following Ajayi (1997), Boyce and Ndikumana (2001), and Ndikumana and Boyce (2003 and 2007), we compute trade misinvoicing between FZ countries and their trading partners in industrialised countries by comparing data on exports and imports of these countries to those of their trading partners. The total amount of the said trade misinvoicing (FALSCOM) is equal to:

4. Euro (from 2001); Deutsche mark and French franc (until 2000).

$$FALSOM_{it} = \frac{DEX_{it}}{PMEX_i} + \frac{DIM_{it}}{PMIM_i} \quad (7)$$

In this calculation, DEX is the export differential between FZ countries and industrialised countries. DIM is import differential between FZ countries and industrialised countries. PMEX represents the share of industrialised countries in the exports of a FZ country, and PMIM is the average share of industrialised countries in the imports of a FZ country. The calculation of DEX and DIM is as follows:

$$DEX_{it} = IMPI_{it} - (EXPAZF_{it}{}^{*}CAF_t) \quad (8)$$

$$DIM_{it} = IMPAZF_{it} - (EXPI_{it}{}^{*}CAF_t) \quad (9)$$

IMPI represents the industrialised countries' imports from an FZ country. IMPAZF is the imports of an FZ country from industrialised countries, while EXPAZF is exports of an FZ country to industrialised countries. EXPI stands for the exports from industrialised countries to FZ countries, and CAF is the CIF/FOB factor representing insurance and freight costs.

3.1.3. Adjustment for Inflation

In view of the fact that all the data is expressed in dollars, following Boyce and Ndikumana (2001), and Ndikumana and Boyce (2003 and 2007), we shall use the US producer price index to make inflation adjustment to capital flight. This adjustment will help obtain the actual values of capital flight. Taking into account the three adjustments indicated above, we calculate actual capital flight as follows:

$$FCR(BM)_{it} = \frac{(\Delta DETAJU_{it} + INDE_{it}) - (CC_{it} + \Delta RES_{it}) + FALSCOM_{it}}{IPPEU_t} \quad (10)$$

$$FCR(MG)_{it} = FCR(BM)_{it} - \frac{\Delta ABD_{it}}{IPPEU_t} \quad (11)$$

FCR (BM) denotes the real capital flight using the World Bank (1985) residual method and adjusted for foreign exchange fluctuations, trade misinvoicing and inflation. FCR (MG) is the real capital flight calculated using the Morgan Guaranty (1986) residual method and adjusted for foreign exchange fluctuations, trade misinvoicing and inflation. ABD represents assets held abroad by domestic banks, and IPPEU is the US producer price index.

Using this method of capital flight measurement, we obtain results analysed in the following section.

3.2. Estimated Capital Flight Results

Annual values of real capital flight reveal that the phenomenon did not begin only at the start of the 1980s debt crisis (*Cf. Table A.2 in Annex 3*). Indeed, for many countries in the sample, the amounts of the pre-1980 capital flight were higher than those of 1980. These results are consistent with those of Ndikumana and Boyce (2007).

Using these annual data, we calculated the total and average values of real capital flight over the period concerning each country (*Cf. Table 4*). The table shows that seven countries in the sample recorded positive capital flight. These are Burkina Faso, Cameroon, the Central African Republic, Congo, Côte d'Ivoire, Gabon, and Chad. Côte d'Ivoire tops the group with massive capital flight amounting to $34.4 billion (annual average of $956.7 million) or $34.1 billion (annual average of $946.1 million). With the World Bank method, Côte d'Ivoire is followed by Cameroon ($14.8 billion), Congo ($13.1 billion), Gabon ($11.4 billion), Chad ($2.247 billion), Burkina Faso ($2.244 billion) and the Central Africa Republic ($1.6 billion). This ranking of the countries is confirmed with the Morgan Guaranty method. Similarly, the ranking is confirmed when average values of capital flight are used as comparison indicator.

Real capital flight is negative for the other eight countries in the sample, indicating that they benefited from capital inflows. The eight countries are Benin, Comoros, Guinea Bissau, Equatorial Guinea, Mali, Niger, Senegal, and Togo[5]. In this group, Senegal had the highest volume of capital inflows with -$273.6 million or -$289.7 million per annum. Using the World Bank method, Senegal is followed by Niger, Benin, and Togo. For each of these three countries, capital inflow exceed $100 million per year). The volumes of capital inflows for the other countries were as follows: Mali (-$96.3 million per annum), Guinea Bissau (-$36.8 million per annum), Equatorial Guinea (-$10.9 million per annum), and the Comoros (-$6.4 million per annum). This ranking of the countries is confirmed by the Morgan Guaranty method, except that Mali's capital inflows (-$107.4 million per annum) slightly exceed those of Togo (-$106.3 million per annum).

This negative capital is partly accounted for by the size of migrants' remittances recorded in these countries. Indeed, Benin, the Comoros, Guinea Bissau, Mali, Senegal, and Togo rank among the top 10 countries sub-Saharan Africa receiving migrant remittances, both in terms of volumes and percentage of the GDP or exports (Gupta *et al.* 2007). For Equatorial Guinea, negative capital flight can be accounted for in terms of the predominance of domestic investment rate. Over the 1970-2005 period, Equatorial Guinea received the highest domestic investment in the FZ. It reached 42.4 percent (Cf. Table 1 above).

5. Since these countries do not have the same periods, the annual average of capital flight becomes the best indicator for comparing capital outflows.

Table 4. ***Total and Average Values of Real Capital Flight in the FZ countries (US$ million 2000)***

	Real Capital FLight (World Bank)		Real Capital FLight (Morgan)		
COUNTRY	**Total Amount**	**Annual Average**	**Total Amount**	**Annual Average**	**Periode**
Bénin	– 4 711,7	– 130,9	– 5 036,2	– 139,9	1970-2005
Burkina Faso	2 244,7	62,4	1 998,2	55,5	1970-2005
Cameroon	14 885,1	413,5	14 415,7	400,4	1970-2005
CAR	1 633,8	45,4	1 605,8	44,6	1970-2005
Comoros	– 166,5	– 6,4	– 174,3	– 7,3	1980-2005
Congo	13 147,4	375,6	12 979,4	370,8	1971-2005
Côte d'Ivoire	34 441,8	956,7	34 058,3	946,1	1970-2005
Gabon	11 433,1	326,7	11 006,5	314,5	1970-2004
Guinee Bissau	– 294,8	– 36,8	– 280,7	– 35,1	1998-2005
Equatorial Guinea	– 207,9	– 10,9	– 354,2	– 18,6	1987-2005
Mali	– 2 022,0	– 96,3	– 2 254,6	– 107,4	1985-2005
Niger	– 6 015,8	– 167,1	– 6 127,6	– 170,2	1970-2005
Senegal	– 9 851,2	– 273,6	– 10 430,5	– 289,7	1970-2005
Chad	2 247,5	62,4	2 177,3	60,5	1970-2005
Togo	– 3 634,4	– 101,0	– 3 826,6	– 106,3	1970-2005
WAEMU	10 156,5	26,7	8 100,2	19,1	
CEMAC	43 139,0	202,1	41 830,5	195,4	
Total	53 129,1	94,6	49 756,4	87,9	

Source: Calculations by author using data from:
–World Bank, *Global Development Finance 2007* (CD-ROM Edition)
–World Bank, *World Development Indicators 2007* (CD-ROM Edition)
–IMF, *International Financial Statistics 2007* (CD-ROM Edition)
–IMF, *Balance of Payments Statistics* (CD-ROM 2004 Edition supplemented by yearbooks)
–IMF, *Direction of Trade Statistics* (Edition CD-ROM 2004 supplemented by yearbooks)
–IMF, *Selected Issues and Statistical Appendix* (in www.imf.org)

Note that in this table:
–The calculation of real values of capital flight entails an adjustment of capital flight for fluctuations of exchange rate, trade misinvoicing, and inflation (Boyce and Ndikumana 2001).
–For Comoros, the period is 1980-2005 with the World Bank method, and 1982-2005 with the Morgan Guaranty method.
–WAEMU comprises Benin, Burkina Faso, Côte d'Ivoire, Guinea Bissau, Mali, Niger, Senegal, and Togo.
–CEMAC comprises Cameroon, Central African Republic, Congo, Gabon, Equatorial Guinea, and Chad.

For the FZ on the whole, there is massive capital flight amounting to about $53.1 billion (on average $94.6 million per annum) or $49.7 billion (on average $87.9 million per annum).

Problems of capital flight are more acute in the CEMAC zone than in the WAEMU zone. Indeed, capital outflows from the CEMAC zone amount to $43.1 billion, compared to $10.1 billion for the WAEMU zone (World Bank method). Using the Morgan Guaranty method, CEMAC capital flight amounts to $41.8 billion, against $8.1 billion for the WAEMU. In percentage terms, capital flight in CEMAC represents 81.2 percent or 84 percent that of the FZ, depending on the measurement technique used.

This predominance of capital flight in the CEMAC may be explained by the productive structure of these countries, all of which produce oil as well as

Table 5. ***Real Capital Flight in % of GDP and Domestic Investment***

	Real Capital Flight (World Bank)		Real Capital Flight (Morgan Guaranty)		
COUNTRY	**% GDP**	**% Investment**	**% GDP**	**% Investment**	**Period**
Benin	– 171,1	– 854,0	– 182,9	– 912,8	1970-2005
Burkina Faso	67,3	374,5	59,9	335,9	1970-2005
Cameroon	123,5	637,9	119,6	617,8	1970-2005
CAR	178,0	3 018,1	175,0	2 970,4	1970-2005
Comoros	– 71,9	– 772,3	– 75,3	– 808,7	1980-2005
Congo	329,8	1 468,3	325,6	1 449,5	1971-2005
Côte d'Ivoire	329,0	3 196,1	324,5	3 160,5	1970-2005
Gabon	217,4	943,1	209,3	907,9	1970-2004
Guinea Bissau	– 138,1	– 1 372,1	– 131,5	– 1 306,8	1998-2005
Equatorial Guinea	– 5,5	– 11,6	– 9,3	– 19,7	1987-2005
Mali	– 61,4	– 217,4	– 68,4	– 212,4	1985-2005
Niger	– 27,5	– 1 488,3	– 280,6	– 1 516,0	1970-2005
Senegal	– 178,4	– 641,2	– 188,9	– 678,9	1970-2005
Chad	86,4	399,0	83,7	386,5	1970-2005
Togo	– 241,9	– 1 164,9	– 254,7	– 1 226,5	1970-2005
WAEMU	34,7	182,6	27,7	145,6	
CEMAC	150,8	629,3	146,2	610,2	
Total	91,4	427,1	85,6	400,0	

Source: Calculations by author using data from:
– World Bank, *Global Development Finance 2007* (Edition CD-ROM)
– World Bank, *World Development Indicators 2007* (Edition CD-ROM)
– IMF, *International Financial Statistics 2007* (Edition CD-ROM)
– IMF, *Balance of Payments Statistics* (Edition CD-ROM 2004 supplemented by yearbooks)
– IMF, *Direction of Trade Statistics* (Edition CD-ROM 2004 supplemented by yearbooks)
– IMF, *Selected Issues and Statistical Appendix* (in www.imf.org)

Note that in this table:
– The real values of capital flight are derived from the results of Table 4.
– For the Comoros, the period is 1980-2005 with the World Bank method, and 1982-2005 with the Morgan Guaranty method.
– WAEMU comprises Benin, Burkina Faso, Côte d'Ivoire, Guinea Bissau, Mali, Niger, Senegal, and Togo.
– CEMAC comprises Cameroon, Central African Republic, Congo, Gabon, Equatorial Guinea, and Chad.
– In this table, domestic investment is measured by the gross capital formation (World Bank Africa Development Indicators, 2007).

other types of natural resources. The abundance of natural resources in these countries constitutes a major factor in the level of corruption (Leite and Weidmann 1999; Stevens 2003; Wurthmann 2006), and can consequently be an aggravating factor of capital flight.

To better appreciate the scale of capital flight, it is important to compare it with macroeconomic variables (*Cf. Table 5*). This table shows that the burden of capital flight in relation to GDP is not heavier in countries with the largest capital flight in absolute terms. In measuring capital flight in terms of percentage of the GDP, Congo ranks first with a ratio of 329.8 percent or 325.6 percent. It is followed by Côte d'Ivoire with 329 percent or 325.4 percent. For Gabon, it is 217.4 percent or 209.3 percent. Central African

Republic follows with 178 percent or 175 percent. The ratio of capital flight to GDP for Cameroon with 123.5 percent or 119.6 percent, while for Chad and Burkina Faso, it is less than 100 percent.

In the group of countries with negative capital flight, Niger receives the highest level of capital inflows in terms of percentage of GDP, followed by Togo, Senegal, Benin, Guinea Bissau, Comoros, Mali, and Equatorial Guinea. For each of these first five countries, capital inflows exceed the level of the GDP. In contrast, capital received by the last three countries is less than their respective GDPs.

The ratio of capital flight to GDP for the 15 countries in the sample amounts to 91.4 percent or 85.6 percent. The burden of capital flight on the GDP is heavier in the CEMAC zone than in the WAEMU zone. Capital flight represents about 1.5 times the CEMAC GDP, whereas capital outflows from the WAEMU zone is less than half the GDP of this sub-region.

Concerning domestic investment, for countries with net capital outflows, capital flight does not exceed the level of investment (*Cf. Table 5*). In this group of countries, Côte d'Ivoire, Central African Republic, and Congo are the hardest hit by capital flight, representing over 31-fold, 29-fold and four times respectively, of the investment level. For the remaining countries in the group, the scale of capital outflows is just as significant, albeit less acute. Capital flight represents over 9-fold and 6-fold investments in Gabon and in Cameroon respectively, and over 3-fold the level of investment in Burkina Faso and in Chad.

For countries that have experienced negative capital flight, namely Niger, Guinea Bissau, and Togo, capital inflows outstrip investment by more than 14 times, 13 times and 11 times respectively. Benin, Comoros, Senegal, and Mali have also benefited from capital inflows in excess of investment by over eight times, seven times, six times, and two times, respectively. Only Equatorial Guinea received capital inflows less than the investment, with a ratio of -11.6 percent or -19.7 percent.

Capital flight exceeds investment by more than six times in the CEMAC zone, and on average 1.6 times in the WAEMU zone. For all the FZ countries, it represents about four times the level of investment.

The scale of capital flight is such that it outstrips the level of domestic investment. Thus, the higher the capital outflows, the more limited the resources available for domestic investment needs of FZ countries. It is important to estimate the proportions in which these outflows can reduce investment. This is the aim of the following chapter.

4. Econometric Estimation

We shall apply a three-stage methodological approach. First, we will examine the effect of capital flight on total domestic investment from an econometric perspective. Subsequently, we shall make an estimation of the

impact of capital flight on private investment and public investment to determine whether the effect of capital outflow on total domestic investment is through private investment or public investment. Lastly, in view of the fact that the share of the CEMAC zone in total capital movements in the FZ zone is predominant, we shall analyse the influence of capital flight from the CEMAC and that of the WAEMU on the level of domestic investment in ZF.

4.1. Impact of capital flight on total domestic investment

To determine the impact, we shall use the following basic equation:

$$INVP_{it} = \alpha_1 INVP_{i,t-1} + \alpha_2 \Delta FCRP_{i,t-1} + \alpha_3 X_{it} + \alpha_4 Y_{it} + u_i + v_t + \varepsilon_{it} \qquad (12)$$

– INVP is the ratio of domestic investment to GDP. Investment is measured by the gross capital formation (World Bank, Africa Development Indicators 2007). Empirical evidence shows that past domestic investment positively impacts on its current level (Asante 2000 and Ndikumana 2003).

– FCRP is the ratio of real capital flight to GDP. The annual values of capital flight are given in Table A.2 of Annex 3. With regard to the theory, we expect a negative coefficient of capital flight.

– X represents the vector of macroeconomic control variables. Of these, we considered the following: Real GDP growth rate (GGR), the private sector credit to GDP (CPP) ratio, and the rate of inflation (INF), measured by the annual change of the GDP deflator[6]. These control variables help in taking account of the effect of the macroeconomic environment on domestic investment.

– Y denotes the vector of institutional control variables including the quality of institutions measured by constraints on the executive (CONEX), with the values of such constraints ranging from one (worst institutional quality) to seven (best institutional quality) (*Cf. Polity IV Project database*); governance (GOUVER) measured by the political regime index (Polity 2) with values ranging from -10 (worst governance) to +10 (best governance) (*Cf. Polity IV Project database*). These control variables help to account for the influence of institutional environment on domestic investment.

– u is the specific country effect. v is the specific temporal effect, and &#03B5; is the error term of the model.

Since capital flight, investment, and credit to the private sector are in dollars, whereas the other variables (economic growth rate, inflation, quality of institutions, and governance) are without units, the model needs to be harmonised by presenting the variables in dollars without units. To do this following the past empirical studies on the explanation for investment

6. In view of the lack of data for the period of study for some countries in the sample we made estimates of the rate of inflation using the GDP deflator variation.

(Asante 2000 and Ndikumana 2003), we divide the dollar variables by the GDP. Thus, in the equation (12), all the variables are without units.

All the variables have been defined and their sources indicated (*Cf. Table A.3. in Annex 4*).

We adopt the Generalised Method of Moments (GMM), which handles problems by using delay-dependent variables as independent variables as well as other sources of endogeneity. In our study, since past investment is taken to be an explanatory variable of the current investment, there is a risk of endogeneity problems. Furthermore, some independent variables, such as economic growth rate, can increase if investment increases. Consequently, the growth rate appears to be a potential endogenous variable to the model.

The Hausman endogeneity test indicates that the delayed variable (past investment) and economic growth rate are indeed endogenous variables of the model. These considerations therefore justify the choice of the GMM method to address these endogeneity problems. We shall consider the GMM estimator in the Bludell and Bank system (1998), since these authors have shown that it is more efficient than the GMM, an initial difference from Arellano and Bond (1991) (Kpodar 2005).

The results show that, irrespective of the capital flight measurement method used in this study, capital movements affect total domestic investment negatively and significantly (*Cf. tables 6 and 7*). Consequently, financial haemorrhage in the form of capital flight provides the FZ with less available resources for the financing of domestic investment. This negative influence of capital flight on investment remains valid even after verifying macroeconomic variables (economic growth rates, credit to the private sector, and inflation) or institutional variables (governance and quality of institutions).

Capital movements have coefficients ranging from -0.040 to -0.045, which gives an average of -0.043 (*Cf. Table 6*), and -0.039 to -0.050, producing an average of -0.045 (*Cf. Table 7*). Since capital flight and total domestic investment are measured in percentage of GDP, it means that for each dollar that exits in an FZ country in the form of capital flight, 4.3 percent or 4.5 percent deprives the economy of resources that could have been used to finance domestic investment.

4.2. Impact of Capital Flight on Private and Public Investment

We estimate the following equations:

$$INVPRI_{it} = \alpha_1 INVPRI_{i,t-1} + \alpha_2 \Delta FCRP_{i,t-3} + \alpha_3 TCP_{i,t-6} + u_i + v_t + \varepsilon_{it} \quad (13)$$

$$INVPUB_{it} = \alpha_1 INVPUB_{i,t-1} + \alpha_2 \Delta FCRP_{i,t-3} + \alpha_3 TCP_{i,t-6} + u_i + v_t + \varepsilon_{it} \quad (14)$$

Table 6. ***Impact of Capital Flight on Total Domestic Investment, World Bank*** [#]

Explanatory variables[##]	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**
Capital flight ($\Delta FCRP_{-1}$)	-0.040 (2.27)**	-0.042 (2.32)**	-0.044 (1.82)*	-0.045 (2.03)*	-0.044 (2.34)**
Past investment ($INVP_{-1}$)		0.481 (2.27)**	0.468 (2.29)**	0.560 (3.14)***	0.478 (2.26)**
Credit to private sector (ΔCPP)			0.668 (2.45)**	0.612 (2.22)**	
Economic growth rate (TCP_{-2})			0.768 (2.21)**	0.490 (1.47)	
Rate of inflation (INF_{-3})				-0.118 (2.14)*	
Governance ($\Delta GOUVER$)					0.000 (0.12)
Quality of institutions ($CONEX_{-1}$)					0.000 (2.24)**
Constant	0.208 (10.06)***	0.108 (2.16)**	0.086 (2.17)**	0.085 (2.57)**	0.109 (2.18)**
Observations	430	427	423	411	427
Countries	15	15	15	15	15
AR(1) test	0.312	0.039	0.054	0.067	0.039
AR(2) test	0.828	0.406	0.202	0.959	0.400
Hansen test	0.244	0.364	0.226	0.443	0.343
Robust t statistics in parentheses					
* significant at 10%; ** significant at 5%; *** significant at 1%					

In this table, capital flight is measured by using the World Bank (1986) residual method adjusted for exchange fluctuations, trade misinvoicing and inflation (Boyce and Ndikumana 2001).
The definitions of each of these variables are provided in Table A.3 in Annex 4.

INVPRI is the ratio of private domestic investment to GDP. This corresponds to gross private investment in the World Bank Africa Development Indicators 2007. INVPUB is the ratio of public domestic investment to GDP. It corresponds to gross public investment in the World Bank Africa Development Indicators 2007. FCRP represents the ratio of capital flight to GDP, and TCP denotes the economic growth rate. The latter is the control variable that takes account of accelerator effects.

With the GMM, we obtained results indicating that capital flight influences private investment significantly, whereas its effect on public investment is not significant (*Cf. Tables 8 and 9*). Consequently, the negative impact of capital flight on total domestic investment in FZ is felt more in private investment than in public investment.

Two factors account for this result. First, capital flight stems from the transfer abroad of part of private savings intended to finance private investment. Second, capital flight can also be accounted for by an uncertain macroeconomic, political, and institutional environment. In a context of

Table 7. ***Impact of Capital Flight on Total Domestic Investment, Morgan Guaranty#***

Explanatory variablesmh;.3m##	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**
Capital flight ($\Delta FCRP_{-1}$)	-0.039 (2.32)**	-0.042 (2.38)**	-0.048 (1.92)*	-0.050 (2.21)**	-0.045 (2.43)**
Past investment ($INVP_{-1}$)		0.475 (2.26)**	0.468 (2.29)**	0.561 (3.13)***	0.472 (2.26)**
Credit to private sector (ΔCPP)			0.667 (2.46)**	0.610 (2.23)**	
Economic growth rate (TCP_{-2})			0.777 (2.36)**	0.493 (1.51)	
Rate of inflation (INF_{-3})				-0.121 (2.13)*	
Governance ($\Delta GOUVER$)					0.000 (0.15)
Quality of institutions ($CONEX_{-1}$)					0.000 (2.27)**
Constant	0.208 (9.99)***	0.109 (2.20)**	0.086 (2.14)*	0.084 (2.54)**	0.110 (2.22)**
Observations	428	425	423	411	425
Countries	15	15	15	15	15
AR(1) test	0.328	0.046	0.050	0.065	0.045
AR(2) test	0.775	0.411	0.191	0.931	0.405
Hansen test	0.215	0.358	0.237	0.449	0.327
Robust t statistics in parentheses					
* significant at 10%; ** significant at 5%; *** significant at 1%					

In this table, capital flight is measured by using the World Bank (1986) residual method adjusted for exchange fluctuations, trade misinvoicing and inflation (Boyce and Ndikumana 2001).
The definitions of each of these variables are provided in Table A.3 in Annex 4.

portfolio choice (Collier *et al.* 2004), such an environment increases the risks of losses on the real value of domestic assets of private economic agents, thereby compelling them to change the composition of their portfolios in favour of foreign assets. The result is a decline in private investment.

4.3. Impact of Capital Flight from CEMAC and WAEMU on Investment in FZ

The estimation equation is as follows:

$$INVP(ZF)_t = \alpha_1 INVP(\mathrm{ZF})_{t-1} + \alpha_2 FCRP(UEMOA)_{t-2} + \alpha_3 FCRP(CEMAC)_{t-2} + \alpha_4 TCP(ZF)_t + u_i + v_t + \varepsilon_{it} \quad (15)$$

In this, INVP(ZF) stands for the ratio of total domestic investment to GDP for the entire FZ (investment is gross capital formation in World Bank, Africa Development Indicators 2007). FCRP(WAEMU) is the ratio of capital flight to GDP for the WAEMU zone, while FCRP(CEMAC) is the same

Table 8. ***Impact of Capital Flight on Public and Private Investment, World Bank#***

Explanatory Variables ##	Private Investment	Public Investment	Private Investment	Public Investment	Private Investment	Public Investment
$\Delta FCRP_{-3}$	-0.023 (2.00)*	0.003 (0.33)	-0.028 (2.51)**	0.003 (0.37)	-0.021 (2.62)**	-0.000 (0.04)
$INVPRI_{-1}$			0.337 (2.91)**		0.490 (5.41)***	
$INVPUB_{-1}$				1.097 (8.42)***		0.975 (7.55)***
TCP_{-6}					0.210 (1.80)*	-0.068 (2.01)*
Constant	0.131 (6.02)***	0.072 (15.31)***	0.088 (3.36)***	-0.009 (0.92)	0.060 (3.41)***	0.002 (0.21)
Observations	336	339	325	329	314	318
Countries	15	15	15	15	15	15
AR(1) test	0.283	0.704	0.203	0.029	0.176	0.035
AR(1) test	0.457	0.311	0.343	0.297	0.299	0.399
Hansen	0.665	0.998	0.643	0.814	0.136	0.420
Robust t statistics in parentheses						
* significant at 10%; ** significant at 5%; *** significant at 1%						

In this table, capital flight is measured by using the World Bank (1986) residual method adjusted for exchange fluctuations, trade misinvoicing and inflation (Boyce and Ndikumana 2001).
The definitions of each of these variables are provided in Table A.3 in Annex 4.

for the CEMAC zone. TCP(FZ) is the economic growth rate for the entire FZ. It is the control variable that takes into account the accelerator effects.

The Hausman test indicates that the TCP (ZF) variable is not endogenous to the equation. Using the ordinary least squares method, we found that capital flight from the CEMAC impacts total domestic investment negatively and significantly in FZ, whereas capital outflows from the WAEMU zone did not have any significant influence on total investment in FZ (*Cf. Table 10*). This result suggests that the negative impact of capital flight on domestic investment in FZ is more attributable to the capital outflows from the CEMAC than from the WAEMU zone.

The explanation for this relates to the predominance of the contribution by CEMAC countries to total capital movements in FZ (81.2 percent or 84 percent, depending on the measurement method used, according to the results of Table 4), stemming from the productive structure of these oil producing countries. Indeed, the abundance of natural resources is a key source of increased capital flight since it contributes to increased level of corruption.

Table 9. ***Impact of Capital Flight on Public and Private Investment, Morgan Guaranty#***

Explanatory Variables ##	Private Investment	Public Investment	Private Investment	Public Investment	Private Investment	Public Investment
$\Delta FCRP_{-3}$	-0.024 (2.18)**	0.005 (0.56)	-0.026 (2.57)**	0.004 (0.53)	-0.020 (2.25)**	0.001 (0.15)
$INVPRI_{-1}$			0.345 (2.97)**		0.489 (5.33)***	
$INVPUB_{-1}$				0.976 (6.14)***		0.977 (7.59)***
TCP_{-6}					0.210 (1.81)*	-0.068 (2.03)*
Constant	0.132 (6.03)***	0.070 (15.60)***	0.087 (3.32)***	-0.000 (0.01)	0.060 (3.37)***	0.002 (0.20)
Observations	334	337	323	327	314	318
Countries	15	15	15	15	15	15
AR(1) test	0.283	0.816	0.202	0.041	0.173	0.035
AR(1) test	0.456	0.263	0.339	0.346	0.296	0.393
Hansen	0.524	0.675	0.606	0.417	0.133	0.415
Robust t statistics in parentheses						
* significant at 10%; ** significant at 5%; *** significant at 1%						

In this table, capital flight is measured by using the World Bank (1986) residual method adjusted for exchange fluctuations, trade misinvoicing and inflation (Boyce and Ndikumana 2001).
The definitions of each of these variables are indicated in Table A.3 in Annex 4.

Table 10. ***Impact of Capital Flight from CEMAC and WAEMU on Investment in FZ#***

Explanatory Variables ##	World Bank	Morgan Guaranty	World Bank	Morgan Guaranty
$FCRP_{-2}$ (WAEMU)	0.057 (1.37)	0.056 (1.30)	0.047 (1.60)	0.051 (1.66)
$FCRP_{-2}$ (CEMAC)	-0.139 (2.34)**	-0.137 (2.40)**	-0.152 (2.68)**	-0.153 (2.59)**
$INVP_{-1}$			0.435 (2.75)**	0.430 (2.69)**
TCP			0.254 (2.13)**	0.267 (2.23)**
Constant	0.221 (40.11)***	0.221 (41.61)***	0.122 (3.69)***	0.122 (3.71)***
Observations	34	34	34	34
R-squared	0.11	0.11	0.47	0.48
Robust t statistics in parentheses				
* significant at 10%; ** significant at 5%; *** significant at 1%				

In this table, capital flight is measured by using the World Bank (1986) residual method adjusted for exchange fluctuations, trade misinvoicing and inflation (Boyce and Ndikumana 2001).
The definitions of each of these variables are indicated in Table A.3 in Annex 4.

4.4. Political implications

In view of the negative impact of capital flight on investment, repatriation of fled capital can help raise the level of domestic investment.

The results show that in the FZ, it is private actors who play a key role in the negative impact of capital outflows on domestic investment. Consequently, the issue is to find out how the lost private capital can be repatriated. Private savings is one of the channels through which private capital flees. Consequently, if residents transfer their savings to foreign banks, it is because earnings on saving deposits are more attractive abroad than at home. Promoting higher interest earnings on domestic deposits can therefore contribute to repatriating private capital to local banks.

Another channel through which private capital is transferred abroad relates to factors increasing the risk of the erosion of domestic assets of residents, such as uncertainty over the macroeconomic and institutional environment. The greater the uncertainty about the impact of these environments on the real value of domestic assets of investors, the more the latter prefer to transfer their wealth abroad, thereby fuelling capital flight. It is therefore essential to reduce the uncertainty of the macroeconomic and institutional environment in order for private capital to be repatriated.

In this regard, low and steady inflation, reduced and stabilised budgetary deficit, and low taxes, result in less risk of depreciation of the real value of the domestic assets of private investors. This can induce repatriation of assets and encourage investors to return to the domestic environment. Moreover, in view of the stable exchange rate enjoyed by the FZ, it is less sensitive to external shocks. Consequently, with this stability, the wealth of residents is less exposed to risks, thus providing an additional incentive for repatriating private capital.

Furthermore, concerning the institutional environment, efforts made to improve governance and the quality of institutions, and to promote a stable political environment can help minimise risks affecting the wealth of residents and ultimately facilitate the return of fled capital.

The econometric analysis also shows that only a portion of the FZ (namely the CEMAC zone), accounts for the negative impact of capital movements on domestic investment in view of the productive structure of the CEMAC countries, which are rent economies. Indeed, the abundance of natural resources aggravates corruption and fuels capital flight. In other words, part of the export revenues from natural resources is channelled to foreign banks in the form of capital flight.

The issue of the responsibility for the repatriation of such resources therefore rests with the governments, CEMAC, and foreign banks. Capital flight repatriation depends on efforts by FZ governments to promote greater accountability in the management of natural resources, particularly those of the CEMAC countries. To this end, it is important to combat corruption and weak institutional governance. Furthermore, foreign banks must realise that

these resources transferred to them are public funds, and therefore belong to the people. Foreign banks have a moral responsibility to co-operate in the repatriation of such public resources.

5. Conclusion

This study has assessed the impact of capital flight on domestic investment in FZ. The analysis of investment over the 1970-2005 period shows an irregular trend marked by a predominance of periods of decline and high variability of up to 116.02 percent. From 1970 to 2000, domestic investment did not exceed the 1981 level of $9.9 billion.

To determine the role of capital flight in accounting for investment behaviour, we first assessed the scale of capital outflows using two versions of the residual method (World Bank 1985 and Morgan Guaranty 1986) adjusted for exchange rate fluctuations, trade misinvoicing, and inflation (Boyce and Ndikumana 2001). For the FZ countries, we found massive capital flight amounting to 53.1 or 49.7 billion dollars. Our estimates indicate contrasted capital movements within the FZ, with a higher magnitude in the CEMAC zone ($43.1 billion or $41.8 billion, representing 81.2 percent or 84 percent of total capital outflows in FZ) than in the WAEMU zone (1$0.1 billion or $8.1 billion).

This scale of capital flight far outstrips the 2005 level of domestic investment. It does so by as much as four times in FZ, six times in the CEMAC zone, and 1.6 times in the WAEMU. Thus, the higher the capital, the less the resources available to FZ countries, particularly those of the CEMAC, to finance their domestic investment needs. This led us to estimate the extent to which these capital outflows can reduce investment.

The econometric analysis shows that capital movements reduce domestic investments considerably in FZ. For each dollar that leaves the country in the form of capital flight, about 4.3 percent or 4.5 percent deprives the economy of resources that could have been used to finance investment. Furthermore, our results show that capital flight significantly reduces private investment, whereas its effect on public investment is insignificant. Consequently, the negative impact of capital flight on total domestic investment in FZ is felt more through private investment than through public investment. We also found that capital flight from CEMAC affects total domestic investment negatively and significantly in FZ, whereas capital outflows from the WAEMU zone do not have any significant influence on total investment in the FZ. Thus, the negative effect of capital flight on domestic investment in FZ is due to capital outflows from the CEMAC zone more than from the WAEMU zone.

In light of these results, capital flight repatriation can help raise the level of domestic investment. To do this, and in view of the key role of private actors in the negative impact of capital flight on investment, it is important to

repatriate private savings to local banks by promoting higher interest rates on deposits. The study recommends a reduction of the macroeconomic and institutional uncertainty in order to minimise the risks of depreciation of the real value of private investors' domestic assets. This will encourage repartriation of capital. In view of these specificities, the FZ is less sensitive to external shocks as a result of the stable exchange rate that can better safeguard the wealth of private actors from risks.

The productive structure of CEMAC countries, which are producers of oil and other types of natural resources, explains the fact that these countries mainly account for the negative impact of capital movements on domestic investment. Consequently, capital flight repatriation will require efforts by the CEMAC governments in promoting accountability in the management of natural resources. To achieve this, it is essential to combat corruption and poor institutional governance. Furthermore, responsibility for the repatriation of capital involves foreign banks, which must be aware of the fact that such resources transferred to them are public funds that belong to people. To that extent, foreign banks have a moral responsibility to co-operate in the repatriation of these public resources.

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Annex

Methods for Measuring Capital Flight

a. The Dooley method

The Dooley method calculates capital flight by drawing the difference between total capital outflows and change of the stock of external assets. According to this method, the total amount of capital can be calculated as follows:

$$FETC_{it} = EE_{it} + INDE_{it} - CC_{it} - \Delta RES_{it} - EON_{it} - BMFMI_{it} \quad (16)$$

In this calculation, FETC is equal to total capital outflows, EE the external borrowing as reported in the balance of payments data, EON the net missions and errors, and BMIMF the difference between the change in the external debt stock as reported in the World Bank data and external borrowing indicated in the IMF balance of payments data. The stock of external assets, corresponding to interest earnings, is equal to:

$$AE_{it} = \frac{GINT_{it}}{r_{it}} \quad (17)$$

Here, AE denotes external assets, while r is the interest rate on US deposits (supposed to be the interest rate of a representative international market). GINT represents interest gains. Thus, by the Dooley (1986) method, capital flight (FC_d), is measured by:

$$FC_{dit} = FETC_{it} - \Delta AE_{it} \quad (18)$$

b. The "hot money" method

The "hot money" method is the sum of short-term capital outflows and net omissions. There are three variants of the hot money method as indicated below (Cuddington 1986; Ajayi 1997):

$$FC1_{ait} = -(g_{it} + c1_{it}) \quad (19)$$

$$FC2_{ait} = -(g_{it} + c_{it}) \quad (20)$$

$$FC3_{ait} = -(g_{it} + c_{it} + e1_{it} + e2_{it}) \quad (21)$$

$FC1_a$ is the first variant of the "hot money" method. $FC2_a$ is the second variant of the "hot money" method, whereas $FC3_a$ is the third variant of the "hot money" method. g denotes net errors vouchers and actions respectively. c is another short-term capital of other sectors and c1 is the other assets.

c. The Assets Method

Studies, such as those by the Bank of England (1989), Hermes and Lensink (1992), Collier *et al.* (2001), consider the total stock of assets of non-bank residents held in foreign banks to be a measure of capital flight. It is the assets method.

Annex 2. Table A.1. ***Estimated Capital Flight from FZ Countries in the Literature (US $million, 2000)***

	Ojo (1992)		Ajayi (1997)					Hermes, Lensink et Murinde (2002)				Ndikumana et Boyce (2007)	
	Methodology	Period	Methodology				Period	Methodology	Period	Methodology	Period	Methodology	Period
African Countries of the Franc Zone	World Bank		World Bank	Morgan Guaranty	World Bank (adjusted for trade misinvoicing)	Morgan Guaranty (adjusted for trade misinvoicing)		World Bank		World Bank		World Bank (adjusted for trade misinvoicing)	
Benin	NA		NA	NA	NA	NA		NA		NA		-4228,5	1974-2004
Burkina Faso	NA		NA	NA	NA	NA		NA		NA		2894.8	1970-2003
Cameroon	NA		NA	NA	NA	NA		480	1983-1989	460	1990-1998	15803.6	1970-2004
CAR	NA		91.8	146.97	692.33	747.5	1980-1991	NA		NA		1352.3	1970-2004
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
Chad	NA		NA	NA	NA	NA		NA		NA		931.1	1977-2004
Togo	NA		NA	NA	NA	NA		NA		NA		-3210.3	1974-2004

Annex 3. Table A.2. ***Annual Values of Real Capital Flight in FZ (US$ million, 2000)***

	Benin		Burkina Faso		Cameroon		CAR		Comoros	
YEAR	FCR(BM)	FCR(MG)	FCR(BM)	FCR(MG)	FCR(BM)	FCR(MG)	FCR(BM)	FCR(MG)	FCR(BM)	FCR(MG)
1970	5.5	-4.1	44.8	44.8	-105.1	-91.7	-9.2	-28.8	NA	NA
1971	-5.2	-13.6	50.7	38.2	-30.3	-34.5	14.5	14.6	NA	NA
1972	-19.0	-5.6	17.7	32.0	-304.3	-295.8	27.7	26.3	NA	NA
1973	5.8	1.8	4.9	-11.9	-527.9	-551.2	98.6	81.9	NA	NA
1974	76.4	54.9	137.7	146.2	-22.2	1.7	-18.2	11.1	NA	NA
1975	-5.6	-111.9	-33.1	-33.9	176.2	178.3	-3.1	-3.0	NA	NA
1976	-147.4	-31.9	-12.2	-8.1	-117.2	-136.4	80.8	63.8	NA	NA
1977	-97.5	-99.5	113.3	108.0	548.8	520.4	-24.9	-15.8	NA	NA
1978	-174.7	-171.8	198.3	197.7	135.6	125.2	-23.9	-32.0	NA	NA
1979	-189.7	-187.9	48.5	53.3	-473.9	-470.9	-10.0	-16.5	NA	NA
1980	-661.1	-658.2	159.6	151.2	283.9	280.8	-8.6	-12.2	-3.4	NA
1981	-585.0	-588.3	93.2	97.9	277.7	118.8	146.9	150.9	3.4	NA
1982	-868.0	-863.9	80.3	81.3	373.6	480.4	100.3	108.4	-1.5	-4.6
1983	-142.8	-161.0	52.2	49.7	751.9	674.9	96.1	91.5	3.6	4.6
1984	-141.2	-138.4	34.8	33.3	2184.3	1992.5	45.1	44.4	-9.9	-8.0
1985	-180.6	-178.9	-41.3	-45.4	-292.3	-487.0	89.9	74.1	5.8	1.2
1986	-39.3	-52.5	61.7	60.0	2487.5	2889.4	6.3	-1.8	8.1	10.3
1987	-51.8	-48.4	52.9	21.2	1477.3	1281.1	45.9	43.7	3.7	5.9
1988	-124.4	-121.8	-6.2	-1.3	486.8	341.5	29.9	50.4	-0.6	-6.9
1989	333.0	344.3	270.4	255.4	1561.9	1461.5	-14.2	-11.0	2.8	4.7
1990	-116.9	-136.3	69.4	56.3	1268.5	1655.5	51.3	48.9	-1.8	-1.8
1991	-204.0	-234.8	-29.6	-11.1	977.1	941.8	78.8	82.5	16.6	14.3
1992	-17.1	-39.5	161.4	150.2	1827.5	1912.3	-94.5	-94.1	-1.3	0.4
1993	-183.7	-209.9	112.2	107.1	500.4	512.3	-15.5	-13.0	4.0	5.8
1994	120.6	68.1	166.7	53.9	1628.0	1575.9	34.3	29.2	67.8	70.5
1995	155.8	54.2	541.3	437.0	483.7	488.4	524.1	529.5	-6.2	-8.5

	Benin		Burkina Faso		Cameroon		CAR		Comoros	
YEAR	FCR(BM)	FCR(MG)	FCR(BM)	FCR(MG)	FCR(BM)	FCR(MG)	FCR(BM)	FCR(MG)	FCR(BM)	FCR(MG)
1996	-43.7	-84.7	259.9	302.2	376.3	418.8	240.8	242.8	2.6	2.8
1997	-67.2	-52.8	12.7	59.8	2300.2	2284.6	-4.4	-5.0	-161.0	-163.2
1998	-286.3	-311.8	210.2	210.3	394.4	375.6	50.9	50.0	-154.0	-151.6
1999	-274.7	-237.7	81.6	12.4	-354.6	-397.5	-8.1	-12.9	-8.1	-14.5
2000	-98.1	-58.4	-231.2	-210.9	440.9	441.2	-29.5	-26.9	5.4	7.8
2001	127.4	102.2	-70.2	-46.6	-1279.1	-1269.2	-39.5	-36.1	27.8	24.8
2002	-29.7	-62.1	-22.2	-36.6	-110.3	-206.9	228.5	227.2	23.6	25.6
2003	-170.6	-182.2	136.4	92.1	-1050.7	-1116.7	-75.3	-75.8	-6.4	-4.1
2004	-206.8	-251.0	-157.8	-180.2	-433.6	-500.7	-39.1	-45.1	21.8	23.2
2005	-403.8	-362.6	-324.5	-267.6	-955.9	-978.7	61.2	64.7	-9.3	-13.0

Table A.2 (Cont'd). ***Annual Values of Real Capital Flight in FZ (US$ million, 2000)***

	Congo		Côte d'Ivoire		Gabon		Guinea Bissau		Equatorial Guinea	
YEAR	FCR(BM)	FCR(MG)	FCR(BM)	FCR(MG)	FCR(BM)	FCR(MG)	FCR(BM)	FCR(MG)	FCR(BM)	FCR(MG)
1970	NA	NA	318.0	267.0	192.3	193.1	NA	NA	NA	NA
1971	-44.5	-60.9	380.9	355.1	352.6	343.9	NA	NA	NA	NA
1972	-22.6	-15.5	443.6	668.8	587.7	574.8	NA	NA	NA	NA
1973	124.9	122.8	528.9	483.9	385.4	387.2	NA	NA	NA	NA
1974	-242.1	-246.4	285.5	-9.4	865.7	855.8	NA	NA	NA	NA
1975	-528.3	-524.2	993.2	1285.9	629.7	627.4	NA	NA	NA	NA
1976	-958.3	-963.9	660.4	499.5	0.1	-41.0	NA	NA	NA	NA
1977	-47.0	-49.1	2250.5	2176.6	481.8	491.8	NA	NA	NA	NA
1978	309.8	296.0	1599.9	1653.8	531.8	544.7	NA	NA	NA	NA
1979	257.4	254.3	337.8	377.8	792.3	768.3	NA	NA	NA	NA
1980	484.3	487.3	1511.9	1511.8	441.9	464.2	NA	NA	NA	NA
1981	-302.5	-319.3	363.0	355.0	56.5	39.3	NA	NA	NA	NA
1982	732.9	741.4	1117.6	1088.5	257.3	251.8	NA	NA	NA	NA
1983	472.7	480.6	228.2	258.6	370.3	385.2	NA	NA	NA	NA
1984	814.1	805.0	225.5	165.5	-41.5	-31.6	NA	NA	NA	NA
1985	805.9	791.4	809.1	772.7	33.8	19.7	NA	NA	NA	NA
1986	-332.7	-330.9	1170.5	1180.4	-312.4	-334.3	NA	NA	NA	NA
1987	1031.8	1021.8	1956.0	1924.6	285.7	290.3	NA	NA	46.4	39.4
1988	-448.9	-458.4	1191.1	1237.2	-139.9	-141.7	NA	NA	26.9	31.0
1989	302.4	310.8	1606.9	1622.6	314.7	265.1	NA	NA	17.2	18.1
1990	-164.6	-175.7	3155.0	3099.7	468.1	460.5	NA	NA	9.8	7.8
1991	-105.6	-107.7	2058.1	2087.8	157.8	159.5	NA	NA	45.1	44.5
1992	450.3	430.7	1516.5	1467.5	-134.2	-104.3	NA	NA	32.8	32.3
1993	90.4	73.8	1790.6	1824.4	-66.6	-57.2	NA	NA	51.8	54.0
1994	-230.0	-184.4	-182.4	-210.5	468.6	436.5	NA	NA	62.8	60.9
1995	414.2	423.0	1968.8	1808.7	126.2	133.2	NA	NA	20.1	20.8

	Congo		Côte d'Ivoire		Gabon		Guinea Bissau		Equatorial Guinea	
YEAR	**FCR(BM)**	**FCR(MG)**	**FCR(BM)**	**FCR(MG)**	**FCR(BM)**	**FCR(MG)**	**FCR(BM)**	**FCR(MG)**	**FCR(BM)**	**FCR(MG)**
1996	-1513.2	-1513.2	691.5	778.9	294.1	207.5	NA	NA	32.9	33.0
1997	909.5	915.1	1554.2	1555.9	948.3	1046.5	NA	NA	20.5	23.1
1998	899.2	897.9	-10.6	-58.1	78.5	71.1	38.1	38.0	32.5	15.8
1999	1002.7	997.4	-670.1	-713.0	596.9	593.3	1.7	4.5	-6.3	-28.9
2000	1332.3	1225.7	-496.1	-396.7	724.7	559.9	-157.9	-143.6	-67.5	-55.6
2001	354.4	471.9	-538.1	-508.2	67.7	173.8	-79.7	-81.2	51.8	37.9
2002	493.1	382.8	934.0	789.9	447.5	464.1	7.0	2.0	47.9	-17.3
2003	2146.0	2230.8	2979.0	3050.5	143.5	94.7	1.2	-1.6	127.6	159.0
2004	4023.1	3982.5	346.9	291.6	1026.4	813.3	-35.7	-37.3	-136.6	-169.8
2005	636.4	586.1	1366.1	1314.0	NA	NA	-69.5	-61.6	-623.5	-660.3

Table A.2 (Cont'd). ***Annual Values of Real Capital Flight in FZ (US$ million. 2000)***

	Mali		Niger		Senegal		Chad		Togo	
YEAR	**FCR(BM)**	**FCR(MG)**	**FCR(BM)**	**FCR(MG)**	**FCR(BM)**	**FCR(MG)**	**FCR(BM)**	**FCR(MG)**	**FCR(BM)**	**FCR(MG)**
1970	NA	NA	43.3	47.0	-57.8	-63.5	67.4	58.0	41.4	63.8
1971	NA	NA	75.3	63.9	-36.1	-33.3	164.8	164.9	27.0	28.4
1972	NA	NA	89.8	84.9	-72.5	-81.7	169.8	168.3	5.7	14.1
1973	NA	NA	111.0	107.8	-155.1	-167.4	170.7	160.8	81.8	84.7
1974	NA	NA	-204.1	-210.8	-370.8	-380.4	73.1	82.7	186.1	47.4
1975	NA	NA	-224.7	-218.4	-49.1	-57.7	315.5	308.7	-203.2	-91.6
1976	NA	NA	-334.2	-344.4	-252.7	-283.9	43.0	36.2	45.6	29.0
1977	NA	NA	-355.3	-379.3	46.4	28.2	121.4	126.5	296.7	284.9
1978	NA	NA	-1.6	9.8	-119.5	-120.4	151.6	135.4	99.9	30.6
1979	NA	NA	-532.3	-564.2	-570.4	-581.6	90.4	88.3	190.9	182.0
1980	NA	NA	108.0	135.1	-158.9	-165.5	71.1	73.8	-40.0	-11.2
1981	NA	NA	-211.4	-208.1	-200.5	-180.8	-10.6	-5.9	-98.7	-126.1
1982	NA	NA	-401.0	-392.2	-329.6	-345.9	-26.2	-24.0	-283.4	-276.9
1983	NA	NA	20.5	10.5	-151.1	-137.5	38.1	40.7	-422.7	-398.6
1984	NA	NA	34.1	42.4	-163.5	-157.5	-31.8	-44.8	-212.1	-212.4
1985	-161.3	-149.9	21.8	26.2	-505.1	-506.9	5.7	-6.6	-79.9	-84.2
1986	-290.7	-303.0	-78.3	-85.6	-173.2	-170.7	35.0	48.4	-129.9	-121.0
1987	-187.4	-190.6	-238.3	-237.4	-59.2	-58.9	62.4	60.2	-80.0	-107.1
1988	-339.0	-329.3	-147.1	-157.6	-622.1	-645.2	131.7	135.2	-48.8	-66.4
1989	-182.5	-234.9	-306.3	-305.1	-184.5	-215.8	5.7	2.3	223.2	176.5
1990	72.5	63.0	35.9	33.8	-126.3	-87.8	183.8	139.8	-119.8	-81.6
1991	-61.1	-48.3	-279.8	-284.9	-574.7	-592.4	69.6	99.4	-340.0	-350.4
1992	285.4	308.5	39.0	37.1	-603.4	-610.4	56.2	56.3	-52.5	-46.0
1993	-61.3	-45.6	-53.3	-50.1	-675.0	-670.3	-1.5	23.5	-181.4	-148.5
1994	11.2	-90.6	-62.2	-80.7	-214.7	-283.9	41.0	38.2	79.3	22.8
1995	100.9	53.1	-132.7	-133.6	-15.9	-46.3	27.6	28.9	184.1	182.6

	Mali		Niger		Senegal		Chad		Togo	
YEAR	FCR(BM)	FCR(MG)	FCR(BM)	FCR(MG)	FCR(BM)	FCR(MG)	FCR(BM)	FCR(MG)	FCR(BM)	FCR(MG)
1996	-124.7	-96.7	-434.3	-427.7	-565.2	-551.5	48.0	47.4	-43.3	-32.4
1997	152.6	172.4	-285.7	-291.7	-423.3	-428.1	52.4	29.7	-153.8	-118.1
1998	-114.9	-123.0	-92.5	-89.3	172.8	99.2	-32.2	-23.5	-48.2	-51.3
1999	-257.0	-247.9	-165.4	-172.1	-332.3	-372.3	-56.6	-73.0	-153.1	-143.5
2000	-405.7	-429.3	-419.1	-416.2	-964.4	-927.0	-96.5	-84.4	-430.5	-451.9
2001	-303.6	-357.8	-434.1	-446.4	184.2	165.3	-17.1	-31.8	-374.4	-380.2
2002	264.6	269.8	-413.2	-407.9	148.5	25.3	-645.8	-644.5	-245.3	-261.9
2003	-87.9	-115.7	-210.1	-226.5	-328.5	-452.4	24.3	26.8	-501.5	-515.9
2004	74.3	19.8	-389.7	-403.7	-723.7	-818.5	430.1	429.4	-101.4	-149.9
2005	-406.4	-378.8	-187.5	-192.1	-624.0	-552.7	515.5	506.3	-751.8	-746.2

Source: Computations by author based on data from:
– World Bank, *Global Development Finance 2007* (Edition CD-ROM)
– World Bank, *World Development Indicators 2007* (Edition CD-ROM)
– IMF, *International Financial Statistics 2007* (Edition CD-ROM)
– IMF, *Balance of Payments Statistics* (Edition CD-ROM 2004 supplemented by yearbooks)
– IMF, *Direction of Trade Statistics* (Edition CD-ROM 2004 supplemented by yearbooks)
– IMF, *Selected Issues and Statistical Appendix* (in www.imf.org)
NB: In Table A.2:
– FCR (BM) is real capital flight based on World Bank method, adjusted for foreign exchange fluctuations, trade misinvoicing and inflation (Boyce and Ndikumana 2001).
– FCR (MG) real capital flight based on the Morgan Guaranty method adjusted for foreign exchange fluctuations, trade misinvoicing and inflation (Boyce and Ndikumana 2001).

Annex 3. Table A.3. ***Definitions and Sources of Variables***

Variable	Definition	Source
CONEX	Constraints on the executive power (indicator of quality of institutions), values ranging from 1 to 7	Polity IV Project's Database
CPP	Private sector credit to GDP ratio	World Bank World Development Indicators (2007)
FCRP	Real capital flight to GDP ratio	Table A.2 and World Bank World Development Indicators (2007)
FCRP(CEMAC)	Real capital flight to GDP ratio for CEMAC zone	Table A.2 and World Bank World Development Indicators (2007)
FCRP(UEMOA)	Real capital flight to GDP ratio for WAEMU zone	Table A.2 and World Bank World Development Indicators (2007)
GOUVER	Governance, with values ranging from -10 à +10	Polity IV Project's Database
INF	Rate of inflation measured by the variation of GDP deflator	World Bank World Development Indicators (2007)
INVP	Total domestic investment to GDP ratio, with investment being measured by gross capital formation	World Bank Africa Development Indicators (2007)
INVP(ZF)	Total domestic investment to GDP ratio for all countries of the franc zone (investment is gross capital formation)	World Bank Africa Development Indicators 2007
INVPRI	Private investment to GDP ratio	World Bank Africa Development Indicators (2007)
INVPUB	Public investment to GDP ratio	World Bank Africa Development Indicators (2007)
TCP	Real GDP growth rate	World Bank World Development Indicators (2007)
TCP(ZF)	Real GDP growth rate for all franc zone countries	World Bank World Development Indicators (2007)