Capital Flight and its Impact on Economic Growth: the Case of WAEMU Countries

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Abstract
This paper estimates the volume of capital flight using the residual method, and analyzes the impact of capital flight on economic growth in the West African Economic and Monetary Union (WAEMU). Over the period 1970 to 2016, total real capital flight from these countries is found to be positive and significant with a magnitude that amounts to 58655.28 million constant dollars, representing 57.5 percent of GDP. Four countries have experienced significant real capital flight over the past four decades, namely Ivory coast, Niger, Burkina Faso and Senegal. Thus, through the use of dynamic fixed effects estimation, it is found that in the long run, capital flight significantly reduces economic growth in countries with positive capital flight and the adverse effect seems to be unquestionably aggravated with investment in the case of these groups of countries. Furthermore, the paper recommends that the authorities show commitment to reducing capital flight by improving governance, strengthening the quality of institutions, and promoting a stable policy environment.

Keywords : Capital flight ; Economic growth ; Residual method ; WAEMU.

JEL Classification Codes: F20, F21, F32, E22, F43.

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1. Introduction

Today, it is widely recognized that the phenomenon of capital flight is a real obstacle to the economic progress of developing countries in general, and Africa in particular, as it constitutes the essential untapped resource for financing economic growth (Hermes, Lensink & Murinde, 2002). There is a plethora of scholarly and popular debate about the nature and extent of capital flight from Sub-Saharan Africa. Studies since the early 1990s have documented significant capital flight from African countries (Wood & Moll, 1994). There is even evidence that it is increasing. Interest in the issue has been rekindled by new empirical studies revealing the increasing scale of the financial hemorrhage caused by capital flight (Henry, 2012; Ndikumana & Boyce, 2011a).

However, according to Ndikumana & Boyce, (2011a), capital flight is only increasing and reached a peak of $40,407.2 million in 2006. Moreover, in the literature, Côte d'Ivoire is among the top countries in Sub-Saharan Africa with the highest capital flight ($45.4 billion or 194.1% of GDP). The richest countries in Africa in terms of natural resources (Nigeria, Angola, etc.) are those where capital flight is most massive. The MENA region (Middle East and North Africa) to record the largest growth in illicit financial flows (31.5% per year), followed by sub-Saharan Africa at 19.8%. In this regard, the exodus of capital from African countries is therefore a source of concern. Thus, it is becoming increasingly clear that countries cannot afford to ignore the role of capital flight and its reversal in their quest for economic development. In the literature, authors are unanimous in confirming the adverse consequences of capital flight on many economies: Ajayi, (1997); Cerra, Rishi & Saxena, (2008); Ndikumana, (2006); Ndiaye, (2009b); Fofack & Ndikumana, (2010); Bakare, (2011); Ndikumana & Boyce, (2011a).

With a low level of domestic resource mobilization in the West African Economic and Monetary Union (WAEMU) zone, it is important to analyze the magnitude of capital flight to measure its impact on economic growth. This paper first examines the magnitude of capital flight in WAEMU countries and then its effect on economic growth. Specifically, it will answer the following questions: what is the volume of capital flight in WAEMU countries during the period from 1970 to 2016? And what is its impact on economic growth?

To empirically study the relationship between capital flight and economic growth in a panel of WAEMU countries, a dynamic heterogeneous panel regression as a panel-ARDL model is set up and the dynamic fixed effects (DFE) estimation technique is applied from 1970 to 2016. For the DFE estimator, only the individual effects (which can be fixed or random) allow for sample heterogeneity, while the coefficients of the exogenous variables are assumed to be constant. This technique is increasingly used (Asongu et al. 2016; Asafu-Adjaye et al. 2016).

However, the results suggest over the period 1970-2016, real capital flight for the eight (8) countries in the WAEMU zone is found to be positive and significant with a magnitude that amounts to about $58655.28 million, representing 57.55% of GDP. The measurement results show that significant capital flight is recorded especially in economies such as Côte d'Ivoire, Burkina Faso, Niger and Senegal. However, the econometric results show that capital flight in aggregate does not significantly reduce economic growth in the WAEMU. On the other hand, when decomposing the sample, the group of countries with capital flight have coefficients that respect the central hypothesis of this paper over the period while the impact is not pronounced in countries with negative flight which is consistent with the work of Almounsor (2017); Lawal et al. (2017); Orimolade & Olusola (2018); Ogbenro, (2019). Similarly, the results also indicate that the harmful and devastating impact of capital flight on economic growth increases with the level of investment) as demonstrated by authors like Boyce & Ndikumana, (2001); Fofack &

Ndikumana, (2010) and. Ndikumana, (2009). These results are robust in the sense that they do not depend on the specifications of the economic growth model, and remain true even after controlling for other variables, notably macroeconomic and institutional variables.

From this perspective, the contribution of this work to the economic literature is threefold. The first contribution is methodological with the use of an updated technique of capital flight available in the literature. Second, to the best of our knowledge, this is the first study to examine the issue of capital flight on economic growth in a sample consisting essentially of WAEMU countries. Finally, while dissociating the zone into two groups of countries on the basis of the magnitude of capital flight, our contribution offers a better understanding of the effects of capital flight in explaining economic growth performance in this zone; with important policy prescriptions.

The paper is structured in four sections. The first section reviews the economic literature on the link between capital flight and economic growth with an analysis of the stylized facts of capital flight and economic growth in the zone. The second section discusses the methodology that will be adopted. The third section develops the empirical results from the different estimations. And finally, the last section concludes the paper and draws policy implications.

2. Brief review of the literature on capital flight on economic growth

In the literature, authors such as Ndikumana, (2009); Fofack & Ndikumana, (2010) and Boyce & Ndikumana, (2001) unanimously acknowledge the potentially negative effect of capital flight on economic growth through investment (other forms of channels exist in the literature). Capital flight reduces the resources that could have been invested to increase economic growth, which suggests that capital flight affects economic growth through investment. The phenomenon of capital flight occurs through the transfer abroad of part of domestic private savings. The persistence of this phenomenon can lead to a decline in domestic savings, which reduces the resources available for financing domestic investment and promoting economic growth. In the same vein, Salandy & Henry, (2017) who study the relationship between capital flight, domestic investment and economic growth in the small resource-based economy of Trinidad and Tobago using the vector error correction model (VECM) covering the period from 1971 to 2011. The result shows that capital flight is a fundamental problem affecting economic growth and domestic investment.

In support of the literature, Lawal et al (2017) investigate the impact of capital flight and its determinants on economic growth in Nigeria using the Autoregressive Distributed Lag (ARDL) model to analyze data collected from the period 1981 to 2015. The results indicate the existence of a long-run relationship between the variables, and that capital flight has a negative impact on economic growth in Nigeria for the period under consideration. According to Almounsor, (2017), capital flight from Saudi Arabia reached over $212 billion in 2010, resulting in a 3.57% decline in growth. The author further provides new estimates of illicit capital flight in Saudi Arabia for the period covering 1971 to 2015 using a residual methodology and considers the social opportunity cost of these unregulated funds in terms of lost economic growth. The results show that capital flight has a negative effect on economic growth.

Similarly, Orimolade & Olusola, (2018) examine the impact of capital flight on economic growth in Nigeria in line with the World Bank's residual approach to measuring capital flight. Using the ARDL model to estimate the model coefficients on time series data from 1970 to 2016, the result shows the presence of a negative relationship between capital flight and economic growth. Using a panel framework, Osei-Assibey, Domfeh &Danquah, (2018)

investigate the effect of corruption and institutional governance indicators on capital flight using a portfolio choice framework through GMM and fixed effect regression on panel data from 32 countries in Sub-Saharan Africa (SSA) over a sample period covering 2000 to 2012. The results show that corruption encourages capital flight on the continent and thus retards economic growth in the long run. Further, Ogbenro, (2019) examined the impact of capital flight on economic growth in Nigeria for the period 1990 to 2017. The ADF test was employed to test for time series stationarity. The Ordinary Least Squares (OLS) econometric method of data analysis was used for this study. The T-test showed a positive relationship between capital flight proxies and GDP as a proxy for economic growth.

From the review of the empirical literature, it can be inferred that the debate is still ongoing and never-ending given the magnitude of the phenomenon and the inconsistency of results between different research on the precise impact of capital flight on economic growth in developing countries.

2.1. Results of the capital flight estimation

What is clear from the annual data on real capital flight[1] is that the phenomenon in WAEMU is a chronic problem, which accelerated and worsened during the second half of the 1980s (Figure 1) until the first half of the 1990s.

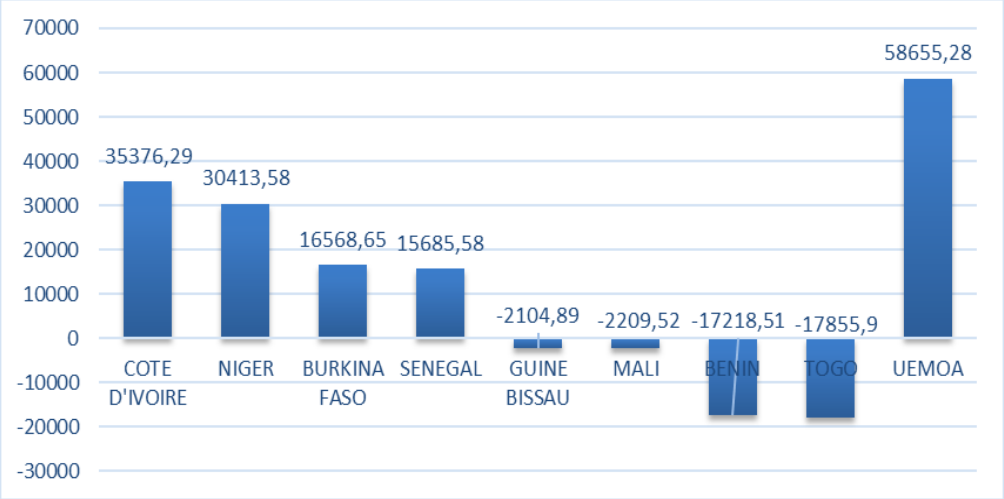

Figure 1: Real capital flight by WAEMU country, 1970-2016 (US$ million 2010)

In general, between 1970 and 2016, the total real capital flight of the eight (8) countries in the subregion covered in this paper amounted to $58,655.27 million (US$ million 2010). However, these countries recorded a capital inflow of $47,556.82 million between 2010 and 2016 according to the residual method. It seems clear that some countries have positive values of capital flight while others have negative values over the period. Capital outflows have exploded particularly among the major countries that have a high productive structure and are therefore the most exporters in the area.

[1] Capital flight is measured by adopting an updated version of the World Bank (1985) residual method updated by Boyce & Ndikumana, (2018). Like these two authors, we have considered adjustments such as the net change in interest arrears, exchange rate fluctuation, trade transaction falsifications, and inflation to make these figures more concrete.

In general, countries that export more goods show positive values of real capital flight while others show negative values. However, Mali shows a sign contrary to our expectations with lower values. Mali's capital inflow over the period was $2209.52 million. However, when it comes to negative values or capital repatriation, the most important are Togo with an inflow of $178.90 million, followed by Benin with $172.18 million, and lastly Guinea Bissau with $2104.89 million over the study period. There are significant variations in the temporal trends of capital flight among the eight WAEMU countries. In all of these countries, however, it is clear that capital flight is not a new phenomenon in all cases.

However, the magnitude of capital flight should be taken seriously, even if the data relative to the size of the economy and population of these countries sometimes suggest otherwise. This analysis shows that WAEMU could have had financing available to meet its public investment needs in most of the priority sectors, particularly education and health. Indeed, this capital could have covered the needs in terms of human development, improving economic infrastructure and reducing unemployment and poverty.

3. Methodology

3.1. Data source

A panel data[2] analysis approach for the WAEMU over the period 1970-2016 was adopted. In general, capital flight data are taken from the World Bank (World Development Indicator, 2017) and International Monetary Fund (IMF, 2017) databases. Other data on the selected variables are mainly from World Bank publications (economic growth (CROIS), investment (INV), openness (OUV), inflation (INF), and domestic credit to the private sector (CCP) with the exception of statistics on corruption control which are from the World Bank, Worldwide Governance Indicators (WGI). Since the variables for Guinea-Bissau have missing data for the period (1970-1984), this forced us not to consider this country in our estimates. The analysis of the data is followed by the analysis of the modeling technique that will be used to perform the econometric tests and estimates.

3.2. Modeling techniques

The empirical linear model of this study is inspired by the specification of the economic growth model in the literature (Forgha, 2008; Bakare, 2011). The final model is as follows with the inclusion of explanatory variables:

$$CROI = f(FKR, INV, CCP, INFL, OUV, INS) \quad (1)$$

$$CROI_{it} = \alpha_1 FKR_{it} + \alpha_2 INV_{it} + \alpha_3 CCP_{it} + \alpha_4 INFL_{it} + \alpha_5 OUV_{it} + \alpha_6 INS_{it} + \mu_t \quad (2)$$

Where CROI is the real GDP growth rate; FKR is the ratio of real capital flight to GDP; INV is the ratio of domestic investment to GDP, INF is the inflation rate measured by the annual change in the consumer price index, OUV is the degree of openness, CCP is the variable domestic credit to the private sector, and INS is the institutional variable of the quality of institutions measured by the control of corruption, which takes values between -2.5 (lowest corruption) and 2.5 (highest corruption). The empirical nonlinear model reflecting our specification is based on the equation specified above and is as follows:

[2] We excluded Guinea-Bissau because it only joined the Union in 1997 and because we do not have data for the entire period for some variables. Excluding Guinea-Bissau allows us to have a disaggregated panel.

$$CROI_{it} = \alpha_1 FKR_{it} + \alpha_2 INV_{it} + \alpha_3 CCP_{it} + \alpha_4 INFL_{it} + \alpha_5 OUV_{it} + \alpha_6 INS_{it} + \beta(FKR_{it} * INV_{it}) + \mu_t \quad (3)$$

We use a family of alternative techniques for estimating cointegration relationships in panels, namely the Mean Group (MG), the Dynamic Fixed Effects (DFE) and the Pooled Mean Group (PMG). In practice, the PMG and MG techniques were not conclusive with our data. Indeed, the execution of the command in Stata does not lead to any result, probably because of the weakness of the temporal dimension of the panel. Consequently, only the DFE estimates were performed.

4. Empirical results

To study the effect of capital flight on economic growth in WAEMU countries, we adopt a three-step approach[3]. First, we estimate the effect of capital flight on economic growth in the presence of other macroeconomic control variables. In the second stage, as Ndiaye (2011) argues, the magnitude of capital flight serves as a barrier to growth, as it significantly reduces economic growth through the domestic investment channel. To this end, we use the interaction between domestic investment and capital flight in our subsequent estimates of economic growth. Finally, the configuration of the data (volume of capital flight) does not allow us to consider the broader range of the data. A decomposition of the total sample of countries into two groups is desired. This allows us to identify two different groups from which the EU countries could be situated: a situation in which capital flight is positive and one in which capital flight is observed to be negative over the period.

4.1. Analysis of descriptive statistics

Table A.2 (Appendix) shows that all variables vary considerably across countries. The results from the descriptive statistics show that on average capital flight is 5.27 percent, yet the growth rate of GDP over the period is a relatively low 3.48 percent. The results also indicate that WAEMU countries are developing slowly and unevenly, with an average inflation rate of about 4.89 percent. Finally, investment, at 18.26%, is very low overall.

4.2. Results of the dynamic fixed regression estimates

The cointegration relationships thus highlighted are estimated using dynamic fixed effects (DFE). By examining the results of the linear model and the non-linear model in tables 1, 2 and 3 respectively, we see that the heterogeneous error correction model, proposed by Persean (1999), shows that the recall force (Ecm) is significant and has the expected signs, which indicates that the long-term relationships between the variables are validated. The error correction coefficient (Ecm) therefore indicates that economic growth adjusts to its long-term equilibrium in the presence of capital flight.

4.2.1. Impact of capital flight on economic growth in WAEMU countries

According to the results of the econometric estimation presented in Table 1. The coefficient on the investment variable is positive and statistically significant at the 99% confidence level in all specifications. An increase in the investment variable has a positive effect on growth, as expected, and is very significant. Consistent with the gas pedal principle, investment growth facilitates more rapid economic growth. This suggests that investment stimulates growth. A percentage increase in investment leads to an increase of between 0.11% and 0.17% in the rate

[3] There are two main reasons for this distribution. Thus, despite this constraint, it allows us to focus on the particular case of countries with positive leakage and thus to shed light on the debates on capital flight from the union. We therefore examine the direct effect of capital flight on economic growth. We also study its indirect effect by focusing on the main driver of the growth effect of capital flight, namely investment.

of economic growth. This suggests that WAEMU countries can promote economic growth by stimulating investment. This result suggests that countries are able to improve economic growth through sound macroeconomic policies and more efficient economic sectors.

The key variable of the model, capital flight, has a mixed sign due to its coefficient and the heterogeneity of the area (in terms of the volume of capital flight), which does not confirm the validity of the central hypothesis of this work that capital flight is a factor that weakens economic growth in our sample. The trade openness variable has a statistically significant and negative coefficient in the long-run relationships of the regressions (except for the model with the non-linear specification). This result suggests that, in general, trade openness is not beneficial to economic growth in WAEMU countries. The effect of the institutional environment of WAEMU countries proxied by the control for corruption has a positive and statistically significant coefficient at the 90% confidence level. As defined above, the control of corruption varies between -2.5 and 2.5 with a higher value indicating more control of corruption (less corruption). This result indicates that levels of economic growth increase with a satisfactory level of corruption control. In an environment where corruption is under control, domestic and foreign investors are encouraged to invest.

4.2.2. Impact of capital flight on economic growth by country group

The objective of this subsection is to test the robustness of the empirical results found above from a disaggregated perspective and to analyze some potential disparities between two groups of countries considered in order to better identify some specificities. This demarcation is made necessary by the notable distinctions in the estimation of capital flight recorded in the WAEMU. The estimation results are presented in Tables 2 and 3 for each group of countries and using the 8 specifications in Table 1 above. In fact, these specifications group together the introduction of the different control variables of the model. The first intuition concerns the error correction coefficient, which is negative and significantly different from 0 at the 1% error threshold; in all the regressions, therefore, the long-term relationships between the variables are validated.

It is clear from Table 3 that the coefficients of the first group of countries, associated with the investment, trade openness and institutional variables, retain their signs and significance. On the other hand, in the second group of countries, only domestic investment has a positive effect on economic growth. On the other hand, the key variable in the model, capital flight, has a negative and statistically significant coefficient. However, establishing the negative influence of capital flight on growth is consistent with economic theory (group of countries with positive flight); since according to Ajayi, (1997) capital flight has a negative and significant influence on growth. This means that an increase in the ratio of capital flight to GDP generates a reduction in the economic growth rate and confirms the validity of the central hypothesis of this work. The capital flight variable has coefficients ranging from 0.034% to 0.0399%, or an average of 0.037%.

Table 1. Results of capital flight estimates on economic growth in the WAEMU

	Dependent variable: economic growth in % GDP							
Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Ecm	-1.20	-1.22	-1.21	-1.29	-1.29	-1.21	-1.04	-1.29
	(0.00)***	(0.00)***	(0.00)***	(0.00)***	(0.00)***	(0.00)***	(0.00)***	(0.00)***
FKR	-0.001	0.001	-0.00	0.00	0.00	0.014	0.011	-0.002
	(0.34)	(0.82)	(0.45)	(0.99)	(0.96)	(0.48)	(0.55)	(0.91)
INV	0.117	0.087	0.12	0.132	0.14	0.132	0.1671	0.14
	(0.00)***	(0.085)*	(0.002)***	(0.00)***	(0.00)***	(0.00)***	(0.00)***	(0.00)***
CCP		0.05		0.056	0.053			0.051
		(0.35)		(0.17)	(0.182)			(0.24)
INFL			-0.06		-0.061			-0.047
			(0.446)		(0.123)			(0.32)
OUV				-0.034	-0.042		0.00	-0.04
				(0.00)***	(0.00)***		(0.928)	(0.00)***
INS*FKR						-0.00	-0.001	0.00
						(0.46)	(0.24)	(0.92)
INS	5.76	5.90	5.65	3.97	3.76	5.70		3.91
	(0.00)***	(0.00)***	(0.00)***	(0.00)***	(0.00)***	(0.00)***		(0.00)***
Constant	6.59	6.56	6.72	7.25	7.47	6.17	0.31	7.51
	(0.0)***	(0.00)***	(0.00)***	(0.00)***	(0.00)***	(0.00)***	(0.51)	(0.00)***

Numbers in parentheses note standard deviations. ***,** and * indicate significance at 1% ,5% and 10% respectively

Source: Author (2017), outputs from STATA software

Table 2. Results of estimates of the effect of capital flight on economic growth in WAEMU countries with capital flight

Variables	Dependent variable: economic growth in % GDP							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Ecm	-1.26	-1.27	-1.25	-1.39	-1.38	-1.29	-1.05	-1.36
	(0.00)***	(0.00)***	(0.00)***	(0.00)***	(0.00)***	(0.00)***	(0.00)***	(0.00)***
FKR	-0.03	-0.04	-0.04	-0.04	-0.04	0.03	0.04	-0.01
	(0.00)***	(0.000)***	(0.002)***	(0.005)***	(0.005)***	(0.51)	(0.12)	(0.88)
INV	0.13	0.15	0.14	0.24	0.24	0.15	0.24	0.24
	(0.00)***	(0.00)***	(0.00)***	(0.00)***	(0.00)***	(0.00)***	(0.00)***	(0.002)***
CCP		0.03		-0.06	0.06			-0.06
		(0.74)		(0.10)	(0.02)			-0.11
INFL			-0.01		-0.06			-0.03
			(0.96)		(0.67)			-0.79
OUV				-0.04	-0.04		0.01	-0.03
				(0.00)***	(0.00)***		(0.41)	(0.088)*
INS*FKR						0.00	0.00	0.00
						(0.037)*	(0.09)*	(0.66)
INS	7.16	7.30	7.17	4.34	4.22	6.36		4.29
	(0.00)***	(0.00)***	(0.00)***	(0.00)***	(0.00)***	(0.00)***		(0.00)***
Constant	7.41	7.64	7.27	7.32	7.41	6.47	-1.46	6.52
	(0.00)***	(0.00)***	(0.00)***	(0.00)***	(0.00)***	(0.00)***	(0.24)	(0.00)***

Numbers in parentheses note standard deviations. ***,** and * indicate significance at 1% ,5% and 10% respectively

Source: Author (2017), outputs from STATA software

Table 3. Results of estimates of the effect of capital flight on economic growth in countries with negative flight in the WAEMU

Variables	Dependent variable: economic growth in % GDP							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Ecm	-1.11	-1.16	-1.12	-1.16	-1.16	-1.14	-1.15	-1.19
	(0.00)***	(0.00)***	(0.00)***	(0.00)***	(0.00)***	(0.00)***	(0.00)***	(0.00)***
FKR	-0.01	-0.00	-0.00	0.00	-0.00	0.01	0.017	0.01
	(0.03)*	(0.89)	(0.106)	(0.002)**	(0.91)	(0.64)	(0.67)	(0.66)
INV	0.114	0.102	0.11	0.096	0.09	0.099	-0.036	0.08
	(0.00)***	(0.00)***	(0.00)***	(0.002)**	(0.004)**	(0.00)***	(0.05)*	(0.02)*
CCP		0.054		0.026	0.025			0.035
		(0.297)		(0.74)	(0.77)			(0.63)
INFL			-0.017		-0.045			-0.032
			(0.81)		(0.68)			(0.83)
OUV				0.011	0.003		-0.001	-0.007
				(0.46)	(0.83)		(0.97)	(0.175)
INS*FKR						-0.00	-0.00	-0.001
						(0.45)	(0.56)	(0.31)
INS	1.11	2.34	1.36	1.72	2.12	0.788		2.10
	(0.29)	(0.404)	(0.44)	(0.52)	(0.53)	(0.41)		(0.54)
Constant	3.79	4.02	4.15	3.18	4.46	3.88	4.87	5.49
	(0.001)**	(0,033)*	(0,044)*	(0,004)**	(0,079)*	(0,001)**	(0,004)**	(0,04)*

Numbers in parentheses note standard deviations. ***,** and * indicate significance at 1% ,5% and 10% respectively

Source: Author (2017), outputs from STATA software

But since capital flight and economic growth are measured as a percentage of GDP, the result is that, on average, for every dollar leaving some WAEMU countries in the form of capital outflows, 0.037 percent deprives the economy of resources that could be used to finance economic growth. On the other hand, the opposite result is given for countries with a negative leakage. These two opposite results may explain, in part, the configuration of the total sample that foreshadows the econometric result found in the aggregate case. Finally, these results are still robust to the case of controlling for the macroeconomic variable.

Finally, when the interaction variable is included in the last specifications of the model for countries with positive leakage, the result shows that the negative impact of capital flight on economic growth increases with the level of investment, implying that, in some WAEMU countries, the effect of capital flight on economic growth is very large through domestic investment, which is consistent with previous results in the literature (Ndiaye, 2009b; Fofack & Ndikumana, 2010).

Disaggregating the total sample according to this criterion also allowed us to test robustness. Indeed, the institutional environment proxied by the control of corruption is found to be positive and statistically significant only in the case of countries with a positive leakage, while for the other countries it does not exert a significant effect on economic growth. These results remain true even after controlling for other variables, notably macroeconomic ones (domestic investment, inflation, foreign direct investment, and the degree of openness).

5. Conclusion and policy implications

Over the period 1970-2016, real capital flight for the eight (8) countries in the WAEMU zone is found to be positive and significant with a magnitude that amounts to about $58,655.28 million, representing 57.55% of GDP. The measurement results show that significant capital flight is recorded especially in economies such as Côte d'Ivoire, Burkina Faso, Niger and Senegal.

To this end, the objective of the paper is to measure the impact of capital flight on economic growth. By adopting an econometric method, we used the Dynamic Fixed Effects (DFE) panel estimation method. The econometric results show that capital flight in aggregate does not significantly reduce economic growth in the WAEMU. In contrast, when decomposing the sample, the group of countries with capital flight have coefficients that respect the central hypothesis of this paper over the period while the impact is not pronounced in countries with negative flight. The results also indicate that the harmful and devastating impact of capital flight on economic growth increases with the level of investment. These results are robust in the sense that they do not depend on the specifications of the economic growth model, and remain true even after controlling for other variables, including macroeconomic and institutional variables.

Based on the subsample results, the adverse effects of capital flight on growth in the WAEMU zone seem incontrovertible. Therefore, ignoring the investment channel may undermine the effects of capital flight on growth in the zone. We also note that the inflow of investment is not sufficient to offset the effect of capital flight from the zone. Nevertheless, they have proven to be essential to improve the growth performance of these four countries. Above all, stricter capital controls should be put in place to deter capital outflows from the WAEMU. In addition, serious and conscious efforts can be made to address the prevailing macroeconomic uncertainties in the WAEMU zone to mitigate its influence on capital flight. Finally, repatriation of capital flight through improved governance, strengthening the quality of institutions, and promoting a stable policy environment are necessary.

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APPENDIX

Table A.1: Definition of variables and data sources.

Variables	Définition	source
Dependent variable: economic growth (CROIS)	Measured by Real GDP Growth Rate	World Development Indicators 2017
	Variables indépendantes	
Variable d'impact : capital flight (FKR)	Ratio of real capital flight to GDP	Author's calculations
	Control variable	
Investment (INV)	Gross fixed capital formation as a % of GDP	World Development Indicators 2017
Inflation (INF)	Annual change in the consumer price index (CPI)	Africa Development Indicators 2017
credit to the private sector (CCP)	credit to the private sector (CCP)	Africa Development Indicators 2017
Degree of opening (OUV)	Exports plus imports as % of GDP	Africa Development Indicators 2017
	Institutional variable	
Polity2 (INS)	Polity2 index (revised combined policy score)	Polity IV

Table A.2: Descriptive statistics of variables

Indicators	Average	Standard deviation	Minimum	Maximum	obs
CROIS	3.489	4.608	-17.05	20.287	329
FKR	5.272	34.760	-324.00	117.26	329
CCP	18.386	8.813	3.302	42.26	329
INF	4.892	7.356	-8.40	39.16	287
INV	18.261	6.040	6.767	38.89	282
OUV	60.198	20.51	0	140.86	329
INS	-0.399	0.71	-2.264	1.049	126

Source: Author (2017), outputs from STATA software