

**An assessment of the contribution of Monetary Unions to Economic Growth:  
the case of the CFA Franc zone**

By

**MBEINTA, Lambert Chia**

**THESIS**

Submitted to

KDI School of Public Policy and Management

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For the Degree of

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Committee in charge:

Professor Jongyeon LEE, Supervisor



Professor Chrysostomos TABAKIS



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Professor Byoung-Joo KIM



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## **Abstract**

Monetary Unions (MU) as a form of economic integration is believed to procure a bonus growth point to member countries of the union. However, since Britain voted to leave the European Union in 2016, there are growing claims that integration does not enhance growth and welfare. This thesis examines the impact of MU membership on economic growth, with focus on the CFA Franc zone. The random effect model is used to analyze panel data from 47 SSA countries for the period 2000 to 2015. The result shows a negative and significant growth effect. Also, capital accumulation appears to be the main determinant of growth. These results remain unchanged when the pooled OLS regression is used. This implies that MU membership does not always enhance economic growth. These findings are similar to those of previous studies. Member countries should revisit the CFA Franc cooperation framework to foster growth and development within the region.

**Keywords:** Monetary Union, economic growth, CFA Franc zone, Sub Saharan Africa.

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## **Abbreviations**

|       |  |
|-------|--|
| CAEMU | Central Africa Economic and Monetary Union |
| WAEMU | West African Economic and Monetary Union   |
| IMF   | International Monetary Fund                |
| MU    | Monetary Union                             |
| KDI   | Korean Development Institute               |
| XAF   | Central African Francs CFA                 |
| SSA   | Sub-Sahara Africa                          |
| EMU   | European Monetary Union                    |
| BEAC  | Bank of Central African States             |
| BCEAO | Bank of West African States                |
| FDI   | Foreign Direct Investment                  |
| GDP   | Gross Domestic Product                     |

## **Dedication**

Dedicated to my family

## **Acknowledgement**

I thank God for the opportunity and strength given me to complete this Master program.

My profound gratitude goes to the Korean people, the administration of the KDI School of Public Policy and Management, lecturers and staffs for an academically enriching and inspiring experience. I am particularly grateful to my supervisors, Professors LEE Jongyeon and Tabakis Chrysostomos for supervising this work, and Professors SHIN Jaune and Gina LEE for their inspiration and encouragements.

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# CHAPTER I: INTRODUCTION

## 1.1 Background

The CFA Franc zone is a MU<sup>1</sup> comprised of 14 African countries (Appendix C). Eight of these countries are found in West Africa and constitute the West African Economic and Monetary Union (WAEMU), and the six others are located in Central Africa forming the Central African Economic and Monetary Union (CAEMU). Both regions form the CFA Franc zone, with the CFA Franc as the single currency. The zone was established by two separate agreements between France and each of the unions (CAEMU in 1972 and WAEMU in 1979). The CFA Franc currency is denoted as XAF in the CAEMU and XOF in the WAEMU. But the XAF and the XOF are not convertible with each other. However, the CFA Franc zone is treated as one MU because of free movement of capital, guaranteed convertibility and equal parity with the French currency (Hadjimichael & Galy, 1997). With the advent of European integration, the two currencies are fixed to the Euro at 1€=655.957 XAF/XOF.

On the 23<sup>rd</sup> of December 2016, an extra ordinary summit of heads of States of the CAEMU took place in Yaoundé, Cameroon. Present at the summit was the IMF Director General, Christine Lagarde, the French Minister of Finance, Michel Sapin, and other high profile guests. From the official press document presented by the presidency of the Republic of Cameroon, among other reasons, the urgency at hand is the region's worrying foreign reserves situation. According to the IMF, as at December 2016, the CAEMU region's reserves stood at approximately 3.34 billion USD, compared to about 10 billion USD in 2010. Figure 1 shows an evolution of the region's reserves from 2000 to 2016.

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<sup>1</sup> A Monetary Union or Currency Union is an agreement among members of that union (countries or other jurisdictions) to share a common currency, and a single monetary and foreign exchange policy (IMF-CBPS-CUTEG 2004 issues paper 1).

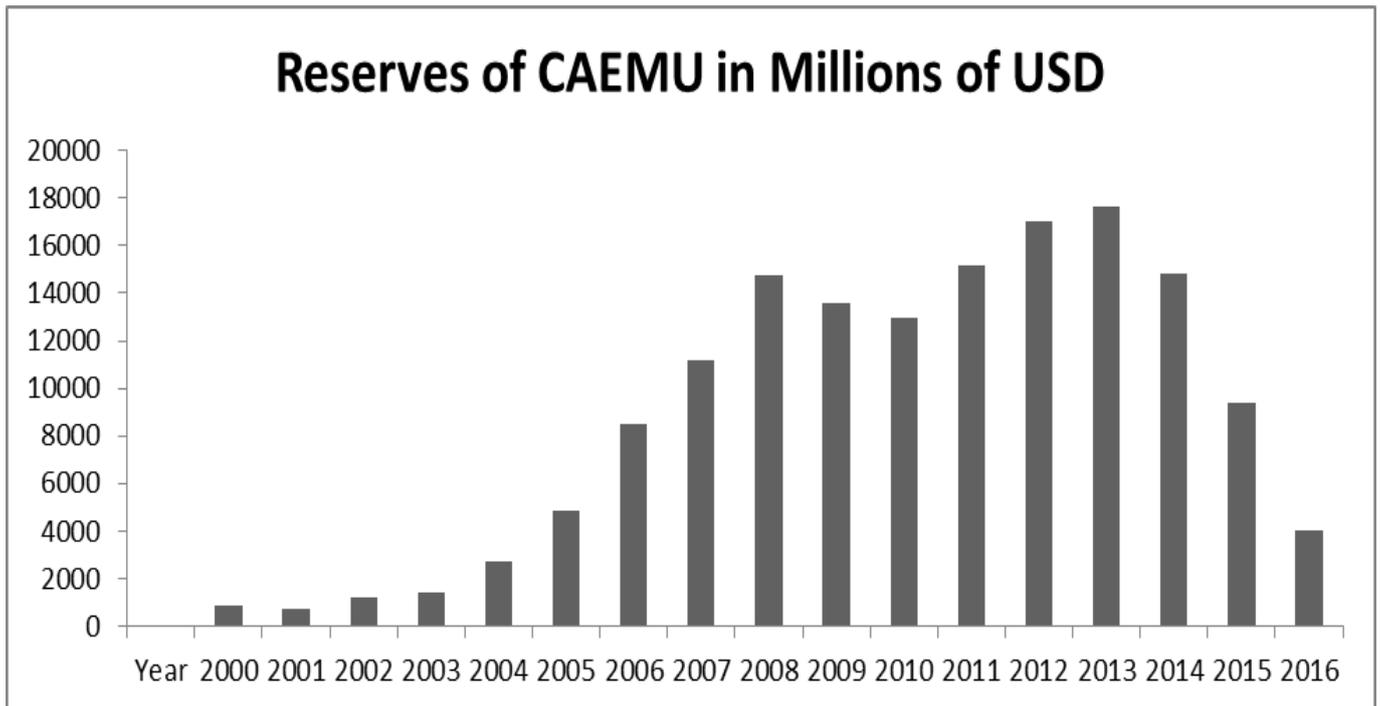


Figure 1: Evolution of foreign reserves

Source: World Bank WDI

In 2016 alone, the region lost about 6 billion USD of foreign reserves, much of it due to the drop in oil prices according to the same source. This situation takes the CAEMU more than a decade back in terms of foreign reserves stock.

On the 10<sup>th</sup> of April 2017, a similar meeting was held in Abidjan, Ivory Coast. The meeting brought together all heads of states and governments of the WAEMU. Discussions centered on the region's economic performances among other issues.

One possible consequence of the present reserve crisis is devaluation. For some, it is not an option, but for others, it is unavoidable. Some people still have in mind the difficult conditions they went through after the 1994 devaluation of the CFA Franc. This possibly explains why even the man on the street is not indifferent to the present reserve crisis. In this regard, one can say without fear of contradiction that the CFA Franc zone's functioning mechanism may be going through one of the most detailed scrutiny of its existence.

The functioning mechanism of the Franc zone is founded on four main sets of rules: the fixed exchange regime, foreign currency reserves management, rigorous macroeconomic

management and the presence of French representatives in the union's management organs. (Guillaumont & Guillaumont, 2012). According to these authors, these sets of rules have evolved over time, in adjustment to political and economic changes of each party, with the advent of the EMU (European Monetary Union) being the most important. First, the fixed exchange regime guarantees unlimited convertibility of each member's currency to the Euro at 1€=655.957 XAF/XOF. In exchange for unlimited convertibility, is the centralization of each country's foreign reserves at the regional Central Bank (BEAC for CAEMU and BCEAO for WAEMU). The second set of rules on foreign reserve management requires that the Central Banks deposit 50% of these reserves in the French treasury. According to (Guillaumont & Guillaumont, 2012), the third set concerning rigorous macroeconomic management is not clearly spelled out in the agreements. However, they require that economic policies should be aligned to the fixed exchange regime. Finally, the fourth set of rules related to the presence of French representatives in the governing organs of the Central Banks differs across the two sub-unions. In the WAEMU, it is required that 1 out of the 10 members of the Board of Directors (BOD) of the Central Bank (BCEAO) should be a French representative. In the CAEMU, the requirement is for 2 French representatives out of the 14 members of the BOD of the Central Bank (BEAC). In the Monetary Policy Committee of the BCEAO, 1 out of the 16 members should be a French representative, while there are 2 out of the 14 members in the same organ at the BEAC. (Guillaumont & Guillaumont, 2012).

Debates on the benefits of the CFA Franc zone membership have existed since the creation of the union. The present reserve crisis has amplified these debates and led to demonstrations. Britain's refusal to join the EMU and subsequent 2016 vote to leave the EU is seen as a strong case in point that MU membership or economic integration is not always beneficial as previously claimed by integrationists.

Supporters argue that the CFA Franc zone enables members to enjoy relative

macroeconomic stability compared to the rest of SSA. These claims are supported by existing data. According to the World Bank WDI, inflation within the zone stood at about 3% between 2000 and 2015, as against 10% in the other SSA countries (excluding Zimbabwe). Also, they hold that member countries of the CFA Franc zone have shown more fiscal discipline compared to their other SSA counterparts. Over the period 1965-1984, Yehoue (2006) found that zone member countries showed better fiscal management in contrast to non-members. Fiscal deficits decreased in the zone from 4.9 percent average in the 1960s to about 3.3 percent in the early half of the 1980s. Over the same time periods, it increased from 5.2 percent to 7.6 percent in non-zone countries. In their opinion, the zone needs to be widened and integration should be further deepened to promote growth and development. However, these arguments don't seem to persuade CFA Franc zone critics.

Skeptics claim that the CFA Franc is a colonial currency. They say it was instituted in 1945, long before African countries got their independence. The CFA Franc cooperation agreements were equally signed in a post-colonial era (1970s). As such, the CFA Franc zone was designed to serve only French interests and not those of African countries. Allechi and Niamkey (1994) exploited statistical data from the French treasury's operations account where CFA zone member's reserves are stored. The study concludes that African states are more net losers than winners in the MU. Also, other studies including Boughton (1991), Quéré and Coupet (2003) and Zhao and Kim (2009) agree that the Franc zone is not an optimal area, based on elements of Mundell (1961) Theory of Optimum Currency Areas (OCA). The zone is as such perceived by critics as a "monetary servitude" mechanism. Talking about the CFA Franc, Dr. Carlos Lopez, former Executive Secretary of the United Nations Economic Commission for Africa (UNECA), said it is unheard of for a currency to be used for more than thirty years without being reviewed. For him, there is need for something to be done. Further, opponents insist that despite the relative macroeconomic stability, this has not contributed to

growth in member countries. According to the World Bank WDI, average GDP per capita growth rate stands at about 7% in both zone and non-zone member countries for the period 2000 to 2010. Empirical evidence of the contribution of CFA Franc zone membership to growth is somehow limited to settle the ongoing debate.

## **1.2 Objective of the study**

A key economic motivation for the put in place of the EU and the Euro-zone was an anticipated growth enhancement among members (Dreyer & Schmid, 2016). This is based on previous claims that economic integration accelerates growth. The objective of this thesis is to investigate these claims for the CFA Franc zone. The findings will add to the relatively limited literature and better orientate policy decisions.

## **1.3 Research question**

This thesis attempts to answer the following question: Does the CFA Franc zone membership enhance economic growth?

This question is important because belonging to a MU entails costs and benefits. These costs and benefits may be economic, political, security and socio-cultural. As such, deciding to join or stay in, or not to join or quit such a union will require a comprehensive cost-benefit analysis (CBA). This will help avoid miscalculations and facilitate decision making that is overall beneficial to the country. A possible case of such miscalculated decisions in the past is the exit of Mali. The country left the CFA Franc zone in 1962 only to rejoin in 1984. Apparently, an assessment of the net outcome of Mali's in and out movement has not been discussed in past literature, but it is fair to believe that like Madagascar (which left the CFA Franc zone in 1973), Mali wouldn't have returned to the union if exiting had been a better

option. Reason why the decision to exit can be seen

The research question seeks to know if Franc Zone member countries have benefitted from a bonus growth point. The answer to this question will help better assess the gains of membership and contribute to the current debates on the Zone Franc.

## **1.4 Research Hypothesis**

The null hypothesis to the research question above is that Zone Franc membership has contributed to economic growth in member countries

This hypothesis is based on previous claims of a growth bonus associated with economic integration. According to the Robert Schuman Foundation, peace and economic prosperity were the main motivating factors that brought together the key founders<sup>2</sup> of the present day EU. This probably explains why many scholars have shown so much interest on the growth effect of European integration. Although existing literature appears divided, it is reasonable nonetheless to believe that the continuous expansion of the EU and the deepening of this union into a MU (Euro), that European integration has somehow been successful. As such, the hypothesis is justified by the European experience.

There are two possible outcomes of this study. The CFA Franc zone membership may have a significant or insignificant coefficient of association with economic growth (measured by increase per capita GDP). If the coefficient is insignificant, it means there is absence of a relationship between zone membership and economic growth. This will mean, belonging to a MU or not does not influence growth. If the coefficient is significant and positive, it means CFA Franc zone membership does enhance growth. In this case, the research hypothesis is

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<sup>2</sup> There were seven key founders : Robert Schuman, Jean Monnet, Konrad Adenauer, Alcide de Gasperi, Paul-Henri Spaak, Johan Willem Beyen and Joseph Bech (Robert Schuman Foundation).

valid. If the coefficient is significant and negative, it means membership inhibits growth. the research hypothesis is not valid.

## **1.5 Scope**

This thesis assesses the contribution of the CFA Franc zone membership on economic growth for the period 2000 to 2015. Determinants of growth in SSA identified from past studies are used as control variables. Zone membership (a dummy variable) is the variable of interest. 47 out of 49 countries in SSA are selected (14 CFA Franc zone member countries and 32 non-member countries). Somalia and South Sudan are left out of the study due to limited available data.

## **1.6 Methodology**

Panel data for the 47 SSA countries is obtained from the World Bank WDI and UNCTAD. The dependent variable is annual growth rate of GDP per capita. Independent variables include: inflation, gross capital formation, openness, government expenditure, FDI net inflow, labor and personal remittance. OLS regression is used to observe the relationship between the dependent and independent variables. The study applies the random effect model to investigate the growth effect of zone membership and the determinants of growth. Both methods are done using Stata.

After this first chapter on the introduction, chapter two focuses on the review of literature, while the data and model specification are examined in chapter three. The empirical analysis and results are discussed in chapter four and chapter five covers the conclusion.

## **CHAPTER II: LITERATURE REVIEW**

### **2.1 Overview**

There is a substantial amount of literature on the effect of economic integration or MU (both terms are used interchangeably in this study since MU is a form of economic integration) on economic growth. Most of it however focuses on the European case. Past studies on the CFA Franc zone appear to pay more attention to the zone as an Optimum Currency Area or OCA<sup>3</sup>, with little on the growth effect of zone membership. Regardless of the region of focus and the domain of study, the contribution of MU and economic integration to growth has divided researchers. Some studies conclude that MU membership enhances growth while others found a negative or no effect of MU membership on growth.

According to the new growth theory, economic integration increases growth through various channels such as trade Rose (2000), Baldwin, Richard and Taglioni (2007), and openness (Harrison, 1996). The neoclassical growth theory on the other hand believes that economic integration or change in economic policy in general only has short term effect on growth (Solow, 1956)

### **2.2 Empirical Literature**

A recent study in favor of a growth bonus in economic integration is Mann (2015). The paper examined the growth effect of European economic integration on Central Eastern European countries. A convergence equation was estimated using the augmented Solow model with panel data from ten countries over a 16 years period (1995-2010). Trade was used as a

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<sup>3</sup> The Optimal Currency Area (OCA) was developed by Robert Mundell in 1961 to describe the features of an integrated area with optimum economic benefits for its members.

measure of integration. The result showed a significant bonus point on growth. These findings are supported by Bukowski (2017) which concluded that the convergence criteria adopted by the EMU was a vital factor for long run macroeconomic stabilization and growth within the union.

Further, Barrell, Gottschalk, Holland, Khoman, Liadze and Pomerantz (2008), analyzed the European Economic and Monetary Union (EMU) and concluded that membership had a positive effect both on growth and employment. Potential channels of this growth effect include a stable macroeconomic situation and financial integration. The methodology comprised of analyzing and describing developments before and after the euro.

In the same light, Bagella, Becchetti, and Hasan (2004) measured the effects of the Eurozone MU on exchange rate volatility and quality of institutions and macroeconomic policies. They evaluated the effect of these two variables on economic growth. A comparison of the volatility of real exchange rate level and variance of institutional quality in Eurozone member countries with other similar groups of countries, suggests less volatility and better institutions across members countries. Subsequently, the study found that these two variables have a positive effect on economic growth, implying that the member countries of the Eurozone benefitted from a bonus growth point.

Also, Frankel and Rose (2000) estimated the trade and growth effect of Currency Unions. Both economic and geographic data from over 200 countries for the period 1970 to 1990 was used. First, the study evaluated the effect of Currency Unions on trade and then the effect of trade on growth. These estimates revealed that membership in a Currency Union increased trade more than three times. Then, an increase in one percent of trade as a proportion of GDP, increased per capita income by approximately 1/3 of a percent in a 20-years' timeframe.

Looking at the case of the CFA Franc zone, Boughton (1991) examined the two

dimensions of the zone, i.e. the monetary union and the pegged exchange rate system. The conclusions revealed that when France is included the union, the gains of membership are more visible even though they don't form an OCA, but. These results are supported by Yehoue (2006), who observed that when France is included in the union, its economic situation improves. According to the latter, when the CFA zone member countries experienced a shock, French Aid to these countries increased at the same time. This Aid increase acted as a shock absorber. The shock absorption was estimated to be about 44 percent for the CAEMU and 63 percent for the WAEMU (Yehoue, 2006). The negative correlation observed between Aid from France and deteriorating terms of trade in the CFA Franc zone could have contributed to the net gains observed by Boughton (1991).

These relatively recent studies confirm the results of earlier studies including Romer (1990) which held that economic integration in general enhances growth. However, other studies on the growth of MU have had contradicting results.

Dreyer and Schmid (2016) examined whether EU and Euro Zone membership contributed to the growth of members. The paper applied the augmented Solow growth model on data collected for 31 countries for the period 1999 to 2013. The results indicated that EU membership enhanced growth. Nonetheless, Euro Zone membership had a negative impact on economic growth during crisis, specifically the period from 2007 to 2013.

Lohi (2014) tested the effect of the fixed exchange rate regime on inflation in SSA countries. Regrouping countries in according to their different exchange regimes and comparing them to those of the CFA Franc zone, the result validated the inflation-growth trade-off in the CFA Zone. Despite having low inflation levels in the long and short term, zone member countries have suffered great losses in output, compared to non-zone members in general, and non-zone members with fixed exchange systems as well. These results support past claims by Devarajan and Rodrik (1991) that the fixed exchange rate mechanism of the

CFA Franc zone hurts economic performance in member countries.

Assessing the European EMU after five years of entry to force of the Euro, the 2004 European Commission Special Report No. 1, concluded that member countries have realized a sound level of nominal convergence and macroeconomic stability. However, the report insists that in terms of economic growth, the region witnessed “mixed fortunes” (page 25) with a rapid growth in the first two years (1999-2000) and a slowdown in the next three years (2001-2003). The ten years report published in 2008 equally shared this stance. The report maintained that growth rate within the Eurozone was weak. Economically smaller countries had higher growth rates while bigger countries saw their GDP growth rate reduce after the entry to force of the Euro.

Devarajan and Rodrik (1991) carried out a Cost Benefit analysis of the fixed exchange rates system in the CFA Franc zone. They compared the benefit of member countries “tying up their own hands” with the fixed exchange system and enjoying lower prices, with the cost of not being able to adjust exchange rate policies to external shocks. They found that, the costs of the shocks could have possibly been reduced with a flexible exchange rate system, implying less economic performance.

As shown above, existing literature on the growth effect of MU membership has been dominated by the European EMU, with diverging results. Meanwhile, studies on the CFA Franc zone have focused either on the zone as an OCA or net gains of zone membership. The contribution of MU membership on economic therefore still divides researchers. This study focuses on the growth bonus within the CFA Franc zone and makes use of relatively recent data collected for the period 2000 to 2015.

## **CHAPTER III: DATA AND MODEL SPECIFICATION**

### **3.1 Data**

The data is collected from the WB WDI and from UNCTAD. The dependent variable for the study is real GDP per capita. Explanatory variables include: Gross capital formation, labor, Foreign Direct Investments (FDI), inflation, openness of the economy, government expenditure and personal remittance. The choice of these variables is based on similar past studies including Dreyer and Schmid (2016). The period of the study is 16 years (2000-2015). This timeframe allows for the most recent and available data to be used. The sample is comprised of 47 SSA countries out of the 49. South Sudan and Somalia are left out due insufficient data.

Table 1 shows the descriptive statistics of each of the variables of the study. It distinguishes zone and non-zone member countries. While most of the variables are similar between these groups, inflation as expected is higher in non-zone countries than in zone countries.

Table 1: Descriptive statistics for the period 2000-2015

| Variable                | Obs | Mean     | Std. Dev. | Min      | Max      |
|-------------------------|-----|----------|-----------|----------|----------|
| Year                    | 752 | 2007.5   | 4.61284   | 2000     | 2015     |
| Inflation               | 720 | 46.30417 | 910.8815  | -35.8    | 24411    |
| personal remittance     | 393 | 5.198494 | 8.705306  | 0.053    | 61.924   |
| government expenditure  | 381 | 18.97559 | 7.996638  | 2        | 52.8     |
|                         |     |          |           |          |          |
| Labor                   | 747 | 0.056851 | 0.048795  | 0        | 0.229922 |
| Net FDI Inflow          | 745 | 5.36953  | 8.485539  | -6       | 89.5     |
| GDP per capita          | 748 | 2125.775 | 3162.387  | 193.9    | 20333.9  |
| Gross capital formation | 697 | 21.73687 | 12.56069  | 0        | 147.9    |
| Openness                | 747 | 0.598367 | 0.432921  | 0        | 2.36     |
|                         |     |          |           |          |          |
| Zone                    | 752 | 0.297872 | 0.457628  | 0        | 1        |
| Country                 | 752 | 24       | 13.57369  | 1        | 47       |
| Lngdp                   | 748 | 6.980919 | 1.067939  | 5.267343 | 9.920045 |

This high rate of inflation can be attributed to Zimbabwe, a country which has suffered from hyperinflation in recent years. However, when Zimbabwe is removed, average inflation in non-zone countries is still above 12.43 percent compared to about 3 percent in zone countries.

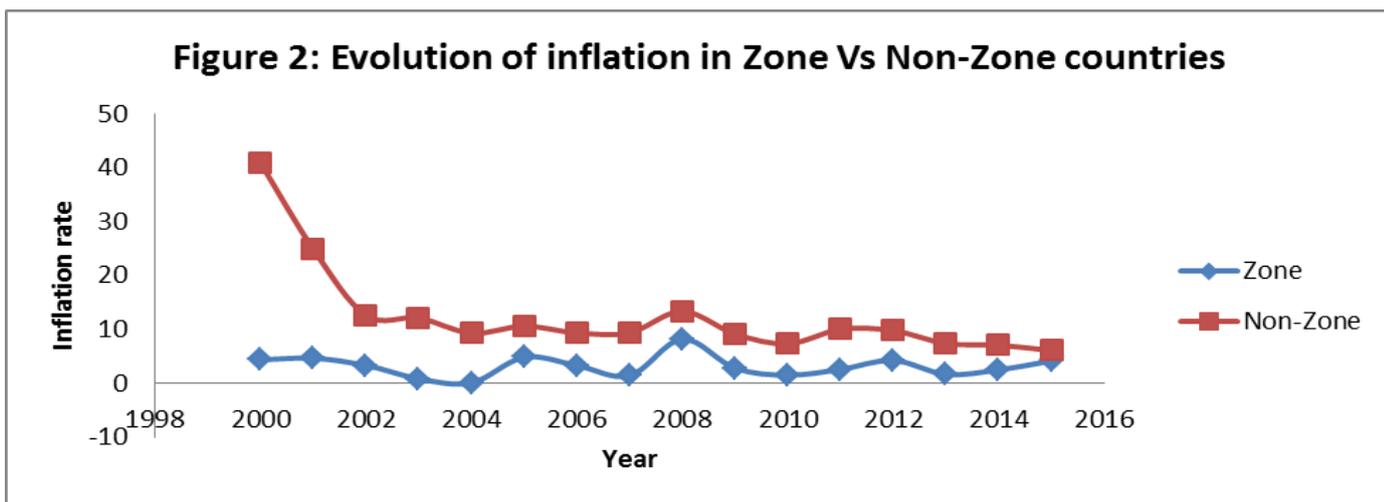


Figure 2: Evolution of inflation in zone and Non-zone CFA countries

Figure 2 shows the evolution of annual inflation rates between the two groups without Zimbabwe. It is worth mentioning that, throughout the period of the study, inflation is higher in

non-zone countries. However, there is decreasing trend over the years.

### 3.2 Model specification

The random effect model is applied to examine the growth effect of CFA Franc zone membership. Six determinants of growth from past studies are integrated as control variables. In total, the model includes one dependent variable and seven explanatory variables, including the single dummy variable, zone membership. The model can be presented as:

$$Y_{ct} = \beta_0 + \alpha Z + \beta X_{ct} + \varepsilon_{ct}$$

Where:

$Y_{ct}$  denotes the dependent variable

$\beta_0$  denotes the intercept of the equation

$\alpha$  represents the coefficient of the dummy variable

$Z$  represents the dummy variable (zone)

$\beta$  indicates the coefficient of the explanatory variables

$X$  indicates the explanatory factor (i) at (t) time

$\varepsilon$  is the error term

$c$  denotes the cross-sectional dimension

$t$  denotes the time series dimension

From the above, the empirical model is as follows:

$$AGr_{ct} = \beta_0 + \beta_1 GCF_{ct} + \beta_2 INF_{ct} + \beta_3 LAB_{ct} + \beta_4 GOV_{ct} + \beta_5 OP_{ct} + \beta_6 FDI_{ct} + \beta_7 PR_{ct} + \alpha Zon + \varepsilon_{ct} \dots (1)$$

Where:

$AGr_{ct}$  = log of real GDP per capita

$GCF_{ct}$  = Gross Capital Formation as a percentage of GDP

$INF_{ct}$  = Annual inflation rate (CPI)

$LAB_{ct}$  = Labor work force as a percentage of GDP

$GOV_{ct}$  = Government expenditure as a percentage of GDP

$OP_{ct}$  = Openness of the economy, defined by (exports + imports)/GDP (real)

$FDI_{ct}$  = FDI Net inflow as a percentage of GDP

$PR_{ct}$  = Personal remittances as a percentage of GDP

$Zon_{ct}$  = CFA Franc zone membership

The annual growth rate of GDP per capita is obtained by calculating the logarithm of the real GDP per capita collected from the World Bank WDI. The explanatory variables as earlier mentioned are similar variables used in previous studies. It is expected that these variables will have significant positive or negative coefficients.

Labor force is the total labor force of age 15 and above within the country, converted as a percentage of GDP. It is expected to have a positive coefficient. Different researchers including Spiegel and Benhabib (1994) have provided empirical evidence of a positive relationship between human capital and economic growth.

Annual inflation (Consumer Price Index) is projected to have a negative coefficient. Barro (1995), examined the link between annual growth and inflation. Using data from 100 countries the study concludes that when inflation increases by 10 percent points, growth rate of real GDP per capita declines by 0.2 to 0.3 percent points.

It is probable that coefficient of government expenditure is negative. Ndambiri, Ritho, Kubowon, Mairura, Nyangweso, Muiruri and Cherotwo, 2012, investigated the determinants of growth in SSA countries. The results suggest that government expenditure have a negative effect of growth. This is explained by poor governance, which facilitates the misappropriation

of public funds destined for growth enhancement.

Gross capital formation as a percentage of GDP is the growth of total capital between two periods in the economy compared to the GDP. It is likely to have a positive coefficient. According to Ndambiri et al. (2012) and Uneze (2013), increase in gross capita formation contributes positively to growth in SSA.

The level of openness in this study is the sum imports and exports of goods and services divided by the annual GDP of the period. Openness is expected to have a positive coefficient. Gundlach (1996) and Were (2015), both found a positive effect of trade on economic growth.

Personal remittance and FDI data are collected from UNCTAD and expressed as a percentage of real GDP. They are both expected to have positive coefficients as shown by Benmamoun and Lehnert (2013).

Finally, the dummy variable “Zon” is attributed the value “1” for member countries and “0” for non-member countries of the CFA Franc zone.

## **CHAPTER FOUR: EMPIRICAL ANALYSIS AND RESULTS**

### **4.1. OLS & Random Effect**

This chapter presents the different regression results obtained in this study. The results of the Ordinary Least Square (OLS) and random effect models are presented in table 3. They show the relationship between zone membership and economic growth. Since the variable of interest (zone membership) is a dummy, which is time invariant, the fixed effect model is not appropriate and therefore is not executed.

In the OLS regression result, the R-squared has a value of 91.04% with an adjusted value of 90.67%. This suggests that the dependent variable is explained by the explanatory variables in the model. Also, except for the variable Net inflow of FDI, all other variables have significant coefficients at a 1 percent, 5 percent or 10 percent level of significance in the OLS. This is an additional indication, that the model is fit. Zone membership is significant and has a negative coefficient.

In the random effect model, four out of the eight variables are statistically significant. The variable of interest, zone membership is statistically significant and the coefficient still remains negative. This implies that there is a negative relationship zone membership status and growth. As concerns the control variables, Gross capita formation, inflation and labor are statistically significant, with the first having a positive coefficient and the last two having negative coefficients. The result of the OLS and the Random effect from Stata is presented on table 2.

Table 2: OLS and Random Effect

| Model<br>VARIABLES     | OLS<br>Lngdp          | Random Effect<br>Ingdp |
|------------------------|-----------------------|------------------------|
| Inflation              | 0.007*<br>(0.004)     | -0.002**<br>(0.001)    |
| Gross capita formation | 0.007**<br>(0.003)    | 0.002*<br>(0.001)      |
| Labor                  | -19.914***<br>(0.696) | -14.334***<br>(0.828)  |
| Government expenditure | 0.031***<br>(0.004)   | -0.000<br>(0.001)      |
| FDI Net inflow         | 0.003<br>(0.003)      | -0.000<br>(0.001)      |
| Openness               | -0.194***<br>(0.062)  | 0.012<br>(0.020)       |
| Personal remittance    | -0.032***<br>(0.004)  | -0.002<br>(0.002)      |
| Zone membership        | -0.305***<br>(0.058)  | -0.450***<br>(0.166)   |
| Constant               | 7.724***<br>(0.115)   | 7.938***<br>(0.114)    |
| Observations           | 202                   | 202                    |
| R-squared              | 0.910                 | 24                     |

Standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Gross capita formation has a positive coefficient and is statistically significant in both the OLS and the random effect models. This result is in line with the expectations of the study. Inflation is also statistically significant in both models, but has a positive coefficient estimate in the OLS and a negative coefficient in the random effect model. Labor is statistically significant in both the OLS and random effect model. The coefficient estimate also remains negative in both models. This result is in contradiction with some theories and empirical studies of human capital contribution to economic growth. With regards to government expenditure, it is statistically significant with a positive coefficient in the OLS model. In the random effect model it is not statistically significant. As earlier mentioned, FDI Net inflow is not significant

in the OLS and remains the same in the random effect. Trade openness, a major source of growth in economic integration according to many studies, is significant in the OLS, but with a negative rather than a positive coefficient. In the random effect, openness is not statistically significant. Finally, personal remittance is also significant in the OLS but not in the random effect model. However, the coefficient estimate is negative, another ambiguous result with regards to some previous research.

As observed, although similarities exist with both models, existing differences suggest that we choose which of the models (pooled OLS or random effect) is most appropriate to analyze this effect. To make this decision, the Breusch Pagan test is executed.

#### 4.2. Breusch and Pagan test for Random Effect

To decide on which model between the pooled OLS and the random effect, the Breusch and Pagan test for random effect is used. The null hypothesis suggests that the OLS model should be used, while the alternative hypothesis suggests that the random effect model should be used. If the result of the probability chi2 is less than 0.05, we reject the null hypotheses and conclude that the random effect model is more appropriate. If the probability chi2 is greater than 0.05, we fail to reject the null hypothesis and use the pooled OLS model.

The result of this second regression is shown in table 3.

Table 3: test result

|                   |                |        |
|-------------------|----------------|--------|
| Test: Var (u) = 0 |                |        |
|                   | Chibar2 (01)   | 559.21 |
|                   | Prob > chibar2 | 0.0000 |

The probability chi2 in table 3 is 0.000, which is less than 0.05. Following the hypothesis, we reject the null hypothesis and conclude that the random effect model is more appropriate.

With the choice of the model done, it is important to ensure that the variables are free from multicollinearity problems. The existence of multicollinearity creates problems in the evaluation of the regression model. To detect multicollinearity issues between the explanatory variables, this study uses the variance inflation factor (VIF) test.

### 4.3. Variance Inflation Factor (VIF) test for multicollinearity

The VIF test says to what extent the standard error of the coefficient of interest have been inflated upward. A rule of thumb is that the standard error should not have been inflated more than twice its basic size. This means that the VIF for any variable should be less than four. If the vif is less than 4, we conclude the absence of multicollinearity. If the vif is four and above, this means that there is correlation between the variable and one or more other variables. The result of the regression is found in table 4.

Table 4: Results of VIF test for multicollinearity

| Variable                | VIF  | 1/VIF    |
|-------------------------|------|----------|
| Government expenditure  | 2.16 | 0.462817 |
| Labor                   | 1.52 | 0.657814 |
| Inflation               | 1.32 | 0.754772 |
| Openness                | 1.31 | 0.764671 |
| Personal remittance     | 1.30 | 0.770228 |
| Gross capital formation | 1.29 | 0.774820 |
| FDI Net Inflow          | 1.26 | 0.792578 |
| Zone                    | 1.55 | 0.644314 |
| Mean VIF                | 1.46 |          |

From the regression result, all explanatory variables have a value less than four. The mean VIF is 1.46, which is equally less than four. We conclude the absence of a

multicollinearity problem in the model.

#### 4.4. The Random Effect Model

As requested by the Breusch and Pagan test, the random effect model is used to estimate the growth effect of zone membership. To ensure the robustness of the results, the model is further split into three sub models, model I, model II and model III. Where model I is the most reduced and model III is the complete model of the study. Table 4 shows the results of each model.

Table 4: Random Effect model

| VARIABLES              | (Model I)<br>Lngdp   | (Model II)<br>lngdp  | (Model III)<br>lngdp  |
|------------------------|----------------------|----------------------|-----------------------|
| Inflation              | -0.001***<br>(0.000) | -0.000***<br>(0.000) | -0.002**<br>(0.001)   |
| Government expenditure | -0.002<br>(0.002)    | 0.001<br>(0.002)     | -0.000<br>(0.001)     |
| Labor                  |                      | -9.667***<br>(0.591) | -14.334***<br>(0.828) |
| Gross capita formation |                      | 0.003***<br>(0.001)  | 0.002*<br>(0.001)     |
| Openness               |                      |                      | 0.012<br>(0.020)      |
| FDI Net inflow         |                      |                      | -0.000<br>(0.001)     |
| Personal remittance    |                      |                      | -0.002<br>(0.002)     |
| Zone                   | -0.084<br>(0.428)    | -0.098<br>(0.268)    | -0.450***<br>(0.166)  |
| Constant               | 7.162***<br>(0.224)  | 7.561***<br>(0.149)  | 7.938***<br>(0.114)   |
| Observations           |                      | 350                  | 202                   |
| Number of countries    |                      | 33                   | 24                    |

Standard errors in parentheses  
 \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

In model I, economic policy (inflation, and government expenditure) variables alone are considered with zone membership. In this model, all three variables have a negative

coefficient. However, only inflation is statistically significant.

Model II combines economic policy variables in model I with factors of production variables (capital and labor) and zone membership. The regression result shows that the coefficient of zone membership is still negative and insignificant. Inflation and labor are significant and have negative coefficients. Capital as expected is significant with a positive coefficient. Government expenditure is still not significant.

In model III, market related variables (openness and FDI) are added to model II. Inflation, labor, capital formation and zone membership are statistically significant. Zone membership, labor and inflation all have negative coefficients. Gross capital formation has a positive coefficient.

This outcome shows that zone CFA Franc membership does not enhance growth. Although this contradicts previous empirical studies on growth bonus of economic integration, it is in line with other studies which concluded that CFA Franc zone member countries tradeoff economic growth for inflation (Lohi, 2014).

Inflation has a negative effect on growth as expected. An increase in one percentage point of inflation reduces economic growth by 0.16 percent. The result is in line with Barro (2013). However, it is worth noting that, average rate of inflation has been higher in non-zone countries (above 60 percent when Zimbabwe is considered and less than 13 percent without Zimbabwe), compared to 2.99 percent in zone member countries. Notwithstanding the inverse relationship between inflation rate and growth, CFA Franc zone member countries do not seem to have experienced higher growth rates. Average growth rate for both zone and non-zone countries for the period of this study stands at 7 percent.

Against expectations, labor force has a negative effect on economic growth. Much empirical evidence exists on the impact of human capital on growth. However, this evidence is sometimes less clear when it comes to SSA countries. Hanushek (2013) demonstrated that for

human capital to effectively contribute to economic growth in developing countries, focus has to be shifted on quality of education and not on quantity. Earlier, Tang, Brunschwig, and Sacerdoti (1998) investigated the impact of human capital on growth in West Africa. The results were not statistically significant. This thesis suggests that labor force in SSA may be counterproductive to growth.

Trade openness has a positive coefficient but is statistically insignificant. Although this result maybe confusing, it can find some justification from past literature. Lederman and Maloney (2002) examined the relationship between trade structure and growth. The study found that although growth can be promoted where there is abundant natural resources, concentrating on exports can hinder growth. With large natural resources, most SSA countries export their products with little or no transformation. This leads to low value exports, high value imports and all the consequences that may come with it.

Also, Government expenditure as a share of GDP is not statistically significant. Evidence on the impact of government expenditure on growth is divided. Some studies conclude that government expenditure enhances growth, while others assert that, increase government expenditure has a negative or no growth effect. This thesis aligns itself to the second group.

## **CHAPTER FIVE: CONCLUSION & RECOMMENDATION**

This study attempts to investigate the growth effect of MU membership with focus on the CFA Franc MU. The result indicates that zone membership has a negative effect on economic growth for African countries members of the CFA Franc zone MU. Membership status reduced GDP per capita growth by 0.45% for the period studied. But this result can even be underestimated. French Aid in periods of deteriorating terms of trade (Yehoue, 2006) tends to alleviate economic shocks. In addition, this study finds that gross capita formation is the main contributor to economic growth. The findings add to the relatively limited literature on the contribution of the CFA Franc zone membership to economic growth.

The results imply that MU membership does not systematically give birth to a bnus growth point. The functioning mechanism of a MU should therefore be designed in a way to stimulate growth across member countries. This is a support for the claim that the CFA Franc zone's functioning mechanism should be reviewed. Presently, member countries are trading-off growth for macroeconomic stability. But both are not mutually exclusive goals, they can be attained simultaneously if the mechanism is designed in a way to boost trade, which in turn will improve growth (Harrison, 1996; Tenreyro and Barro 2006). This can be achieved by re-examining the fixed exchange regime, the inflation policy and the reserve deposit requirements.

Firstly, the fixed exchange regime in the CFA Franc zone slows economic performance in the Union (Devarajan & Rodrik, 1991). A flexible regime may be considered in collaboration with other policies to cover for some of its negative consequences. Secondly, the inflation policy in the CFA Franc zone is creating an inflation-growth tradeoff (Lohi, 2014). Reviewing this policy could ameliorate the tradeoff. Thirdly, the reserve deposit requirements which have been modified over the years could be further reduced. Allechi and Niamkey, 1994,

examined data from the French treasury where the reserves are stored and concluded that African countries were net losers. These three policies if optimally combined, may enhance growth in the CFA Franc zone. Notwithstanding, this study has some pitfalls.

One shortcoming of the study is that France is not considered as a member of the zone. According to Couharde, Coulibaly, Guerreiro and Mignon, (2013), the CFA Franc zone has been sustainable. This sustainability can be attributed to the role played by France as shown by Yehoue (2006). Another weakness of this study lies in the model. The random effect model assumes that there is no relation between the error term and that the time-invariant heterogeneity between the different groups is not related with the error term. However, the coefficient estimate of zone membership does not change with the OLS model.

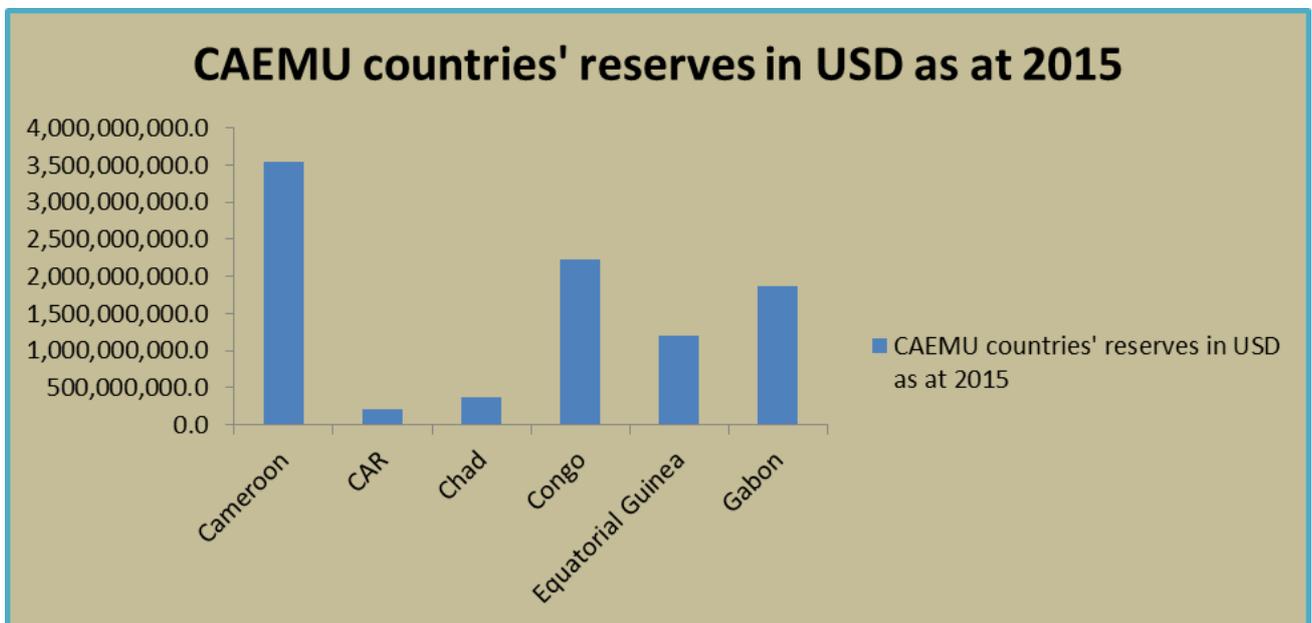
Future studies may investigate the growth effect of CFA Franc zone membership on individual countries. This is because CFA Franc zone member countries of CAEMU and the WAEMU have some similar characteristics, but differences equally exist. For instance, an analysis of the reserve situation of the CAEMU revealed that some countries were faring relatively better compared to others. Cameroon's foreign reserve in 2015 was higher than that of three other members (Central African Republic, Chad and Equatorial Guinea) combined (Appendix B). Looking at country specific growth effects will help policy makers at national level to better evaluate the full costs and benefits of membership.

## **APPENDICES**

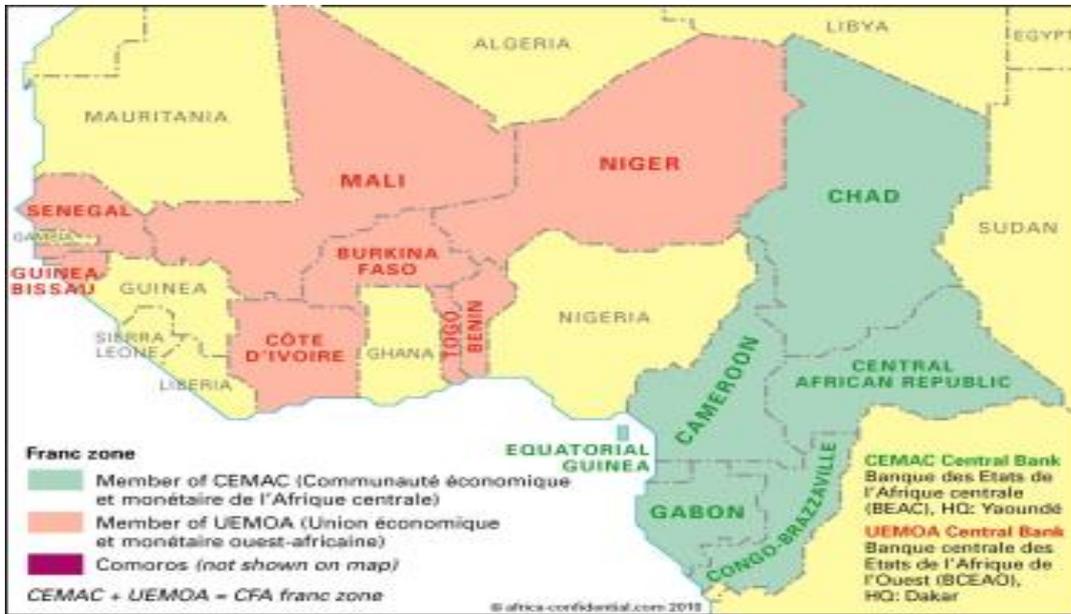
Appendix A : Descriptive statistics (zone and non-zone)

|                    | GDP percap | lnGDP percap | Inflation    | Gross capita | Openness | Govmt Expense | FDI Net inflow | Labor | Personal remmit |
|--------------------|------------|--------------|--------------|--------------|----------|---------------|----------------|-------|-----------------|
| <b>Zone</b>        |            |              |              |              |          |               |                |       |                 |
| Mean               | 2487.64    | 7            | <b>2.99</b>  | 23.15        | 0.66     | 14.47         | 4.43           | 0.05  | 3.89            |
| Standard deviation | 4267.99    | 1.09         | 4.14         | 16.18        | 0.45     | 4.35          | 7.68           | 0.03  | 3.48            |
| Min                | 300.5      | 5.7          | -9           | 3.6          | 0        | 3.3           | -4.9           | 0.001 | 0.05            |
| Max                | 20333.9    | 9.9          | 37.1         | 147.9        | 2.36     | 30.8          | 64.4           | 0.16  | 11.59           |
| <b>Non-zone</b>    |            |              |              |              |          |               |                |       |                 |
| Mean               | 1971.08    | 6.97         | <b>65.86</b> | 21.06        | 0.57     | 20.54         | 5.77           | 0.05  | 5.91            |
| Standard Deviation | 2537.11    | 1.05         | 1097.23      | 10.37        | 0.42     | 8.37          | 8.78           | 0.05  | 10.45           |
| Min                | 193.9      | 5.26         | -35.8        | 0            | 0        | 2             | -6             | 0     | 0.069           |
| Max                | 13542.2    | 9.51         | 24411        | 61.5         | 1.69     | 52.8          | 89.5           | 0.23  | 61.92           |

Appendix B: Foreign reserves in across CAEMU countries



## Appendix C: Geographical area of the CFA Franc zone



Source: lokoleafrique.com

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