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Competitiveness and growth within the CFA franc zone: does the switch to the euro matter?

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Competitiveness and growth within the CFA franc zone: does the switch to the euro matter?

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Abstract:

In this paper, we seek to analyze the impacts exerted by the substitution of the French franc for the euro on real and nominal effective exchange rates, competitiveness and growth within the CFA zone. Our findings show that, since the advent of the euro, the evolution of the real exchange rates and the competitiveness (measured by currency misalignments) have become increasingly dependent on nominal exchange rate movements and therefore on the evolution of the anchor currency. While the appreciation of the euro in the last decade did not translate into strong and generalized currency overvaluations—expect in Central African Republic, Côte d'Ivoire, Congo and Togo—it had however strongly reduced the extend of real undervaluations induced by the 1994 devaluation of the CFA franc. This has resulted in an increasingly negative effect exerted by real and nominal appreciations on growth rates of these countries since the switch to the euro.

Keywords: Anchor currency, CFA zone, competitiveness, growth.

JEL codes: O40, F01, C23.

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1. INTRODUCTION

The CFA zone is an economic and monetary area composed by two completely separate and independent monetary unions: WAEMU (West African Economic and Monetary Union) and CAEMC (Central Africa Economic and Monetary Community), plus the Comoros.[1] The countries of this zone are mostly former French colonies which, after their independence, signed monetary cooperation agreements with France involving a guarantee of their currency convertibility and the pegging of the CFA franc to the French franc. The substitution of the French franc for the euro in 1999, following the European Monetary Union (EMU), was an important transition with considerable issues for the CFA zone countries. Irving (1999) states that the CFA zone is one of the three areas (with Central and Eastern Europe countries and Southern Mediterranean countries) which are more likely to be affected by the creation of the single currency. Nevertheless, the implications of this event for the CFA economies have not been investigated enough even if the euro's introduction has revived old questions about the future of this area as pointed out by Zafar (2005). This issue is indeed important since the monetary policy applied by the European Central Bank (ECB)—based on the model of the German central bank "Bundesbank"—is more restrictive than that the Bank of France's one (see Didier et al., 2008).

The potential economic effects of the advent of the euro on the CFA zone were firstly analyzed by Hadjimichael and Galy (1997) which investigate the likely *ex-ante* economic impacts of the EMU on the real effective exchange rates (REER) and the external competitiveness of the CFA zone members. Indeed, as the monetary and exchange rate policies of the anchor country influence both nominal and real effective exchange rates of the pegged currency, it therefore impacts the competitiveness and economic performance of the pegged country. For instance, Bolle (1997) emphasizes that, in the 1970s, the CFA zone countries realized important competitiveness gains because their currency was pegged to a depreciating French Franc. On the contrary, the appreciation of the French currency (from mid 1980s to 1993), combined with inadequate internal economic policies, had dramatic effects leading to the devaluation of the CFA franc in 1994. Klau (1998) claims that the poor economic performance of the CFA zone members observed during this period was caused by the overvaluation of the CFA franc.

[1] The WAEMU includes Benin, Burkina Faso, Côte d'Ivoire, Guinea Bissau, Mali, Niger, Senegal, and Togo and the CAEMC includes Cameroon, Gabon, Equatorial Guinea, Congo, Central African Republic, and Chad. The name CFA Franc means: "Communauté Financière Africaine" for the WAEMU member countries and "Coopération Financière en Afrique Centrale" for CAEMC member countries.

The peg of the CFA franc to the euro constitutes an exchange rate arrangement with EMU members and was expected to have several positive effects on the CFA zone economies. Irving (1999) has summarized all the channels by which African economies may be affected by the introduction of the euro. Overall, the creation of the EMU was supposed to make the euro a stable currency, to lead to low inflation and interest rates and to enhance its members' growth rates. Consequently, the CFA countries should firstly benefit from the stability of the euro with the reduction of uncertainty in exchange rate variability, in relative price changes, in exports and thus in government revenue fluctuations expressed in local currency. Secondly, they should register higher growth rates due to "hypothetically" strong future growth rates in the EMU because of the important trade between the two areas (see Hadjimichael and Galy, 1997 or Dearden, 1999). Thirdly, pegging to the euro could lead to greater capital inflows from European countries through more financial integration. Borrowers from the CFA zone could thus raise funds more easily and at cheaper rates upon more competitive financial markets (see Irving, 1999). For authors such as Hallet (2008), beyond the CFA zone, the euro might have a more important role—via trade invoicing in euro, as international reserve currency, etc.—in Sub-Saharan Africa as a whole since the EMU members remain their main economic partners. However, since the middle 90's, the trade of the CFA members with developed countries, especially European countries, has significantly declined making these benefits more uncertain.[2]

For the CFA zone economies, it was clear that their main concerns would be a strong euro after the shift of the anchor currency (see Hadjimichael and Galy, 1997 or Zafar, 2005). Indeed, an appreciation of the euro —leading to that of the pegged currency—could generate a currency overvaluation (i.e., a real appreciation higher than that consistent with the evolution of macroeconomic fundamentals), lead to a loss of competitiveness for the CFA zone members against their partners and therefore to a deterioration of their current accounts and their growth rates. As the nominal effective exchange rate (NEER) of the euro has continuously appreciated a few years after its creation (30% between 2002 and 2009), one can therefore ask whether and how the changeover to the euro have impacted real and nominal exchange rates, competitiveness and growth in the CFA zone.

To address this issue, we first rely on the Behavioral Equilibrium Exchange Rate (BEER) framework and recent panel cointegration techniques. This approach enables us to assess the real equilibrium exchange rates and to derive currency misalignments (defined as the

[2] Ehrhart and Jacolin (2012) indicate that the share of the euro area in exports from the CFA zone was reduced from 50% to 25% since the last 20 years.

difference between the REER and its equilibrium value) of the CFA zone countries. We then test the combined effect of movements in both relative prices and nominal effective exchange rates on misalignments in order to determine the main sources of real exchange rates disequilibrium in the CFA zone before and after the introduction of the euro. Finally, we analyze the relationship between the growth and the nominal effective exchange rate, paying a special attention to the substitution of the French franc for the euro.

The rest of the paper is organized as follows. Section 2 describes the evolution of the REER and the NEER before addressing the issue of currency misalignments. Section 3 studies the growth-exchange rate nexus in the CFA zone providing a brief literature review, explaining the estimation methodology and interpreting the estimation results. Section 4 concludes the article.

2. THE PATTERN OF REERS AND MISALIGNMENTS WITHIN THE CFA ZONE BEFORE AND AFTER THE ADVENT OF THE EURO

By definition, the evolution of the real effective exchange rate depends on relative prices' variations and nominal effective exchange rate's movements. But, for the CFA franc zone countries, where the domestic currency is linked to an anchor currency by a fixed exchange rate regime, the evolution of the NEER comes from fluctuations of the euro (the French franc before 1999) against the currencies of the CFA zone's main trading partners.

In this section, we analyze the evolution of real and nominal effective exchange rates and of currency misalignments in both monetary unions of the CFA zone before and after the creation of the single currency. Accordingly, we have computed the nominal and real effective exchange rates (expressed as an index base 100 in 1999) of the CFA zone countries over the period 1985-2009. The nominal effective exchange rate for each member is calculated as a weighted average of bilateral exchange rates against its ten main trading partners. The weights are extracted from the DOTS database of the International Monetary Fund (IMF), they are normalized to sum to one, and correspond to the average share of each partner in imports and exports of goods and services over the 1996-2009 subperiod.[3] Real effective exchange rates correspond to nominal effective exchange rates corrected by the weighted relative prices.

[3] This subperiod corresponds to that used by the IMF to compute effective exchange rates (see Aydin, 2010). For countries listed in the IMF databases, we have values of NEER and REER close to those computed by the IMF.

2.1. Evolution of the real (REER) and nominal (NEER) effective exchange rates

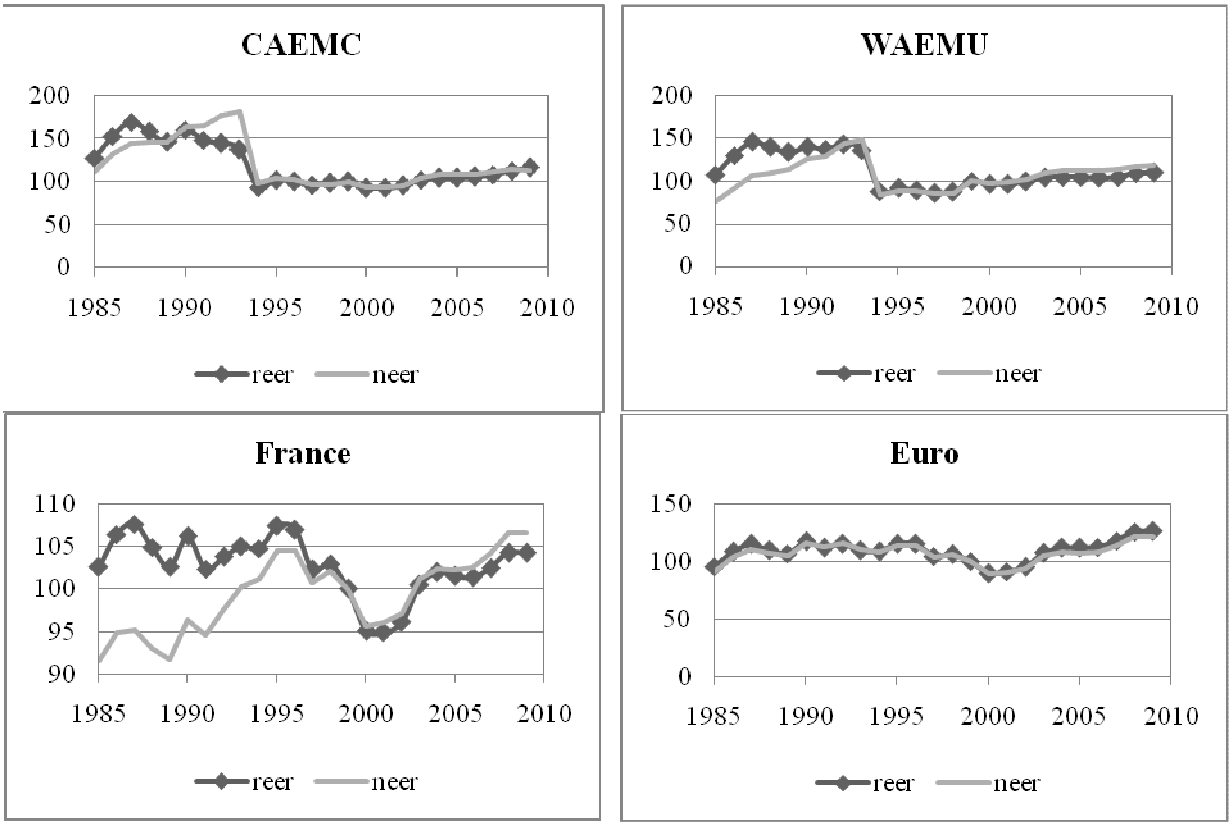
Figure 1 shows the evolution of the REER and the NEER in the whole CAEMC and WAEMU areas, and of the anchor currencies of the CFA franc (the French franc and the euro).[4] Effective exchange rates follow almost the same trend in the two monetary unions of the CFA zone. In the second half of the 1980s, the REER's appreciation has been higher than that of the NEER indicating that part of the real appreciation in both areas was caused by their members' higher inflation compared to their partners, the remainder coming from a nominal appreciation of the currency. This trend was continued in the WAENU until the devaluation of 1994 while it was reversed in the CAEMC at the beginning of 1990s. Indeed, between 1990 and 1993, the real effective exchange rate of the CAEMC as a whole depreciated while the nominal effective exchange rate still appreciated. Consequently, during this period, the CAEMC countries benefitted from a slower increase in prices relative to their partners, which mitigated the effects of the nominal appreciation. To summarize, over the 1985-1993 period, the REER appreciated by 0.8% and 2.6% per year in respectively the CAEMC and WAEMU (see table 1). At the same time the NEER respectively appreciated by 5.5% and 7.7% per year, evidencing the key role of this variable and thus that of the anchor currency in the competitiveness of the two zones.

From the devaluation to 2009, nominal and real exchange rates have almost evolved in a similar way in both CAEMC and WAEMU areas. In particular, real appreciations have been mainly caused by nominal ones as relative prices have remained stable during this period. In particular, the increase of the euro started in 2002 has contributed to the CFA franc appreciation.[5]

[4] To compute the REER and NEER of the CAEMC and the WAEMU, we have used a weighted mean (based on the PPP GDP) of their membership countries. The unweighted means data are available on request and don't affect significantly our findings. Guinea Bissau is not taken into account insofar as it is a member of WAEMU since 1997.

[5] Using a monthly data of REERs, from January 1999 to December 2004, Zafar (2005) has the same result, showing that real appreciations in the CAEMC and WAEMU have been affected by the Euro-Dollar's bilateral exchange rate. The author has also argued that the latter has resulted in a partial loss of competitiveness due to the conservative monetary policies in the two areas which are associated with low inflation rates. Masaki (2009) has also compared the evolution of the NEER and relative prices for a sample of ECOWAS countries with almost the same results for WAEMU members.

Figure 1: Evolution of the REER and the NEER (base 100 in 1999), 1985-2009



Source: World Bank (WDI), IMF (DOTS) and author calculations.
Note: an increase in the nominal (real) effective exchange rate corresponds to a nominal (real) appreciation.

The CAEMC has registered a higher real appreciation, compared to the WAEMU where the REER appreciated less rapidly than its NEER. Indeed, since the launch of the euro, the REER and the NEER have respectively appreciated by 1.4% and 1.1% per year in the CAEMC, against 0.8% and 1.5% in the WAEMU. These findings highlight the relative control of prices in West African countries where inflation rates have decreased significantly in recent years, from 5.3% between 1988-1998 to 2.5% on the 1999-2009 period (see table 1 below). For both considered monetary unions, results also show that nominal appreciations have been higher on the 1985-1998 period, compared to the period of the peg to the euro. Finally, the evolution of the REER and the NEER for each country highlights that, most inflationary countries such as Equatorial Guinea, Benin, Congo and Central African Republic have also experienced the highest real appreciations.

Table 1: Statistics on the CFA franc zone

Countries	*ΔREERa*			*ΔNEERa*			*Inflation*		*Growth*		*Mis model %*		*Mis BMA %*	
	85-93	*94-98*	*99-09*	*85-93*	*94-98*	*99-09*	*88-98*	*99-09*	*88-98*	*99-09*	*88-98*	*99-09*	*88-98*	*99-09*
Cameroon	2.0	0.4	0.5	5.4	-0.2	0.9	4.8	2.7	-3.5	1.2	7.5	-7.6	8.5	-9.4
Central Afr Rep.	-3.4	3.3	1.4	1.2	1.3	0.4	3.4	3.0	-1.2	-1.0	-5.2	1.1	-6.5	4.1
Chad	-1.0	2.7	3.1	4.9	-0.9	1.8	6.2	2.6	0.8	4.1	5.4	-5.4	19.7	-21.9
Congo	2.2	3.3	1.9	9.8	0.1	1.4	5.0	3.0	-1.3	1.3	1.7	-1.0	4.1	-4.5
Equa Guinea	-2.7	4.1	4.6	4.9	0.0	1.0	6.8	5.2	11.1	17.9	3.4	-9.3	-28.0	28.2
Gabon	-0.8	0.5	1.0	4.3	-0.4	1.3	4.1	1.4	1.9	-1.5	12.6	-18.2	20.1	-24.4
CAEMC	***0.8***	***1.1***	***1.4***	***5.5***	***-0.2***	***1.1***	***5.0***	***3.0***	***1.3***	***3.7***	***4.2***	***-6.7***	***3.0***	***-4.6***
Benin	3.7	1.8	2.0	8.7	1.0	1.6	7.3	3.1	0.6	1.2	4.7	-0.8	7.0	-3.2
Burkina Faso	-0.9	0.8	1.2	3.6	1.2	1.4	4.6	2.7	1.9	2.5	3.7	-10.7	1.3	-8.9
Côte d'Ivoire	5.7	-0.6	0.9	9.1	-0.4	1.7	6.3	2.6	-0.5	-1.2	0.2	3.8	3.6	4.0
Mali	-2.7	1.8	0.6	2.3	0.3	0.5	4.7	2.2	1.5	2.4	4.0	-11.5	-0.6	-8.0
Niger	-0.6	-1.1	1.1	10.2	-0.1	1.7	4.7	2.3	-0.8	-0.4	-0.6	-8.2	4.8	-16.3
Senegal	1.6	-1.6	-0.1	7.9	0.8	1.3	3.8	1.9	-0.7	1.5	3.1	-7.1	6.4	-10.4
Togo	2.9	0.8	1.1	9.2	2.0	2.9	5.8	2.6	0.4	-0.7	-5.3	9.2	2.2	0.7
WAEMU	***2.6***	***-0.2***	***0.8***	***7.7***	***0.3***	***1.5***	***5.3***	***2.5***	***0.3***	***0.8***	***1.4***	***-3.6***	***3.5***	***-6.0***

Notes:
a) Annual percentage change.
Mis model: Misalignments using determinants from the theoretical model of Couharde et al. (2012).
Mis BMA: Misalignments using determinants from Coulibaly and Gnimassoun (2013)'s Bayesian analysis.

2.2. The competitiveness of the CFA zone

A continued real appreciation, when it is not accompanied by an improved economic situation, is likely to result in a loss of competitiveness. In these conditions, the increase in the REER leads to a deviation from its equilibrium or "normal" level and then to an overvalued currency. In this section, we determine to what extent the appreciation of the euro has been harmful to the competitiveness within the CFA franc zone. To this end, we assess and compare real exchange rate misalignments for this area' member countries before and after the launch of the euro.

Following the Behavioral Equilibrium Exchange Rate (BEER) approach developed by Clark and McDonald (1999), we have estimated equilibrium real exchange rates in order to assess currency misalignments. According to this approach, the equilibrium exchange rate is the solution of a cointegration relationship between real effective exchange rates and a set of macroeconomic variables called "macroeconomic fundamentals". However, empirical studies on developing countries provide several potential macroeconomic fundamentals—from monetary, fiscal and trade policy indicators to exogenous determinants such as terms of trade and aids—raising a problem of regressors' choice known in the literature as "model uncertainty". This issue has been recently tackled by Coulibaly and Gnimassoun (2013). Using a Bayesian framework, the two authors isolate, among a number of variables, the most robust determinants of real effective exchange rates for a sample of CFA zone and the West African Monetary Zone (WAMZ) countries. Following these authors, we estimate two long-term relationships for the real effective exchange rate: the first relationship takes into account macroeconomic fundamentals identified by Couharde et al. (2012), including terms of trade, relative per capita GDP, Net Foreign Asset position and government spending ; the second involves macroeconomic fundamentals relying on the Bayesian analysis developed by Coulibaly and Gnimassoun (2013), including aids, terms of trade, government spending, investment and money supply.

In order to estimate the long-run relationship between real exchange rates and their macroeconomic fundamentals, we use the pooled mean group (PMG) estimator developed by Pesaran et al. (1998) which provides consistent estimation of the coefficients. One advantage of this estimator is that it allows estimating the cointegration relationship without preliminary investigations—such as unit root and cointegration tests—in the series. Estimation results are summarized in table A.1 in appendix and are used to compute misalignments for the CFA

zone countries displayed in table 1.[6] Our findings show that the appreciation of REERs in the CFA zone did not result into generalized overvaluations. Indeed, REERs in the whole CAEMC and WAEMU were, on average, slightly overvalued on the 1988-1998 period (between 3%-4% and 1.4%-3.5%, respectively) while they have been undervalued since the changeover to the euro.[7] This undervaluation pattern reflects both the effect of the 1994 devaluation of the CFA franc and the improvement of macroeconomic fundamentals. Nevertheless, Central African Republic and Côte d'Ivoire, to a lesser extend Equatorial Guinea and Togo, have seen their competitiveness decline since the EMU creation. The case of Côte d'Ivoire is somewhat alarming since it is the first economy of the WAEMU area. The situation of this country could be explained by the fact that it has experienced a civil war in the early 2000s which has significantly reduced its economic and especially political weight in the WAEMU.

2.3. What explains the evolution of the competiveness within the CFA zone?

Evolutions of effective exchange rates and of currency misalignments do not allow isolating in competitiveness developments the role played by relative prices from that of nominal exchange rates. To address this issue, we seek to (*i*) evaluate the contribution of both relative prices and NEER in currency misalignments and (*ii*) analyze changes in their contributions induced by the peg to the euro. To this end, we estimate the following equation that links misalignments (*Mis*) to movements in both relative prices (*Price*) and in nominal effective rates (*NEER*)[8]:

$$Mis_{it} = \alpha_i + \beta_1 \Delta \mathrm{Pr}ice_{it} + \beta_2 \Delta Neer_{it} + \varepsilon_{it} \qquad (1)$$

Subscripts *i* and *t* represent respectively country and time indexes (*i=1* to *13* and *t=1985* to *2009* or *1999-2009* considering the period of anchoring to the euro). The explanatory variables are expressed in logarithm. Regressions run over the whole period include a dummy variable (*Dum94*) equal to 1 in 1994 and 0 elsewhere in order to take into account the effects of the 1994 devaluation of the CFA franc.

[6] For assessing exchange rate misalignments, we have used the approach developed by Elbadawi et al. (2012) which involves misalignment of each country normalized to zero, on average. For Cline and Williamson (2012), this assumption is a drawback of the BEER approach on the whole as it is plausible only when the exchange rate has been, on average, at its equilibrium level over the period of estimation. However, since the long-run goal of a country could be to reach this level, the latter assumption is not too restrictive when the period of estimation is large. Bénassy-Quéré et al. (2010) have studied different concepts of equilibrium exchange rate and showed that the BEER is relevant in long-run while the Fundamental Equilibrium Exchange Rate (FEER) and the Purchasing Power Parity (PPP) approaches are respectively relevant in short and very long-run.

[7] Similar results have been found by Gnimassoun (2012).

[8] Gnimassoun (2012) provides other determinants of misalignments in this area: misalignments of the anchor currencies (French franc and euro) and the difference between macroeconomic fundamentals and their equilibrium levels.

Equation 1 has been estimated using panel fixed effect estimator which allows controlling for unobservable components and therefore the effects of other potential explanatory variables. For robustness purposes, we have considered as dependent variable the three following indicators: the two measures of misalignments assessed in the previous section and the absolute value of misalignments ($Abs\ Mis$) which measures the size of real exchange rates disequilibrium.

Estimation results are displayed in table 2. On the whole period, our findings show that misalignments and their sizes have been significantly affected by the evolution of both NEER and relative prices. In particular, nominal appreciations (depreciations) have resulted in more overvaluations (undervaluations) and higher exchange rate disequilibrium. Relative prices have instead acted as shocks' absorbers in the area. Indeed, a higher growth in prices has lead to lower exchange rate disequilibrium. This preliminary analysis highlights the potential effects exerted by the evolution of the NEER on relative prices, usually referred to as the *pass-through* of nominal exchange rates on prices.[9]

Turning to the estimations (5-8) covering the period of the peg to the euro, the results show that the evolution of currency misalignments and the size of exchange rate disequilibrium have been only explained by movements in the NEER. Corroborating our previous findings, these results highlight that: (*i*) relative prices have played no significant role in the evolution of the competitiveness within the CFA zone on the 1999-2009 period and (*ii*) that nominal appreciations have contributed to increased overvaluations or reduced undervaluations. Put into the perspective of misalignment evolutions since the launch of the euro, our results evidence that the observed appreciation of the NEER has reduced the size of real undervaluation induced by the 1994 devaluation. This explains also why movements in the NEER have also led to less exchange rate disequilibrium.

[9] For example, relative prices—which greatly increased after the 1994 devaluation — have mitigated the effects of the devaluation.

Table 2: Determinants of misalignments in the CFA zone

	1985-2009				1999-2009			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
VARIABLES	Mis Model 1	Abs Mis Model 1	Mis Model 2	Abs Mis Model 2	Mis Model 1	Abs Mis Model 1	Mis Model 2	Abs Mis Model 2
Δ*Neer*	0.60***	0.08	0.67***	0.23**	0.42***	-0.25**	0.60**	-0.01
	(0.12)	(0.07)	(0.18)	(0.10)	(0.14)	(0.11)	(0.27)	(0.20)
Δ*Price*	-0.77***	-0.25***	-0.82***	0.05	0.32	-0.20	0.16	0.20
	(0.15)	(0.09)	(0.22)	(0.12)	(0.23)	(0.17)	(0.44)	(0.32)
Dum1994	0.36***	0.13***	0.40***	0.12*				
	(0.08)	(0.05)	(0.12)	(0.07)				
Constant	-0.03***	0.11***	-0.03**	0.15***	-0.06***	0.10***	-0.07***	0.15***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
No.observations	311	311	310	310	142	142	141	141
R-squared	0.215	0.046	0.135	0.017	0.069	0.044	0.038	0.003
No. Countries	13	13	13	13	13	13	13	13

Notes:

*- Standard errors in parentheses and *** p<0.01, ** p<0.05, * p<0.1.*

- Mis and Abs Mis correspond respectively to misalignments and the absolute value of misalignments.

- Model 1 and model 2 correspond respectively to the first and the second estimated equation of real equilibrium exchange rates.

- Dum 1994 is a dummy variable corresponding to 1 if year = 1994 and 0 elsewhere.

Relying on findings in the whole section 2, one could conclude that currency misalignments within the CFA zone have been lower since the launch of the single currency. However, the advent of the euro had two main consequences. Firstly, it has allowed reducing considerably the benefits of the 1994 devaluation although REERs remain mostly undervalued. Such a trend must then be closely guarded in order to avoid the same situation as that before 1994. Moreover, in countries such as Central African Republic, Côte d'Ivoire and Congo real exchange rates were overvalued, in 2009, by more than 15%. Secondly, the advent of the euro has changed the dynamics of the zone members' competitiveness which henceforth depends only on the NEER movements; relative prices playing a limited role.

2.4. A comparison with the euro area

The euro area member states—facing economic difficulties and competitiveness problems—have also suffered from the continuous appreciation of the euro. Since the beginning of the 2000s, the real effective exchange rate of the euro zone has appreciated, on average, by 2.1% per year (see table 3 below). With the exception of Germany, Greece and Portugal, the members of this area have experienced higher appreciation and/or appreciations of their REER after the launch of the euro. The case of Greece and Portugal could be explained by a higher inflation rate before the advent of the single currency. These two countries have also seen their nominal effective rate depreciate by respectively 5.7% and 1.1% over the 1988-1998 period due to the 1992 crisis and the following widening of band fluctuation in the European monetary system which has allowed a more flexibility of nominal exchange rates. However, they remain the most inflationary countries in the euro area even if their inflation rates have significantly decreased. High inflation, associated with significant nominal appreciations since the launch of the euro could explain the competitiveness and/or economic difficulties faced by Greece, Portugal and other countries as Ireland, Spain or Austria.

Table 3: Statistics on the euro area

	ΔREERa		*ΔNEERa*		*Inflation*		*Growth*		*Misalignment[2] %*	
Countries	*88-98*	*99-09*	*88-98*	*99-09*	*88-98*	*99-09*	*88-98*	*99-08[1]*	*88-98*	*99-09*
Austria	0.1	0.6	0.5	0.4	2.2	1.8	2.4	2.0	2.0	1.3
Belgium	0.0	0.8	0.5	0.6	2.1	2.0	2.1	1.7	0.9	-1.1
Finland	-1.9	0.7	-1.5	0.8	2.9	1.8	1.7	2.9	4.2	-8.2
France	-0.2	0.4	0.8	0.6	2.2	1.6	1.7	1.3	1.1	-2.3
Germany	0.4	0.4	0.7	0.7	2.5	1.6	2.0	1.6	1.7	-0.2
Greece	1.7	1.3	-5.6	0.2	12.9	3.1	1.4	3.3	-2.6	8.2
Ireland	-0.5	2.4	0.0	1.2	2.5	2.9	6.0	3.3	-0.2	-2.6
Italy	-0.8	0.9	-2.2	0.6	4.6	2.3	1.8	0.8	0.4	0.1
Netherlands	-0.2	1.0	0.4	0.7	2.0	2.3	2.6	2.0	-1.2	0.8
Portugal	2.3	0.8	-1.1	0.4	7.1	2.6	3.5	1.1	-1.5	10.2
Spain	-0.3	1.5	-1.6	0.5	4.8	2.9	2.7	2.1	2.0	1.1
Euro area	***-0.3***	***2.1***	***-0.1***	***1.8***	***4.2***	***2.3***	***2.5***	***2.0***	***0.6***	***0.7***

Notes:

a) indicates the annual percentage change.

[1)] In order to eliminate the obvious effects of the economic crisis on the euro area, growth in 2009 has not taken into account.

[2)] *Misalignment assessments are from Coudert et al. (2013).*

The effects of the euro on the competitiveness within the euro area have been recently analyzed by Coudert et al. (2013). Misalignments that these authors have assessed are summarized in table 3 above. They show that the single currency has resulted in a slightly more overvalued REER in the whole euro area. The currency misalignment reached on average 0.6% between 1988-1998, against 0.7% over the 1999-2009 period. However, this evolution must not hide major differences between the Member States. Greece, Portugal and Netherlands have experienced a higher real overvaluation since the launch of the euro. The real exchange rate of Austria and Spain were overvalued under both periods but the size of their misalignments has decreased under the recent period. For the remaining countries, REER have been undervalued in recent years while overvalued over the 1988-1998 period. Overall, whether the CFA zone economies have been affected by the introduction of the euro, our findings show that a strong euro in the 2000s has more impacted the EMU members.

3. THE EURO ADVENT AND THE ECONOMIC GROWTH WITHIN THE CFA ZONE

Events within the euro area such as crises are likely to affect directly and indirectly the CFA zone economies through several channels. For instance, Ehrhart and Jacolin (2012) have analyzed the transmission channels of the recent crisis in the EMU. According to them, the CFA economies have been directly affected through the decrease of their exports to the euro area, and indirectly through downward pressures on commodity prices. The financial channel, namely via capital flows, has also been analyzed. However, Ehrhart and Jacolin (2012) have not investigated an important transmission channel related to the peg of the CFA franc to the euro. On one hand, less volatile exchange rate induced by a more stable anchor currency reduces uncertainty in relative prices, in export and government revenue fluctuations expressed in CFA franc; and could then lead to higher growth rates. On the other hand, the evolution of the competitiveness is also affected by movements in exchange rates of the anchor currency. In particular, as shown in the previous section, real effective exchange rates and their misalignments have been increasingly affected by evolutions of nominal effective exchange rates since the changeover to the euro. As suggested in the literature, misalignments can have negative impacts on economic growth through the loss of competitiveness. Particularly, the overvaluation of a currency, by deteriorating the competitiveness of the domestic country, reduces its exports, production and investment, and increases its imports.

Consequently, the current account is damaged and the GDP and the employment are deteriorated.

3.1. Brief literature review

The literature on economic growth is very large and heterogeneous both theoretically and empirically (see for instance, Aghion and Durlauf, 2005 or Aghion and Howitt, 2009). In general, empirical studies are interested in understanding why some countries are richer or record higher growth rates than others. Thus, several factors have been highlighted in order to explain disparities in growth rates, such as: trade liberalization, high quality of institutions, better governance, more investment and other sound policies.[10] Regarding the specific role played by the exchange rate policy, studies have focused on the impact exerted by real exchange rate's misalignments and volatility on growth (see Klau, 1998, Mejía-Reyes et al., 2004 and Sallenave, 2010). Another strand of the literature seeks instead to analyze the impacts of exchange rate regimes.[11]

If we look at the first issue, one of the first main empirical proofs of the adverse impact of the real exchange rate on the economic performance in the less developed countries (LDCs) has been provided by Cottani et al. (1990). These authors argue that economic performance of Latin American, East Asian and African countries are mainly explained by their exchange rates stability and their currencies' misalignments. Indeed, even if they have faced the same external conditions (terms of trade shocks, etc.), Asian developing countries have registered higher growth rates compared to African and Latin American countries. This discrepancy between the zones is explained by inappropriate domestic macroeconomic and trade policies that all are reflected in higher misalignments and volatility of real exchange rates in the two latter areas. Consequently, the real exchange rate's instability and currencies' misalignments are often considered as the main determinants of the growth rate in LDCs.

In general, empirical studies highlight a negative relation between misalignment and growth in both developing and developed countries (see the survey summarized in table A.2 in appendix). Cottani et al. (1990) found a strong negative correlation between the economic growth and the instability and misalignment of REERs for a sample of developing countries. These authors argue that persistent misalignments hamper the development of agriculture and reduce domestic food supply in African economies. Considering a broader sample of developing countries, Toulaboe (2006) also has highlighted that higher misalignments were

[10] See among others: Levine and Renelt (1992); Dollar (1992); Ghura and Hadjimichael (1996); Savvides (1995); Sachs and Warner (1997); Easterly and Levine (1997) and Dollar and Kraay (2004).

[11] The present review concerns only the first group of studies. Turning to the second group, interested reader could find a review on Sub-Saharan African countries in Coulibaly and Davis (2013).

associated with lower per capita growth. Razin and Collins (1999); Aguirre and Calderon (2005) and Gala and Lucinda (2006) have obtained similar results although they have included some developed countries in their sample. Concerning Sub-Saharan African (SSA) states, an interesting contribution was provided by Ghura and Grennes (1993). They found a robust negative correlation between economic performance and REER misalignments on a sample of 33 SSA countries. They concluded that countries which have pursued more predictable macroeconomic policies have experienced lower currency misalignments and thus better economic performance. Studies of Klau (1998) and Elbadawi et al. (2012) have resulted in the same conclusion for the CFA zone and SSA countries respectively. On the whole, empirical literature highlights that high overvaluations tend to harm growth by inducing some instability while moderate undervaluations enhance the growth rates (see Rodrik, 2008).[12]

Unlike these previous studies, we are interested in the potential effects of movements in nominal effective exchange rates on growth rates of the CFA countries. The NEER is an important variable for the monetary unions composing the CFA zone and, as evidenced before, its fluctuations determine the dynamics of REERs and their misalignments in this zone. In addition, considering the NEER movements as growth determinant could allow assessing the effects of the changeover to the euro.

3.2. Some stylized facts

Exports of the CFA zone states are concentrated around few products, generally commodities, making them more exposed to external shocks. They also exhibit similar features in terms of life expectancy (low) and population growth (high) indicating widespread poverty in the area. Oil-exporting countries and those experiencing better economic situations in recent years have devoted a large share of their income to investment (e.g. Equatorial Guinea, Senegal and Mali). The most opened economies in this area are generally coastal states and/or oil exporters (see Coulibaly, 2012 for statistics on these variables). Besides these common characteristics, growth rates are quite disparate. Less than half of the sample's countries have registered a positive average growth rate between "1985-2009" denoting the weakness and instability of the growth process in the area. Data on growth rates reported in table 1 show the heterogeneity within west and central Africa. Over the period of the peg to the euro, Central African Republic, Gabon, Côte d'Ivoire, Niger and Togo have experienced on average negative growth rates while the others have improved their economic situations compared to the previous period. Among the cited countries, Gabon and Togo are those who

[12] For recent development in that field, see Aguirre and Calderon (2005), Béreau et al. (2012) or Aflouk and Mazier (2011). These authors study a non-linearity in the relationship between misalignment and growth.

have experienced the highest deterioration since the introduction of the euro. Indeed, their growth rates, positive before the advent of the euro, have becoming negative thereafter representing a decrease of respectively 3.4 and 1.1 points. Although part of these findings could be attributed to competitiveness problems for Togo, the situation of Gabon is completely different. Indeed, this country has experienced a severe economic crisis in 1999 and recovered only partially in 2000 and 2001 thanks to the dynamic of the non-oil sector and a decline in oil production slower than expected. For their part, Côte d'Ivoire and Central African Republic have experienced on average negative growth rates during both periods. These countries have also been characterized by highest real overvaluations in recent years.

About the euro area, findings are more obvious. For the whole area, growth has decreased by 0.5% since the introduction of the single currency if we exclude the effects of the recent financial crisis (see table 3). Ireland, Italy and Portugal have experienced the largest decline in growth rates (from 2.7 to 1points), followed by Netherlands and Spain where growth rates have decreased by 0.6 point. Growth in the remaining countries has declined by about 0.4% point; except Greece, the only country which has improved its growth rate on the 1999-2008 period.

3.3. Empirical methodology

3.3.1. Augmented growth equation

Empirical studies provide several potential determinants of growth referring to both the neoclassical and the endogenous theory of growth.[13] Sala-i-Martin (1997) identified 60 potential variables that could explain the growth performance and classified them as: regional, political, religious and economic variables (human capital, type of investment, share of primary sector, inflation, initial level of GDP, government consumption, financial development, etc.) and also factors linked to market distortions (as exchange rate misalignment, etc.). The number of potential explanatory variables shows that there is no consensus on the key explanatory variables of growth rates, especially for developing countries. In order to identify relevant determinants of growth in the world as a whole and particularly in Africa, Tsangarides (2005) uses a Limited Information version of the Bayesian Model Averaging (BMA) framework developed initially in the growth literature by Fernández et al. (2001) Brock and Durlauf (2001) and Sala-i-Martin et al. (2004). Relying on the posterior probability of inclusion in the most relevant model (more than 90%) and the sign certainty probability (more than 99%), Tsangarides (2005) identifies the following variables

[13] For more detail on the growth framework, and the various theoretical models that underlie it, see Barro and Sala-i-Martin (1995) or Aghion and Durlauf (2005).

that are strongly related to the growth in Africa: inflation, government consumption, terms of trade growth, debt service, initial income, investment, fiscal balance and trade openness.[14]

We then consider the following augmented growth equation[15]:

$$\Delta Y_{it} = u_i + \beta Y_{it-1} + \rho Neer_{it} + \theta CV_{it} + \xi_{it} \qquad (2)$$

With Y_{it}, the logarithm of the real GDP, Y_{it-1} corresponding to the convergence term of traditional neoclassical models. $Neer_{it}$ is the nominal effective exchange rate and is our variable of interest. CV_{it} is a set of standard control variables that are robustly associated with growth performance and identified by Tsangarides (2005) as relevant determinants of growth in Africa. In order to test the effect of the changeover to the euro we have included, as an additional explanatory variable, the product of the NEER and a dummy variable which accounts for the launch of the euro.

3.3.2. Estimation methodologies

In practice, the estimation of growth equations has evolved in conjunction with the improvement of econometric techniques.[16] First empirical studies used time series (single country) and cross country estimations to analyze economic growth. Thereafter, panel data and the Least Squares Dummy Variable (known as LSDV or fixed effect or within) estimator have been used in order to take into account the joint occurrence of dynamics and unobserved individual heterogeneity (see Islam, 1995 for instance). This method was criticized by Kevin et al. (1998) because of the inconsistence of the fixed effect estimator in the context of dynamic panel-data models such as growth equations. In fact, since the contribution of Nickell (1981), it has become clear that the fixed effect estimator is not consistent in dynamic panel-data models. This has led to the development of consistent estimators: instrumental variable (IV) proposed by Anderson and Hsiao (1982) and generalized method of moments (GMM) developed by Arellano and Bond (1991) and Blundell and Bond (1998).

These estimators have been used almost systematically in recent studies while they must be used with caution for macroeconomic panel datasets (i.e. with a large time dimension and

[14] Democracy index; annual change in the polity index and incidence of civil war in the last 10 years have also been indentified but are not taken into account in this study due to a lack of available data over the whole period.

[15] Overall, the data used in this study are from World Economic Outlook 2012 (IMF), World Development Indicator (World Bank) and UNTAD databases.

[16] Note that we are here interested in linear models. For the non linear growth equations, one could refer to the Gonzalez et al. (2005) Panel Smooth Transition Regression (PSTR) estimator used by Bereau and al. (2012); Dufrénot et al. (2010)'s quantile regressions or the Hansen (1999) Panel Transition Regression (PTR) estimator used by Combey and Nubukpo (2010).

small individual dimension) as pointed out by Judson and Owen (1999). Indeed, using a Monte Carlo experiment, these authors have shown that the IV-GMM estimators could be severely biased and imprecise for long panels (see also, Kiviet, 1995; Bruno, 2004 and Buddelmeyer et al., 2008). Kiviet (1995) has showed that the corrected LSDV estimator (labeled as LSDVC) outperforms the IV-GMM estimators in term of bias and root mean squared error (RMSE), findings corroborated later in Bun and Kiviet (2003). Finally, for typical macroeconomic panels, Judson and Owen (1999) have concluded that the LSDVC is the best estimator while the GMM estimator is designated as the second best solution.

Consequently, we rely on the LSDVC approach to estimate equation (2) for our panel of 13 CFA zone states over the 1985-2009 period.[17] In practice, this approach consists of subtracting an estimated value of a bias to the coefficients obtained by using fixed effect (within or LSDV) estimator. Bun and Kiviet (2003) provide three types of bias that depend on the true values of the lagged dependent variable coefficient. Since the latter are unknown, an IV-GMM estimator could be chosen as its approximation (see quoted papers for more details, precisely Bruno, 2005).[18]

3.3.3. Estimation results and interpretation

Table 4 reports the results of LSDVC estimations of augmented growth equations (i.e. including control variables) for the CFA zone economies over the 1985-2009 period. All the control variables are significant and have the expected signs. A higher growth in one year leads to more growth in the following year, a result commonly found in the literature (see for instance, Hoostrate and Osang, 2005). An increase in investment and trade openness as well as the improvement of fiscal balances and terms of trade also lead to a higher growth rate while debt services harm it. Concerning the NEER, findings show that its movements have high and significant negative effects on the economic growth. All things being equal, an appreciation of the NEER by 1% leads to a decrease of the real per capita GDP growth of 6 points (see column 1). These negative effects have been worsened since the launch of the euro by increasing approximately by 0.4 point in recent years, pointing out the consequence to be pegged to a strong currency as the euro in the 2000s.

For robustness purposes, we have also considered alternative specifications replacing the NEER by other variables which could also reflect the effects of the peg. Consequently, we

[17] Our study relies on a typical macroeconomic panel dataset. Note also that this type of panel could be estimated using the Vector Auto-Regressive (VAR) approach. However, the latter do not allows accounting for many control variables since the number of parameters to be estimated will considerably increase.

[18] For comparison and robustness, we have also estimated the growth equation using the Anderson-Hsiao (AH) estimator which also performs well for long panels (Judson and Owen, 1999). Since results are not different enough, they have not been presented here but are available upon request.

have tested the real and nominal effective exchange rates of the euro and the REER of the CFA zone member states. Among these three exchange rates, only the REER of the CFA zone is significant. As the NEER, the appreciation of the REER impacts negatively growth in the CFA zone, while its effect being lower. Indeed, the growth rate decreases by 5 points when the REER appreciates by 1%, a negative effect which has also increased by 0.4 since the launch of the euro. These results are however not sensitive to the inclusion of the effects of devaluation.

Table 4: LSDVC estimation results of the augmented growth equation

VARIABLES	(1)	(2)
ΔY_{it-1}	0.178***	0.192***
	(0.0578)	(0.0574)
Ln(Neer)	*-6.413***	
	(2.104)	
*Ln(Neer)*Dum*	*-0.361***	
	(0.171)	
Ln(Reer)		*-4.886***
		(2.344)
*Ln(Reer)*Dum*		*-0.413***
		(0.185)
Ln(Openness)	3.081*	4.302**
	(1.826)	(1.760)
Ln(Investment)	3.586***	3.433***
	(1.101)	(1.135)
Fiscal	0.131**	0.140**
	(0.0594)	(0.0604)
Tot growth	3.988*	4.214*
	(2.246)	(2.272)
Debt service	-0.279**	-0.191
	(0.130)	(0.126)
No. Observations	292	292
No. Countries	13	13

Notes:
*Standard errors in parentheses and *** p<0.01, ** p<0.05, * p<0.1.*
1) The LSDVC standard errors are estimated by bootstrap. We have used 100 iterations.
2) Dum corresponds 1 in the euro peg period (i.e. 1999-2009) and 0 elsewhere.

4. CONCLUSION

In this article we have analyzed the effects of the euro on real and nominal effective exchange rates, competitiveness and growth within the CFA zone. By comparing the

evolution of real and nominal exchange rates, we have showed that recent real appreciations in this area have been mainly caused by a strong euro, thereby raising the question of the effect exerted by the changeover to the euro on competitiveness and growth of the CFA zone. Thus, after assessing currency misalignments, we have shown that REER appreciations in the 2000s did not translate into strong and generalized overvaluation due to: (i) the improvement of fundamentals in most countries; (ii) better prices compared to their main trade partners and (iii) the remaining effects of the devaluation in 1994. On average, misalignments have been lower since the peg to the euro than over the 1988-1998 period. However, the advent of the euro had two main consequences. Firstly, it has contributed reducing considerably the benefits of the devaluation although REERs remain mostly undervalued. Such a trend must be closely guarded in order to avoid the same situation as that before 1994. Already in 2009, countries such as Central African Republic, Côte d'Ivoire and Congo registered real exchange rates strongly overvalued (more than 15%). Secondly, the advent of the euro has changed the dynamics of the zone members' competitiveness which has increasingly becoming dependant on movements in the NEER relative prices playing now a limited role.

Our findings also highlight that real and nominal appreciations of the CFA franc have been associated with lower growth rate. These damaged effects on growth have worsened during the recent period, indicating the growing role of the exchange rate policy in the CFA zone countries since the substitution of the French franc for the euro. This result seems consistent with the reduction of undervaluations and overvalued exchange rates in some case observed in recent years. In the light of these findings, one could then ask if the "double anchoring"[19] of the CFA franc is not too restrictive and impede the CFA zone countries to take up the challenge of development. As illustrated by the responses of many countries to the recent economic crisis, competitive devaluation and nominal depreciation could be an important instrument helping to alleviate the economic costs of external shocks.

[19] This expression indicates the fact that members of the CFA zone are gathered into monetary unions (first anchoring in a country level) and that their common currencies are pegged to an external one (second anchoring).

APPENDIX

***Table A.1*:** Estimations PMG

VARIABLES	(1) Model	(2) BMA
Prod	0.251***	
	(0.048)	
Nfa	0.160***	
	(0.030)	
Tot	0.063*	0.165***
	(0.037)	(0.036)
Gov	0.282***	0.491***
	(0.040)	(0.064)
Aid		-0.101***
		(0.023)
Investment		0.127***
		(0.040)
Error-correction term	*-0.377****	*-0.223****
	(0.068)	*(0.058)*
Constant	1.669***	0.562***
	(0.300)	(0.145)
No. Observations	312	310

*Notes: Standard errors in parentheses and *** p<0.01, ** p<0.05, * p<0.1.*

***Table A.2**:* Literature review

Authors	Sample	Economic Performance Indicators	Measures of misalignment	Estimation methods	Results
Cottani. Cavallo and Khan (1990)	24 developing countries 1960-1983	- Growth - Investment to GDP - ICOR - Export - Agricultural	- PPP - Their model based measure	- Cross-section OLS	- Non significant for PPP - Negative for model
Elbadawi. Kaltami and Soto (2009)	83 (36 SSA) countries 1980-2004	- Growth - Export diversification	- Permanent Equilibrium Exchange Rate (PEER)	- GMM-IV system	- Negative
Gala and Lucinda (2006)	58 (23 African') countries 1960-1999	- Growth	- Adjusted Real Exchange Rate	- Pooled OLS. Within and IV; GMM system - GMM difference	- Negative - Non significant for difference GMM
Ghura and Grennes (1993)	33 SSA countries 1972-1987	- Growth - Investment - Saving - Exports and Imports	- BEER - PPP - Black market premium	- Cross-section estimation - Panel OLS	- Negative
Klau (1998)	22 SSA countries 1980-1995	- Growth - Inflation	- Variation of the RER	- Panel OLS - Panel IV	- Negative for growth. - Positive for inflation
Razins and Collins (1997)	93 (23 SSA) countries 1975-1992	- Growth	- BEER method including short-run variables shocks	- Panel OLS	- Negative
Toulaboe (2006)	33 developing countries 1985-1999	- Growth	- PEER	- Panel OLS	- Negative

Source: Author

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