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8 November 2013

Online at <https://mpra.ub.uni-muenchen.de/54075/>
MPRA Paper No. 54075, posted 03 Mar 2014 01:42 UTC

Exchange rate regimes and economic performance: Does CFA zone membership benefit their economies?

Issiaka Coulibaly[†] and Junior R Davis[‡]

Abstract:

This paper aims to evaluate the importance and impact of CFA zone membership by distinguishing between the effects of being in monetary union from those which arose from anchoring the CFA franc. Using *de jure* and *de facto* regime classification schemes and a sample of 35 SSA countries over the 1985-2009 period, our results show that the CFA zone membership has been beneficial in terms of inflation, while it has not resulted in a significant effect on growth. Finally, we evidence that greater fiscal discipline can be associated with peg regimes in SSA, but not necessarily with monetary union.

JEL classification: F31, C22, C32, E31, E60.

Keywords: Exchange rate management, CFA, monetary zones.

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1. INTRODUCTION

The choice of exchange rate regime is a major issue of macroeconomic policy particularly in developing countries characterized by “the fear of float”¹. For Sub-Saharan African countries (SSA, hereafter) countries, many facing economic instability (high inflation and output volatility), the trend is towards the formation of single currency areas. In fact, several monetary union projects² are planned in Africa with the ultimate objective being the creation of a common currency for the whole continent in 2021. These monetary unions aim to promote more trade integration and development on the one hand and on the other to promote greater economic stability. However, the empirical studies released so far do not provide clear and unequivocal results on this subject (see section 2). These developments in Africa may largely be influenced by the relative economic stability of the Communauté Financière Africaine (African Financial Community, henceforth CFA) zone.

Indeed, it is argued that CFA zone members benefit from lower inflation and better fiscal discipline compared to similar developing countries, particularly other SSA countries. These supposed monetary and fiscal stabilities might explain the longevity of the CFA zone (more than 60 years of existence) although the latter does not constitute an Optimum Currency Area (OCA)³. Alternatively, some authors argue that the CFA zone member countries have lower economic growth due to the rigidity of their exchange rate regime. Consequently, in this paper we evaluate the effectiveness of the benefits of the CFA monetary union in terms of monetary and fiscal stability (related to inflation and fiscal deficit) and its membership costs in terms of economic growth. This issue is so important that recently, many African leaders highlighted the necessity of maintaining the CFA franc system, especially its convertibility guarantee and rigid regime. In fact, as a counterpart to the CFA franc guarantee, zone members must deposit at least 65 per cent (recently renegotiated to 50 per cent) of their external reserves in special accounts held by the French Treasury. In recent years, these accounts have been in surplus which has raised questions about whether the CFA franc system should continue (see Agbor,

¹ A free floating exchange rate can increase foreign exchange volatility and cause wider problems in developing country economies. These economies tend to have a financial sector characterised as follows: high liability dollarization; financial fragility; and/or strong balance sheet effects. When liabilities are denominated in foreign currencies while assets are in the local currency, unexpected depreciations of the exchange rate can diminish bank and corporate balance sheets and generate domestic financial system instability. For these reasons developing countries appear to face greater *fear of floating*, as they have much smaller variations of the nominal exchange rate, yet face greater shocks and interest rate and reserve movements (Calvo and Reinhart, 2002).

² These monetary unions include: the AMU (Arab Maghreb Union) in North Africa, COMESA (Common Market for Eastern and Southern Africa) in East and South Africa, ECCAS (Economic Community of Central African States) in Central Africa, SADC (Southern African Development Community) in South Africa and WAMZ (West African Monetary Zone) in West Africa (Masson and Patillo, 2004).

³ The geographic area in which a single currency might create the greatest economic benefit (see Coulibaly and Gnimassoun, 2013, for review on the optimality of this area).

2012). Moreover, it becomes increasingly difficult to identify the benefit, in terms of trade, of the CFA pegging to the euro (European Monetary Union single currency) since Europe is no more the privileged partner of the CFA zone members. They export more to other developing countries (namely, China, India and Brazil) and less to developed countries (especially Europe). Thus, it appears that the significant improvement in terms-of-trade engendered by the commodity boom of 2003-2009 has resulted in higher trade with developing countries and lower with developed while trade with other African states stayed stable.

In this paper, we analyze the effects of the fixed exchange rate on three key macroeconomic variables: inflation, fiscal balance and growth. In particular, we seek to evaluate the importance and impact of CFA zone membership by distinguishing between the effects of being in monetary union from those which arose from anchoring the CFA franc. Indeed, as pointed out by Bleaney and Fielding (2002), the CFA franc zone has a special exchange rate regime as it combines two hard peg regimes (monetary union and the pegging of its common currency to the French Franc). These regimes are generally expected to affect economic performance in the same way, the only difference being that monetary union implies greater political commitment and credibility than a peg. Thus, to better estimate the impacts of the CFA zone exchange rate regime on its economic performance, requires differentiating the effects of the two regimes (Ghosh et al., 2008). To this end, we apply the method used by Bleaney and Fielding (2000, 2002) which consists of simultaneously estimating the effects of the peg and that of the CFA using dummy variables (see detail in section 3). Therefore, the first dummy will capture the overall effects of the peg while the second will provide the additional effect of belonging to the CFA monetary union. Unlike Bleaney and Fielding (2000, 2002), our analysis is based on a panel framework which allows us to consider the joint occurrence of dynamics and unobserved individual heterogeneity. We also use two different exchange rate classification methods (the *de jure* and *de facto* classifications⁴) recently provided by Ilzetzki et al. (2008). Finally, as previously mentioned, our study focuses on the SSA countries which share most of the salient features of the CFA zone countries (commodities and oil producers, low or middle-income countries, exposure to external shocks and occurrence of political crisis).

The remainder of the paper is organized as follows. Section 2 provides a literature review of the implications of fixed and flexible exchange rate regimes on inflation, fiscal balance and

⁴ The *de jure* regime corresponds to the official exchange rate regime that a country declares to the IMF while the *de facto* regime is the exchange rate policy that a country actually practices. The latter regime classification is estimated in the literature by relying on the evolution of some macroeconomic variables such as countries' exchange rates volatilities, their foreign reserves, parallel market rates, etc.

growth across SSA countries. Section 3 describes the empirical methodology and presents model results. Section 4 concludes the paper and draws some policy implications for exchange rate regime choice in SSA.

2. EXCHANGE RATE REGIMES IN SUB-SAHARAN AFRICA AND THEIR POTENTIAL IMPACT ON INFLATION, FISCAL BALANCE AND ECONOMIC GROWTH

The exchange rate can affect and be influenced by most macroeconomic variables through several channels, thereby making it difficult to separate its direct from indirect effects (Ghosh et al., 1996). As a consequence, many empirical studies lead to contradictory conclusions as Rose (2011) states: *it is generous to characterize the empirical performance of existing models as “poor”*.⁵ Overall, much of the recent research concludes that exchange rate regimes may be insufficient to explain significant differences between countries economic performance (see Klein and Shambaugh, 2010 and Rose, 2011). However, in this section, we review the relationship between exchange rate regimes and three key macroeconomic variables (inflation, fiscal discipline and growth) and compare SSA countries.⁶ From the perspective of the development of monetary unions in Africa, the evolution of these variables is closely analyzed as an improved performance is necessary for a successful common currency (see for instance, Musungaie, 2010 or Wang et al., 2007). In addition, inflation and fiscal balance conditions belong to the first order criteria that countries have to meet before joining these monetary unions. Consequently, we focus on the potential impact of fixed and flexible regimes on the aforementioned variables as intermediate regime effects are highly uncertain.

2.1. Inflation

A fixed exchange rate regime is generally associated with lower inflation. This is usually due to two main factors: a discipline and a credibility effect. On the one hand, countries with fixed exchange rates have lower money supply growth to sustainably maintain the parity level which is considered as the main goal of monetary policy (Edwards and Savastano, 1999). On the other hand, a fixed regime provides greater monetary credibility as it implies that the pegged country's inflation converges towards that of the anchor country. Private operators will therefore have the confidence to hold local currency rather than goods (i.e. save rather than spend) or foreign currencies reducing the inflationary consequence of money supply

⁵ See also Sfia (2007) and Glodstein (2002) for reviews on limits of empirical studies.

⁶ Generally, the literature focuses on inflation, growth, variability and crisis vulnerability leaving aside an important variable for monetary unions that is the fiscal balance. As we will see, fiscal discipline is largely ignored in the literature even though it is an issue of enormous policy interest according to Rose (2011).

growth as argued by Ghosh et al. (1996). Moreover, this regime is a highly visible commitment and its collapse is relatively costly, leading governments to apply “sound” economic policies. Nevertheless, another strand of the literature suggests that a peg could lead to higher inflation through fiscal indiscipline. Tornell and Velasco (2000) arguments are discussed further in the next section. Concerning flexible exchange rates, the tacit monetary autonomy allows government—to “surprise” the private sector through unexpected devaluations and inflation—to reach full employment, finance its deficit or even to reduce the burden of debt expressed in local currency. Consequently, the private sector will anticipate high inflation and therefore have a high degree of wage indexation creating greater inflationary pressure on the economy. Conversely, Tornell and Velasco (2000) maintain that a free float leads to greater fiscal discipline and lower inflation as governments must avoid flawed policies, which are immediately observed and punished in a flexible exchange rate regime. For Quirk (1996), flexible exchange rates can lead to lower inflation if sufficiently flexible to permit market-driven appreciations.

There is an abundant literature studying the impact of exchange rate regimes on inflation which suggests that pegging is a means of reducing inflation, especially for developing countries. For example, Edwards (1992) finds that pegging successfully led to lower inflation in a sample of 52 developing countries during the period 1980-89. Using a large sample of developed and developing countries, Ghosh et al. (1996) show that peg lead to lower inflation rate and argue that this stems from discipline and credibility effects of this regime. Ghosh et al. (2002) have deepened their previous analyses (e.g. Ghosh, 1996) by relying on *de jure* and consensus classification schemes and differentiating countries relative to their income levels. They find similar results for middle and low-income countries but no significant effect of the peg on inflation for developed countries.⁷ Levy-Yeyati and Sturzenegger (2001) also find a robust relationship between a long peg (more than 5 years) and lower inflation for non-industrial countries. Bleaney and Francisco (2007), whose study is exclusively based on non-industrial countries, and using five classification methods find that a hard peg and, to a lesser extent, a soft peg have been associated with lower inflation. As previous authors, Rogoff et al. (2004) reach a similar conclusion for developing countries. They maintain afterward that countries will benefit considerably from adopting more flexible regimes as they develop economically and institutionally. However, relying on their own exchange rate classification scheme, Klein and Shambaugh (2010) analyze the experience of 80 industrial and developing

⁷ For upper income countries, only one regression out of four displays significant negative effect of the peg on inflation. But this effect is due to the discipline effect.

countries between 1980-1999 and observe that the reported negative impacts of using a peg on inflation from earlier studies are relatively minor. Unlike previously studies, Klein and Shambaugh (2010) find that there is no credibility effect of a peg in developing countries while both discipline and credibility effects operate in industrial countries. More recently, using four exchange rate classification methods, Rose (2011) concludes that “*what is perhaps more surprising is how weak are the inflationary consequences of exchange rate regimes*”.

Concerning SSA countries, especially CFA zone members, it is widely argued that the latter performed better in terms of inflation. In a study of 40 SSA countries exchange rate regimes, capital and price controls, Chhibber (1991) finds that pegged countries have registered lower inflation. But also shows that the CFA zones better performance is due to the underlying monetary and financial arrangements rather than the peg. Other authors have highlighted the exceptional performance of CFA zone members in terms of inflation compared to other SSA countries (see Honohan, 1990; Devarajan and De Melo, 1991; Eldadawi and Madj, 1996 and Klau, 1998). But the latter do not separate the effects of monetary union from those of pegging as suggested in Bleaney and Fielding (2000, 2002) and Ghosh et al. (2008). Using a sample of 80 developing countries, Bleaney and Fielding (2000) find that a peg reduces inflation by 13 percentage points per year. They also show that CFA membership provides additional gains in terms of lower inflation (3.9 percentage points). Similarly, Ghosh et al. (2008) show that membership in the CAEMC and WAEMU respectively is associated with 8 and 10 percentage points lower inflation compared to other low and lower-middle income countries. However, compared to countries with fixed exchange rate regimes, previous differences slightly decline to 6.2 and 9.4 percentage points for CAEMC and WAEMU respectively, suggesting potential membership benefits. Bleaney and Fielding (2002) control for other determinants’ effects on inflation and find a similar value (8 percentage points) as evidence of the potential benefits of CFA membership.

In this paper, we present some statistics on inflation, money supply growth, fiscal balance and GDP per capita growth in SSA, which is divided into 4 groups: (i) the CFA zone; (ii) the Rand Monetary Area (RMA), the second monetary area in SSA; (iii) countries officially operating a fixed exchange rate regime (PEG IMF) or a *de facto* classification scheme (PEG IRR) and (iv) other SSA countries (see table A in the appendix). During the period 1985-2009, the average rate of inflation in the CFA zone was two-times lower than that of the RMA (4 per cent versus 10 per cent) and four times lower than other SSA countries (18 per cent). The CFA zone inflation rate was also three times lower than that of other SSA countries when

their currencies were pegged highlighting the exceptional performance of the zone members in terms of inflation. The differences between these groups of countries and the CFA zone are reflected in the evolution of money supply. Indeed, the growth rate of their money supply is at least twice that of the CFA zone. The importance of this variable in determining inflation was evident during the 1980s and the first half of the 1990s. During the 1994-2009 period⁸, the growth rate of money supply for other groups of countries has significantly decreased resulting in a lower inflation rate as compared to the previous period. However, the performance of the zone in terms of inflation remains significantly lower to that of other groups.

2.2. Fiscal discipline

The impact of exchange rate regimes on fiscal discipline is relatively ignored in the literature (see Ghosh et al., 2002; Klein and Shambaugh, 2010 and Levy-Yeyati, 2011). Rose (2011) highlights this omission as a shortcoming in several studies. However, it is generally argued that a peg provides greater fiscal discipline (Tornell and Velasco, 2000).⁹ Indeed, adopting lax fiscal policies, in this regime, can lead to a depletion of reserves and thereby to a costly collapse of the agreement. Tornell and Velasco (2000) have developed a standard inter-temporal model within which fiscal policy is endogenously determined by maximizing fiscal authority—and propose a counterargument to this conventional wisdom. They show that a flexible exchange rate can lead to greater fiscal discipline and welfare. They also argue that unsustainable fiscal policies are costly in both fixed and flexible regimes, but the difference concerns the inter-temporal distribution of these costs. Under a flexible regime, unsound policies are immediately noticed—through changes in exchange rate and price levels — and therefore penalized. To prevent paying these costs, government must apply sound policies implying greater fiscal discipline. Conversely, unsound fiscal policies are revealed much later under a fixed exchange rate regime which may result in its costly collapse. This is particularly apparent in monetary unions where a country can benefit from having a higher budget deficit than other members because of a uniform union-wide interest rate (Masson and Patillo, 2004).¹⁰ Edwards and Savastano (1999) adopt a similar stance using historical arguments

⁸ With regard to the CFA zone, the analysis of this sub-period is necessary since before 1994, the two monetary unions comprising it were only monetary cooperation areas. The crisis that had hit the CFA zone countries during this period led to the devaluation of the CFA franc (down 50 percent) and highlighted the need to enhance economic cooperation. Thus, the monetary unions became economic and monetary areas.

⁹ With the recent debt crisis in the Euro zone (Greece, Italy, Portugal and Spain), can we still argue that a peg or hard peg leads to greater fiscal discipline? Note however that part of these debt problems is due to bank bailout and recovery plans adopted by governments to address the 2008-2009 economic crisis.

¹⁰ This is known in the Optimum Currency Area (OCA) literature as free riding behavior.

maintaining that in the past, fixed exchange rates often failed to ensure macroeconomic discipline resulting in major devaluations.

There are very few empirical studies about the exchange rate regime implications for fiscal discipline in Africa. Comparing 11 CFA zone members to 17 non-CFA SSA countries between 1980-1984, Tornell and Velasco (2000) show that the latter countries applied more robust fiscal policies than the former. However, it should be noted that this finding may be subject to sample bias since the period of study is very short, and thus cannot be generalized. As shown by Yehoue (2006), a comparison between the CFA zone and others in terms of fiscal discipline depends on the time dimension of the sample. Calculating unconditional averages of fiscal discipline indicators over the period 1965-2004, the author shows that CFA zone budget deficits were lower between 1965-1984 and 1995-2004; but higher between 1985-1994 than in 27 other SSA countries. Wang et al. (2007) also compare these countries' fiscal balances from 1980 to 2005 with almost the same conclusions (see also Musungaie, 2010).

In this paper, we compare the fiscal balance of CFA zone members to that of other SSA countries depending on their exchange rate regimes. In the long-run (during 1985-2009), the average budget deficit to GDP of the CFA zone (-1.87 per cent) was lower than other SSA countries (-3.75 per cent), but higher than the RMA's deficit (-0.62 per cent) and that of pegged countries (-0.64 and -0.98 for respectively IRR and IMF classification schemes). Most groups of countries have improved their fiscal balance over the 1994-2009 period, with the exception of those SSA countries which do not operate a peg regime. In particular, the average fiscal balance in the CFA zone has increased by 4.62 percentage points: from a deficit of -4.97 during the period 1985-1993, to a deficit of -0.29 per cent of GDP between 1994-2009. This may be explained by the exceptional performance of the CAEMC area. However, although the latter period corresponds to the establishment of multilateral surveillance criteria in the CFA zone, the performance of the CAEMC or the whole CFA zone could not be solely attributed to zone membership benefits. It could also result from other factors such as a terms-of-trade improvement. Indeed, with the exception of the Central African Republic, the CAEMC countries¹¹ as oil producers and exporters have benefited from the commodity boom of 2002-2009.

2.3. Growth

¹¹ Chad has started to exploit and export its oil in the beginning of the 2000s.

The relationship between exchange rate regimes and economic growth is ambiguous. Economic growth depends on several variables¹² including the real exchange rate which also influences many of them. However, the literature provides some general, but unconventional arguments. On the one hand, a flexible exchange rate regime allows a country to have an independent monetary policy which can be used to cope with internal and external shocks. Consequently, it can stabilize output and absorb shocks, such as terms of trade shocks which frequently affect developing countries. However, this regime is costly in terms of credibility, particularly in the latter countries where institutions and financial systems are too weak to ensure independent and credible policies. A weak financial system, i.e. which does not provide the necessary guarantees and sophisticated financial instruments to cover risks, could indeed hamper the ability to sustain a flexible exchange rate. On the other hand, a fixed exchange rate induces some rigidities which may result in price distortions, exchange rate misalignments, and thus currency crisis and higher unemployment. Indeed, some authors have argued that an exchange rate peg is associated with greater exchange rate misalignments, leading in turn to currency crises (through speculative attacks), with adverse effects on growth (see Coudert et al., 2011 and Dubas, 2009). Other authors highlight the difficulty of pegged countries when they are confronting terms-of-trade shocks leading to lower growth performance (see Brada, 2001 and Edwards and Levy-Yeyati, 2005). However, a peg can also lead to stronger economic growth through its positive impact on investment and trade. First, a fixed exchange rate enhances investment contributing to a more stable economic environment with lower inflation and interest rates and through access to larger capital markets. Second, an exchange rate peg encourages reduced transaction costs due to a flexible exchange rate, and thereby fosters trade between countries.¹³ The latter leads to greater business cycle synchronization and economic growth (Frankel and Rose, 2002).

On the whole, most empirical studies do not find strong evidence of exchange rate regime effects on growth. This result is not surprising since some authors consider the choice of exchange rate regime as a monetary policy decision which does not affect real variables such as long-run economic growth (see Bailliu et al., 2001; Levy-Yeyati and Sturzenegger, 2003; Rose, 2011). For Bailliu et al. (2001), the exchange rate regime could however influence the adjustment process of real variables to their long-run levels. Studying the experience of 25 emerging countries over the period 1973-1998 and using two regime classification schemes,

¹² See for instance, Sala-i-Martin (1997) and Durlauf et al. (2005) who have studied the relevance of 60 and 140 potential growth determinants, respectively.

¹³ Thus, it is argued that small and more opened countries benefit to peg their currencies to that of their main trading partner(s).

the authors conclude that flexible regimes lead to higher growth when capital market is relatively opened or, to a lesser extent, when domestic financial market is developed. Bailliu et al. (2003) show that a solid monetary policy framework is more important than the type of regimes themselves. Ghosh et al. (1996) abound in the same sense by maintaining that exchange rate regimes do not influence growth performance. Indeed, they show that a peg is associated with higher levels of investment and trade than a floating exchange rate, while the latter leads to greater productivity growth. They also note that a peg involves more volatile output and employment. As for inflation, Ghosh et al. (2002) provide more detailed results depending on income levels and regime classification schemes resulting in findings ranging in all directions for both output growth and its volatility. Mitigated results have also been found by Klein and Shambaugh (2010) for a set of 92 developed and developing countries over 20 years (1980-1999). They show that fixed exchange rates lead to lower growth compared to flexible and flip¹⁴ regimes namely for non-industrial countries. But these findings are not robust to the inclusion of other growth determinants highlighting the relevant role of the latter.

Unlike, Levy-Yeyati and Sturzenegger (2001) find clear evidence of regimes' impacts, namely of the peg, on growth for developing countries only as well as Bleaney and Francisco (2007). In fact, they show that both long and short pegs are negatively related to per capita output growth in non-industrial economies. These findings are later corroborated by Levy-Yeyati and Sturzenegger (2003) who exclusively focused on output growth and volatility. To summarize, Rogoff et al. (2004) argue that rigid exchange rate regimes (peg and intermediate arrangements) have helped developing countries, to achieve lower inflation with little apparent costs in terms of lost growth. In addition, they show that rigid exchange rate regimes lead to higher output growth volatility and greater currency crises. Finally, as Rose (2011) notes the main differences between the reviewed findings are probably linked to the methodologies used to evaluate the potential growth effects resulting from varied exchange rate regimes.

For SSA it is often argued that the CFA zone's growth performance is worse than for other countries. Estimating growth averages (unconditional) for 29 SSA countries between 1981 and 1992, Ghura and Hadjimichael (1996) show that the CFA zone income declines (-0.91 per cent) during this period while the remaining countries stagnated (0.01 per cent output per capita growth). Thereafter, they confirm their results by controlling for other determinants of growth and conclude that price stability in the CFA zone did not generate higher economic

¹⁴ A country is considered as operating in flip regime when it abandons its peg a time before adopting it after.

growth. Hoffmaister et al. (1998) studied the importance of domestic and external shocks in 8 CFA zone countries compared to 15 other SSA economies. The authors show that the growth performance of the CFA zone was better during the period 1975-1985 due to positive terms-of-trade shocks, but the trend was largely reversed between 1985 and 1993. The relative stagnation during the latter period is attributed to CFA franc overvaluation generated by appreciation of the French Franc (see also Klau, 1998). Hoffmaister et al. (1998) also highlight the greater importance of external shocks in the CFA zone due to its exchange rate regime. These different arguments and counterarguments were usefully reviewed by Elbadawi and Madj (1996). The latter maintain that the marginal effect of zone participation on growth was negative in the short-run (comparing the periods 1986-1989 to 1982-1985) and positive but not significant in the long-run (1980s vs. the 1970s). However, Devarajan and Melo (1991) find contradictory results which corroborate their earlier findings in Devarajan and Melo (1987). Indeed, comparing 11 CFA zone members to 20 other SSA countries over the periods (1973-1981 and 1982-1989), they show that growth rate in the CFA zone was better. But, they also highlight that the zone members registered lower growth rates compared to low income countries and primary or oil exporters. Besides this literature, other studies attempt to analyze the effects of real exchange rate volatility and misalignment on growth. Generally, they have shown that higher exchange rate misalignment—associated with fixed regimes¹⁵—lead to lower economic growth (see Ghura and Greenes, 1993; Klau, 1998; Elbadawi et al., 2012). However, most of these studies also found that higher real exchange rate volatility—associated with flexible regimes—lessens the growth performance.

As the literature suggests, there does not appear to be an unequivocally clear link between an exchange rate regime and GDP per capita growth. Table A in the appendix shows that the CFA zone countries growth rate was not significantly different to that of the RMA members or other SSA countries operating a different regime. Alternatively, countries seem to have experienced higher growth when they peg their exchange rates. Considering the period 1985-1994, we reach a similar conclusion to Ghura and Hadjimichael (1996) with a CFA zone in recession and other SSA countries stagnating. However, the CFA zone has achieved a better growth performance following devaluation with an increase of 3.4 percentage points on average relative to the previous period. The other groups have also improved their growth performance unlike countries which really operate a fixed exchange rate regime. Otherwise, the RMA had the most stable growth rate with the lowest standard error of the GDP per capita

¹⁵ See Dubas (2009) and Holtemöller and Mallick (2012) or also Coudert et al. (2011) for evidence on CFA zone.

growth, following by the remaining SSA countries when their currencies were pegged. In contrast, the CFA zone had, the highest growth volatility, especially the CAEMC.

3. ECONOMETRIC METHODOLOGY

Our empirical study is based on a sample of 35 SSA countries¹⁶ over the period 1985-2009. The database (variables used, their definitions and sources; and countries retained) is detailed in Appendix Table B. As previously mentioned, our aim is to evaluate the effectiveness of the benefits or costs of the CFA zone membership which involves differentiating the effects of being in monetary union to that of having a fixed exchange rate. Although this counterfactual issue is impossible to answer, Bleaney and Fielding (2000, 2002) and Ghosh et al. (2008) provided some attempts. The overall idea is to control one regime (monetary union or peg) and to evaluate the additional specific gains or losses of belonging to the CFA zone. Bleaney and Fielding (2000, 2002) suggested estimating simultaneously the effect of peg and that of CFA zone membership using dummy variables while controlling the effect of other potential determinants of variables of interest. Ghosh et al. (2008) proposed to choose as control group countries that operate a fixed exchange rate regime. Thus, the remaining differences in economic performance would highlight the real costs or benefits of the monetary union. To distinguish the effects of the two regimes of the CFA zone, one could also compare the zone members with other countries that are in monetary unions. Therefore, any observed difference could be attributed to the pegging of the CFA franc to an external currency.

In this study, we use the approach proposed by Bleaney and Fielding (2000, 2002) and two different exchange rate classification methods in a panel data framework. In our sample, 29 countries have declared—at least once over the period of study—that they were in a hard peg regime (IMF classification) while only 21 actually operated such a regime (IRR classification) including 13 CFA zone members. However, since the dummy representing the CFA zone members is time-invariant variable, its coefficient cannot be directly estimated in traditional fixed effects panel model. To tackle this issue, we rely on the Feasible Generalized Least Squares (FGLS) as suggested in Wooldridge (2002). However, since the endogenous variables in the equations of growth and inflation are likely to depend on their lagged values,

¹⁶ Given its similarities with the CFA zone members, the other SSA countries are the most relevant group of control for the CFA zone (Elbadawi and Madj, 1996). However, a sample of low-income countries would be used as group of control. To be sure that the choice between these two groups of control do not significantly affect our findings, we re-estimate the inflation equation of Ghosh et al. (2008) who compare the WAEMU and the CAEMC areas to low income countries. Our results are slightly higher than those of these authors (with 8 percentage point gains for both WAEMU and CAEMC areas) and are available upon request.

one could expect to have a dynamic panel models. In this case, the coefficients of the peg and CFA dummies are estimated in two steps. Firstly, we use the generalized method of moments (GMM) developed by Arellano and Bond (1991) and Blundell and Bond (1998) to estimate the dynamic equations with other potential determinants. This allows controlling the effects of the latter, that of persistence (lagged value) and countries specific effects.¹⁷ In the second step, we evaluate the residual effects of the peg and that of the CFA membership. The basic models and estimation results are presented in the next subsections.

3.1. Inflationary benefit of the CFA membership

The starting point of most studies analyzing inflation is a standard money demand equation which—derived from the Fisher identity—considers inflation as a monetary phenomenon and suggests that it depends positively on the growth rate of money supply ($\Delta M2$); the nominal interest rate (I); the velocity of money (V) and negatively on real GDP growth (Growth). As Ghosh et al. (2008) we added to the Fisher identity the following control variables generally used in the literature (see Levy-Yeyati and Sturzenegger, 2001 and Klein and Shambaugh, 2010): (i) trade openness; (ii) government balance; (iii) terms of trade variation; (iv) money demand (M2 to GDP); and (v) lagged inflation to control for the potential effect of anticipated inflation and thus of past policies on the current situation.¹⁸ Beyond econometric aspects, the lagged value of inflation should be accounted for as inflation tends to be persistent (Bleaney and Francisco, 2005). However, this effect is not taken into account in many studies as Ghosh et al. (2002, 2008) and Klein and Shambaugh (2010). The estimated equation is specified as follows:

$$\pi_{it} = \theta\pi_{it}^e + \beta_p PEG + \beta_c CFA + \delta_j CV_{it} + \mu_i + \xi_{it} \quad (1)$$

With π_{it}^e , expected inflation is approximated by lagged inflation; PEG , a dummy variable corresponding to 1 when a country has a fixed exchange rate and 0 elsewhere; CFA , a dummy variable representing the members of this area; CV , the control variables cited above; μ_i , the country effects and ξ_{it} the disturbance term.

In short-run, *ceteris paribus*, the benefits of the CFA zone are denoted ($\beta_p + \beta_c$) and that of the peg equal to (β_p). In long-run, the coefficient (θ) is added to the latter values in absolute terms. Tables 1 and 2 below summarize the results for respectively IMF *de jure* and IRR *de*

¹⁷ Note that for the money demand equation, countries' effects could also tackle the issue concerning the fact that low inflationary countries tend to operate a peg exchange rate policy i.e. the endogenous phenomena (Klein and Shambaugh, 2010).

¹⁸ Due to the data limitation, the nominal interest rate has not taken into account.

facto classification schemes over the periods 1985-2009 and 1994-2009. In the two cases, various significant variables have the expected signs except the trade openness which has positive effects on the inflation rate. Indeed, following Romer (1993), the literature suggests that the more a country is opened, the less are the advantages of unexpected inflation. Thus, greater openness should lead to lower inflation. However, empirical evidence of this assumption is mixed (see Alfaro, 2005; Klein and Shambaugh, 2010). Regression results also highlight the significant impact of previous inflation on current rates. This suggests that a peg will usually lead to lower inflation in the long-run (from 0.46 to 0.77 percentage point). Other control variables as money growth, money demand and, to a lesser extent, terms of trade, trade openness and economic growth have significant and expected impacts on inflation in SSA.

Table 1: Estimation of money demand equation (IMF *de jure* classification)

VARIABLES	1985-2009			1994-2009		
	(1)	(2)	(3)	(4)	(5)	(6)
π_{it-1}	0.7682*** (0.09)	0.6898*** (0.10)	0.5144*** (0.07)	0.5759*** (0.03)	0.6802*** (0.05)	0.4621*** (0.10)
PEG	-0.0151** (0.01)	-0.0048 (0.01)	0.0065 (0.01)	-0.0192* (0.01)	-0.0192** (0.01)	0.0078 (0.01)
CFA			-0.0372*** (0.01)			-0.0426*** (0.01)
$\Delta M2$		0.2168*** (0.08)	0.2939*** (0.10)		0.2539*** (0.06)	0.2386*** (0.05)
M2 to GDP		-0.0453 (0.04)	-0.1390*** (0.05)		-0.0565** (0.03)	-0.0764*** (0.03)
Growth	0.1506 (0.53)	0.0666 (0.46)	-0.8080*** (0.30)	-0.0591 (0.35)	-0.0793 (0.33)	-0.4239 (0.28)
Open	0.0116 (0.02)	0.0106 (0.02)	0.0458** (0.02)	0.0189 (0.02)	0.0138 (0.02)	0.0282* (0.02)
ΔTot	-0.1050 (0.07)	-0.1416** (0.07)	-0.1306** (0.06)	-0.0502 (0.04)	-0.1134*** (0.04)	-0.0823* (0.04)
Fiscal balance	-0.0006 (0.00)	-0.0007 (0.00)	-0.0005 (0.00)	-0.0009 (0.00)	-0.0008 (0.00)	-0.0007 (0.00)
Constant	0.0159 (0.02)	0.0027 (0.03)	0.0457*** (0.02)	0.0385*** (0.01)	0.0260* (0.01)	0.0322** (0.01)
Observations	724	720	796	506	502	548
Nb of country	35	35	35	35	35	35
Hansen	0.72	0.82	0.91	0.56	0.62	0.61

AR1	0.00	0.00	0.00	0.00	0.00	0.00
AR2	0.13	0.12	0.10	0.12	0.80	0.15

Notes: Standard errors in parentheses and *** p<0.01, ** p<0.05, * p<0.10.

Based on the IMF classification scheme, our results show that countries have experienced 1.5-1.9 percentage points per year lower inflation under a peg than other regimes (columns 1 and 4). This difference is due to lower money growth (discipline effect) for the period 1985-2009. Alternatively, accounting for money growth does not affect the coefficient of the peg during the period 1994-2009.¹⁹ As previously noted, the aim is to evaluate the benefits of CFA zone membership. Consequently, after controlling for country specificities, inflation anticipations and monetary discipline effects, we show that inflation of the CFA zone has been around 4 percentage points lower than that of other SSA countries even relative to those in fixed exchange rate regimes (columns 1 and 4).

Table 2: Estimation of money demand equation (IRR *de facto* classification)

VARIABLES	1985-2009			1994-2009		
	(1)	(2)	(3)	(4)	(5)	(6)
π_{it-1}	0.7481*** (0.07)	0.6704*** (0.08)	0.5144*** (0.07)	0.5614*** (0.04)	0.6652*** (0.06)	0.4621*** (0.10)
PEG	-0.0251*** (0.01)	-0.0172** (0.01)	-0.0096 (0.02)	-0.0193** (0.01)	-0.0161** (0.01)	0.0058 (0.02)
CFA			-0.0240 (0.02)			-0.0413*** (0.02)
$\Delta M2$		0.2121*** (0.08)	0.2939*** (0.10)		0.2393*** (0.05)	0.2386*** (0.05)
M2 to GDP		-0.0728** (0.03)	-0.1390*** (0.05)		-0.0590* (0.03)	-0.0764*** (0.03)
Growth	-0.0445 (0.48)	-0.1163 (0.44)	-0.8080*** (0.30)	-0.0413 (0.37)	-0.0545 (0.35)	-0.4239 (0.28)
Open	0.0215 (0.02)	0.0224 (0.02)	0.0458** (0.02)	0.0205 (0.02)	0.0154 (0.02)	0.0282* (0.02)
ΔTot	-0.0946 (0.07)	-0.1304* (0.07)	-0.1306** (0.06)	-0.0492 (0.04)	-0.1039** (0.04)	-0.0823* (0.04)
Fiscal balance	-0.0003 (0.00)	-0.0005 (0.00)	-0.0005 (0.00)	-0.0008 (0.00)	-0.0008 (0.00)	-0.0007 (0.00)
Constant	0.0225	0.0170	0.0457***	0.0357***	0.0232	0.0322**

¹⁹ This result is probably due to the fact that there is no high inflation episode (more than 50%)—thus no outliers' effects—over the period 1994-2009, unlike to the period before.

	(0.02)	(0.02)	(0.02)	(0.01)	(0.02)	(0.01)
Observations	749	745	796	527	523	548
Nb of country	35	35	35	35	35	35
Hansen	0.72	0.84	0.91	0.61	0.68	0.61
AR1	0.00	0.00	0.00	0.00	0.00	0.00
AR2	0.12	0.11	0.10	0.11	0.81	0.14

Notes: Standard errors in parentheses and *** p<0.01, ** p<0.05, * p<0.10.

If we consider the IRR classification scheme, the findings are much clearer. They show that a peg has been associated with lower inflation (2.5-1.9 percentage points per year) and that part of this benefit arises from the discipline effect. Indeed, lower money growth has contributed to around 30 percent and 16 percent of the benefit in terms of inflation of the peg in SSA (see columns 2 and 4 respectively). For the CFA zone, its membership benefit is estimated at 4.1 percentage points as previously with the IMF classification scheme. Overall, our estimates show that beyond the discipline and anticipated inflation effects, CFA zone membership results in additional benefits in terms of inflation. This result is consistent with findings provided by Ghosh et al. (2008). According to them, the institutional structure of the monetary unions of the CFA zone (pooling of foreign exchange reserves, convergence criteria, etc.) leads to greater credibility and hence to better inflation performances. The estimated values are moreover similar to that of Bleaney and Fielding (2000).

3.2. What effect has CFA membership had on fiscal deficits?

The theoretical reference model used to evaluate the macroeconomic determinants of a fiscal deficit follows Tornell and Velasco (2000). They link the fiscal deficit to real GDP per capita growth (CGrowth), terms of trade variation (ΔTOT) and external public debt (Debt). Increased growth and terms of trade is expected to improve the deficit while that of external public debt has a negative effect on the latter. The basic model is described as follows:

$$F_{it} = \beta_p PEG + \beta_c CFA + \beta_1 Debt_{it-1} + \beta_2 CGrowth_{it-1} + \beta_3 \Delta TOT_{it} + \alpha_i + \xi_{it} \quad (2)$$

With F_{it} , the fiscal balance; α_i , the individual effects and ξ_{it} , the disturbance term.

In addition to the variables retained in the original model, we also use overseas development assistance (ODA) and Kauffman et al. (2010) institutional indicators related to political stability and the absence of violence, corruption and government effectiveness.²⁰ However, these indicators were only available during the period 1996-2009, so we do not

²⁰ Dufrenot and Sakho (2008, pp 43-71) used the same explanatory variables as Tornell and Velasco (2000)—to which they added external aids, the share of economic sectors and institutional variables—to analyze the WAEMU countries' tax revenues.

consider them in the regression covering the whole period 1985-2009. Consequently, we consider three possible specifications: (i) a basic model; (ii) a model which takes into account the dynamics of ODA and therefore in some way the “*shock absorber*” role of France through its ODA to the CFA zone often mentioned (see Yehoue, 2006); and (iii) a model including institutional indicators and /or differentiating between oil and non-oil exporters.

The results are summarized in table 3 and 4 for the both classification schemes. The main determinants of fiscal balance in SSA have the expected signs and are: external government debt, terms of trade growth, oil production indicator, country stability and to a lesser extent aid to CFA zone. An increase of terms of trade and greater political stability lead to better fiscal balance while greater external public debt reduces it. Concerning oil-exporting countries, they tend to have a better fiscal balance (between 5.4 and 5.5 percentage points) than non-oil exporters²¹. Moreover, there is some evidence of negative effects of ODA on the fiscal balance in the CFA zone. This is a surprising, but also interesting finding which has two main explanations. On the one hand, it could confirm the proposition that France increases its ODA when the zone members are facing negative shocks associated with a large fiscal deficit (see Yehoue, 2006). Thus, when French ODA does not eliminate all the negative effects of shocks on deficit, it will be negatively correlated to the latter. On the other hand, this finding could imply that the CFA zone governments either increase their spending or decrease tax revenue mobilization when they receive more ODA. For the WAEMU, Dufrenot and Sakho (2008) highlight a negative effect of ODA on this areas member’s tax revenue.

Table 3: Estimation of fiscal deficit (IMF *de jure* classification)

VARIABLES	1985-2009			1994-2009		
	(1)	(2)	(3)	(4)	(5)	(6)
PEG	-0.06 (0.68)	0.05 (0.67)	-0.06 (0.66)	0.58 (0.84)	0.70 (0.83)	0.07 (0.84)
CFA	0.40 (0.93)	1.52 (1.17)	0.20 (1.17)	1.32 (1.03)	3.00** (1.37)	1.31 (1.50)
CGrowth	6.30* (3.30)	4.68 (3.35)	1.96 (3.35)	1.12 (3.73)	0.57 (3.73)	-2.69 (3.73)
Debt	-0.03*** (0.01)	-0.03*** (0.01)	-0.03*** (0.01)	-0.03*** (0.01)	-0.02*** (0.01)	-0.03*** (0.01)
ΔTot	6.37***	6.19***	5.49***	6.04***	6.02***	4.84***

²¹ Usually, government in oil-exporting countries exclusively holds oil export revenues (Arezki and Hasanov, 2013)

	(1.50)	(1.50)	(1.48)	(1.77)	(1.77)	(1.75)
Aid		-0.02	0.01		0.00	0.03
		(0.04)	(0.04)		(0.05)	(0.05)
Aid*CFA		-0.12*	-0.07		-0.20**	-0.12
		(0.07)	(0.07)		(0.10)	(0.10)
Oil			5.42***			5.44***
			(1.14)			(1.30)
Stability						1.09*
						(0.57)
Gov Effectiveness						-1.50
						(1.18)
Corruption						0.06
						(1.15)
Constant	-0.72	-0.71	-0.90	-1.04	-1.23	-1.31
	(0.74)	(0.80)	(0.78)	(0.79)	(0.84)	(0.86)
Observations	684	683	683	497	497	497
Nb of country	35	35	35	35	35	35

Standard errors in parentheses and *** p<0.01, ** p<0.05, * p<0.10.

Turning to the role of peg and the benefit of CFA zone membership, results are mixed depending on the exchange rate classification schemes. Results based on the IMF *de jure* classification scheme show that neither the fixed exchange rate nor the CFA zone membership has a significant effect on the fiscal deficit. However, regression (5), which accounts for the effect of ODA over the recent period, shows that the CFA zone membership has been beneficial with a fiscal balance 3 percentage points higher than other SSA countries.

Table 4 below, shows results based on IRR *de facto* classification scheme, leads to different conclusions concerning the effect of a peg. It shows that countries, when they operate a fixed exchange rate regime, experience lower fiscal deficits (from 2 to 3 percentage points) than other SSA countries, which contradicts the argument advanced by Tornell and Velasco (2000). The estimated benefit is however slightly higher for the period 1994-2009 highlighting the improvement in terms of fiscal discipline of pegged countries. However, our results show overall that the CFA zone membership does not lead to additional benefit as the dummy representing the zone is not significant. Consequently, it could be argued that a peg leads to greater fiscal discipline unlike a monetary union suggesting the possibility of a free riding phenomenon in this latter regime.

Table 4: Estimation of fiscal deficit (IRR *de facto* classification)

VARIABLES	1985-2009			1994-2009		
	(1)	(2)	(3)	(4)	(5)	(6)
PEG	1.96 (1.20)	1.98* (1.16)	2.32** (1.11)	2.58** (1.30)	2.54** (1.27)	2.81** (1.26)
CFA	-1.44 (1.34)	-0.18 (1.50)	-1.90 (1.48)	-0.65 (1.42)	1.14 (1.69)	-1.13 (1.79)
CGrowth	6.74** (3.20)	5.00 (3.26)	2.36 (3.25)	1.45 (3.64)	0.85 (3.64)	-2.20 (3.62)
Debt	-0.03*** (0.01)	-0.02*** (0.01)	-0.03*** (0.01)	-0.03*** (0.01)	-0.02*** (0.01)	-0.03*** (0.01)
Δ Tot	6.35*** (1.44)	6.18*** (1.45)	5.53*** (1.43)	5.94*** (1.69)	5.94*** (1.69)	4.86*** (1.67)
Aid		-0.02 (0.04)	0.01 (0.04)		0.00 (0.05)	0.03 (0.05)
Aid*CFA		-0.13* (0.07)	-0.07 (0.07)		-0.19** (0.10)	-0.12 (0.10)
Oil			5.44*** (1.13)			5.53*** (1.28)
Stability						1.10** (0.55)
Gov Effectiveness						-1.17 (1.14)
Corruption						-0.20 (1.13)
Constant	-1.16* (0.70)	-1.14 (0.75)	-1.43** (0.72)	-1.26* (0.73)	-1.39* (0.79)	-1.80** (0.79)
Observations	709	708	708	518	518	518
Nb of country	35	35	35	35	35	35

Standard errors in parentheses and *** p<0.01, ** p<0.05, * p<0.10.

3.2. CFA membership, peg and economic growth

There are several variables which can influence a country's growth performance: from real to nominal variables through to institutional or external determinants (see for instance Sala-i-Martin, 1997 or Tsangarides, 2005). As our study focuses on the exchange rate regime implications, we only control for the effect of relevant determinants of economic growth. Thus, we consider the following explanatory variables: investment to GDP; inflation; terms-of-trade growth; fiscal balance or government spending; debt service and trade openness.

Moreover, to control for the potential effects of initial income—referring to the real convergence phenomenon of the growth theories—one could use the lagged value of the real per capita GDP (Y_{it-1}). In fact it has been widely argued that high income countries tend to have a lower growth rate than low income countries, so the latter will converge towards the former. Thus, the expected sign of the initial income is negative. Using the Limited Information version of the Bayesian Model Averaging (LIBMA), Tsangarides (2005) tested several potential determinants of growth for African states and showed that these variables are robustly correlated with their growth rates. The equation to be estimated could be summarized as follows:

$$\Delta Y_{it} = \beta_p PEG + \beta_c CFA + \theta Y_{it-1} + \delta_j CV_{it} + \mu_i + \xi_{it}, \quad \text{with } j \geq 2 \quad (3)$$

With Y_{it} , the logarithm of the real GDP per capita; Δ , the first difference operator; CV , the control variables cited above; μ_i , the country effects and ξ_{it} , the disturbance term.

The estimation results are summarized in tables 5 below for both classification schemes. They show that investment and government intervention play a key in SSA countries growth. To a lesser extent, the economic growth of these countries is also linked to their terms-of-trade movements and debt service. Findings also show some evidence of significant convergence process between these countries.²²

Table 5: Growth equation estimation for both classification schemes

VARIABLES	IMF de jure Classification				IRR de facto Classification			
	(1)	(3)	(2) ^a	(4) ^a	(5)	(6)	(7) ^a	(8) ^a
Y_{it-1}	-0.0142** (0.01)	-0.0195 (0.01)	-0.0145* (0.01)	-0.0080 (0.01)	-0.0234 (0.02)	-0.0195 (0.01)	-0.0265 (0.02)	-0.0080 (0.01)
PEG	-0.0106 (0.02)	-0.0099 (0.01)	-0.0037 (0.02)	-0.0072 (0.01)	0.0208 (0.05)	-0.0233** (0.01)	0.0336 (0.05)	-0.0077 (0.01)
CFA	- -	0.0186*** (0.01)	- -	0.0023 (0.01)	- -	0.0349*** (0.01)	- -	0.0055 (0.01)
Investment	0.0281*** (0.01)	0.0196** (0.01)	0.0345** (0.01)	0.0339*** (0.01)	0.0244*** (0.01)	0.0196** (0.01)	0.0295** (0.01)	0.0339*** (0.01)
Deficit	0.0011*** (0.00)	0.0010** (0.00)	0.0011*** (0.00)	0.0011*** (0.00)	0.0010*** (0.00)	0.0010** (0.00)	0.0010** (0.00)	0.0011*** (0.00)
Δ Tot	0.0279** (0.01)	0.0262* (0.01)	0.0117 (0.01)	0.0128 (0.02)	0.0258* (0.01)	0.0262* (0.01)	0.0081 (0.01)	0.0128 (0.02)
Debt service	-0.0018 (0.00)	-0.0023* (0.00)	-0.0030*** (0.00)	-0.0035*** (0.00)	-0.0015 (0.00)	-0.0023* (0.00)	-0.0029** (0.00)	-0.0035*** (0.00)
Oil	0.0299 (0.03)	0.0767 (0.06)	0.0408 (0.03)	0.0427 (0.04)	0.0378 (0.04)	0.0767 (0.06)	0.0501 (0.04)	0.0427 (0.04)
Constant	0.1077 (0.09)	0.1788 (0.17)	0.0912 (0.10)	0.0165 (0.09)	0.2013 (0.15)	0.1788 (0.17)	0.2200 (0.19)	0.0165 (0.09)

²² The inclusion of institutional variables in the regressions over the 1994-2009 period does not significantly influence our findings. This is why we do not report them here but they are available upon request.

Observations	706	786	496	542	731	786	517	542
Nb of country	35	35	35	35	35	35	35	35
Hansen	0.78	0.76	0.57	0.62	0.80	0.76	0.69	0.62
AR1	0.04	0.01	0.08	0.04	0.03	0.01	0.07	0.04
AR2	0.34	0.23	0.29	0.26	0.30	0.23	0.25	0.26

Standard errors in parentheses and *** p<0.01, ** p<0.05, * p<0.10.

^{a)} For regression over the period 1994-2009.

We find that the impact of a peg is ambiguous and mostly not significant for both classification schemes used and periods of study considered. Only regression (6), based on IRR classification scheme and over the whole period, shows a significant and negative relationship between the fixed exchange rate regime and the per capita economic growth. Alternatively, the results concerning the CFA membership effects are quite clearer. Over the whole period, findings show that the growth rate of the CFA zone members has been 1 and 2 percentage points greater than countries in fixed regime (see respectively, regressions 6 and 3). However, over the period 1994-2009, the rigid exchange rate regime of the CFA zone has not significantly affected its economic growth. Consequently, one could conclude that the belonging to the CFA zone was beneficial in long-run unlike recent years where many SSA countries applied sound policies relative to the 1980s and the first half of 1990s.

4. POLICY IMPLICATIONS AND CONCLUSION

In recent years, there have been growing debates about whether the CFA franc impedes the economic development of the area. This paper aims to participate in this debate by examining the extent to which the CFA zone's economic performance is due to its exchange rate regime. We have also reviewed much of the theoretical and empirical literature in this field. We find that the literature does not assert a direct and consistent link between a country's exchange rate regime and three key macroeconomic variables (inflation, fiscal balance and growth), in general, and are interested in the case of SSA countries. We have compared the economic performance of the CFA zone with other SSA countries including the RMA, the second monetary area on the continent. This study goes further than previous studies by taking into account specific features of the CFA franc agreement, which may influence its economic performance. Thus, it both deepens and widens the analysis of the growth-exchange rate nexus, and the role of inflation, fiscal balance and monetary union.

Our findings show that anticipated inflation and rigorous monetary policy have played key role in the determination of inflation in SSA countries. In long-run, fixed exchange rate will bring down the inflation rate reducing the anticipated inflation. In short-run, the inflationary

benefits of the peg have been estimated between 1.5 and 2.5 percentage points relative to other SSA countries. But significant part of these benefits is linked to lower money growth. Controlling for all these factors influencing the inflation rate, our results show that the CFA zone members have experienced around 4 percentage points lower inflation than other SSA states, even those in fixed exchange rate regimes. They also highlight a greater performance (between 1 and 2 percentage points) in terms of economic growth of the CFA zone compared to other SSA countries over the period 1985-2009. However, this result was not confirmed during the period 1994-2009. The effect of anchoring on the growth is also ambiguous according to both classification schemes used. With these mixed findings, one could conclude that the rigid exchange rate regime of the CFA zone does not hamper its growth in contrast to the expectations. Finally, we find that the CFA zone membership does not have overall significant effects on the fiscal balance. But the effects of peg on the latter depend on the used classification method. Indeed, when a country really operate a fixed exchange rate regime, it benefit from better fiscal balance. Thus, according to the *de facto* classification scheme, one could conclude that peg lead to greater fiscal balance unlike monetary union highlighting a possible free rider behavior in the latter. Alternatively, the fiscal balance of countries which have declared that they have a fixed exchange rate regime is not significantly different to that of others. The analysis also highlights the important role of ODA in the CFA zone, changes in the terms-of-trade and a country's economic characteristics on the fiscal deficit.

From the perspective of establishing monetary unions in Africa, our results have three implications. Firstly, they suggest that a complete monetary union such as the CFA zone will probably lead to lower inflation without any significantly negative effect on economic growth. Secondly, since pegging regimes seem to exert negative effects on growth, a monetary union without being anchored to an external currency (or with a more flexible exchange rate regime than the CFA zone as a whole) might be a better option. Finally, African countries committed to the establishment of a monetary union must be vigilant about possible free riding behavior in such regime by establishing clear and realistic criteria whose violation will be penalized by other countries.

Appendix

Table A: Economic performance of SSA countries over the 1985-2009 period

Areas	Periods			
	Average 85-09	Average 85-09 (1)	Average 94-09 (2)	Increase (+) /Decrease (-) (2)-(1)
Inflation				
CFA	3.79 (8.97)	0.87 (9.56)	5.43 (8.20)	4.56 (-1.36)
PEG IMF	13.67 (14.40)	16.89 (17.00)	10.49 (10.43)	-6.40 (-6.57)
PEG IRR	12.39 (12.18)	13.42 (3.78)	11.95 (14.37)	-1.47 (10.59)
RMA	9.84 (4.31)	14.02 (3.45)	7.48 (2.62)	-6.54 (-0.83)
Other SSA	17.44 (25.07)	29.26 (38.79)	12.07 (11.96)	-17.19 (-26.83)
Money Growth				
CFA	7.91 (16.18)	-0.95 (14.26)	12.35 (15.27)	13.3 (1.01)
PEG IMF	16.56 (18.57)	16.48 (22.06)	16.62 (15.18)	0.14 (-6.88)
PEG IRR	15.43 (9.80)	15.68 (7.86)	15.34 (10.48)	-0.34 (2.62)
RMA	13.20 (7.02)	14.29 (7.21)	12.65 (6.93)	-1.64 (-0.28)
Other SSA	20.03 (15.34)	24.89 (28.71)	18.07 (13.30)	-6.82 (-15.41)
Fiscal Balance				
CFA	-1.87 (7.16)	-4.97 (5.13)	-0.29 (7.54)	4.62 (2.41)
PEG IMF	-0.98 (6.71)	-1.71 (6.98)	-0.31 (6.42)	1.40 (-0.56)
PEG IRR	-0.64 (5.48)	-1.39 (5.88)	-0.28 (5.30)	1.11 (-0.58)
RMA	-0.62 (5.34)	-2.06 (5.67)	0.19 (5.02)	2.25 (-0.65)
Other SSA	-3.75 (5.58)	-3.88 (5.80)	-3.69 (5.50)	0.19 (-0.30)
GDP per capita growth				
CFA	1.44 (10.15)	-0.82 (6.03)	2.58 (11.52)	3.40 (5.49)
PEG IMF	2.32 (4.16)	2.16 (4.64)	2.46 (3.74)	0.30 (-0.90)
PEG IRR	3.13 (3.63)	3.29 (3.61)	3.07 (3.67)	-0.22 (0.06)
RMA	1.96 (2.93)	1.85 (4.12)	2.02 (2.15)	0.17 (-1.97)
Other SSA	1.42 (5.44)	9.7x10 ⁻⁰⁵ (5.28)	2.00 (5.41)	2.00 (0.13)

Notes:

a) Standard deviations in parentheses.

b) PEG IMF= PEG according to the IMF de jure classification scheme, CFA zone members being excluded.

c) PEG IRR= PEG following the de facto classification scheme of Ilzetzi, Reinhart and Rogoff (2008), CFA zone members being excluded.

Table B: Variables definitions and data sources

Variable	Description	Source
<i>Inflation</i>	The annual growth rate of the consumer price index.	<i>World Economic Outlook 2012 (IMF)</i>
<i>Deficit</i>	The ratio of government fiscal balance to GDP	<i>World Economic Outlook 2012 (IMF)</i>
<i>Growth</i>	The annual growth rate of the real GDP	<i>World Economic Outlook 2012 (IMF).</i>
<i>Investment</i>	The ratio of total current investment to current GDP	<i>World Economic Outlook 2012 (IMF)</i>
<i>Oil</i>	A dummy variable corresponding to 1 if the oil balance of the country is higher than 10% and 0 otherwise. The oil balance corresponds to oil exports minus oil imports as a percent of GDP.	<i>World Economic Outlook 2012 (IMF)</i>
<i>TOT</i>	The percentage ratio of the export unit value indexes to the import unit value indexes, measured relative to the base year 2005.	<i>World Development Indicators (World bank)</i>
<i>Open</i>	Sum of imports and exports as a percent of GDP	<i>World Development Indicators (World bank)</i>
<i>Debt</i>	Public long-term external debt	<i>UNTAD, UntadSTAT</i>
<i>Aid to GDP</i>	Net official development assistance and official aid received as a percent of GDP	<i>UNTAD, UntadSTAT</i>
<i>Governance Indicators</i>	Political stability and Violence, Government effectiveness, Control of corruption, Regulatory quality and Voice and Accountability	<i>Kaufmann et al. (2010)</i>

Countries retained in our study are:
Cameroon; Central African Republic; Chad; Congo; Equatorial Guinea and Gabon for the CAEMC.
Benin; Burkina Faso; Côte d'Ivoire; Mali; Niger; Senegal and Togo for the WAEMU.
Lesotho; South Africa and Swaziland for the RMA.
Botswana; Burundi; Cape Verde; Ethiopia; Gambia; Ghana; Kenya; Madagascar; Malawi; Mauritania;
Mauritius; Mozambique; Nigeria; Rwanda; Seychelles; Sierra Leone; Tanzania; Uganda and Zambia
for other SSA.

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