

# FOREIGN AID INFLOWS AND THE REAL EXCHANGE RATE IN THE CFA FRANC ZONE

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**ABSTRACT.** This paper presents an empirical analysis of the relationship between foreign aid inflows and the real exchange rate in the countries of the CFA Franc zone. Using panel data analysis we find that foreign aid inflows are associated with the appreciation of the real exchange rate in the CFA countries between 1980 and 2000. However, our results also suggest that the potential "Dutch Disease" effects associated with these inflows could be offset if appropriate policies are implemented.

*JEL* Classification: C23; E31; F35.

Keywords: Aid; Panel Data; Real Exchange Rates.

**RÉSUMÉ.** Cet article présente une analyse empirique de la relation entre les flux d'aide entrants et le taux de change réel pour les pays membres de la zone Franc CFA. Le recours à des données de panel montre que les flux d'aide étrangère sont associés à l'appréciation du taux de change réel qui s'est produite dans ces pays au cours de la période 1980-2000. Toutefois, les résultats indiquent également que les effets potentiels de type « syndrome hollandais » liés à ces flux pourraient être compensés par des mesures de politique économique appropriées.

Classification *JEL* : C23 ; E31 ; F35.

Mots-clefs : Aide ; données de panel ; taux de change réels.

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## 1. INTRODUCTION

Many studies have attempted to address the issue of whether foreign aid inflows exert a positive macroeconomic impact on the recipient country's economy. The vast majority of these studies have focused on the relationships between aid and growth nexus. Although the general consensus is that aid works, the question how it works remains the main issue of debate.<sup>2</sup> Some studies found that the working of aid depends on the policy environment of the recipient (see Burnside and Dollar, 2000; Collier and Dollar, 2001, 2002; Collier and Dehn, 2001; Collier and Hoeffler, 2002). Others studies found that aid works irrespective of the policy environment of the recipient economy (see Durbarray *et al.*, 1998; Hansen and Tarp, 2000, 2001; Dalgaard and Hansen, 2001; Lensink and White 2001; Chauvet and Guillaumont 2002; Easterly *et al.* 2004; Dalgaard *et al.*, 2004). Another group of researchers argue that the working of aid depends on its categorisation (see Clement *et al.*, 2004; Ouattara and Strobl, forthcoming).

A small part of the wider aid effectiveness studies, such as fiscal response studies, depart from this approach by examining how aid inflows affect the public sector (the primary recipient of aid) behaviour in developing countries (Mavrotas, 2002; Mavrotas and Ouattara, 2006a,b among others). As far as the potential "Dutch disease" effects of foreign aid inflows are concerned, only a relatively limited number of studies have investigated this channel, notwithstanding the fact that an appreciation of the real exchange rate could harm the export competitiveness of aid recipient countries and thus harm their growth prospect. This issue has become ever important given the emphasis on scaling up aid to achieve the Millennium Development Goals (MDGs). The present study is an attempt to supplement this relatively small literature (aid and "Dutch disease" literature).

The focal point of the theory on aid inflows and "Dutch disease" has been the impact exerted by aid on the relative price of non-tradable goods (see Wijnbergen, 1986 and 1989) where the main argument, essentially, is that some part of aid will be spent on nontraded goods. This may put upward pressure on domestic prices and lead to a real exchange rate appreciation. In turn, the real appreciation may induce a reallocation of labor toward the nontraded goods sector, thereby raising real wages in terms of the price of tradables. The resulting deterioration in competitiveness may lead to a decline in export performance and an adverse effect on growth. However, it has also been argued that if aid has a direct effect on public investment in infrastructure or in the presence of learning by doing and learning spillover, then the response of the real exchange rate to aid flows may be ambiguous (see Torvik, 2001; Adam and Bevan, 2003).

The empirical literature on the effect of aid flows on the real exchange rate reports mixed results Elbadawi (1999) in a panel study of 62 developing countries, including 28 from Africa, found that unsustainable aid inflows have caused substantial partial real exchange rate overvaluation in many African and non-African countries. Moreover, exceptionally high

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2. Most studies since the paper by Burnside and Dollar (2000) appear to agree on this point.

aid-dependent African countries have experienced overall real overvaluation. An earlier study by White and Wignaraja (1992) found that aid inflows were associated with the appreciation of the real exchange rate. In a recent study, Opoku-Afari *et al.* (2004), also, found support for the “Dutch disease” hypothesis for Ghana. In contrast, Ogun (1995) for Nigeria, Nyoni (1998) for Tanzania and Sackey (2001) for Ghana find no evidence of “Dutch disease”. Indeed, these authors found that aid flows were associated with real depreciation.

The present paper attempts to contribute to the aid and “Dutch disease” literature by exploring the effect of aid flows on the real exchange rate of 12 CFA countries over the period of 1980-2000.<sup>3</sup> These countries present a good case for such a study for two main reasons. Firstly, they have the same monetary and exchange rate arrangements.<sup>4</sup> Secondly, from an econometric view point as shown by Llyod *et al.* (2001), pooling countries with different underlying time series properties leads, very often, to misleading results. In other words, the assumptions about the homogeneity of parameter estimates and the data generating process are more likely to hold in the context of the relatively similar CFA countries, than if we were to study a rather large sample which includes other African or developing countries. Another contribution of the present study is that it includes an interaction term to assess whether or not conditionality enhances aid effectiveness.

The remainder of the paper is organised as follows. The next section presents some stylised facts on aid and the real exchange rate in the countries of the CFA zone. Section 3 discusses the model and the methodology employed. Section 4 presents and analyses the econometric results. Finally, section 5 concludes and provides some policy recommendations.

## 2. ECONOMIC BACKGROUND AND FOREIGN AID AND THE REAL EXCHANGE RATE IN THE CFA FRANC ZONE

This section focuses of the economic background of the CFA countries and the preliminary assessment of the aid- real exchange rate relationship.

### 2.1. Economic background

The CFA (Communauté Financière Africaine) Franc zone, which was created around 60 years ago, is a monetary union which consists of 15 African countries. The zone is divided into three sub-unions which are:

- Banque Central des États de l’Afrique de l’Ouest (BCEAO) which consists of 8 countries Benin, Burkina, Côte d’Ivoire, Mali, Niger, Senegal, Togo and the new entrant Guinea Bissau (joined in 1997);

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3. The countries examined are Benin, Burkina Faso, Cameroon, Central African Republic, Chad, Congo (Republic of), Côte d’Ivoire, Gabon, Mali, Niger, Senegal and Togo. The CFA zone also includes Equatorial Guinea and Guinea Bissau, however, there was not sufficient data to include these in our empirical analysis.

4. Member countries do not have a monetary policy on their own and all countries must operate under the fixed exchange rate regime.

- Banque des États de l’Afrique Centrale (BEAC), formed by 6 countries Cameroon, Chad, Congo, Gabon, and Equatorial Guinea (joined in 1984);
- Comoros that has its own central bank.

The CFA Franc has been freely convertible into French Francs (now Euros) at a fixed rate.

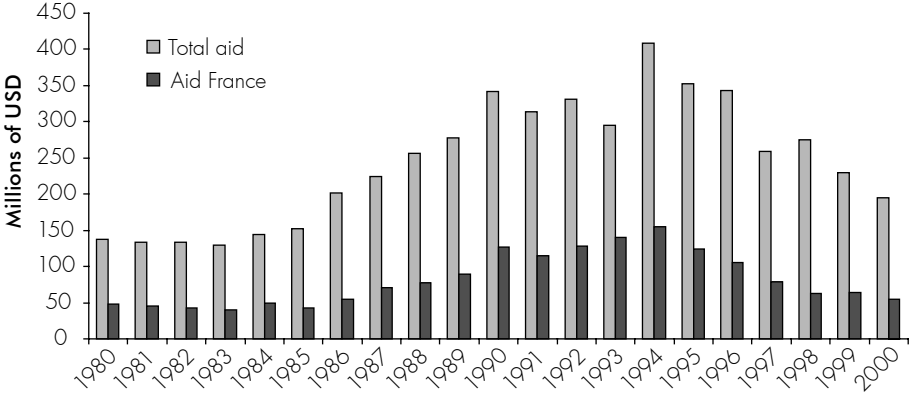
France created the Franc zone, after World War II, to help burgeoning economies of its former colonies and also to exert some control over these countries. The zone was designed to allow the ability to facilitate transfers of fund between France and its ex-colonies in Africa; to convert currency at a fixed rate in the zone; and, finally, to centralise all of the monetary reserves of the zone in the French Treasury. These arrangements helped the CFA countries in two main fronts. Firstly, the currency stability helped prevent inflationary pressures, and secondly, the common currency facilitated trade transactions among the countries.

In terms of aid allocation, French aid represents more than one third of the total aid to the zone, on average, where IMF and the World Bank constitute the other two main donors of the zone – as can be seen from FIGURES 1 and 2. French aid normally takes the form of pure grants and loans as well as technical assistance grants. In some cases France has acted as a guarantor for World Bank lending to a country. This was the case of Côte d’Ivoire, the largest economy of the zone, in the early 1990s. Furthermore, when the IMF, the World Bank, and other donors pulled out of the country, following the deterioration of the economy in the late 1980s, France continued to provide its assistance.

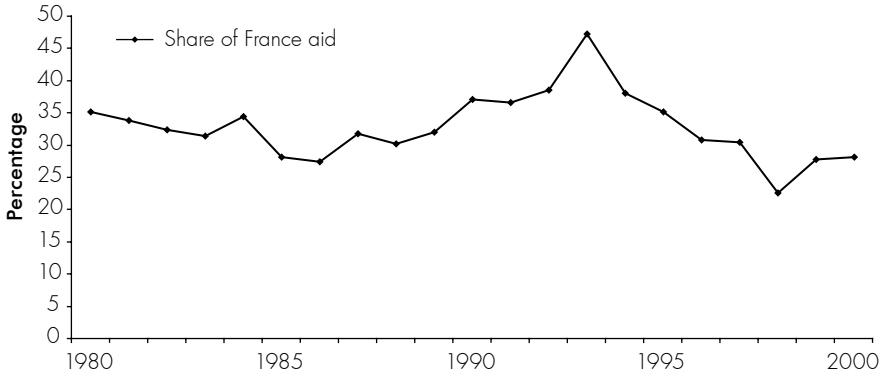
In terms of its economic development the Franc zone has witnessed three key stages. During the first stage, which covers the period of independence (1960) to the mid-1980s, economic performance in the zone was remarkable compared to other Sub-Sahara African countries. On average, annual real GDP growth was estimated at 4.6 percent during that period, compared to 1.4 percent to non-CFA countries. By the mid-1980s the inflation rate (based on the consumer price index) in CFA zone was around at 11.2 percent versus 17.8 in the non-CFA countries. Three key factors were behind this economic success of the CFA countries during this period. Firstly, the devaluation of the French Franc (to which the CFA Franc is pegged), in 1958 and 1969, *vis-à-vis* the US dollar increased the competitiveness of these countries in relation to the non-CFA countries. Secondly, the discipline imposed on monetary policy arrangements ensured that appreciation of the real effective exchange rate arising from inflationary financing was largely prevented. Thirdly, CFA countries benefited from a rise in the price of raw materials for which they enjoyed a near monopoly.

The second period, spanning from 1986 to 1993, was characterised by a crisis. The financial and economic situation of the zone deteriorated. The crisis first started when the zone terms of trade deteriorated by about 50 percent due to a sharp drop in the world market prices for its main exports (coffee, cocoa, cotton, and petroleum) (Clément *et al.*, 1996). The situation was made worse by the French policy of maintaining a strong Franc in the early 1986 and the aggressive competitiveness of non-CFA countries, such as Nigeria and Ghana. As a result, real GDP growth was estimated at –0.2 percent (annual average) for CFA countries compared to 2.8 percent in non-CFA countries. Budget deficits went from

**Figure 1 - Trends in total aid and French aid to the CFA zone (1980-2000)**



**Figure 2 - Share of French aid in total aid to the CFA zone (1980-2000)**



an average of 5% of GDP between 1975 and 1985 to 7.4 percent of GDP between 1986-1993. The authorities attempted an internal adjustment by reducing the wage, improving revenues, restructuring the banking system and public enterprises, etc. However, this effort did not live up to its results and the economy of the CFA zone countries further deteriorated.

The third period corresponds to the post-devaluation period. Given that the attempt to internally adjust their economies did not succeed, CFA countries were left with one policy option that is to externally adjust by altering the parity of CFA Franc with the French Franc. Thus on January 12 1994, the CFA Franc was devalued by 50 percent in foreign currency terms and the Comorian Franc by 33 percent. Following the devaluation, real GDP grew at 5 percent (annual average) between 1995 and 1998, while the inflation rate, which reached 33 percent in 1994, was brought down to 3.5 percent by 1996. The budget balance, which was negative in 1993 and 1994 turned into a surplus by 1995. However, since the political turmoil in Côte d'Ivoire (the largest economy in the CFA zone at 40 percent of the zone total GDP), in recent years, the zone started to face a new crisis. Furthermore,

the fall in agricultural prices and the rise in the value of the Euro *vis-à-vis* the US dollar have hindered the economic recovery of the CFA zone.

## 2.2. Aid and the exchange rate in the CFA zone

The real effective exchange rate (REER) is the price of traded goods relative to the price of nontraded (domestic) goods. In the absence of readily available indices of tradable and nontradable prices, the real exchange rate has to be proxied by available domestic and world price indices and nominal exchange rates. There is no unique way of constructing a proxy measure, but all commonly used measures compute the ratio:

$$REER = \frac{NER \times P^f}{P^d} \quad (1)$$

where  $NER$  denotes the nominal exchange rate (measured as domestic currency per foreign currency),  $P^f$  is an index of foreign prices and  $P^d$  is an index of domestic prices.

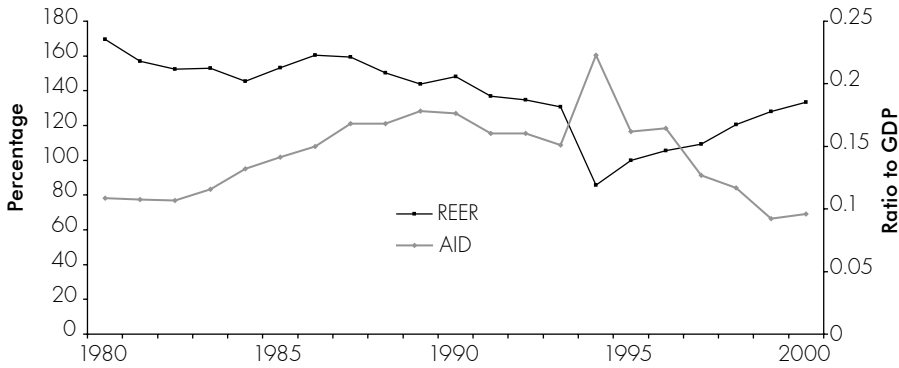
Different measures of  $P^f$  and  $P^d$  are used in the literature depending on data availability. For example, for foreign prices some studies use the consumer price index of trading partners or the consumer price index of US (given that most international transactions are quoted in US dollars). Others use the foreign producers wholesale price. With regard to domestic prices some studies use the domestic consumer price index and other use the GDP deflator. To construct our real exchange rate, our preferred method is to proxy foreign prices by the US consumer price index and domestic prices by the CFA countries consumer price index.<sup>5,6</sup> This definition of the REER implies that an increase in the REER corresponds to a real depreciation.

As FIGURE 3 indicates, the REER and Aid as a percentage of GDP have experienced different trends. Starting with foreign aid inflows, one witnessed a steady build up between 1980 and 1990. At just 10% of GDP in 1980, they reached 14% of GDP in 1985 before jumping to almost 18% of GDP in 1989. During the same period the real effective exchange rate appreciated-going from almost 170 % in 1980 to 153% in 1985 and then 143% by 1989. Based on this evidence alone one might be tempted to argue that the appreciation of the exchange rate was the result of the steady build up in aid inflows. However, between 1989 and 1993 the exchange rate continued to appreciate (reaching 131 % in 1993), and thus, despite the fact that foreign aid inflows have decreased to reach 15% of GDP. After 1994 the exchange rate started to depreciate sharply, going from 86% in 1994 to 133 % in 2000. This corresponds to the period when the CFA Franc was devalued to enhance the competitiveness of the zone *vis-à-vis* non-CFA countries, such as Ghana and Nigeria, who were pursuing very aggressive competitiveness policies at the time. This period also witnessed a sharp decline in aid inflows as a share of GDP. From over 22% in 1994, aid inflows decreased to less than 10 % of GDP by 2000.

5. A plot of different proxies for foreign prices shows a strong correlation between them. The same also applies for domestic prices. This implies that whatever measure of the real exchange rate we use should lead to similar outcome.

6. The base year for our calculated REER is 1995.

**Figure 3 - The REER and aid flows in The CFA zone (1980-2000)**



### 3. ECONOMETRIC METHODOLOGY AND DATA ISSUE

#### 3.1. Methodology

The methodology employed, here, is based on the generalized method of moments (GMM), first proposed by Arellano and Bond (1991). The main advantage of this approach is that it allows the control for unobserved country specific effects and potential endogeneity of the explanatory variables.

Following Edwards (1989) the behaviour of the real exchange rate for our panel of CFA countries can be represented by the following functional specification:

$$REER_{i,t} = \delta_1 REER_{i,t-1} + \delta_2 X_{i,t} + \eta_i + \varepsilon_{i,t} \tag{2}$$

where  $REER$  is the real effective exchange rate,  $X$  is a set of its economic determinants,  $\eta$  represents a set of unobserved time-invariant country specific effects;  $\varepsilon$  is the error term, and the subscript  $i$  and  $t$  represent country and time period, respectively.

To purge the time invariant unobserved country specific factors,  $\eta$ , that may be correlated with the regressors we take first differences of equation (2) as follows:

$$REER_{i,t} - REER_{i,t-1} = \delta_1 (REER_{i,t-1} - REER_{i,t-2}) + \delta_2 (X_{i,t} - X_{i,t-1}) + (\varepsilon_{i,t} - \varepsilon_{i,t-1}) \tag{3}$$

The lagged dependent variable in (3) is by construction endogenous if  $\eta$  is correlated with any of the regressors and hence we employ the Generalised-Method-of-Moments (GMM). Indeed we adopt the improved version of the GMM known as the GMM-system. One should note, however, that the validity of these instruments is necessary for the consistency of the GMM estimators. Moreover, while there is by construction first order serial correlation in (3), the presence of second order serial correlation would render estimates biased. Hence we employ two tests to examine these issues. The first is the Hansen/Sargan test for over-

7. For the estimation we used the logarithmic version of this model.

identifying restrictions, which is asymptotically distributed as  $\chi^2$  and tests the null hypothesis of validity of the (overidentifying) instruments. Failing to reject the null hypothesis (validity of the instruments) gives support for the model. In addition to the Hansen/Sargan test, it is also important to check for the absence of serial correlation in the error term, as consistency of the estimates depends on it. First-order, AR(1), and second-order, AR(2), serial correlation tests are used for this purpose. While first order serial correlation is expected by construction, failure to reject the null hypothesis of "absence of second order serial correlation" leads to the conclusion that the original error term is serially uncorrelated and hence the corresponding moment conditions can be used. The test statistics are asymptotically distributed as standard normal variables. We also experiment with the pooled-OLS estimation technique to ensure that our results are not driven by the choice of methodology.

### 3.2. Data

The set of explanatory variables included in the model are: AID (net official development assistance (ODA) as a ratio of GDP); G (government consumption as a ratio of GDP); Ig (public investment as a ratio of GDP); OPEN (openness of the economy defined as the sum of exports and imports expressed as a ratio of GDP); TOT (terms of trade); and DEV (a dummy variable for the nominal devaluation of the CFA Franc which takes the value of 0 between 1980-93 and 1 between 1994-2000). In constructing our dummy this way, we follow the standard procedure in applied econometrics (see Pesaran & Pesaran 1997; Harris & Sollis 2003; Dougherty 2006; among others for detail discussion)<sup>8</sup>. However, constructing the dummy this way is not without its problems of interpretation. In particular one should keep in mind that while the additional inclusion of year specific time dummies, as we do here, ensures that we are not capturing some year specific effect, there may still have been other changes common to all countries at the same time that we are not aware of that are best modelled as a simple intercept shift. Thus our 'devaluation' interpretation of this dummy variable is conditional on that no other similar changes took place between the two time periods.

The expected theoretical impacts of the respective variables included in our model are as follows.

- Aid: as noted earlier, the "Dutch disease" hypothesis predicts that an increase in foreign aid flows would lead to an appreciation of the real exchange rate.
- Government Consumption: its effect on the real exchange rate will depend on its composition. If consumption is dominated by non-tradable goods then real exchange rate would tend to appreciate, while the consumption of tradables would lead to real depreciation. Loosely speaking, this implies the effect of government consumption on the real exchange rate is ambiguous.

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8. This approach has been widely used in applied work to capture the impact of events such as the 1929 crash, World War II, and the oil shocks, etc.



- Public Investment: similar line of argument as with government consumption. Moreover, it has been argued that investment in infrastructure would lead to real depreciation.
- Openness: trade policy restrictions increase the prices of imports, causing prices in the non-tradables sector to increase, leading to real appreciation. In contrast, an increase in openness (or trade liberalisation) will cause real depreciation.
- Terms of Trade: the response of the real exchange rate to changes in the terms of trade depends on whether income or substitution effects dominate. If the income (substitution) effect dominates then deterioration of TOT leads to real depreciation (appreciation). In other words its effect on the real exchange rate is ambiguous.
- Devaluation: the nominal devaluation of CFA Franc, in 1994, is expected to lead to real depreciation.

Data used to estimate our model is taken from a number of sources. Specifically, information on aid is obtained from the OECD/DAC online database, while data on government consumption, public investment, exports and imports (in OPEN) are extracted from the World Development Indicators 2002 (WDI, 2002). Data on terms of trade has been calculated by dividing export units value by import unit value (base year 1995), obtained from the IMF CD-Rom 2002. Data on nominal exchange rate (NER), the foreign price index ( $P^f$ ) and ( $P^d$ ) the domestic price index were obtained from the WDI 2002. Summary statistics of all our variables are given in TABLE 1.

**Table 1 - Summary statistics (logs of the variables)**

| Variable                      | Mean   | Standard deviation | Minimum | Maximum |
|-------------------------------|--------|--------------------|---------|---------|
| <i>Real Exchange Rate</i>     | 4.560  | 0.400              | 3.745   | 5.320   |
| <i>Aid</i>                    | -2.474 | 0.819              | -6.039  | -1.251  |
| <i>Terms of Trade</i>         | 4.668  | 0.267              | 3.887   | 5.734   |
| <i>Government Consumption</i> | 2.586  | 0.261              | 1.699   | 3.250   |
| <i>Public Investment</i>      | 2.769  | 0.497              | 0.657   | 4.090   |
| <i>Openness</i>               | 4.066  | 0.366              | 2.999   | 5.037   |
| <i>Real Income per capita</i> | 6.806  | 0.670              | 5.704   | 8.476   |

#### 4. EMPIRICAL RESULTS

TABLE 2 summarises the results of our estimations. Columns (1)-(3) represent the OLS results while Column (4)-(5) summarise the GMM-SYS results. Starting with the OLS results, the baseline regression, Column (1), shows that the impact of aid on the real exchange rate is negative but statistically insignificant. The coefficient of the devaluation term is positive and significant in statistical terms, thus implying that nominal devaluation leads to real depreciation.

**Table 2 - OLS and GMM-system estimation (dependent variable Real Effective Exchange Rate)**

|                               | OLS                     |                         |                         | GMM-SYS                |                     |
|-------------------------------|-------------------------|-------------------------|-------------------------|------------------------|---------------------|
|                               | (1)                     | (2)                     | (3)                     | (4)                    | (5)                 |
| Lagged dependent variable     | 0.00846***<br>(0.00012) | 0.00824***<br>(0.00015) | 0.00804***<br>(0.00033) | 0.00987***<br>(0.0018) | 0.0122*<br>(0.0075) |
| <i>Aid</i>                    | -0.00201<br>(0.022)     | -0.0487<br>(0.029)      | -0.0865***<br>(0.028)   | -0.298*<br>(0.14)      | -1.007***<br>(0.32) |
| <i>Terms of Trade</i>         | -0.0310<br>(0.040)      | -0.0238<br>(0.038)      | -0.0415<br>(0.037)      | 1.243<br>(0.79)        | -1.159**<br>(0.50)  |
| <i>Government Consumption</i> | -0.0518<br>(0.047)      | -0.0339<br>(0.047)      | -0.0393<br>(0.044)      | 0.289<br>(0.23)        | 1.091**<br>(0.39)   |
| <i>Public Investment</i>      | 0.00736<br>(0.022)      | 0.0122<br>(0.023)       | 0.00206<br>(0.021)      | -0.123<br>(0.14)       | -2.252**<br>(0.77)  |
| <i>Openness</i>               | 0.0429<br>(0.032)       | 0.0834**<br>(0.032)     | 0.103**<br>(0.037)      | 0.576<br>(0.50)        | 1.079**<br>(0.38)   |
| <i>Devaluation</i>            | 0.128**<br>(0.042)      | 0.131***<br>(0.039)     | 0.142<br>(0.084)        |                        |                     |
| <i>(Aid)* (Devaluation)</i>   |                         |                         | 0.119**<br>(0.042)      | 0.278**<br>(0.13)      | 0.272***<br>(0.071) |
| <i>Real Income per capita</i> |                         | -0.0664**<br>(0.024)    | -0.0710***<br>(0.020)   |                        | -1.502**<br>(0.59)  |
| <i>Constant</i>               | 3.742***<br>(0.18)      | 3.844***<br>(0.18)      | 3.849***<br>(0.12)      | -1.244<br>(2.35)       | -2.652<br>(2.13)    |
| Observations                  | 236                     | 222                     | 222                     | 236                    | 222                 |
| R-squared                     | 0.85                    | 0.86                    | 0.87                    |                        |                     |
| Hansen/Sargan test            |                         |                         |                         | 0.326                  | 0.449               |
| AR(1) p-value                 |                         |                         |                         | 0.000                  | 0.162               |
| AR(2) p-value                 |                         |                         |                         | 0.100                  | 0.777               |

Notes: Robust standard errors in parentheses; \*\*\*, \*\*, \* represent 1, 5, and 10 percent significance levels, respectively. Windmeijer demised correction was used in the GMM-SYS regressions. Time dummies were included in the regression.

In Column (2) we include Real Income *per capita* as an additional control variable. The inclusion of income *per capita* as an additional variable would allow to check the robustness of our results as well as testing the Balassa-Samuelson hypothesis, which predicts that higher incomes *per capita* are associated with an appreciation of the real exchange rate. Balassa (1964) and Samuelson (1964) argue that as development takes place the productivity improvement in the tradable goods sector exceeds that of non-tradable goods sector. This implies that the decrease in the price of the former is relatively larger than that in the latter, thus, causing appreciation of the real exchange rate. It is clear from Column (2) that our results do not change with this new specification. The estimated coefficient of the Real Income *per capita* is negative and statistically significant at the conventional level. This evidence clearly supports the Balassa-Samuelson hypothesis i.e. higher income lead to the appreciation of the real exchange rate. In Column (3) we include an interaction term (Aid)x(Devaluation). From the results, in Column (3), it is clear that the estimated coefficient of aid is negative and statistically significant at the 1 percent level, thus implying that aid flows lead to the appreciation of the real exchange rate in the CFA zone. However, the coefficient of the interaction term is positive and significant. This could mean that if governments take appropriate policy measures the potential "Dutch disease" effect of foreign aid can be dampened. Also from this result it is evident that the Balassa-Samuelson hypothesis is supported.

We now turn our attention to the GMM-SYS regressions results. One advantage of this methodology is that it could deal with the issue of endogeneity of the right hand side variables, using internal instruments. It combines the set of equations in first-differences with suitably lagged level of instruments, with an additional set of equations in level with suitably lagged first-differences as instruments. The validity of the instruments is tested using the Hansen/Sargan test, which in our case suggests that we cannot reject the null hypothesis that there are no over identification restrictions. Put differently, this implies that our instruments are valid. Also, the null hypothesis of absence of second order serial correlation cannot be rejected. Turning to the GMM-SYS results Column (4) shows that the estimated coefficients of the GMM-SYS is negative and statistically significant, thus implying that aid flows lead to the appreciation of the real exchange rate.<sup>9</sup> Moreover, one may want to note the change in the size of the coefficient, which provides support for controlling for the potential endogeneity of aid via the GMM systems estimator. In Column (5) we include both our control variable and the interaction term. The results show that aid flows lead to the appreciation of the real exchange rate. However, as found above, the estimated coefficient of the interaction term is positive and statistically significant. The results also confirm the Balassa-Samuelson hypothesis. Moreover, the change in the size of the coefficient on aid supports the importance of taking account of this effect when examining the impact of aid on the real exchange rate.

We now turn our attention to the other variables in the model. The effect of the Terms of Trade variable on the real exchange rate is negative in all five regressions, but only significant in

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9. Note that the dummy is not included in this regression because the differenced of the variable are used in the regressions.

one regression. Government Consumption variable bears a negative as well as positive sign but remain insignificant in all regressions but one (where the coefficient is positive). Turning to Public Investment its impact appears to be insignificant in all the equations except one where it bears a negative sign. The estimated coefficient of the Openness variable is positive in all the equations and statistically significant in 3 out of the 5 regressions.

## 5. CONCLUSION AND POLICY IMPLICATIONS

This paper assessed the impact of foreign aid inflows on the real effective exchange rate of CFA Franc countries between 1980-2000, using panel data estimation method. We found that foreign aid inflows generate "Dutch disease" effect in the countries of the CFA zone. However, after interacting the foreign aid inflows with an indicator of conditionality (the devaluation that took place in 1994) results indicate that this effect was offset. Indeed, we found that interacting aid with the devaluation variable leads to real depreciation.

The main policy recommendation of this paper is that both donors and recipients should not be concerned with the potential "Dutch disease" effects of aid flows, as these effects can be counteracted by appropriate government policy responses. Put differently, contrary to the policy recommendation of Elbadawi (1999)<sup>10</sup>, CFA countries can still continue to receive foreign aid without fears of harming their export competitiveness and thus growth prospect. What is more, if poverty reduction is the main objective, as is the case with the MDGs, scaling up despite these "Dutch disease" concerns could be justified.

This paper, however, has some limitations. Also our paper fails to take into account the issue of aid heterogeneity. A useful extension of the current paper would be to look at the impact of different types of aid namely project aid and programme aid flows. Another extension could be to look at the effect on financial *versus* non-financial aid. The World Bank and the IMF have recently argued in the context of Uganda (following concerns by President Museveni that the country suffers from "Dutch disease" due to aid inflows) that aid could be delivered in material form (food, pills, hydroelectric dams) instead of money, in order to avoid the appreciation of the real exchange rate. Future research should seek to investigate these issues.

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10. The author argues that the dependence of African countries on aid could damage their export competitiveness and thus export-oriented development strategy because of the "Dutch disease" effects generated by aid inflows.

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