Do Aid Inflows Cause Dutch Disease? A Case Study of the CFA Franc Countries

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Abstract

This paper presents an empirical analysis of the relationship between foreign aid inflows and the real exchange rate in 12 countries of the CFA Franc zone. Using dynamic panel analysis we find that foreign aid inflows do not generate Dutch disease effects in these countries. In terms of policy recommendation our results suggest that CFA countries can still receive aid without fear of harming their competitiveness.

Section I: 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 have focused on the relationships between aid and growth, aid and savings, and aid and investment. 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. As far as the potential Dutch disease effects of foreign aid inflows are concerned, only a very 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.

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 Van Wijnbergen 1985 and 1986*), where the main argument is that some part of aid will be channelled to the non-tradable sector of the economy. As a result, the demand for non-tradable goods would rise, thereby raising their price. Given that the real exchange rate (rer) is defined as the relative price of non-tradable goods to that of tradable goods (i.e. *rer = price tradable/price of non-tradable*), a rise in the price of non-tradable means that the rer declines (appreciates). Indeed, in a panel study of 62 developing countries, Elbadawi (1999), in a panel study of 62 developing countries found that aid inflows caused the real exchange rate to appreciate, a results mirrored in the study of Sri Lanka by White and Wignaraja, (1992). In contrast, Ogun (1995) for Nigeria, Nyoni (1998) for Tanzania and Sackey (2001) for Ghana find no evidence of Dutch disease.

The present paper attempts to contribute to the wider aid effectiveness literature by exploring the issue of foreign aid and Dutch disease in the context of 12 African countries in the CFA Franc zone over the period of 1980-2000.[1] These countries present a good case for such study for three main reasons. Firstly, they have the same monetary and exchange rate arrangements.[2] Secondly, these countries have a strong economic link with France one of their main donors in aid. Finally, from an econometric view point-as shown by Llyod *et al*. (2001)- pooling countries with different underlying time series

[1] 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.

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

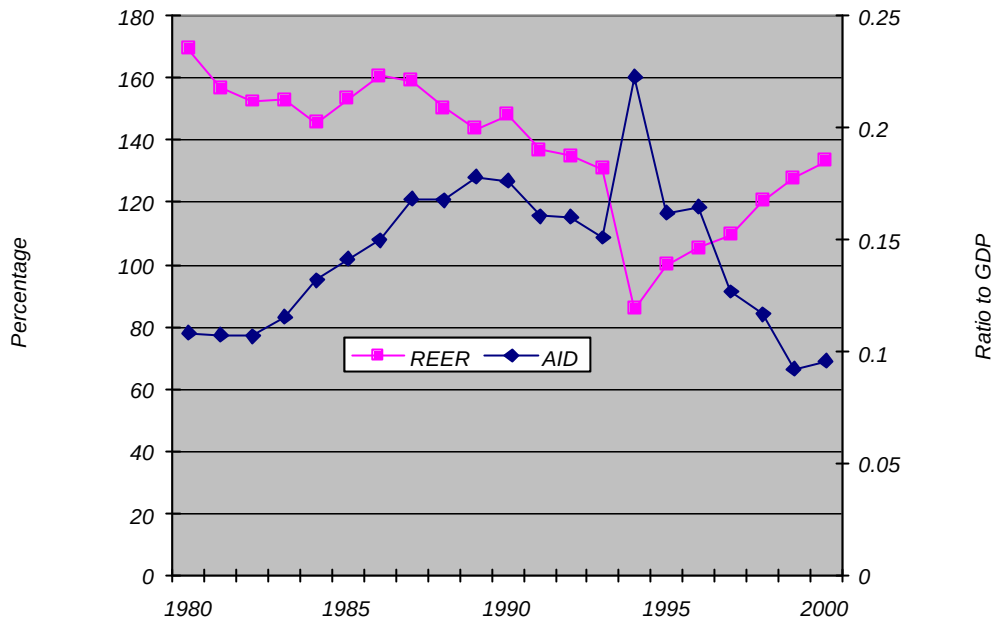
property leads, very often, to misleading results. In other words, the assumptions about the homogeneity of parameter estimates and the data generating process are more likely to hold, in the context of the CFA countries, than if we were to study a rather large sample which includes other African or developing countries.

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 discuses the model and the methodology employed. Section 4 presents and analyses the econometric results. Finally, section 5 concludes and provides some policy recommendations.

Section II: Foreign Aid and the Real Exchange Rate in the CFA franc Zone: Some Facts

Using data from the World Development Indicators database we calculated the real effective exchange rate (REER) for the CFA countries by multiplying the nominal exchange rate by the consumer price index of the US (used as a proxy for foreign price) deflated by the consumer price index of each country, with 1995 as the base year. This definition of the REER implies that an increase in the REER corresponds to a real depreciation. As Figure 1 indicates, the REER and Aid as a percentage of GDP have experienced different trends. Starting with foreign aid inflows, they witnessed a steady build up between 1980 and 1990. Starting from 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. Base on this evidence alone one might be tempted to argue that the appreciation 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 form 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.

Figure 1: The REER and Aid Flows in The CFA zone (1980-2000)



Section III: Empirical Model, Data and Summary Statistics

Following Edwards (1989) the behaviour of the real exchange rate can be represented by the following functional specification:

$$\log REER_t = a_0 + a_1 \log(AID)_t + a_2 \log(G)_t + a_3 \log(Ig)_t + a_4 \log(OPEN)_t + a_5 \log(TOT) + a_6 DCR + a_7 DEV + a_8 \log REER_{t-1} \quad (1)$$

where REER is the real effective exchange rate; AID is net official development assistance (ODA) as a ratio of GDP; G is government consumption as a ratio of GDP; Ig is public investment as a ratio of GDP; OPEN is openness of the economy defined as the sum of exports and imports expressed as a ratio of GDP; TOT is terms of trade; DCR is domestic credit as a ratio of GDP included as a proxy for monetary policy; and DEV is 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.

The model in (1) includes a lagged dependent variable as a regressor, which implies that the usual approach of estimating a fixed effects model i.e. the least squares dummy variable estimator (LSDV) generates a biased estimates of the coefficients and thus not appropriate for estimating (1). To overcome this problem equation (1) can be rewritten by taking the first difference of the variables included in the model, as below:

$$\begin{aligned}\Delta \log REER_t = {} & g_0 + g_1 \Delta \log(AID)_t + g_2 \Delta \log(G)_t \\ & + g_3 \Delta \log(Ig)_t + g_4 \Delta \log(OPEN)_t + g_5 \Delta \log(TOT) \\ & + g_6 \Delta \log(DCR)_t + g_7 \Delta DEV + g_8 \Delta \log REER_{t-1}\end{aligned} \qquad (2)$$

Equation (2) can be regressed using the instrumental variables approach suggested by Arellano and Bond (1991) for dynamic panel models. The use of the Arellano and Bond (1991) GMM estimator with lagged level values of the dependent variable as instruments on (2) will produce unbiased and consistent estimates of our regressors.

The expected theoretical impacts of the respective variables included in model (2) are as follows:

- AID (-) Tends to cause real appreciation by changing the composition of the demand for traded and non-traded goods.
- G (?) The effect will depend on the composition of government consumption. Consumption of non-tradable tends to appreciate the REER, while that of tradables leads to real depreciation.
- Ig (?) Same as G.
- OPEN (+) Openness of the economy should cause real appreciation.
- TOT (?) The impact depends on whether income or substitution effects dominate. If the income (substitution) effect dominates then deterioration of TOT leads to real depreciation (appreciation).
- DCR (-) Increases in domestic credit (proxy for expansionary macroeconomic policy) would generally lead to real appreciation.
- DEV (+) Dummy variable for the 1994 nominal devaluation is

expected to lead to real depreciation.

Data used to estimate (2) are 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 (WDI) 2002, CD-Rom version*. 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. Summary statistics of all our variables are given in Table 1.

Section IV: Empirics

Results of the estimation of model (2) are presented in Table 2. Before going to analyse the results it is important to check the validity of the tests results. Firstly, the Sargan test shows that we cannot reject the null hypothesis that the over-identifying restrictions are valid. Secondly, the AR(1) is significant while the AR(2) is insignificant, thus indicating that the null hypothesis of no first-order autocorrelation in the differenced residuals is rejected, but that there is no second order autocorrelation which would render the estimates biased. In addition to these tests, the results also show that the stability condition (measured by the coefficient of the lagged dependent variable) is correctly signed and statistically significant (i.e. $|-0.038| < 1$). This implies that our model is well specified and therefore the resulting estimates can be interpreted confidently.

Starting with the effect of aid inflows, the results indicate that they are positively associated with the REER with an estimated coefficient of 0.10, significant at the 1% level. This implies that foreign aid inflows in CFA countries tend to cause the depreciation of the real exchange rate, contrary to the Dutch disease theory of foreign aid. Similar finding were reported by Ogun (1995) for Nigeria, Nyoni (1998) for Tanzania and Sackey (2001) for Ghana. However, our finding is in clear contrast to the studies by Elbadawi (1999), in a panel study of 62 developing countries, and White and Wignaraja, (1992), in the context of Sri Lanka, who found that aid inflows caused the real exchange rate to appreciate. Turning to the other variables in the model, the results show that openness of the economy bears a positive and significant sign. This suggests reducing trade and exchange control in the CFA countries is an effective policy instrument for increasing their competitiveness. Government consumption has a negative significant impact of the REER, thus indicating increases in this variable will cause the real

exchange rate to appreciate. As argued earlier, this scenario could occur if government consumption is dominated by non-tradable goods. To counteract this effect CFA governments must undertake some fiscal adjustment by curtailing their consumption of such goods. Public investment bears a negative sign, although the coefficient is not statistically significant. Terms of trade has a negative significant effect on the REER. Expansionary macroeconomic policies, captured by increases in domestic credit, have a negative significant impact on the real exchange rate. Finally, the results related to the variable Devaluation indicate the nominal devaluation of CFA franc in 1994 has significantly led to the depreciation of the real exchange rate.

Section V: Conclusion and policy implications

This paper assessed the impact of foreign aid inflows on the real effective exchange rate of the CFA franc countries between 1980-2000 in order to test the hypothesis that foreign aid inflows cause real appreciation in the recipient country. Using the dynamic panel analysis proposed by Arellano and Bond (1991), we found that this hypothesis is rejected in the case of the CFA countries. Put differently, this finding refutes the belief foreign that aid inflows cause Dutch disease in the recipient country. On the contrary, foreign aid inflows are associated with a real depreciation of the franc.

The results also show that openness of the economy and the nominal devaluation of the CFA franc in 1994 have also contributed to the depreciation of real exchange rate over that period. By contrast, our results indicate that terms of trade, government consumption and expansionary macroeconomic policies led to real appreciation of the franc. The impact of public investment was also negative, but insignificant at the conventional levels.

There are several policy implications coming out of this study. Firstly, contrary to the policy recommendation of Elbadawi (1999)[3], we argue that CFA countries can still continue to receive aid without harming their export competitiveness. Rather, aid inflows to the CFA countries enhance their competitiveness in the light of the evidence presented here. Secondly, the results related to the openness of the economy suggest that CFA governments should work towards more liberalisation. Thirdly, the fact that government consumption appreciates the real exchange rate implies that the public sector has to introduce some fiscal discipline by curtailing its consumption or by

[3] 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.

changing its composition in favour of traded goods. Finally, there appears to be a need for the two Central Banks of the CFA zone (*Banque des Etats de l'Afrique de l'Ouest*, for West Africa and *Banque des Etats de l'Afrique Centrale*, for Central Africa) to play a crucial role by avoiding increases in the domestic credit as this could harm the member countries' competitiveness.

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Table 1: Summary Statistics

Variable	Mean	Standard Deviation
log(RER)	4.446	0.267
log(OPEN)	-0.539	0.366
log(Aid/GDP)	-2.474	0.819
log(G/GDP)	-2.200	0.261
log(I/GDP)	-1.836	0.497
log(tot)	4.668	0.267
Changes in domestic credit	-0.002	0.321

Table 2: Dynamic Panel estimates of the Real Effective Exchange Rate

Variables	Estimates
Real Exchange Rate (-1)	-0.038*
	(0.020)
Openness	0.081***
	(0.004)
Aid/GDP	0.100***
	(0.007)
Government Consumption/GDP	-0.031***
	(0.006)
Public Investment/GDP	-0.012
	(0.008)
Terms of Trade	-0.009**
	(0.004)
Domestic Credit	-0.071***
	(0.008)
Devaluation	0.147***
	(0.007)
Constant	0.057
	(0.008)
Observations	196
Number of cid	12
Wald Test (b=0)	1282***
AR(1) Test	1.715***
AR(2) Test	1.174
Sargan test p-value	1.000

Notes: (1) Standard errors in parentheses. (2) ***, **, and * indicate 1, 5, and 10 per cent significance levels.