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Foreign Direct Investment and Macro Economic Performances in the Central African Economic and Monetary Community (CEMAC)

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Abstract

This article analyzes the impact of macroeconomic performances on the inflow of Foreign Direct Investment (FDI) in the Central African Economic and Monetary Community (CEMAC)'s Countries over the period 1995 – 2010, Using a dataset which breaks down FDI flows into primary, secondary and tertiary sector investments and a GMM dynamic approach to address concerns about endogeneity. We find that, Our result suggests that all sectors FDI have no strong linkages to either macroeconomic conditions, or institutional quality, though like other forms of FDI, clustering effects appear important, with larger stocks attracting greater additional inflows. The main recommendation are (i) CEMAC Countries must diversify their economies in other to increase their market size and non natural resources growth potential (i) institutional quality should be improved.

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1. Introduction

The decision to engage in FDI is a long and deliberate process. It is a decision that involves a long term commitment of the multinational corporation's time, effort and resources. The benefits of FDI are not unknown to developing countries, as most of them compete with each other to attract FDI by liberalizing their policy regimes and offering various incentives packages, such as tax rebates, trade liberalization measures, establishment of special economic zone and incentive packages to foreign investors. Athukorala (2009) asserts that issue related to the determinants of FDI is multidimensional, because different types of motives work behind the decision of investment in foreign countries by the multinational corporations.

Over the 1990 decade, CEMAC's countries[1] have been undergoing a series of exciting changes with the support of the World Bank and the International Monetary Fund (IMF). Before the 1980 decade crisis, CEMAC's was still a highly inward-oriented economy with a government that was outspoken in its criticism of multinational cooperation's. Today, CEMAC's countries rank among the most outwardly-oriented developing economies of the world. This study deals with the way in which macro-economic performances and policy incentives influence FDI flows to CEMAC.

In this context, the objective of this article is to investigate the role of macroeconomic performances on the inflow of FDI in CEMAC's Countries. The article is organized as follow: Section II presents the literature review; Section III discusses the methodology; Section IV presents empirical results; and Section V concludes the article.

2. Literature Review

There exists a vast body of literature that pertains to the FDI decision process. Since Hymer (1970), research in the FDI area has taken off in many directions. Today, literature on FDI and the multinational corporation crosses disciplines. Dunning (1993) outlines four motives for a firm to engage in this type of investment: access to resources, access to markets, efficiency gains, and acquisition of strategic assets. Policy shifts by the governments could impact the efficiency gains companies might experience, and have effect on the ability of companies to access markets. This in turn motivates the literature on whether country-level factors and conditions can also lead to stronger flows. Whether macroeconomic and other national – level factors can account for cross-country differences in FDI inflows.

Previous work has looked at the relationship of FDI with several macroeconomic variables. Some that might be thought to have a connection to FDI are the size and growth potential of the host market, economic stability, the degree of openness of the host economy and the income level, as well as the quality of institutions and level of development.

Market size and growth potential

In theory, the multinational corporation (MNC) need not set up a plant inside a country in order to gain access to its market. The MNC can also gain market access by

[1] The countries included in the sample are Cameroon, Central African Republic, Chad, Congo, Gabon and Equatorial Guinea

licensing and exporting. However, there are other real world considerations that often render these options unrealistic. An important example is transportation costs. For some products, the cost of transportation makes it impractical to export the good over any great distance. Other factors include trade barriers and consumers' preference for domestically produced goods (Daniels and Radebaugh, 1989**).**

Daniels and Radebaugh (1989) identify production costs as another important determinant of FDP. The realities of competing in a global marketplace make it necessary for MNCs to seek out the most cost efficient sources of raw materials and factors of production. An empirical study by Cushman (1987) on the effects of real wages and labor productivity on FDI failed to support the theory that real wages are an important determinant of FDI in the US. Caves (1971) argues that the decision to undertake FDI is a function of the cost of home production relative to the cost of foreign production. Since global financial markets are very integrated, capital has become very mobile. It is not so with labor. As such, the country with a comparative advantage in low cost labor will be a net recipient of foreign capital (Caves, 1971).

Larger host countries' markets may be associated with higher foreign direct investment due to larger potential demand and lower costs due to scale economies (Resmini 2000, Bevan and Eastrin (2000). Dupuch and Milan (2005), the determinants of FDI in developed countries revolve around cost factors and are mostly vertical or relocative FDI in search of cheaper production factors. Grub and Lin (1991) found that the growth rate of the market (GDP growth) is a key variable in explaining FDI in Singapore and Malaysia.

Openness and exchange rate valuation

In the literature, there is disagreement over the effect of the trade balance on FDI. The political risk assessment literature identifies the trade balance as an indicator of a country's political and economic stability. Resmini (2000), studying manufacturing investment in Central and Eastern Europe, finds that these largely vertical FDI flows, benefit from increasing openness, as might be expected in a sector for which international trade flows in intermediate and capital goods are important. Singh and Jun (1996) also find that export orientation is very important in attracting FDI, and link this to the rising complementarity of trade and FDI flows. Persistently high trade deficits can result in the restriction of foreign exchange transfers. This inhibits the ability of the MNC to repatriate its profits. The government may also attempt to reduce imports by devaluing the local currency or by restricting imports of certain goods. Froot and Stein (1991) find evidence of the relationship: a weaker host country currency tends to increase inward FDI within an imperfect capital market model as depreciation makes host country assets less expensive relative to assets in the home country. Blonigen and Piger (2011) makes a "firm specific asset" argument to show that exchange rate depreciation in host countries tend to increase FDI inflows. MNCs often depend on external sources for their inputs to production. As such, a devaluation of the local currency increases production costs as intermediate goods become more expensive. Similarly, import restrictions raise production costs or impede production. In this sense, a high trade deficit discourages FDI (Bunn and Mustafaoglu, 1978**).**

It is also argued that a high trade deficit weakens the country's currency. On the one hand, this makes it more expensive for MNCs to import intermediate goods. On the other hand a weaker currency should stimulate demand for the country's exports, stimulate production and consequently, raise income and improve the population's purchasing power (Madura, 1989**).**

As such, the MNC will be able to sell more of its products both within the country and export more to the rest of the world. In this sense, a high trade deficit may be appealing to foreign investors. Clearly, the literature does not tell us whether a high trade deficit should be considered an indication of economic stability or economic instability.

Another important indicator of economic stability is the external debt level. This is very closely related to the trade deficit in that a sustained trade deficit year after year contributes to the external debt level. A high government debt level discourages FDI. This is especially true if the government is an important customer of the MNC in that a large debt may curtail the purchasing power of the government and hence harm the profitability of the MNC (Madura, 1989**).** High private debt levels are also harmful in that they contribute to the overall level of external debt. A high external debt level does not inspire confidence in investors in that there is a higher risk of the country defaulting on its external obligations.

Inflation

Inflation is significant because inflation affects the purchasing power of consumers and as a result, consumer demand for the MNC's products (Madura 1989**).** Nunez points out that inflation also pushes up the costs of production and may eat into the profits that an MNC hopes to repatriate. Grub and Lin (1991) also found that inflation is a key explanatory variable of FDI in Malaysia and Singapore.

Clustering effects

Studies have identified clustering effects: foreign firms appear to gather together either due to linkages among projects or due to herding as a larger existing FDI stock is regarded as a signal of a benign business climate for foreign investors. FDI may also benefit from the presence of external scale economies, where new investors mimic past investment decisions by other investors in choosing where to invest. By clustering with other firms, new investors benefit from positive spillovers from existing investors in the host country. Evidence for these effects is widespread, with Wheeler and Mody (1992) in the case of U.S. firms, Barrell and Pain (1999) in the Western European context, and Campos and Kinoshita (2003) in the transition economies, all finding empirical evidence of agglomeration effects.

Institutions

Institutional quality is a likely determinant of FDI, particularly for less-developed countries, for a variety of reasons. First, good governance is associated with higher economic growth, which should attract more FDI inflows. Second, poor institutions that enable corruption tend to add to investment costs and reduce profits. Third, the high sunk cost of FDI makes investors highly sensitive to uncertainty, including the political uncertainty that arises from poor institutions. Unfortunately, it is hard to measure institutional factors, and empirical results are vague. For example, regulatory framework, bureaucratic hurdles and red tape, judicial transparency, and the extent of corruption in the host country are found insignificant by Wheeler and Mody (1992) in their analysis of firm-level U.S. data though Wei (2000) finds that corruption significantly adds to firm costs and impedes FDI inflows.

The two papers use different measures of institutional quality, and look at different types of data (investing firms versus aggregate FDI inflows), which might explain this difference. The coverage of countries also varies among existing studies. Schneider and Frey

(1985) look at a wide spectrum of developing countries, while Resmini (2000) use a smaller regional sample. Papers focusing on firm level data are almost by necessity limited to a single country, most often the United States. Another concern arising from studies focused only on advanced economies is whether lessons will apply to developing economies (and perhaps to a lesser extent, vice versa). Wheeler and Mody (1992) find some difference in investment decisions by firms in developing and developed economies. Djaowe (2009), Benassy-Quere et al. (2007) and Assiedu (2002) greatly consider institutional determinants. They characterize the attractiveness of developing countries. Stein and Daude (2007) confirm that institutional and political factors are important determinants in the location of FDI in developing countries. Wei (2000) finds that corruption has a significant adverse effect on the location of FDI. This result is robust through the use of different measures of corruption.

3. Methodology

The data used in this article are annual FDI data with observations from 1995 to 2010 for six CEMAC's countries.Data on net FDI flows broken down into primary, secondary, and tertiary flows are from UNCTAD. While an ideal analysis would use investment-level data classified by industry and available across a wide variety of countries, such a dataset is not readily available, and using macro-level FDI data disaggregated into primary, secondary, and tertiary flows allows some distinctions to be drawn between the determinants of extractive industries, manufacturing, and services.

Institutional indicators are mainly from the World Bank's development indicators. The dependent variable in the specifications below is the inflow of FDI as a share of nominal GDP. A first pass of the data looks at which macroeconomic variables are associated with higher FDI flows, based on the channels laid out above. The variables include openness, the log level of the multilateral real exchange rate, trailing 3-year moving average inflation, the stock of FDI, real GDP growth and the log level of GDP per capita. GDP per capita and real GDP growth proxy for host countries' market size and growth potential, the stock of FDI stands for the degree of clustering, and inflation proxies for macroeconomic stability[2]. Private Investment is the Log of the volume of gross fixed capital creation. Openness is measured as the share of goods and services trade in GDP. Dummy Shows oil producing and non-oil-producing countries (0 for those who do not produce and 1 for those who produce).

The institutional and qualitative variables used include infrastructure quality and corruption. Corruption is capture by Transparency International corruption perception index. School enrollment at the primary, secondary and tertiary levels is also included to capture the human capital.

Measuring the relationship between FDI flows and many of the macroeconomic variables listed above, especially GDP per capita and real GDP growth but conceivably also openness and the real effective exchange rate, raises some endogeneity concerns. To address these, we use as Walsh and Jiangyan (2010), the Generalized Method of Moments (GMM) dynamic estimator based on the Arellano-Bond methodology, see appendix.

[2] Including nominal GDP, either in USD or PPP terms, and in levels or logs, produced similar but less robust results to those using GDP per capita. These weaker results are perhaps not surprising, as the dependent variable is the ratio of FDI to nominal GDP: with the overall size of GDP already controlled for, income per capita is a clear measure of market scope.

The Arellano-Bond methodology specifies a dynamic model which allows for time-invariant country-specific effects. This seems plausible in the case of FDI, where variables outside the analysis, such as political regime and distance to home countries display little, if any, variation over the period of the analysis. The expanded empirical model is estimated as follows:

$$\text{FDI as share of GDP}_{i,t} = \beta_0 + \beta_1 GDP_{i,t} + \beta_2 REER_{i,t} + \beta_3 Open_{i,t} + \beta_4 Inf_{i,t} + \beta_5 GDP\ per\ Capita_{i,t} + \beta_6 FDI\ Stock_{i,t} + \beta_7 Inv_{i,t} + \beta_8 corrup_{i,t} + \beta_9 Infrast_{i,t} + \beta_{10} HC_{i,t} + \beta_{11} Dummy_{i,t} + \varepsilon_{i,t} \quad (1)$$

4. Empirical Results

Variables	Total FDI as share of GDP	Primary FDI as share of GDP	Secondary FDI as share of GDP	Tertiary FDI as share of GDP
Open	3.89 (4.212)	-1.85* (1.466)	3.16** (1.699)	49.01*** (9.989)
REER	-0.82 (0.704)	-0.08 (0.245)	-0,91*** (0.305)	3.67*** (1.345)
GDP	0.02 (0.078)	0.00 (0.08)	0.01* (0.012)	0.21** (0.042
Inf	0.00 (0.003)	-0.00 (0.002)	-0.00 (0.002)	-0.00 (0.002)
GDP per Capita	0.01 (0.198)	-0.00 (0.041)	-0.15*** (0.062)	-1.15*** (0.455)
inv	-0.004 (-0.56)	-0.037 (-0.82)	-0.045 (-0.71)	-0.023 (-0.74)
FDI stock	3.24*** (1.107)	0.81** (0.385)	2.36*** (0.424)	3.78*** (1.702)
corrup	-0.0252 (0.4)	-1.002 (-1.46)	-0.465 (-0.72)	-0.07501 (-1.02)
infrast	0.0262*** (4.89)	0.028** (4.61)	0.0225*** (4.59)	0.025*** (1.89)
HC	-0.08*** (-4.09)	-0.078*** (-4.46)	-0.023*** (-4.56)	-0.074*** (-3.45)
dummy	1.22*** (9.99)	0.798*** (4.96)	0.038 (0.56)	0.23** (3.12)
constant	2.60 (3.345)	1.94 (4.23)	-0.65 (4.01)	4.68 (2.97)
observations	88	85	87	86
Sargan p-Value	0.97	0.97	0.58	0.26

Standard errors in parentheses
***p<0.01, **p<0.05, *p<0.1
Source: Author's construction

The baseline macroeconomic performances specification used across the regressions includes openness, GDP growth, average inflation over the three previous years, the logs of

GDP per capita and the real effective exchange rate, and (to estimate clustering effects) the stock of FDI.

Running the same specification with slightly different dependent variables did not alter the main result: similar conclusions can be drawn from regressions using the ratio of FDI to fixed capital formation or the moving average of the ratio of FDI to nominal GDP, or regressions using the log of FDI.

For total FDI flows, the results are not particularly strong. The clustering effects noted in a variety of other studies are also visible here with the coefficient on FDI stock, and this result tends to hold up broadly in other cases. For openness (open) and the exchange rate (REER), which appear significant in a variety of other studies, the results are more puzzling. For the exchange rate, it may be that the measure used here, the IMF's real effective exchange rate, is different from the values used in other studies, which in many cases look at firms' decisions denominated in a single currency. The result for openness, which is generally measured as measured here, is more difficult to dismiss. It is possible that the reason for these poor results for macroeconomic variables is the aggregation of heterogeneous FDI inflows which have different, and at times opposing, determinants. This can be addressed by looking at sectoral flows.

The relationship between the GDP and FDI is minimal in all sectors. This is not surprising, as investments in resource extraction have little connection to the broader macroeconomy. In CEMAC's Countries, forest, mining and petroleum account for the largest share of primary sector FDI. With outputs priced in dollars rather than domestic currency, and with relatively little domestic labor content or relation with domestic financial systems, macroeconomic considerations are secondary to the location of natural resources in determining where such investments will go. In fact, the economies of Central Africa are poorly diversified; they are cash saving economies merely contented with the extraction of mineral resources and the exploitation of forest resources.

Openness did not appear to matter for primary or secondary sector FDI, it is very important for FDI in services even when the real effective exchange rate is controlled for, with a positive and highly significant coefficient. Most often described as an economically slow region, the macroeconomic reforms implemented since 1993 help in strengthening economic exchanges. Reductions in custom taxes levied on companies that invest in the area, encourage foreign investment.

Since most services FDI is likely to be horizontal (i.e., aimed at the market in which the investment is made) rather than vertical (i.e., intended for export), this is somewhat surprising, but the result is strong enough for this sector to appear when all three sectors are aggregated into total FDI. Since services flows have little to do with trade flows per se, it is not obvious why this should be the case. It is possible; however, that openness to trade is correlated with the type of economic liberalization that also generates a sound economic environment for the service sector.

The real exchange rate is also important for the tertiary sector. While secondary sector FDI appears to be drawn into countries with more depreciated real exchange rates, the opposite is true for tertiary FDI, which is at least weakly associated with more appreciated real exchange rates, with a coefficient larger than that of secondary FDI but of the opposite sign. The reasons for this difference are not obvious, but it could be that manufacturing

investment is attracted by the lower wages associated with the weaker real exchange rate, while investment in services is more attractive in markets with higher relative wages and profits. And finally, the stock of FDI in all three sectors has the same effect: the clustering effects discussed above would appear to be the only determinant that shows an important linkage to each of these different FDI flows.

Inflation is not significant across all three sectors. This result, though ambiguous because it fails to attest to literature on this variable, however remains relevant. All the six countries of CEMAC have the same currency and the same central bank, Bank of Central African States (BEAC). They are subject to comply with an inflation threshold of 3% (convergence criteria). Despite the fact that all the countries do not respect this threshold, efforts made to keep to it help to stabilize the purchasing power and contribute to the attractiveness of FDI.

The salient point is that determinants of FDI flows differ strongly across sectors. While a depreciated currency is associated with more manufacturing FDI, a stronger one is associated with more services investment. Openness is important for services, while GDP per capita is a more important driver of manufacturing. Finally, no macroeconomic variables appear to be strongly tied to primary sector FDI at all.

The contribution of infrastructure (Infra) represented by the number of mobile phone subscribers is a widely used variable in related literature. It is positive and significant for all sectors. This result is also obtained by Blonigen and Piger (2011). Averagely, 2.8% of FDI came into the sub-region because the infrastructure therein is improving, roads; a means of integration, are constructed and new technologies are globally being used.

The null variable *'dummy'* represents oil production. It is significant for primary sector proving that oil is a resource very much sought by multinational firms: the sector is currently experiencing a very high variation of investing partners. French firms which were dominant in oil-producing countries of the CEMAC zone, as the case may be, are now being replaced by American and Chinese firms. Today, a greater number of multinationals are now taking over oil exploitation in this region.

Human capital (HC) is significant but negative. This result obtained from the research attests to the low level and quality of education received. In Central Africa, 1% of FDI is being diverted because of a shortage of engineers and skilled personnel capable of using technology brought by multinationals.

As concerns private investment (INV) and corruption (corrup), their non-significance confirms facts and even the nature of FDI in Central Africa. These are investments in search of natural resources, regardless of the level of private investment or the weight of corruption. Nevertheless, although they appear non-significant, their signs are generally negative, indicating that they would negatively influence the attractiveness of FDI in the sub-region. Privatizations, mergers and acquisitions of the 1990s have not resulted in a capital accumulation; FDI has replaced private initiative.

5. Conclusion

The objective of this article was to investigate the role of macroeconomic performances on inflow of FDI in the CEMAC's countries. Ours result suggest that all sectors FDI have no strong linkages to either macroeconomic conditions, or institutional quality, though like other forms of FDI, clustering effects appear important, with larger stocks

attracting greater additional inflows. This is intuitive, as FDI decisions in forest, mining or petroleum are primarily determined by the location of those resources, with both equipment and labor easily transferable across borders. CEMAC Countries must diversify their economies in other to increase their market size and non natural resources growth potential. Institutional quality should be also improved.

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Appendix

The Arellano-Bond methodology specifies a dynamic model which allows for time-invariant

country-specific effects. This seems plausible in the case of FDI, where variables outside the

analysis, such as political regime and distance to home countries display little, if any, variation over the period of the analysis.

Considering the equation estimated:

$$Y_{i,t} = \alpha + \lambda Y_{i,t-1} + X'_{i,t}\beta + \mu_i + \nu_{i,t} \quad (2)$$

Where y denotes FDI as a share of GDP, X is the vector of macroeconomic and institutional/qualitative variables, and μ represents the time-invariant country-specific effects.

Taking first difference of equation (1) eliminates the time-invariant country-specific effects,generating the following equation:

$$\mathrm{Y_{i,t}} - Y_{i,t-1} = \alpha + \lambda\left(\mathrm{y_{i,t-1}} - \mathrm{y_{i,t-2}}\right) + \left(\mathrm{X'_{i,t}} - \mathrm{X'_{i,t-1}}\right)\beta + \left(\nu_{\mathrm{i,t}} - \mathrm{v_{i,t-1}}\right) \quad (3)$$

To account for possible endogeneity between the explanatory variables $X_{i,t}$, and the dependent variable $Y_{i,t}$, the equation is estimated using as instruments the lagged values of the left- and right-hand side variables in levels. These instruments are valid if the error term ν is not serially correlated. All specifications, in which the growth-related macroeconomic variables but not the institutional variables are used as instruments, pass Sargan tests for overidentifying restrictions, providing evidence of validity of the choice of instruments. There are some statistical shortcomings to a straight forward instrumental variables estimation of the above equation, namely that in a small sample with some persistent explanatory variables, lagged levels make weak instruments for the regression when run in differences.

To address this weakness, Blundell and Bond (1988) developed the system GMM dynamic model, which combines the regression in first differences above with an estimation run in levels, using both lagged levels and lagged differences as instruments as follows.

$$W_i = \begin{bmatrix} [y_{i1}] & & 0 \\ & [y_{i1}, y_{i2}] & \ddots \\ 0 & & [y_{i1}, \dots, y_{iT-2}] \end{bmatrix}$$

and the generalized least square regression can be conducted by pre-multiplying W' with equation (2):

$$W'\Delta Y = W'\Delta Y_{-1}\lambda + W'\Delta\nu \tag{4}$$

The one-step consistent estimator of Arrelano and Bond (1991) then is

$$\hat{\lambda}_1 = [(\Delta Y_{-1})'W(W'(I_N \otimes G)W)^{-1}W' \Delta Y_{-1}]^{-1}W[(\Delta Y_{-1})']W(W'(I_N \otimes G)W)^{-1}W'\Delta Y \tag{5}$$

Where $G = \begin{bmatrix} 2 & -1 & 0 & \dots & 0 & 0 \\ -1 & 2 & -1 & \dots & 0 & 0 \\ 0 & -1 & 2 & \dots & 0 & 0 \\ \vdots & \vdots & \vdots & \ddots & \vdots & \vdots \\ 0 & 0 & 0 & \dots & 2 & -1 \\ 0 & 0 & 0 & \dots & -1 & 2 \end{bmatrix}$

Arellano and Bond also put forward a consistent 2-step generalized method of moments

(GMM) estimator:

$$\hat{\lambda}_2 = [(\Delta Y_{-1})'WV_N^{-1}W' \Delta Y_{-1}]^{-1}W[(\Delta Y_{-1})']W(W'V_N^{-1}W)^{-1}W'\Delta Y \tag{6}$$

Where $V_N = \sum_{i=1}^{N} W_i' (\Delta\nu_i)(\Delta\nu_i)'W_i$.

Under the assumption that the error term is not serially correlated and the explanatory variables are weakly exogenous, the GMM dynamic panel estimators use the following moment conditions:

$$E\left[Y_{i,t-s} \cdot (\nu_{i,t} - \nu_{i,t-1})\right] = 0 \quad \text{for } s \geq 2; t = 3, \dots, T \tag{7}$$

The above estimate of the difference GMM dynamic model, however, could be subject to statistical shortcomings. In a small sample where some explanatory variables are persistent over time, lagged levels make weak instruments for the difference model regression.

Asymptotically, the variance of the coefficients would rise and coefficients could be biased.

To address the weakness, Blundell and Bond (1998) developed the system GMM dynamic model. The model combines the regression of first differences and that of levels. The instruments for the differences regression are the same as above, while the instruments for levels regression are the lagged differences of the variables. The additional moment conditions of the regression of levels are:

$$E\left[(Y_{i,t-s} - Y_{i,t-s-1}) \cdot (\mu_i + \nu_{i,t})\right] = 0 \quad \text{for } s = 1 \tag{8}$$

The model can be expanded to introduce additional explanatory variables. In that case, the instrument matrix W would also include the lagged levels (and differences, if the system GMM is adopted) of these variables, with the number of lags depending on whether the variables are predetermined or strictly exogenous.