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Foreign capital inflow and economic growth in Cameroon

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Abstract

The purpose of this paper is to capture the impact of foreign capital inflows (which include foreign aid and foreign direct investment) on economic growth in Cameroon. Using the autoregressive distributive lag approach to cointegration and time-series data for the period 1980–2008, the results of the study indicate that the domestic capital stock and foreign direct investment have positive and significant impacts on economic growth in the short and long terms, while the impact of the labour force on growth was significantly negative in both terms, a result that may be attributable to the fact that Cameroon is a developing country with an unlimited supply of labour whose increase has a detrimental effect on the country's growth.

Keywords: foreign aid, foreign direct investment, growth, cointegration, Cameroon.

JEL classification: C32, F21, F35, O40, O55

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Acronyms

ADF	augmented Dickey Fuller test
ARDL	autoregressive distributive lag
EEA	external economic assistance
ESAF	enhanced structural adjustment facility
FA	foreign aid
FCI	foreign capital inflows
FDI	foreign direct investment
ODA	official development assistance
PP	Phillips-Perron unit root test
PRGF	poverty reduction and growth facility
PRSPs	poverty reduction strategy papers
SAPs	structural adjustment programmes
SSA	sub-Saharan Africa
TFP	total factor productivity

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1 Introduction

In the development literature, it is widely accepted that foreign capital inflows (FCIs) stimulate economic growth in developing countries and make it possible for host countries to achieve investment levels that are higher than their own levels of domestic savings. Moreover, FCIs are a major source of finance which may facilitate the transfer of the modern technology and innovations of industrialized countries to developing countries, thus helping them to accelerate the speed of their economic development. However, some evidence suggests that FCIs growth promotion effects vary from one country to another and that for some countries, FCIs may adversely affect the growth process (Borensztein et al. 1998; De Mello 1999; Lipsey 2000).

The main advantages of capital inflows and other external financial resources, which manifest themselves through their externalities, are not only the adoption of new technologies and innovations, but also their complementarities with domestic sources of finance that affect major macroeconomic variables such as domestic investment, job creation, the acquisition of knowhow by the workforce and the business environment, as well as the competitiveness of developing countries' exports. There exist several forms of foreign capital inflows¹ of which the most important are foreign aid and foreign direct investment, and most empirical studies in the literature analyse their impacts on growth separately. In the case of Cameroon, no studies, to our knowledge, exist which analyse the combined impacts of foreign aid and foreign direct investment on economic growth simultaneously in the same model. Consequently, this study aims to examine the effect of foreign capital inflows, namely foreign aid (FA) and foreign direct investment (FDI), on economic growth in Cameroon, a country whose specific characteristic as an oil producer and exporter makes this investigation attractive and penetrating.

The study is based on annual timeseries data over the period 1980–2008 derived from the Africa Development Indicators of the World Bank (CD-ROW 2011). Econometric techniques include testing for the stationarity of data by applying both the augmented Dickey Fuller (ADF) test and the Phillips-Perron (PP) test, and using the autoregressive distributed lag (ARDL) approach to cointegration developed by Pesaran and Shin (1995) which has proven to perform better than other conventional cointegration techniques, particularly in small samples as is the case of Cameroon.

The paper is organized as follows. After the introduction (section 1), section 2 presents a descriptive background on foreign aid and FDI inflows into Cameroon. Section 3 summarizes the overview of previous theoretical and empirical studies on foreign aid, foreign direct

¹ Foreign capital inflows come in several forms. They include subsidies, loans, export credit, assistance to projects and non-projects, technical assistance, emergency relief, etc. Theoretically, FCIs come in two forms: (i) foreign private investment, which is made up of foreign direct investment (FDI) and foreign portfolio investment, as well as (ii) official development assistance (ODA) which consists of bilateral and multilateral aid, subsidies, and loans.

ODA is made up of the disbursement of loans (on concessional terms) and subsidies by official agencies, multilateral institutions and advanced countries to promote economic development and welfare in developing countries. It also includes loans with a grant element and aid inflows originating from official donors.

FDI inflows are the net investment inflows needed to acquire a lasting management interest in an enterprise operating in an economy other than that of the investor's. It is the sum of equity capital, earnings reinvestment, as well as other short- and long-terms capital.

investment, and economic growth. Section 4 provides the analytical model and the econometric methodology of the study. Section 5 presents the empirical results while section 6 concludes the study and makes a few policy recommendations.

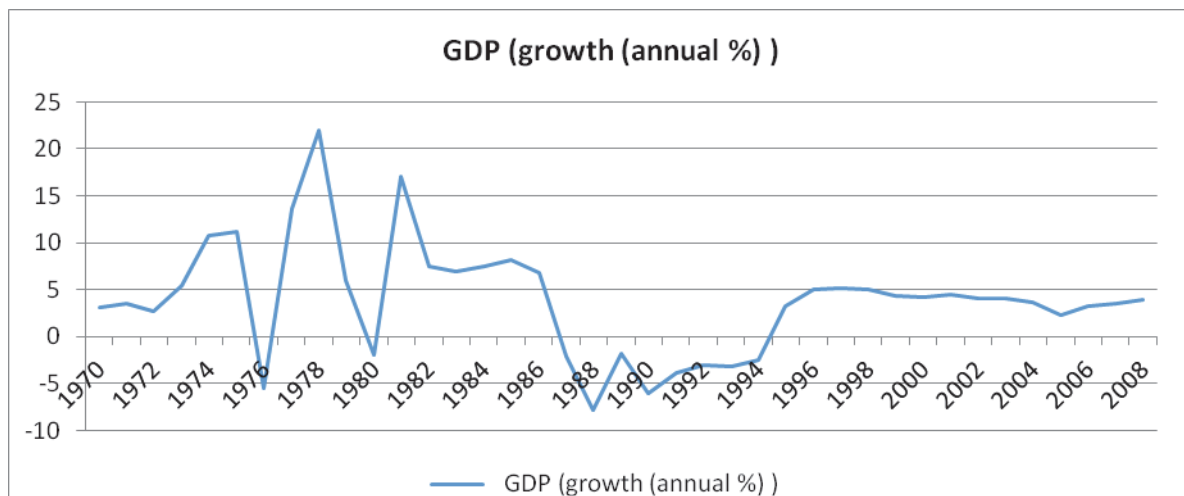
2 An overview of growth, foreign aid and FDI inflows into Cameroon

2.1 Changes in real GDP

From independence in 1960 up to 1985, Cameroon witnessed a period of sustained economic growth, notably between 1977 and 1985. During this period, the annual rate of economic growth was hovering around 10 per cent (see Figure 1). From 1986 to 1994, however, the country was hit by a serious economic crisis which led to a fall of 50 per cent in GDP per head, to public finance imbalances and unsustainable indebtedness, as well as to an accumulation of significant external and domestic payment arrears. After 1994, the year in which the CFA Franc was devalued relative to the French Franc, Cameroon recovered economic growth at the rate of about 4.5 per cent per year.²

Given the growth rate of the country's population, the growth rate of the economy in recent years has hardly been higher than 3 per cent, and it has led to a stagnation of GDP per capita. This growth rate remains far below the targeted 6 per cent which was set in the poverty reduction strategy paper (PRSP) in 2003, and was supposed to reduce the incidence of poverty in Cameroon by 50 per cent by the 2015 horizon.

Figure 1: GDP growth in Cameroon, 1970-2008



Source: Author's computations based on data from Africa Development Indicators of the World Bank

² In addition to the CFA Franc devaluation, the government of Cameroon implemented structural reforms aimed at downsizing the civil service, including the privatization of public enterprises, the restructuring of banking, and the liberalization of domestic prices and interest rates. These reforms largely contributed to the stabilization of the country's economy. On the whole, real GDP witnessed a trend reversal from an average rate of decline of about 4 per cent during the period 1987–93, to an average growth rate of about 2 per cent over the period 1994–96. It should also be noted that starting in 1997, the government embarked on the implementation of various programmes such as the enhanced structural adjustment facility (ESAF), and the poverty reduction and growth facility (PRGF).

2.2 Evolution of official development aid (ODA)

An examination of Figure 2 below shows that, from 1973 onwards, there was a steady increase in ODA³ which reached a volume of US\$264.8 million in 1980 before declining to US\$198.3 million in 1981. Starting in 1981, we can see an almost stagnant trend in ODA despite a contrasting evolution as shown in Figure 2. From 1989 onwards, we particularly note an increase in ODA probably owing to the government's implementation of structural adjustment programmes (SAPs) with the support of the Bretton Woods institutions following a significant ODA fall in the mid-1990s. This ODA decline may be explained by the failure of the first SAP supported by the IMF. Between 1997 and 1999, we observe an increase in ODA due mainly to the success of the first three-year programme (1997–99) signed by the IMF, and the grant of budgetary assistance given by financial backers to finance structural adjustment programmes.

During the period 2000–08, the ODA granted to Cameroon generally witnessed an upward trend, but after a significant increase in 2003 and 2004, ODA inflows decreased in 2005 before substantially rising again in 2006 and 2007. These ODA increases were intended for the debt relief granted in the context of the Heavily Indebted Poor Countries (HIPC) Initiative and the Multilateral Debt Relief Initiative that were implemented in 2006.

2.3 FDI inflows into Cameroon

FDI inflows into Cameroon are mostly in the form of direct investment with a significant share of portfolio investment. According to UNCTAD (2002), FDI is still limited in Cameroon, but it is increasing. Figure 2 summarizes the evolution of FDI inflows into the country over the period 1970–2008. An examination of Figure 2 shows a regular evolution of FDI inflows into Cameroon during the 1970s and the mid-1980s. The years 1980, 1981, 1982 and 1985 witnessed FDI volumes amounting to US\$112.3, 117.6, 89.2, and 283.7 million, respectively. This favourable trend in FDI inflows may be explained by the economic growth achieved by the country during the period 1970–85,⁴ which made it possible for the government to initiate investment projects to improve the living conditions of the population.⁵

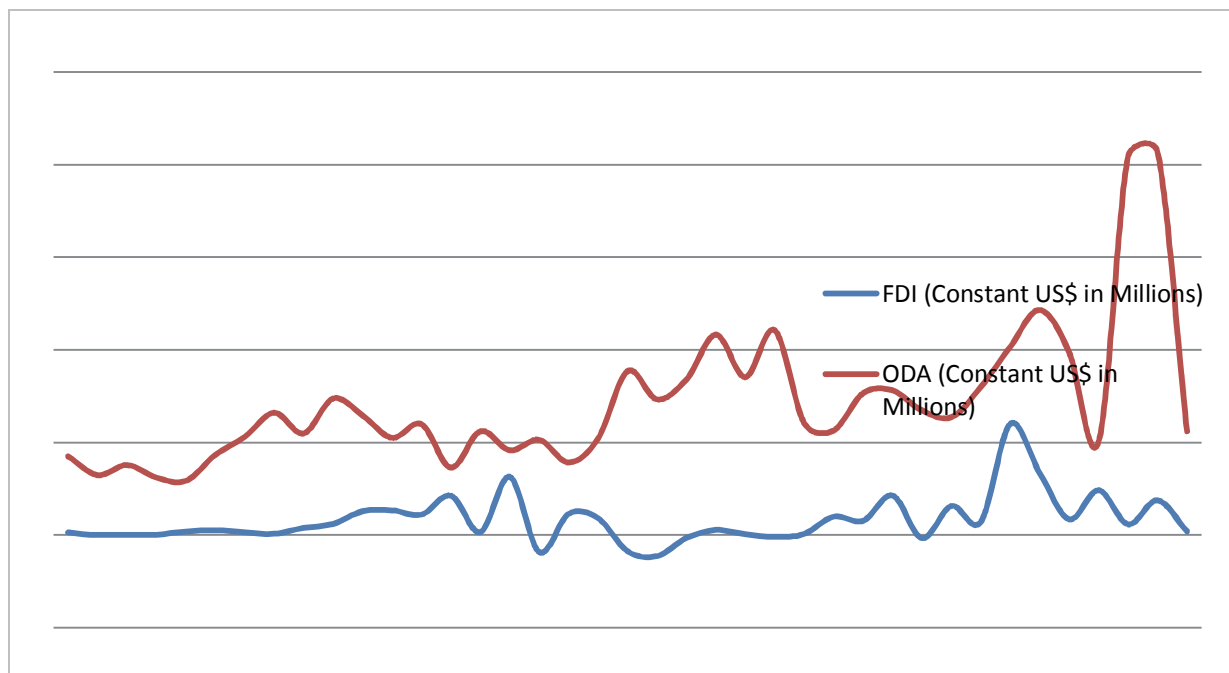
During the period 1985–94, Cameroon experienced a massive disinvestment amounting to about US\$67, 103, and 11 million, respectively, in 1989, 1990, and 1991 owing mainly to the severe economic crisis which struck the country between 1986 and 1994, following the sharp fall in the prices of oil and of the exports of the country's traditional agricultural commodities in international markets. This crisis lasted for almost a decade and literally led to a total

³ ODA is granted to Cameroon at concessional terms, i.e., at generally fixed interest rates which may vary between 0 and 5 per cent and with maturities ranging from 18 to 50 years, including deferred payments ranging between 6 and 10 years. Cameroon's major ODA donors are the European Economic Community, the World Bank Group, France, Japan, Canada, Germany, and the United States.

⁴ It is opportune here to note that during this period, the favourable trend in FDI inflows was interrupted in 1984 by the attempted coup d'état which took place that year. But a year later in 1985, FDI inflows resumed and reached a record level of CFA francs 316 million, thanks to investments made in the oil exploration sector.

⁵ In effect, GDP amounted to about US\$7.6 billion in 1985 and GDP per capita remained one of the highest in Sub-Saharan Africa, that is to say, about US\$890 in 1982 (World Bank 2000).

Figure 2: Foreign capital inflows in Cameroon, 1970-2008



Source: Author's computations based on data from Africa Development Indicators of the World Bank

disruption of the business environment and a deterioration of economic and commercial activities, while both domestic and foreign investments plummeted to their lowest levels until corrective measures were implemented by 1994–95 with the assistance of the international financial community.

FDI inflows reached US\$547 million in 2002 and fell to US\$321 million in 2007. Between 1996 and 2000, FDI inflows hovered between US\$97 and 197 million owing, on the one hand, to the implementation of the privatization process⁶ which led to foreign companies investing heavily in the country and, on the other, to the effects of economic recovery which was essentially brought about by the devaluation of the CFA Franc vis-à-vis the French Franc in 1994. The FDI inflows of the years 2002 and 2003 were mostly generated by the construction of the Chad-Cameroon oil pipeline.

Despite its great potential for attracting FDI, foreign investors used to consider Cameroon a high-risk area for investment when the political and economic situation of the country deteriorated in the early 1990s. Since the devaluation of the CFA Franc against the French Franc in January 1994, FDI inflows have been increasing steadily, driven almost exclusively by occasional privatization and investment in the oil sector (EIU 2002). However, FDI inflows have slowed down significantly in recent years due notably to the country's institutional weaknesses, corruption, ineffective legal institutions, political uncertainty and low labour productivity.

⁶ Calls for foreign capital investment were mostly made in the context of the privatization of public enterprises initiated in 1994. Foreign companies, mostly of French origin, were the main buyers of these parastatals.

3 Review of the literature

In the development literature, the role of external economic assistance (EEA) in economic development remains controversial. Some studies have empirically shown the positive impact of EEA on economic development, while others have highlighted its negative impact on growth. On the basis of empirical evidence from developing countries, Chenery and Strout (1966) conclude that foreign capital has a positive effect on economic growth. Later studies have also maintained that external economic assistance boosts growth. In the following section, we in turn present the literature on the link between foreign aid and growth and that of direct foreign investment and economic growth.

3.1 Foreign aid and economic growth

The role of foreign aid in the development process of developing countries has been the subject of a large number of studies, for the simple reason that it is also a subject of great concern from the standpoint of its implications for poverty reduction in developing countries.

Foreign aid plays a fundamental role in stimulating economic growth as an additional source of domestic finance which includes savings and domestic as well foreign borrowing. Therefore, it increases the recipient country's available investment fund and the capital stock. According to Morrissey (2001), foreign aid may contribute to economic growth by increasing investment in physical and human capital, as well as in the capacity of the country to import capital goods and technology. Moreover, aid does not have any of those indirect effects that reduce investment and saving rates. Furthermore, aid is associated with the type of technology transfer which boosts the productivity of capital and stimulates endogenous technical change. McGillivray et al. (2006) note the existence of four alternative viewpoints on the effectiveness of foreign aid, namely: (i) aid generates diminishing returns; (ii) the effectiveness of aid is affected by external and climatic conditions; (iii) the effectiveness of aid is influenced by political conditions; and (iv) the effectiveness of aid depends on the quality of institutions in the host country.

Previous research studies on the relationship between foreign aid and economic growth have not only attracted considerable interest, but have also arrived at various diverging findings. The literature on the link between foreign aid and economic growth is currently so rich that we will need to limit ourselves to the review of only a few of the most recent papers published on this research theme.

One point of view of foreign aid maintains that foreign assistance in the form of foreign aid supports economic growth and development in developing countries. Durbarry et al. (1998) test this theory, using both panel and cross-section data techniques, and find that foreign aid accelerates economic growth, but that its effectiveness varies over time depending on its volume, geographic location and the country's classification based on the level of income. These authors suggest that these economic gains depend on a stable macroeconomic policy environment. Following Durbarry et al. (1998), Easterly (2003) tests this relationship by developing a theoretical analytical framework of the link between foreign aid and economic growth, and confirms the existence of this relationship empirically with the help of panel analysis. He also tests foreign aid's effectiveness in growth performance, and observes a positive and robust link between economic growth and foreign assistance. The mutual results of both of the above studies suggest that an environment that is harmful to investment discourages FDI inflows, and as a consequence, the majority of the economies depend on foreign aid.

Using a sample of 41 countries, Hadjimichael et al. (1995) find that foreign aid has had a positive impact on economic growth over the period 1986–92. The model of the above authors also captures the potential effect of the ‘Dutch disease’ on foreign aid. Hansen and Tarp (2000) provide strong support to other studies which find that foreign aid has not only led to an increase in aggregate savings and investment, but has also had a positive impact on economic growth. Similarly, using the augmented Easterly-Fisher model as well as cross-section and panel data techniques, Durbarry et al. (1998) confirm this result for a sample of 68 developing countries of Latin America, the Caribbean Islands and sub-Saharan Africa (SSA) between 1970 and 1993.

The study by McGillivray (2005) shows that the foreign aid granted to African countries not only increases economic growth, but also reduces poverty. Levy (1988), Gomanee et al. (2005), Ekanayake and Chatrnas (2010) also present some evidence according to which foreign aid has contributed positively to economic growth in SSA countries by financing public investment.

Even though Boone (1996) finds evidence that foreign aid does not increase the rate of economic growth in particularly poor countries, Burnside and Dollar (2000) show that in poor countries where sound economic policies are implemented, foreign aid accelerates economic growth. Conversely, these authors point out that in highly distorted economies, foreign aid is wasted in unproductive government spending. This interpretation suggests that external assistance acts as an income transfer which may or may not lead to growth, and that the final outcome depends on whether foreign aid is used to finance capital investment or to finance consumption expenditures. If foreign aid is invested, it will effectively boost growth; if it is consumed, it will be ineffective.

Some studies maintain that sound fiscal, monetary and trade policies are the necessary conditions for foreign aid to be effective in boosting economic growth (Burnside and Dollar 1997). The study by Hansen and Tarp (2000) arrives at somewhat contradictory results. The latter suggest that the impact of foreign aid on growth is not conditional upon sound policies. It seems evident that the relationship between foreign aid and growth is sensitive to the methodological approach and to the nature of the control variables used in the study. Hansen and Tarp (2000) find that despite the positive link between foreign aid and growth, foreign aid does not have a positive effect on growth when human capital and investment are used as control variables. However, it may generally be said that the theoretical link between foreign aid and economic growth remains robust and stable despite some contradictory findings.

The study by Karras (2006) examines the correlation between foreign aid and growth in per capita GDP, using annual data for the period 1960–97 and a sample of 71 developing country recipients of foreign aid. The author finds that the impact of foreign aid on economic growth is positive, permanent, statistically significant, and non-negligible.

Gomanee et al. (2002, 2005) directly tackle the mechanisms or channels of transmission through which foreign aid affects growth. Using a sample of 25 SSA countries over the period 1970–97, these authors establish that foreign aid has a positive and significant impact on growth. Moreover, they identify investment as being the most significant transmission mechanism between foreign aid and growth. They conclude that, on average, each percentage point increase in the foreign aid/GNP ratio contributes one-quarter of a percentage point to the rise in the rate of economic growth. As a result, the poor growth performance witnessed in Africa should be attributed to factors other than aid ineffectiveness.

With the help of cointegration analysis, Murthy et al. (1994) observe that per capita real GDP, the saving rate and external aid were cointegrated, and that foreign aid had positive long-term effects on growth in Cameroon over the period 1970–90.

The negative effect of foreign aid on economic growth has been predicted by a number of studies. Mallik (2008) examines the effectiveness of foreign aid in the economic growth of six of the Africa's poorest countries highly dependent on foreign aid, namely the Central African Republic, Malawi, Mali, Niger, Sierra Leone and Togo. Using cointegration analysis, the author discovers the existence of a long-term relationship between GDP, foreign aid, investment and trade openness. In the short term, however, foreign aid inflows have had no significant impact on economic growth, except in Niger, and the long-term effect of foreign aid on growth was found to be negative in five of the countries under review.

The study by Voivodas (1973) also shows the negative and insignificant impact of foreign aid on economic growth in a sample of 22 developing countries between 1956 and 1968. Several studies, such as those of Mosley et al. (1987), Ovaska (2003), and Brautigam and Knack (2004) also establish results showing that foreign aid has a negative impact on economic growth. Furthermore, it is opportune to note that some studies such as those of Mosley (1980), Mosley et al. (1987), Boone (1996), and Jensen and Paldam (2003) suggest that aid does not have an impact on economic growth.

It also emerged from the literature that the estimation of the impact of foreign aid on economic growth is complicated by the endogeneity of foreign aid in GDP growth in the aid-recipient countries. Mosley (1980) suggests the use of instrumental variables to generate the exogenous variation of GDP per capita as a solution to the endogeneity problem. Easterly (2005) provides support to the suggestion of Mosley (1980) by using the interest rates of donors as 'instruments'.

Considering the fact that foreign aid and FDI were used as complements to capital accumulation, their impacts on economic growth have also been subjected to in-depth analyses. These empirical studies focus not only on the complementary role of these variables in economic growth, but also on their importance in the economic growth process.

Ericsson and Irandoust (2005) use the maximum likelihood function based on the cointegration of a panel of five SSA countries over the period 1965–2000, and conclude that foreign aid and FDI positively affect economic growth in all these countries. The authors therefore conclude that foreign aid not only plays the role of an additional domestic financial resource, but it is also a complement to domestic savings. Bhandari et al. (2007) analyse the joint impact of foreign aid and FDI on economic growth for a sample of European countries. They use annual panel datasets over the period 1993–2002 and apply the fixed effects panel technique to these data. The main results of their paper include the effectiveness of the impact of these two forms of capital inflows on economic growth. In addition, their paper concludes that FDI inflows are an important determinant of economic performance, whereas foreign aid does not play a significant role in the promotion of growth in the sample of countries used in the study. Ndambendia (2010) examines the link between FDI, foreign aid, and economic growth for a sample of 36 African countries. Using a dataset covering the period 1980–2007 and dynamic fixed effects techniques, the author confirms a positive and robust relationship between both FDI and foreign aid and economic growth in these countries.

3.2 Foreign direct investment and growth

The role of FDI is widely recognized as a factor which promotes growth in developing countries, and the relationship between FDI and economic growth has given rise to a vast empirical literature focused both on developed and developing countries. Neoclassical and endogenous growth models have been the starting point for many empirical studies on the link between FDI and growth. According to Chowdhury and Mavrotas (2005), the link between FDI and growth has been analysed through four major channels: (i) the determinants of growth; (ii) the determinants of FDI; (iii) the role of multinational firms in host countries; and (iv) the direction of causality between the two variables.

Neoclassical growth theory suggests that economic growth generally originates from two major sources, namely the accumulation of factors of production and total factor productivity (TFP) growth (Felipe 1997). The empirical literature focuses more on the study of factor inputs than on TFP growth.

Contrary to the limited contribution giving credence to FDI through the neoclassical growth theory, the literature on endogenous growth shows that FDI can contribute not only to economic growth through capital formation and technological transfer (Blomstrom et al. 1996; Borensztein et al. 1995), but also contribute to growth by increasing the level of knowledge through in-service training and the acquisition of skills (de Mello 1997, 1999). Endogenous growth models suggest three principal channels through which FDI affects growth. First, FDI increases capital accumulation in recipient countries by introducing new inputs and new technologies (Dunning 1993; Blomstrom et al. 1996; Borensztein et al. 1998). Second, FDI increases the levels of knowledge and skills in host countries by training workers and managers on the job (de Mello 1996, 1999). Third, FDI boosts competition among the industries of host countries by overcoming barriers to entry and by reducing the market power of existing firms.

Many empirical studies on the role of FDI in host countries suggest that FDI is an important source of capital, because it complements private domestic investment and is often associated with job opportunities and the increase in technology transfer and external effects; it improves human capital (knowledge and skills) and stimulates overall economic growth in host countries (Chowdhury and Mavrotas 2005). On the other hand, other studies carried out at the level of firms such as that by Carkovic and Levine (2005) as well as Gorg and Greenway (2004), for instance do not support the view that FDI boosts growth.

Moreover, empirical studies on the relationship between FDI and growth at the macroeconomic level in developing countries have shown that, under a certain number of crucial conditions involving factors—such as existing trade regimes and levels of human capital in host countries, their financial market regulations and banking systems, as well as the degree of openness of their economies—FDI has a positive impact on overall economic growth.⁷

⁷ See, for instance, Balasubramanyam et al. (1996, 1999) and Borensztein et al. (1998) for a critical evaluation of the literature review.

During the last two decades, a number of interesting studies on the role of FDI in boosting economic growth have been carried out. In his review of the literature,⁸ de Mello (1997) identifies two principal channels through which FDI may affect economic growth. First, FDI may encourage the adoption of new technologies in the production process through the external effects of capital. Second, FDI may stimulate the transfer of knowledge both in terms of on-the-job training and the acquisition of skills, as well as by introducing alternative management practices and better organizational measures. A journal of the OECD (2002) supports these observations and maintains that 11 studies out of 14 found that FDI contributes positively to income growth and factor productivity.

According to de Mello (1997) and OECD (2002), the impact of FDI on growth seems to depend on the economic and technological conditions which exist in host countries. In particular, it seems that developing countries must achieve a certain level of education and infrastructure development before they become capable of making the best use of the potential benefits associated with FDI. As a consequence, FDI seems to have more limited effects on growth in technologically less advanced countries. The main result of the study by the OECD (2002) is that a strong link seems to exist between FDI and growth. Although this relationship is largely heterogeneous across countries, the general consensus is that on average, FDI has an impact on growth in the context of causality in the sense of Granger.

The empirical results of studies on the relationship between FDI and growth in developing countries are diverse in nature, and this relationship has not received all the attention in the literature that it deserves until very recently. We therefore briefly present a few of these studies below.

Blomstrom et al. (1992) conclude that per capita income growth in developing countries has a positive relationship with the average FDI inflows to GDP ratio. Borensztein et al. (1998) find that FDI alone has a negative impact on economic growth, and that the joint effect of FDI and human capital accumulation on growth is positive only when it is coupled with human capital accumulation, which is considered as a good proxy for the absorptive capacity of developing host countries. These authors further maintain that FDI may have higher productivity than domestic capital due to external positive effects, thereby accelerating the accumulation of domestic investment.

De Mello (1999), on the other hand, finds a less uniform FDI impact on economic growth in a group of industrialized and developing countries. The study concludes that the growth promotion effects of FDI depend on the relationship between FDI and domestic investment. Zhang (2006) analyses the impact of FDI on economic growth in China using panel data techniques. This study illustrates the transmission channels through which FDI causes positive as well as negative impacts on growth. With the help of provincial data from the inland and coastal areas of China covering the period 1992–2004, the author finds that FDI has positive impacts on growth, and that these impacts are more robust in China's coastal areas. Focusing on Ireland, Kim and Bang (2008) analyse the link between FDI and economic growth using annual time-series data for the period 1975–2006 and the autoregressive distributed lag (ARDL) approach, to find a long-term relationship between FDI and economic growth. The study's empirical results show FDI's statistically significant impacts on growth in both the short and long terms. The results of the Granger causality test indicate that FDI causes economic growth. Moreover, FDI helps to create job opportunities in host countries and

⁸ See de Mello (1997, 1999) and the World Bank (2001) for a detailed review of the literature on the link between FDI and growth, as well as additional evidence on the relationship between FDI and economic growth.

complements domestic financial resources. Athukorala (2003) examines the effects of FDI on economic growth indicators in Sri Lanka using cointegration and an error correction model (ECM), as well as annual timeseries data for the period 1959–2002. The author arrives at results that are somewhat ambiguous, because the net effect of FDI on growth is not strong enough due notably to corruption, bad laws, and a poor governance structure.

Finally, we can conclude this review of the literature on the relationship between foreign capital inflows and growth by observing that generally speaking, capital inflows have been shown to stimulate economic growth by acting as a complement to domestic savings in developing countries, thus providing them with additional financing to acquire the factors of production, infrastructures, technology, and the knowhow needed to accelerate their economic development. It should, however, be emphasized that for foreign capital inflows to have a positive impact on growth in developing countries, these countries must design and implement sound development policies, and provide incentive packages that are acceptable and attractive to foreign investors. In the presence of very poor policies, on the other hand, foreign capital inflows have no positive effect on growth.

However, an in-depth analysis of the preceding literature shows that the evidence is not only controversial (which would further justify new investigations), but also that these studies (i.e., cross-section studies and country regressions) are limited in terms of robustness and the methodologies used. A study by Hoeffler (2002) for example, has highlighted the fact that cross-section country studies do not provide specific information on a particular country, and it is therefore difficult to bring out policy implications specific to a given country. In addition, the lack of consensus on the impact of foreign aid or of foreign direct investment on economic growth suggests that country-specific studies should be carried out to understand the particular nature of each individual country. The present country study on Cameroon will therefore supplement the existing empirical literature on the simultaneous impact of foreign aid and foreign direct investment on economic growth.

4 Methodology and data

4.1 The analytical framework

Since the objective of this paper is to analyse the impact of foreign aid (*FA*) and foreign direct investment (*FDI*) on economic growth in Cameroon, we use an aggregate production function (Y_t) which incorporates *FA*, *FDI*, and other relevant variables in the model. This approach, based on an endogenous growth model which uses the Cobb-Douglas production function as the aggregate production function of the economy, is given by the following equation:

$$Y_t = A_t K_t^\alpha L_t^\beta e^{\varepsilon_t} \quad (1)$$

where Y_t is the output of the economy and represents real GDP at time t ; A_t , K_t and L_t are respectively the productivity factor, the capital stock, and the labour stock at time t ,⁹ ε_t is the disturbance term and e is a base of natural logs.

⁹ Contrary to Solow's neoclassical growth models, changes in the rate of investment and in government policies in endogenous growth models may impact on the short- and long-term growth rates of the economy.

The impacts of FA and FDI may be captured through the A_t component of (Y_t) . Since the objective of the study is to capture the impacts of FA and FDI inflows on economic growth through the changes in A_t , we therefore assume that A_t is a function of FDI and FA . Thus:

$$A_t = f(FDI_t, FA_t) = FA_t^\delta FDI_t^\phi \quad (2)$$

By combining Equations (2) and (1), we obtain the following equation:

$$Y_t = K_t^\alpha L_t^\beta FA_t^\delta FDI_t^\phi e^{\varepsilon_t} \quad (3)$$

where α , β , δ , and ϕ are the constant elasticity coefficients of output relative to K , L , FA , and FDI ; ε_t is an error term.

Taking natural logs of equation (3) yields:

$$\ln Y_t = \alpha \ln K_t + \beta \ln L_t + \delta \ln FA_t + \phi \ln FDI_t + \varepsilon_t \quad (4)$$

From Equation (4), an explicit estimable function is specified as follows:

$$\ln Y_t = c + \alpha \ln K_t + \beta \ln L_t + \delta \ln FA_t + \phi \ln FDI_t + \varepsilon_t \quad (5)$$

where all the variables are defined as previously; c is the constant term, and ε_t , the error term which is assumed to be independently and normally distributed with zero mean and constant variance.

Following many previous studies on this research theme, the capital stock is proxied by the share of investment in GDP. This is necessary, given the formidable problems associated with attempts to measure the capital stock, especially in the context of developing countries. Moreover, the labour input is represented by the workforce.

The regression coefficients associated with variables K and L are expected to be positively linked to Y . Similarly, we expect foreign aid to have a positive impact on real output. However, as discussed previously, some studies suggest that foreign aid may have a negative impact on the economy. Consequently, the expected effect of foreign aid on the level of output may be ambiguous. On the other hand, given the consensus which emerges from the existing literature and which relates FDI to economic development, we expect FDI to have a positive impact on the output level.

4.2 The econometric procedure

Although several econometric methods have been proposed to investigate the existence of a long-term equilibrium (i.e., cointegration) between variables given in the form of timeseries data, including the methods developed by Engle and Granger (1987), Phillips and Hansen (1990), and Johansen (1988), for the purpose of the present study, the autoregressive distributed lag (ARDL) approach to cointegration is used to achieve the objectives of the

This constitutes an important characteristic of the model estimated in this study where the short- and long-terms determinants of growth are estimated.

study. Popularized by Pesaran and Shin (1995), Pesaran and Smith (1997), and Pesaran et al. (2001), the ARDL modelling approach to cointegration has several advantages over other cointegration procedures.

The major advantage of this approach is that it can be applied without taking account of the fact that regressors are I(1) or I(0). Consequently, this approach makes it possible to bypass unit root tests at the outset of the empirical analysis. Moreover, the ARDL approach usually yields unbiased estimates of the long-term model, and the t-statistics derived from it are valid even if some of the regressors are endogenous (Harris and Sollis 2003). Pesaran and Shin (1995) also show that the estimators of the long-term coefficients, which are based on the ARDL procedure, are super-consistent, and that inferences about the long-term parameters can be made by using standard asymptotic theory. To apply the ARDL approach, Equation (5) may be specified as a conditional ARDL-error correction model as follows:

$$\begin{aligned} \Delta \ln(Y) = & \beta_0 + \sum_{i=1}^p \beta_i \Delta \ln(Y)_{t-i} + \sum_{i=0}^p \mu_i \Delta \ln(FDI)_{t-i} + \sum_{i=0}^p \phi_i \Delta \ln(FA)_{t-i} + \sum_{i=0}^p \varphi_i \Delta \ln(SI)_{t-i} + \\ & + \sum_{i=0}^p \gamma_i \Delta \ln(LAB)_{t-i} + \lambda_1 \ln(Y)_{t-1} + \lambda_2 \ln(FDI)_{t-1} + \lambda_3 \ln(FA)_{t-1} + \lambda_4 \ln(SI)_{t-1} + \lambda_5 \ln(LAB)_{t-1} + \varepsilon_t \end{aligned} \quad (6)$$

where , β_0 is the drift component; ε_t , the white noise error term; $\ln(Y)$, the natural log of real GDP; $\ln(FDI)$, the natural log of foreign direct investment; (FA) , the natural log of official development assistance; $\ln(SI)$, the natural log of the share of investment; $\ln(LAB)$, the natural log of the labour force; p , the optimal lag length; and Δ , the first difference operator; β_i , μ_i , ϕ_i , φ_i , and γ_i , the short-run effects of variables in the model, while λ_1 , λ_2 , λ_3 , λ_4 and λ_5 represent the long run elasticities.

The ARDL approach to cointegration involves three stages. In the first stage, the hypothesis that cointegration is absent is tested. More specifically, the null hypothesis is that the coefficients of lagged regressors (in levels) in the underlying ARDL error correction model are jointly equal to zero. The null hypothesis is defined by: $H0: \lambda_1 = \lambda_2 = \lambda_3 = \lambda_4 = \lambda_5 = 0$ and it is tested against the alternative hypothesis that $H1: \lambda_1 \neq 0, \lambda_2 \neq 0, \lambda_3 \neq 0, \lambda_4 \neq 0, \lambda_5 \neq 0$.

The ARDL approach uses the F-test to determine the presence (or not) of a cointegrating relationship between variables, although the asymptotic distribution of the F-statistic in this context is not standardized without taking account of whether the variables are I(0) or I(1). The critical values of this distribution are given in Pesaran and Pesaran (1997), and Pesaran et al. (2001). Two sets of values are presented in the form of a table. The first set assumes that all the variables are I(1), while the second set assumes that all the values are I(0). This makes it possible for the variables to be stationary and first-order integrated. If the value of the calculated F-statistic is higher than the highest value of this region, the null hypothesis is rejected, thus indicating the presence of cointegration between variables without taking account of whether they are I(1) or I(0). If the value of the F-statistic falls below this region, the null hypothesis of no cointegration cannot be rejected, whereas an F-value lying within the region implies that the result of the test is indeterminate.

If the existence of a long-term relationship between the variables is borne out, the second stage in the analysis consists in estimating the short- and long-term parameters, using the

ARDL approach. Once the long-term relationship between the variables is determined, then the estimates of the long-term ARDL can be obtained. If a long-term relationship between the variables exists, then there also exists an error-correction representation. Consequently, the error correction model is estimated in the third step; it indicates the speed of adjustment to long-term equilibrium following a short-term shock.

A general error-correction representation of Equation (6) is formulated as follows:

$$\Delta \ln(Y) = \beta_0 + \sum_{i=1}^p \beta_i \Delta \ln(Y)_{t-i} + \sum_{i=0}^p \mu_i \Delta \ln(FDI)_{t-i} + \sum_{i=0}^p \phi_i \Delta \ln(FA)_{t-i} + \sum_{i=0}^p \varphi_i \Delta \ln(SI)_{t-i} + \sum_{i=0}^p \gamma_i \Delta \ln(LAB)_{t-i} + \lambda EC_{t-1} + u_t \quad (7)$$

where, λ is the speed of adjustment parameter, and EC , the residuals derived from the estimation of the cointegration model given in Equation (6).

To determine the performance and/or the adequacy of the ARDL model, diagnostic tests are carried out. The diagnostic tests are automatically derived by Microfit from the estimation of the ARDL model, and they test for the existence (or not) of serial correlation (or autocorrelation), the functional form of the model, normality, and the heteroscedasticity associated with the model.¹⁰

4.3 The data

The data used in this paper come from the Africa Development Indicators of the World Bank (CD-ROW 2011), covering the period 1980–2008.¹¹ Data format is annual timeseries consisting of real GDP, foreign direct investment in constant 2007 US dollars, foreign aid in constant 2007 US dollars, the labour force, and the share of investment in GDP.

5 Empirical results

5.1 Results of the unit root tests

Before carrying out the ARDL bounds test, we first test for the stationarity of all the variables in the model to determine the order of integration for each variable. This is a necessary step to ensure that variables are not second-order stationary (i.e., I(2)) and to avoid fallacious results. According to Ouattara (2006), the calculated F-statistics which Pesaran et al. (2001) provide are not valid in the presence of I(2) variables, since the bounds tests are based on the assumption that variables are either I(0) or I(1). Consequently, the use of unit root tests in the ARDL procedure may still be needed to make sure that none of the variables is integrated of order 2 or beyond.

¹⁰ This results from the fact that the ARDL is also an OLS method, hence the need to satisfy the classical assumptions of least squares if the model must be considered as adequate for making inferences.

¹¹ The data used in the econometric analysis only cover the period 1980-2008 because the data of the Labour Force variable only start from the year 1980, contrary to the other variables of the model whose data start in the year 1970.

In this respect, we use the standard unit root test, namely the Augmented Dickey-Fuller (ADF) (1979) test which implies the estimation of the following equation:

$$y_t = a + (1 - \phi)\delta t + \phi y_{t-1} + \sum_{i=1}^k \gamma_i y_{t-i} + \varepsilon_t$$

$$\Delta y_t = a + \rho \delta t + \rho y_{t-1} + \sum_{i=1}^k \gamma_i y_{t-i} + \varepsilon_t$$
(8)

where, $t = 1, 2, \dots, n$.

The null hypothesis is $H_0: \rho = 1 - \phi = 0$ (unit root), k is the number of lags of the dependent variable, and n is the number of observations.

The stationarity tests results are presented in Table 1 below, and they show that all the variables retained in the model are either I(0) or I(1).

Table 1: ADF unit root tests results

Variables	Level		First difference		Conclusions
	Constant and no trend	Constant and trend	Constant and no trend	Constant and trend	
LFDI	-2.29	-2.88	-5.22**	-5.11**	I(1)
LY	-1.87	-2.16	-4.09**	-4.11**	I(1)
LFA	-2.46	-2.80	-6.27**	-6.10**	I(1)
LSI	-2.02	-1.79	-4.05**	-4.06**	I(1)
LLAB	-3.922**	-1.33**			I(0)

Note: ** indicates stationarity at the 5% level.

Source: See text.

Perron (1989) maintains that in the presence of structural changes, the power of conventional unit root tests to reject the unit root hypothesis decreases. In our case, the ADF statistics may be misleading, for several timeseries data used in the study have been subjected to structural changes over the study period. To test for the stationarity of the model's variables in the presence of structural changes, we use the Phillips-Peron (PP) test. The results of the PP test are presented in Table 2. It emerges from this table that the variables retained in the model are either I(0) or I(1) as in the preceding ADF test.

Table 2: Phillips-Perron (PP) unit test results

Variables	Level		First difference		Conclusions
	Constant and no trend	Constant and Trend	Constant and no trend	Constant and trend	
LFDI	-2.45	-2.37	-5.46**	-5.27**	I(1)
LY	-1.95	-2.48	-4.28**	-4.23**	I(1)
LFA	-2.72	-2.98	-7.06**	-6.93**	I(1)
LSI	-2.36	-1.97	-4.26**	-4.29**	I(1)
LLAB	-4.27**	-1.94**			I(0)

Note: ** indicates stationarity at the 5% level.

Source: See text.

Once we determine that the orders of integration of the variables retained in the model are either 0 or 1, we can then confidently apply the ARDL bounds tests to our model.

The cointegration test

Now, we apply the cointegration test developed by Pesaran et al. (2001) to determine the existence (or not) of a long-term relationship between the variables. Since the dataset is relatively small, we choose a lag length of one. The cointegration test results are reported in Table 3.

The calculated F-statistics of the joint null hypothesis that there is no long-run relationship between the variables is 9.2579, a value that is greater than the higher bound of the 95 per cent critical value interval (2.850-4.049). This implies the rejection of the null hypothesis that no long-run relationship exists between the variables, and we conclude that there is evidence of cointegration or of a long-run relationship between *FDI*, *FA*, *SI*, *LAB* and *Y*.

Table 3: F-Statistic resulting from testing for the existence of a long-run relationship between the variables of the model

Computed F-statistic	9.2579**
Bound testing critical values at 5%	2.850 (lower)
	4.049 (upper)

Notes: The critical values are taken from Pesaran and Pesaran (1997: 478) intercept and no trend with four regressors. ** denote rejecting the null at 5% level of significance. The range of the critical value at 1% and 10% are 3.817–5.122 and 2.425–3.576, respectively.

Source: See text.

Estimation of the long- and short-term dynamics

After proving the existence of a long-term relationship between the variables of the model, the second step of the methodology consists in searching for the short- and long-term coefficient estimates of the model.

On the basis of the Schwarz Bayesian criterion (SBC), the optimal ARDL model selected by Microfit is ARDL (1, 1, 0, 1, 1). The SBC was preferred because it is more parsimonious than the more popular Akaike Information Criterion (AIC). The empirical results of the ARDL (1, 1, 0, 1, 1) are presented in Table 4, and they show the short-term coefficients. From the summary statistics (i.e., R^2 , adjusted R^2 , and the F-statistic) derived from model estimation, we may conclude that the selected ARDL (·) shows a good performance. In addition, the diagnostic tests indicate that there are no serious problems with respect to serial correlation, the functional form of the model and heteroscedasticity.

From the results of the selected ARDL (·) regression models, we may note that the variables lagged one period, namely *LY*(-1), *LFDI* (-1), *LFA*(-1), *LSI*(-1), and *LLAB*(-1), were selected as additional variables in estimating the ARDL model. The coefficient of lagged real GDP, i.e., *LY*(-1), is equal to 0.86240, and it implies an adjustment coefficient of $-0.1376 = (0.86240-1)$. This is confirmed by the coefficient of the error correction model ECT_{-1} in the error correction model representation of the selected ARDL (·) model presented in Table 5. With a statistically significant value of -0.1376, the adjustment coefficient suggests that less than one year of divergence between the long-term equilibrium value and the actual value of real GDP is corrected during one year. This may be considered as a moderate speed of adjustment. The negative sign of the adjustment coefficient also confirms the existence of cointegration between the variables. The results also suggest that short-term direct investment has a positive impact on economic growth. The signs of the labour force variable and of the ratio of investment to GDP are respectively negative and positive, a result that seems to be supported by economic theory.

Table 4: Autoregressive distributed lag estimates ARDL (1,1,0,1,1) selected based on Schwarz Bayesian criterion

Regressors	Coefficients
LY(-1)	0.86240* (0.085151)
LFDI	0.044121** (0.013297)
LFDI(-1)	0.041028 ** (0.012621)
LFA	0.0057932 (0.017243)
LSI	0.18693 ** (0.054485)
LSI(-1)	-0.16297 (0.062261)
LLAB	-2.1953 ** (1.0273)
LLAB(-1)	2.0765*** (1.0100)
INPTERCEPT	3.5182 (1.3005)
F-Test	119.2041*
Adjusted R ²	0.97224
Serial correlation	0.14637
Functional form	0.75947
Normality	1.8946
Heteroscedasticity	2.3967

Notes: Dependent variable is the real GDP (LY); Subscript (-1) after a variable identifies the lag; ***, ** and * indicate statistical significance at the 1%, 5% and 10% levels of significance, respectively.

Source: See text.

Table 5: Error correction representation for the selected ARDL (1,1,0,1,1), model based on the Schwarz Bayesian criterion

Regressors	Coefficients
dLFDI	0.044121** (0.013297)
dLFA	0.0057932 (0.017243)
dLSI	0.18693 (0.054485)**
dLLAB	-2.1953 (1.0273)
dINTERCEPT	3.5182 (1.3005)
ECT_{-1}	-0.13760 (0.085151)
R ²	0.80348
Adjusted R ²	0.72073

Notes: ** significant at 5% level of significance; Standard error in parentheses. Dependent variable is log real GDP (dLY); d is the first difference operator; ECT_{-1} = error correction term.

Source: See text.

The long-term parameter estimates are calculated using the short-term coefficients, and the long-term relationship is given by Equation (9) below:

$$LY=25.57 + 0.62 (LFDI)** + 0.042(LFA) -0.86 (LLAB)* + 0.17 (LSI)** \quad (9)$$

**significance at the 5% level of significance; *significance at the 10% level of significance

In this long-term equation, the coefficient of FDI is significant and has a positive sign indicating that FDI has a positive impact on economic growth, since FDI inflows into developing countries not only act as a complement to domestic credit, but they also help to introduce new technologies and innovations in host countries while providing them with better job opportunities. In addition, the capital stock also has a positive and significant impact on economic growth in the long term. The impact of foreign aid on economic growth is positive and insignificant. By contrast, the labour force has a negative and significant impact on growth since Cameroon is a developing country with surplus labour. This means that an increase in the workforce causes a negative impact on growth.

One problem tackled by the empirical analysis, is the potential endogeneity of the variables ‘foreign aid (*LFA*)’ and ‘share of investment (*LSI*)’. Although the ARDL model is capable of providing consistent estimates of the long-term parameters, endogeneity may still bias the estimated parameters (Feeny 2005). Blomstrom et al. (1996), for instance, indicate that investment may be endogenous in the model since the direction of causation may go from the growth of GDP towards investment, and not otherwise. Foreign aid may be endogenous if aid donors consider GDP growth when they grant aid to a recipient country.

In the present study, the exogeneity of the variables *LFA* and *LSI* is tested for using the Wu-Hausman test. The calculation of the Wu-Hausman statistic may be carried out by running an OLS regression on the auxiliary exogenous variables in the model, and the residuals are saved under the *RLFA* and *RLSI*. The results of Table 6 reveal that the *t*-ratios of the variables ‘foreign aid’ and ‘share of investment’ are 0.042 and 0.223, respectively. They were found to be insignificant at the 5% significance level, thus suggesting the fact that the variables *LFA* and *LSI* are exogenous cannot be rejected.

Table 6: Wu-Hausman statistic for testing the exogeneity of *LFA* and *LSI*

Regressors	Coefficient	t-ratio
RLFA	-0.0033	-0.042 (0.926)
RLSI	-0.0038	-0.223 (0.728)
F-statistic		0.0253 (0.942)

Notes: *RLFA* and *RLSI* are the residuals from *LFA* and *LSI* regressions, respectively. Figure in brackets (.) are p-values.

Source: See text.

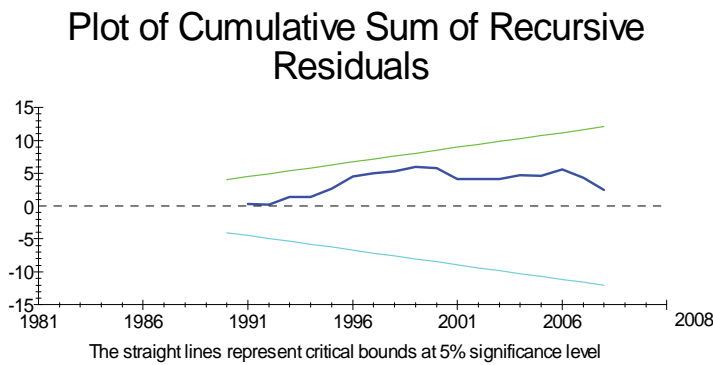
Testing for structural breaks in the model

To bring this study to completion, it is important to test whether the short- and long-term relationships found previously are stable over the entire period of the study. To do this, we must test for the stability of the model parameters. The methodology we use here is based on the cumulative sum (CUSUM) and the cumulative sum of squares (CUSUMSQ) tests proposed by Brown et al. (1975). Contrary to the Chow test which requires the breakpoints to be specified, the CUSUM tests may be used even when the breakpoints are not known. The CUSUM test uses the cumulative sum of recursive residuals based on the first *n* observations,

and it is recursively updated and plotted against the breakpoint. The CUSUMSQ test uses the recursive residuals squared and follows the same procedure. If the plots of the CUSUM and CUSUMSQ remain within the critical limits of the 5 per cent significance level, the null hypothesis that all the coefficients are stable cannot be rejected. However, if one or another of the parallel lines crosses, then the null hypothesis (of parameter stability) is rejected at the 5 per cent significance level.

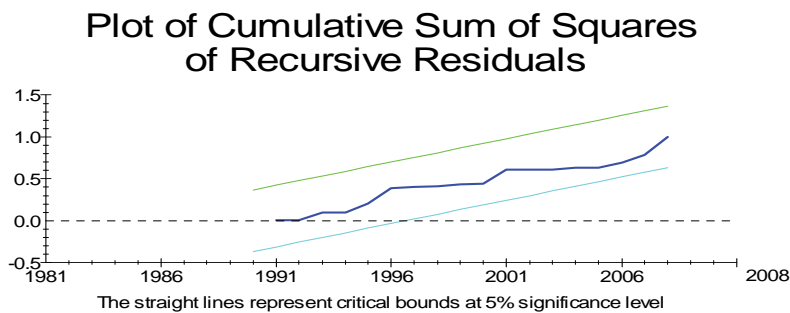
Figures 3 and 4 present the respective results of the CUSUM and CUSUM of squares tests. In both Figures 3 and 4, the lines with green and sky-blue colours represent the critical lower and upper bounds of the region indicating the 5 per cent significance level. The visual inspection of these graphs show no evidence of instability in the regression parameters over the study period, since both the cumulative sum of residuals and the cumulative sum of squared residuals lie within the critical limits of the 5 per cent level of significance.

Figure 3: CUSUM tests



Source: Author's computations using Microfit 4.0.

Figure 4: CUSUMQ tests



Source: Author's computations using Microfit 4.0.

6 Conclusions and policy implications

The purpose of this study was to examine empirically the relationship between foreign direct investment, foreign aid, and economic growth in Cameroon. More specifically the study aimed to test for the efficiency of external factors through their impact on economic growth in Cameroon during the period 1980-2008. To explain the changes which occurred in real GDP over the study period, the model retained as independent variables, the labour force, the

capital stock (domestic factors), and external factors such as official development assistance and foreign direct investment. Annual time-series data covering the period 1980-2008 were used in the application of the econometric method known as the Autoregressive Distributed Lag (ARDL). Recent analytical data techniques were used to diagnose and check the properties of the time-series data. Then, the model was estimated to determine the short and long-terms elasticities and their significance.

The results of the econometric analysis of this study have shown that the domestic capital stock, which is proxied by the share of investment in GDP, and foreign direct investment (FDI) have positive and significant impacts on growth. In addition, foreign aid also was found to have a positive but insignificant impact on growth. Since Cameroon, like most developing SSA countries is characterized by an unlimited supply of labour (unemployment and underemployment) as mentioned above, the econometric results of the study also showed that labour has a negative and significant impact on economic growth.

The policy implications of these results suggest that in addition to the tax incentive packages and other advantages provided for in the country's Investment Code, the government of Cameroon should design and implement sound fiscal and monetary policies, which can not only encourage domestic savings and investment while controlling inflation, but which can also enhance the country's attractiveness as a host country for FDI and foreign aid inflows by making sure that these policies are acceptable to foreign investors and foreign aid donors. Success in attracting foreign capital inflows would accelerate the accumulation of the country's capital stock, thus setting the stage for the progressive structural transformation of the country's economy from a largely agriculture-based economy to a growing economy with expanding industrial and service sectors, capable of absorbing the existing labour surplus and of reducing unemployment and poverty by improving the living standards of its people.

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