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Determinants of Foreign Direct Investment Inflows to ECOWAS Member Countries: Panel Data Modelling and Estimation

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Abstract

This article aims to investigate the explanatory factors of FDI attractiveness in the Economic Community of West African States (ECOWAS) through panel data modelling and estimation over the period 1985-2015. The findings show that stabilization of the macroeconomic environment, government consumption expenditures, domestic credit to the private sector, interest rate, gross fixed capital formation, exchange rate, economic freedom index, as well as natural resources and market size are the main FDI driving factors in ECOWAS.

Keywords

Foreign Direct Investments, Panel Data, ECOWAS

1. Introduction

The ability to attract foreign direct investment (FDI) is considered a major component of development policy. Due to insufficient available resources to finance long-term development of Africa and the growing difficulty in poverty reduction, new economic strategies at national, regional and international levels are now putting more emphasis on FDIs.

The experience of a small number of newly industrialized economies (NIEs) of East Asia experiencing rapid growth and, more recently China, helped to support the idea that FDIs have played an essential role to address the lack of resources in low-income countries and avoid an increase in debt while directly addressing the causes of poverty.

According to the United Nations Conference on Trade and Development [1], the increase of FDI in some countries has been interpreted as a sign that openness of Africa

to international trade could lead to a quick "economic renaissance" at the continental scale.

The objective of this article is to determine the factors explaining the attraction of FDIs in the Economic Community of West African States (ECOWAS). To this end, the paper presents recent developments in terms of FDIs in ECOWAS member countries and FDI attractiveness policy in the region before turning in the literature review, to theoretical and empirical foundations of the analysis of FDI flows. Section 4 presents the model and model specifications, followed by estimation results. The last section deals with policy recommendations related to FDI inflows and concludes.

2. Generalities on FDI

2.1. Definition of the Concept of FDI

According to the Balance of Payments and International Investment Position Manual (BPM6) of the International Monetary Fund (IMF) [2], FDI is a functional category of transnational investment in which a resident of an economy holds a significant influence on the management of an enterprise residing in another economy. That is why, it is necessary to clearly understand the concept of residence of a given individual or a company which is the economic territory[1] with which it has a close relationship, in other words, its leading economic center and that is not necessarily comparable to nationality to distinguish between different investments in an economy.

Another aspect often considered to qualify a transfer of FDI capital is the share of participation in the company's capital. Thus, the Organization for Economic Cooperation and Development (OECD) proposes to consider as direct investment when the share of capital held by foreign investor is at least 10% of the capital of the resident enterprise. Therefore, any investment whose amount is below this threshold has to be classified in another type called portfolio investment.

The World Bank defines foreign direct investment as: "Foreign direct investment are the net inflows of investment to acquire a lasting management interest (10 percent or more of voting stock) in an enterprise operating in an economy other than that of the investor. It is the sum of equity capital, reinvestment of earnings, other long-term capital, and short-term capital as shown in the balance of payments." [3]

FDIs include mainly two types of operations. On the one hand, there are operations made from internal growth within the same transnational company between the parent company and its various institutions established abroad (subsidiaries, representative offices, etc.); ex nihilo creation of new units, expansion of production capacity of existing units, financial flows between institutions (increase in capital, loans and cash advances by the parent, etc.), local reinvestment of profits.

On the other hand, there are those made through acquisitions, provided they attain at least 10% of the coveted foreign company's capital. Nowadays, this threshold is internationally recognized to distinguish FDI from "portfolio investment", the latter be-

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[1]Refer to BPM6.

ing by definition much more volatile and corresponding to participation less than 10% of a company's capital. In this case, the investment is considered by the company as a form of international portfolio diversification [4]. It is thus clear that FDI is the fact of multinational corporations or transnational corporations.

2.2. Overview of FDI Inflows to Africa

FDI inflows to Africa have been rising during the recent years. However, economic growth remains slow compared with other developing regions, and Africa receives only 5% of total FDI inflows to developing countries. However, the amounts involved are much higher than the average level during the first half of the 1990s.

Furthermore, the situation varies considerably from one country to another, because investors are beginning to realize the potential of many African countries. The main FDI recipients in Africa are Nigeria, Egypt, South Africa, Angola, Equatorial Guinea, etc. Countries, such as Ethiopia, Mozambique and Uganda also show their capacity to attract FDIs which are mainly directed towards the manufacturing sector and services.

2.3. FDI Driving Factors

To explain why some countries receive more FDIs than others, it is essential to understand the factors which influence the choice of transnational companies to invest abroad.

Three major types of factors are involved here: recipient country policies (including applicable regulation to FDIs), measures adopted by countries to encourage and facilitate investments and finally general economic characteristics.

Being made up of countries with very different characteristics, most of which are poor and heavily indebted, with weak domestic savings in an international development financing context which is increasingly selective, ECOWAS member countries adopted a strategy of attracting foreign capital and particularly FDI.

Faced with the challenges of the third millennium, economic and social development of ECOWAS member countries should rely more on accelerating the ongoing integration process, including through the effective implementation of sectoral policies, thus completing the achievement of the Customs Union and the convergence of economic policies.

FDI inflows could help ECOWAS member countries to better realize their new development strategy which attaches great importance to private investment, especially FDI.

3. Literature Review on FDI Determinants

If developing countries want to have the greatest possible attractiveness to transnational corporations, it is because they want to make the most profit from FDIs, that is to say, to maximize their positive contribution to development and minimize their negative effects. As well as development, transnational corporation experience the consequences of the growing importance of intensive-knowledge production, rapid technological

change, contraction of economic activities and increasingly openness of the countries.

For example, today most of the developing countries consider FDI as an important factor of development. Public policy has a role to play, but the instruments of government policy had evolved to adapt to the new situation, without the fact that governments must review their objectives to meet new needs.

Regarding transnational corporations, the new situation is reflected both by new opportunities as well as new constraints. They developed rapidly, their number has increased sharply and they have changed their strategies, which not only had an influence on the determinants of their investments abroad but also changed the way their activities affect the economies of recipient countries.

Traditionally, the contribution and the expected impact of transnational corporations was to supplement domestic savings by foreign savings, and thus to increase supply of usable financial resources for development. Today, as many developing countries have liberalized access to financial markets and various other modes of funding, governments compare the contribution of FDIs and other financial flows to development.

Since the development capacity of a country depends increasingly on its ability to cope with technological change and to be integrated into the global economy, technology development, acquisition of management skills and techniques and export competitiveness have become for developing countries much more important.

Meanwhile, the countries pledged to carry out sustainable development, protect the environment and ensure the sustainability of resources for future generations. Transnational corporations are well placed to contribute to development because they play a key role in these areas.

In fact, since FDIs cover a range of assets they can have an impact which is more sensitive than their various components taken individually, and contribute to the restructuration of entire sectors or even to strengthen the competitiveness of the whole economy. They can also have negative consequences for developing countries, *i.e.* oust local investors or cancel some of their advantages through transfer pricing.

Given the fact that developing countries are looking increasingly not only to attract FDIs but also to benefit from them, many authors have dedicated their work to the extent to which FDIs can contribute to the various key sectors of economic development and on the question relative to how to ensure that this contribution be even more strengthened.

3.1. Effects of FDI in Receiving Countries

From the perspective of the recipient countries, FDIs are a catalyst for economic development, particularly through their contribution to the increase in private investment, job creation, growth in domestic supply, deepening technology transfer, training and improving human capital and increase the productivity of enterprise production factors. FDI development also entails greater integration of countries in international trade and should have the effect of facilitating access of developing countries to inter-

national markets [5].

There is in the literature a concept of technology transfer through the multinational firms, according to which technology of the subsidiary would spread to local companies through positive externalities (or "spillovers" in the terminology [6]).

Macdougall [7] is considered the first author who introduced the external effects by analyzing the impact of foreign investment on the general well-being.

Caves [8] examine the effects of FDIs on social welfare and industrial structure. The common objective of these authors was to identify the costs and benefits of FDIs. In this sense, technological externalities were part of FDI indirect effects that depend on government revenue, tax policy, terms of trade and balance of payments. Existing empirical studies differ in their estimates of the size and importance of the positive effects.

The first studies were conducted by Caves who studies the manufacturing sector in Australia, by Globerman [9] who is interested in the Canadian manufacturing sector using cross-sectional data of 1972, and finally, Persson and Blomström [10] who analyze the processing industries in Mexico in 1970.

However, there are studies showing that external effects are not significant. This is the case of Haddad and Harrison [11] for Morocco, Aitken and Harrison [12] for the Venezuelan economy.

Furthermore, the endogenous growth theory considers FDIs as a key enabler in the process of economic development thanks to the positive externalities they generate in the recipient economy. The impact of FDIs on economic growth could result mainly in their direct effects on private capital stock, stimulating local investment in complementary activities of multinational firms [13]. This result was corroborated by Bosworth and Collins [14] who show that FDI exert a ripple effect on domestic investment. FDIs also promote job creation, through direct recruitment in the subsidiaries of multinationals and in companies serving as suppliers, subcontractors or service providers because of the multiplier effects on domestic employment.

3.2. FDI Determinants

In recent works, the analysis of the determinants of private capital flows is usually done by distinguishing between internal factors that can be influenced by the recipient economy "pull factors", external factors associated with economic conditions in the source countries, which are beyond the control of recipient economies "push factors".

3.2.1. Theoretical Analysis

Despite the growing importance of investment flows, there is no unified theoretical framework for understanding FDI determinants.

Traditional theories of international trade highlight the differences in factor endowments to explain trade and factor mobility and in particular the relocation of firms [15]. Companies make their investment decisions in a given country with respect to the presence of tariff barriers and differences in factor remuneration.

However, these theories are in a context of perfect competition very restrictive to the

extent that the majority of multinational firms operate in markets with imperfect competition. Because of this market imperfection firms may have specific advantages and are encouraged to take the risk of investing abroad.

Vernon [16] relies on the product life cycle to explain the process of creation of subsidiaries by multinational corporations and distinguishes three phases. During the first phase, innovation of a new product by a company provides to this firm absolute monopoly. These products that are primarily manufactured for the domestic market are later exported. During the second phase, that of the maturity and growth of the product, the appearance of new demands raises the awareness of the company that it is about to lose its monopoly advantage. Then, the company adopts a defensive policy and sells its knowledge (patents, trademarks) or replaces its production abroad, where wages are favorable. During the third phase, product manufacturing is standardized and there is no differentiation in companies' exports. But in 1979, the author re-examined his own theory and has shown that the life cycle theory is insufficient to explain the complexity of the phenomenon of multinational corporations that are now more geographically widespread.

Kindleberger [17] identifies four types of market imperfection that allow a company to have competitive advantages over rivals and to invest abroad. These are result from product differentiation, qualifications, specific knowledge, and unequal access to resources and production factors. The specific advantages give a company a competitive advantage and can influence the decision to invest abroad [18]. These assets are difficult to imitate and allow the foreign company to overcome the barriers to entry which are the sunk costs of penetrating the host market that can be distinguished as follows: construction costs of a plant (implementation costs specific to a production unit), costs corresponding to expenditures on research and development necessary for product development, equipment costs (purchase of machinery), or staff training. In addition, these assets are typically intangible and therefore difficult to be used if there is no dependence link, such as licensing agreements with established companies in the host country.

The international trade theories developed in the 1990s, including those of Brainard [19] and Markusen [20], incorporating elements of imperfect competition, emphasize the importance of two factors (cost and demand on the host market) in explaining the strategic choices of multinationals. According to these theories, firms in their decision to enter a market by exporting or producing on site, make a trade-off between benefits related to the proximity of consumers and those related to the concentration. When the benefits of locating near consumers are relatively higher than those related to the concentration of activities, the company invests to implement several production sites to serve local markets. One speaks in this case of horizontal FDIs. The benefits of proximity are relatively higher than those of the concentration, if there is the possibility to realize economies of scale between the different sites due to the presence of intangible assets, if the costs of implementation are relatively low, transport costs are high and if the demand on the host market is strong. Otherwise, firms relocate their activities and

allocate them to different countries based on comparative advantages.

The benefits of localization constitute a necessary and sufficient condition for FDIs. In this regard, Dunning [21] grants localization issues explicit importance by combining the specific advantages of the company and items related to transaction costs. Research works on multinationals that are inspired by this model emphasize that the benefits offered by the host country are determined by non-economic factors (such as political risk), specific characteristics of demand and supply (incentive to reduce costs, resource endowment of the host country, physical infrastructure and productivity levels). In the different host countries, productivity levels depend also on market size (if the economies of scale and scope are significant), enrollment levels, professional skills of local workforce, etc.

A comprehensive approach to these explanatory factors of FDIs was attempted by Dunning [22] in the OLI paradigm (Ownership, Localization and Internalization advantages). This approach shows that FDIs are a combination of three broad categories of benefits: 1) the benefits of ownership and management of corporate intangible resources (Ownership advantages), technological advantage, patent, expertise or specific knowledge. These assets enable to reduce the costs and to have a certain degree of market power such as economies of scale or the possession of advanced technology. 2) The benefits of cost internalization (Internalization advantages) that result from the use of external market imperfections. These include uncertainty and transaction cost reduction. 3) The benefits related to the characteristics of the host country (Localization advantages) that include differences in endowments, transport costs, the quality of the workforce, infrastructure, etc.

Venables *et al.* [23], in the modern theory of the multinational firm seek to explain why the same goods can be produced simultaneously in two or more countries, instead of only one. This issue is the location of production. The authors state that in setting up operations abroad, the multinational firm manages to internalize transaction costs. Subsequently, other authors such as Dunning [24] and Krugman *et al.* [25] address this theory in the same logic.

Smith [26], Motta [27], and Kinoshita [28] explain that the strategic investment theory is based on the argument of "localization" to show that FDI is for the multinational firm a credible argument (either the strategy is vertical or horizontal). While the theory of international trade shows that multinational corporations make a tradeoff between proximity and concentration. Indeed, the horizontal type multinational corporations appear when the benefits to locate near consumers are relatively high compared to the benefits related to the concentration of activities. These are investments corresponding to local markets conquer strategies. This is the type of FDI practiced among developed countries in general.

While relocation or vertical FDIs occur when firms are part of a perspective of international division of production process, multinational corporations spread their activities across countries depending on the different comparative advantages (different countries in size and factor endowments, low workforce costs) [29]. Kinoshita shows

that the size (either small or large) of the firm influences differently direct investment decisions abroad. While transport costs and availability of skilled labor guide the investment decisions of the first (case of small firm), competitive strategies with other companies for access to a wider market are recognized to guide large firms. Thus, Kinoshita supplements the analysis of Markusen.

Also, Agnieszka and Young [30] show that factors such as know-how, market and agglomeration factors (presence of value chain) are the main drivers of investment decisions of multinational firms in the region of Mazowieckie (including Warsaw).

Asiedu [31] shows that the choice of location is essentially related to the specific characteristics of the country, especially when it comes to those of SSA. Moreover, the author finds that the motivations of multinational firms are related to the quest for efficiency gains, that is to say, the various possibilities offered by individual countries in terms of labor costs or workforce qualifications and achieving economies of scale or accessibility to new markets in order to lower transaction and production costs. To these factors, one can add agglomeration effects (Procher [32]) and the presence of natural resources [33] as motivating factors not less important in explaining the installation of multinational firms.

The literature on FDI identifies a number of intrinsic factors that make a country a preferred destination or not for FDIs (Theory of "pull-factor"). These conditions include the quality of socio-economic infrastructure, market size, level of human capital development, distance between the country and key international markets, labor cost, openness to international trade, foreign exchange policy, fiscal and non-fiscal incentives, political stability, monetary policy and degree of financial liberalization [34] [35] [36] [37].

In addition to these socio-economic variables, Akinkube [38] adds the endowment in natural mineral resources (such as oil, natural gas, gold, uranium, etc.) or other raw materials. At the African level, inflows are mainly concentrated in a few large countries exporting raw minerals, particularly South Africa, Angola, Nigeria and Ghana.

In addition to the intrinsic characteristics of recipient economies, there are also external factors ("push factors") that affect FDI inflows through different channels. These factors explain to what extent the economic conditions of the country of origin influence the direction of capital flows to developing countries. These include the growth rate of developed countries and interest rates.

According to Reinhart [39], changes in economic growth rate in developed countries could affect FDI flows through an income effect and a substitution effect. Moreover, if resource allocation decisions of firms are determined by the rate of return, an economic recession in developed countries could increase the profitability and attractiveness of developing countries [40].

The change in international interest rates also has an impact on the financing of FDI flows. A study by the World Bank found that over the period 2003-2007, the low level of international interest rate and the subsequent decline in borrowing costs contributed to over 70% increase in capital inflows to developing countries [41].

3.2.2. Empirical Analysis

In the empirical analysis, we focus on some studies on FDI determinants from the perspective of the recipient country, particularly in developing countries. Various empirical studies have considered a wide range of variables (qualitative and quantitative) that influence FDI. Some papers have put emphasis on economic and financial factors [42] [43]; Menegaldo, [44]; Morisset, Asiedu [45] [46]. These economic and financial factors are related to supply and demand characteristics and determine the return on investment. As illustration, there are market size, labor cost and quality, infrastructure, economic openness, macroeconomic stability, etc.

In his study on the determinants of FDI in Africa, Morisset [47] utilizes, among other variables, GDP growth rate, illiteracy rate, exports to GDP ratio, a variable related to economic infrastructures (number of phone lines per 1000 people) and the ratio of urban population to the total population. He notes that the most important factors are economic growth and the economic openness of the country to foreign trade. Obwona also shows that the level and growth rate of GDP have positive and significant impact on FDI flows in Uganda over the period 1981-1995, while the effect of the deficit of trade balance is negative and significant.

Asiedu rejects the role of economic openness on FDI inflows to African countries, considering that African trade reforms would be deemed not credible by foreign investors. The author also shows that some factors, traditionally accepted as relevant determinants of FDI are not validated in the case of African economies, namely the return on capital and infrastructure development.

In the same vein, Kamaly [48] shows that the usual determinants, namely growth rate and openness, have less impact on the attractiveness of the countries than interest rates, which is in line with the basic theory of investment, and contrary to conventional beliefs about FDIs. Thus, high interest rates in developing countries would involve lower FDI inflows. Moreover, Kamaly shows that the variability in the nominal exchange rate affects negatively FDI. He finds that the effects of the determinants are more sensitive in the long run than in the short run. Bouoiyour finds different results for Morocco. He finds that market size, labor cost, level of public investment, inflation, human capital and exports influence positively FDI inflows to Morocco.

For Morisset improvement of the business climate through aggressive trade liberalization can fuel the interest of foreign investors to a particular country. Although for many observers, the ability of African countries to attract FDI has mainly depended on their natural resources endowment and the size of their markets, the implementation by a number of countries (Singapore, Ireland) of proactive policies may be an indication of the improvement the attractiveness of the country.

Many studies, including those of Tsai [49] and Shamsuddin [50] yield results confirming the theory relative to wage rates which postulates that the highest salaries tend to discourage FDIs. Later, Wheeler and Mody [51] in their investigation of investment in the manufacturing sector in general and in the electronic industry, through 42 countries, find that if the wage rate is relatively unimportant in determining FDI flows in

industrialized countries, the wage rate theory remains one of the most important determinants of FDI inflows to developing countries.

Among factors considered logically meaningful in researches, market size is unanimously accepted as an important factor in attracting FDIs. The theory, especially important for FDIs, motivated by the recipient country market, argues that a country with a larger market will have a greater capacity to absorb production due to FDI inflows and thus be more attractive to potential investments.

Dupuch and Milan [52] investigate the determinants of FDI in the countries of Eastern Europe. From a gravity model, they show that market size and geographical proximity are the factors of mobility of FDI to countries of Eastern Europe. The analysis focuses on the flows from the European Union over three periods: 1993-1995, 1996-1998, and 1999-2001. They use a system of equations estimated by the method SURE (Seemingly Unrelated Regression).

Several empirical studies have shown the existence of a positive relationship between FDIs and growth, if recipient countries have favorable initial conditions, including a minimum level of economic development or the existence of local capacity for wealth creation including a sufficiently high level of education.

Borensztein, De Gregorio and Lee, Bengoa and Sanchez-Robles [53] and Li Xiaoying and Xiaming Him [54] argue that FDIs exert a ripple effect on growth mainly when the recipient countries have an important human capital and especially a high education level.

By studying three regional economic groups in North and Central America, Blomstrom and Kokko [55] find that the most significant impacts of FDI flows appear when regional integration agreements are accompanied by a liberalization of the internal market and a stable macroeconomic framework in member countries.

Other studies including Hess [56], Singh and Jun [57], and Ngowi [58] highlight the political risk factors (government stability, socioeconomic conditions, internal and external conflicts, corruption, etc.).

Thus, Singh and Jun find that political risk is an important determinant for countries that attracted the largest amount of FDI inflows. For others that have attracted less, socio-political instability (approximated by the number of working days lost) had a negative impact on investments. Similarly, Kamaly finding a positive impact of democracy on FDI, concludes that democratic countries have an effective advantage over autocracies about the relative attractiveness to FDI.

Analyzing the data from the survey conducted in the Southern African Development Community (SADC) member countries, Hess identifies five main obstacles to FDI, common to these countries: the unstable political and economic environment, inefficient administration, corruption, lack of transparency and the high tax burden. Ngowi concludes that the lack of attractiveness of African countries is explained by their lack of political and institutional stability and predictability.

However, Noukpo and Fotie [59], in an analysis of the statistical relationship between political risk and FDI inflows, for five (5) major African destinations (Nigeria,

South Africa, Botswana, Côte d'Ivoire and Swaziland) conclude that with the exception of South Africa, the political conditions had no impact on FDI inflows. In addition, for Nigeria for the period 1977-1984, the improvement in political risk was accompanied by a decline in FDI inflows.

Political stability is often seen as a factor favorable to FDI in the world. But this is not always true with investments in the extractive industry [60]. Ngouhouo [61] shows that the political risk is significant only if the variable related to natural resources and market size are removed from the econometric models.

Infrastructure is also an important factor in the investment decision of firms abroad. Guisinger cited by Groh and Wich [62] finds that the development of communication and roads positively affect FDI. Mody cited by Groh and Wich adds that infrastructure is one of the most important determinants of FDI in developing countries.

Al Nasser [63] shows that investors are attracted when they find that the host government is strongly committed to the development of infrastructure, and proves it in Latin American countries. Heshmati cited by Groh and Wich adds that telecommunications are important in the attraction of FDI.

Basu and Srinivasan [64] seek to identify the determinants of FDI in seven (07) African countries (Botswana, Lesotho, Mauritius, Mozambique, Namibia, Swaziland and Uganda). According to their study, the countries analyzed have led not only efforts to promote political and macroeconomic stability but also undertook key structural reforms to attract FDI. The most important determinants are political stability, favorable macroeconomic environment, good governance, low levels of corruption, and investment in human capital.

Koukpo [65] shows that the main FDI attraction factor in WAEMU countries is human capital but other factors such as economic openness and the size of the local market have positive effects on FDI.

DJE [66] shows that certain traditional factors, like the openness of the economy to international trade, the rate of investment, particularly public investment, and human capital, are crucial in the analysis of FDI flows towards the WAEMU zone.

4. Methods, Estimation and Results

4.1. Methods

This study makes use of the following variables:

- ✓ Government expenditures are often expenditures of general interest to improve the social conditions of the country. They may be expenditures relative to infrastructure construction.
- ✓ GDP per capita and household consumption which are indicators often used as proxies for material well-being.
- ✓ GDP growth rate reflects the country's wealth creation dynamic and tells whether the economy is doing well or not. It is also a macroeconomic indicator that allows, among others, to compare and possibly to choose between a set of countries for an investment decision. It is expected to have a positive impact on FDI flows into a

country or a given zone.

- ✓ Exchange rate has an impact on imports and exports of a given country. Investors wishing to export their products may find this rate incompatible with their investment choices.
- ✓ Gross fixed capital formation refers to the acquisition or stock of durable production goods. It is a proxy for investment. It can have a positive impact on FDI flows.
- ✓ Domestic credit to the private sector allows an investor to have an idea of the local financing capacity, and this can be a source of funds to the investor in the case of need. Thus, it is normal that the domestic credit impact positively FDI flows in a given country.
- ✓ Debt and debt service, the amount of that debt, which is often public may influence the choice of FDI, by the fact that face to a situation of payment obligation, there could be a reduction in investment, especially public investment.
- ✓ Degree of openness, economies that are most open are assumed to have a better chance of capturing FDI inflows.
- ✓ Gross primary school enrollment, and gross secondary school enrollment: these are variables taken as proxies of human capital. In addition to cheap labor, investors look for a more skilled population because it fits more to the new technologies and has more innovative capacity.
- ✓ Economic Freedom Index[2]: these two variables reflect the global ranking of countries in terms of political rights and freedom to undertake economic and political actions, they can be taken as proxies of good governance.
- ✓ Nominal and real interest rates.
- ✓ Rents from natural resources are the sum of oil rents, natural gas rents, coal rents (hard and soft), mineral rents, and forest rents.
- ✓ Primary energy production[3]: includes the production of a set of resources such as oil, natural gas, coal, biofuels, etc. necessary for energy production. This variable can be considered a proxy of the natural resources of the country because some resources that go into the composition of this aggregate such as plants for the production of nuclear energy, does not exist in ECOWAS member countries. Thus, this variable could be composed primarily of natural resources for these countries.

[2]Economic freedom is the fundamental right of every human to control his or her own labor and property. In an economically free society, individuals are free to work, produce, consume, and invest in any way they please, with that freedom both protected by the state and unconstrained by the state. In economically free societies, governments allow labor, capital and goods to move freely, and refrain from coercion or constraint of liberty beyond the extent necessary to protect and maintain liberty itself. (World Data Atlas)

[3]The Energy Information Administration includes the following in US Primary Energy Production: coal production, waste coal supplied, and coal refuse recovery; crude oil and lease condensate production; natural gas plant liquids production; dry natural gas excluding supplemental gaseous fuels production; nuclear electricity net generation (converted to Btu using the nuclear plants heat rate); conventional hydroelectricity net generation (converted to Btu using the fossil-fueled plants heat rate); geothermal electricity net generation (converted to Btu using the geothermal plants heat rate), and geothermal heat pump energy and geothermal direct use energy; solar thermal and photovoltaic electricity net generation (converted to Btu using the fossil-fueled plants heat rate), and solar thermal direct use energy; wind electricity net generation (converted to Btu using the fossil-fueled plants heat rate); wood and wood-derived fuels consumption; biomass waste consumption; and biofuels feedstock. (World Data Atlas)

✓ The population due to the size of the market which is an important element of attractiveness for FDIs.

4.2. Econometric Model Specification

It is assumed that FDI inflows are explained by a set of variables X that are taken in two dimensions, temporal and individual, X_{it} with i for the individual dimension and t the time. The relationship is written as:

$$FDI_{it} = \alpha + \beta_k X_{it}^k + \mu_i + \varepsilon_{it}$$

With X^k the set of explanatory variables measured on individuals at different dates, the exponent k refers to the kth variable, μ_i refers to the individual effects, and ε_{it} error terms.

The explanatory variables are lagged and this is justified by the fact that to invest in a country in a given year, investors will analyze the macroeconomic behavior of various indicators in the earlier periods. This choice also has the advantage of avoiding bi-directional impact between FDI inflows and the explanatory variables when they are taken in the same year that can create a simultaneity bias in the estimations.

4.3. Data

Two data sources were used in this study. The first is collected from the World Bank [67]. The second additional source is the World Data Atlas for 2016 which gives indicators of the same type. The chosen study period is 1985-2015, computations using STATA software version 2013.

4.4. Unit Root Tests

The analysis of stationarity is a necessary step in any econometric modelling using time series in order to avoid a spurious regression. Regarding panel data, the stationarity test used is Levin Lin and Chu test. It is the extension of the presence of unit root test proposed by Dickey and Fuller for time series. The test is based on the existence or not of a deterministic trend for a given series under the assumption of the presence of unit root.

Table 1 provides a summary (Appendix 1) for all the results from the various unit root tests. First we note that FDI is stationary regardless of the presence of the deterministic trend. It is the same for GDP growth rate, inflation, nominal interest rate, real interest rate, all resource rents (Resources Rents) and terms of trade. The variable, Ratio Popact, (proportion of active people), economic freedom index and population are only stationary without trend. However, all other variables are non-stationary in the absence of trend, leading to differentiate them and to redo the tests to ensure their stationarity. With the exception of the variable Degre_Ouverture which is I(2), all other variables are integrated of order one, that is to say stationary after first differentiation.

In Appendix 1, for each variable two tests were conducted (one with trend and one without trend) using the Levin Lin and Chutest. These tests are performed on the lagged variables (all variables in Table 2 are lagged of one year, but we chose to keep

Table 1. Unit root test.

	Levin Lin and Chu Unit root test: 5% significance level				
	With trend		Without trend		Order of intégration
Variables	Yes/No[4]	P-value	Yes/No	P-value	
ConsGouv	Yes	0.9940	Yes	1.0000	I(1)
PIB_habitant	Yes	0.3729	Yes	1.0000	I(1)
Taux_change	Yes	0.4020	Yes	0.9636	I(1)
FBCF	Yes	0.3788	Yes	1.0000	I(1)
CreditauPrive	Yes	1.0000	Yes	1.0000	I(1)
Croissance_PIB	No	0.0000	No	0.0000	I(0)
Dette	Yes	0.4245	Yes	0.9742	I(1)
Inflation	No	0.0000	No	0.0000	I(0)
Termes_Echange	No	0.0001	No	0.0172	I(0)
Service_Dette	Yes	0.0909	Yes	0.0957	I(1)
Degre_Ouverture	Yes	1.0000	Yes	1.0000	I(2)
TbsPrimaire	Yes	0.5957	Yes	0.2992	I(1)
TbsSecondaire	Yes	0.2007	Yes	1.0000	I(1)
FDI	No	0.0017	No	0.0241	I(0)
IndiceLibrEco	No	0.0342	Yes	0.9272	I(0)
TauxInteret	No	0.0000	No	0.0001	I(0)
TauxIntereReel	No	0.0000	No	0.0000	I(0)
ResourcesRents	No	0.0057	No	0.0478	I(0)
PrEnergiePrimair	Yes	1.0000	Yes	0.8801	I(1)
Population	No	0.0000	Yes	1.0000	I(0)
ConsMen	No	0.9983	Yes	1.0000	I(1)

Source: Author's computation.

their original names). For example, the variable government consumption expenditure (ConsGouv) was lagged of one year (renamed LConsGouvin the appendix).

The first two boxes of the table correspond to the Levin Lin and Chu test with trend and without trend on the lagged variable LConsGouv.

These results are summarized in Table 2.

Then we made stationary the variables that were not. The order of integration for each variable is presented in the last column of Table 2.

For the modeling, the lagged variables are used as regressors. The reasons that the variables are being lagged are exposed in Part 2 which is relative to the specification of

[4]Yes = Presence of unit root; No = Absence of unit root.

Table 2. FDI inflows for 2000, 2010, and 2015 in thousands of US$.

YEAR	2000		2010		2015	
West Africa	32,864	%	92,384	%	152,075	%
Benin	213	0.65%	604	0.65%	1666	1.10%
Burkina Faso	28	0.09%	354	0.38%	1682	1.11%
Cape Verde	192	0.58%	1252	1.36%	1486	0.98%
Côte d'Ivoire	2483	7.56%	6978	7.55%	7318	4.81%
The Gambia	216	0.66%	323	0.35%	350	0.23%
Ghana	1554	4.73%	10,080	10.91%	26,397	17.36%
Guinea	263	0.80%	486	0.53%	2171	1.43%
Guinea-Bissau	38	0.12%	63	0.07%	134	0.09%
Liberia	3247	9.88%	4956	5.36%	7056	4.64%
Mali	132	0.40%	1964	2.13%	2893	1.90%
Niger	45	0.14%	2251	2.44%	5161	3.39%
Nigeria	23,786	72.38%	60,327	65.30%	89,735	59.01%
Senegal	295	0.90%	1699	1.84%	2808	1.85%
Sierra Leone	284	0.86%	482	0.52%	1848	1.22%
Togo	87	0.26%	565	0.61%	1367	0.90%
TOTAL (en %)		100.00%		100.00%		100.00%

Source: UNCTAD, World Investment report, 2016 and author's computation.

the econometric model.

4.5. Specification or Homogeneity Tests and Hausman Specification Test

Both tests allow us to see what estimation method should be adopted for estimating the parameters of our model.

4.5.1. Specification or Homogeneity Tests

Specification tests for deciding whether to estimate the theoretical model by assuming that the coefficients are identical for all countries in the sample or, conversely, the equation must be estimated for each individual country. Three tests are to be performed. Table 3 reports the results of the different tests.

The first line of the table shows the results of testing the hypothesis of a perfectly homogeneous structure (pooled model), that is to say the constants and coefficients of the variables are the same for all countries. It shows that this hypothesis is rejected with a p-value well below 5%. It is therefore concluded that there is heterogeneity from either coefficients or constants. So we run the second test to see whether the heterogeneity can be attributed to the coefficients associated to the variables of the model. From this test, it emerges that the null hypothesis of homogeneity of coefficients is accepted

Table 3. Tests for the presence of individual effects.

Tests for the presence of individual effects at 5% significance level		
Null hypothesis	Statistic	P-value
$\alpha_i = \alpha \, et \, \beta_k^i = \beta_k$, for any variable k and for every country	4.5790	2.182e−18
$\beta_k^i = \beta_k$ for any variable k and for every country	1.3016	0.0502
$\alpha_i = \alpha$ for every country	55.45339	2.879e−83

Source: Author's computation.

by comparing the p-value at 5%. It appears therefore to perform on the constants a third test to confirm or refute the findings made in the first test. The results confirm the findings of the first test and show the heterogeneity from the constants at the 5% level. Therefore, there are individual effects to be taken into account in estimating the model.

4.5.2. Hausman Specification Test

The test is to see if we are in the presence of fixed effects or random effects. This is actually to test the presence of a possible correlation between the individual effects and the explanatory variables (Table 4).

The test rejects the existence of a correlation between the individual effects and the explanatory variables at the 5% level. Thus the model to be estimated is with random effects (Appendix 2).

4.6. Residual Tests

These tests relate to the assumptions made about the residuals of the model with random effects and are used to learn about their veracity.

4.6.1. Homoscedasticity Tests

These tests are relative to two homoscedasticity tests; the first being Breush and Pagan test for testing the hypothesis of global homoscedasticity of the model, that is to say, the variance of the error term is the same for all countries, regardless the date. The second test relative to the specificity of panels (inter-individual heteroscedasticity test) is then to perform when there is heteroscedasticity.

By performing both tests, we note that there is the presence of heteroscedasticity (Appendix 3 and Appendix 4). It is therefore appropriate to correct it.

4.6.2. Autocorrelation Tests

The tests to be performed at this stage are inter-individual autocorrelation test and intra-individual autocorrelation test. The test results show that there is only the presence of an intra-individual autocorrelation (Appendix 5). A correction of this autocorrelation is necessary.

4.7. Presentation and Analysis of Estimation Results

Table 5 reports the estimation results of the relationship between FDI inflows (Appendix 6) and the explanatory variables. Note that the variables that are significant at the

Table 4. Hausman test.

Hausman test: fixed effects versus random effect at 5%		
Null hypothesis	Statistic	P-value
Random effects	chi2 = 51.56	Prob > chi2 = 0.0000

Source: Author's computation.

Table 5. Estimation results.

FDI	Coefficients	z	P > |z|
ConsGouv	0.0243368	0.02	0.986
ConsMen	1.647798	1.67	0.096
PIB_habitant	1.18e+07	3.01	0.003
CreditauPrive	0.0105764	5.22	0.000
Dette	0.5367067	0.67	0.502
Taux_change	3785462	1.02	0.306
FBCF	1.325459	0.72	0.474
Termes_Echange	−2.49e+07	−3.01	0.003
Service_Dette	−7.828796	−0.84	0.399
Degre_Ouverture	−8,179,375	−1.66	0.096
Croissance_PIB	6.03e+09	2.44	0.015
TbsSecondaire	−4.43e+07	−1.16	0.245
TbsPrimaire	3.04e+07	1.39	0.164
Indicedelibertconomique	1.29e+08	4.92	0.000
TauxInteretReel	9,056,738	1.60	0.110
TauxInteret	−1.37e+08	−2.95	0.003
InflationAnnuelle	1.10e+07	1.02	0.308
ResourcesRents	−2.64e+07	−0.68	0.495
PrEnergiePrimair	0.000083	5.35	0.000
Population	1308.806	8.79	0.000

Source: Author's computation.

5% level are GDP per capita, domestic credit to the private sector, growth rate, interest rate, terms of trade, primary energy production considered here as natural resources (refer to IV.1), population and finally economic freedom index, and their coefficients have the expected signs. The coefficients of the variables cannot be directly compared to comment on the magnitude of the impact of a variable on FDI inflows in relation to another variable. This is justified by the fact that all the variables are not in the same order of magnitude, for e.g. household consumption expenditures and growth rate.

Growth rate positively affects FDI inflows to the countries. Growth rate is one of the macroeconomic indicators to understand the dynamics of the economy. A sustained

increase in economic growth for a country may reflect an economy that is doing well and so this may encourage foreign investors.

The domestic credit to the private sector positively impacts FDI inflows. However it should be noted that the magnitude of the impact is relatively low (0.01). Domestic credit amount is often determined by domestic saving which is often low, this could justify this magnitude.

GDP per capita and population have a positive impact on FDI inflows (1.18e+07 and 1308.806, respectively). They can be seen as variables representing market size and capacity of the recipient countries to face the supply of new goods. Thus investors will have a higher propensity to choose a country with a high population or a population with high living standards for their activities. Another variable relative to the market which positively influences FDI inflows but at the 10% level of significance is household consumption which corresponds, in any way, to demand. We note that an increase in interest rates leads to a decrease in FDI inflows. Interest rate being part of indicators to assess the financial situation of a country, its increase discourages investment decisions as it increases the cost of borrowing.

Primary energy production seen as a proxy of natural resources affects positively FDI inflows. This may be a production cost minimization strategy in approaching primary resources needed for production.

Economic Freedom Index whose maximal value is 1000 is a criterion which impacts significantly FDI inflows. The freedom to undertake economic activities could be among the necessary conditions for a country to attract FDI.

The coefficient associated with the terms of trade has a negative sign and therefore, here, the influence of this variable on FDI inflows is unexpected.

5. Conclusions

This study allows identifying the determinants of FDI inflows to ECOWAS member countries and measuring their relative importance. Using panel data, the article shows that FDI attractiveness is a major asset for ECOWAS member countries.

We found that among the identified factors, stabilization of the macroeconomic environment, natural resources endowment, and market size were the most determinants. Exchange rate and the index of economic freedom have a relatively small impact compared to these three factors.

Given these results, the ECOWAS member countries could strengthen, through the implementation of various economic policies, their position in international capital flows. The attractiveness policies of the ECOWAS countries should be based on these main factors.

For the macroeconomic environment, West African governments should continue to reduce the gap between best practices in many major dimensions of ease of doing business, including improving domestic credit to the private sector, ensure that they have competitive interest rates, promote economic freedoms and the development of human capital in a perspective of exploiting the natural resources of ECOWAS, including oil

and gas recently discovered in Senegal.

Trade openness is also a major determinant of the attractiveness of the ECOWAS countries. Regional integration agreements offer to the countries, especially those with limited market size, a gateway into the world economy with less exposure to risks related to the free movement of goods, services and production factors. Besides the decrease or elimination of tariff barriers, regional integration agreements generally include specific measures to facilitate the movement of capital between member countries and the entry of foreign capital in the region. The ECOWAS member countries are encouraged to pursue economic integration established with the entry into force of the Common External Tariff (CET) since 1st January, 2015 and the prospect of the advent of the single currency in 2020.

Investment rates (global or public), are, in the light of the results of the study, another major determinant of FDI in ECOWAS. To increase FDI inflows to the region, it is necessary to increase public investment, particularly in socio-economic infrastructures.

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Appendices

Appendix 1. Unit Root Test

		Levin-Lin-Chu unit-root test, lag(1)			
	Ho: Panels contain unit roots Ha: Panels are stationary	Number of panels = 15 Number of periods = 30			
		With trend		Without trend	
		Statistic	p-value	Statistic	p-value
ConsGouv	Unadjusted t	−4.6447		1.8936	
	Adjusted t*	2.5116	0.9940	8.8202	1.0000
CreditauPrive	Unadjusted t	3.3772		8.7856	
	Adjusted t*	11.1576	1.0000	18.1262	1.0000
Degre_Ouverture	Unadjusted t	−9.4131		−8.1655	
	Adjusted t*	40.8153	1.0000	20.7557	1.0000
Dette	Unadjusted t	−6.9870		−4.5065	
	Adjusted t*	−0.1903	0.4245	1.9467	0.9742
FBCF	Unadjusted t	−5.7593		1.2472	
	Adjusted t*	−0.3086	0.3788	5.2451	1.0000
FDI	Unadjusted t	−9.3515		−5.7487	
	Adjusted t*	−2.9352	0.0017	−1.9751	0.0241
LInflationAnnuelle	Unadjusted t	−16.2104		−14.1606	
	Adjusted t*	−9.3592	0.0000	−10.4370	0.0000
PIB_habitant	Unadjusted t	−5.7306		0.6895	
	Adjusted t*	−0.3242	0.3729	4.1852	1.0000
Service_Dette	Unadjusted t	−10.5030		−6.7995	
	Adjusted t*	−1.3352	0.0909	−1.3066	0.0957
Taux_change	Unadjusted t	−6.8688		−1.3917	
	Adjusted t*	−0.2482	0.4020	1.7940	0.9636
Croissance_PIB	Unadjusted t	−14.6893		−12.1179	
	Adjusted t*	−5.2616	0.0000	−5.4825	0.0000
Termes_Echange	Unadjusted t	−9.6108		−6.6317	
	Adjusted t*	−3.6339	0.0001	−2.1148	0.0172
RatioPopact	Unadjusted t	−9.5725		−3.5525	
	Adjusted t*	−3.0015	0.0013	−1.2003	0.1150
TbsPrimaire	Unadjusted t	−7.3922		−1.9741	
	Adjusted t*	−0.5266	0.2992	0.2423	0.5957
TbsSecondaire	Unadjusted t	−6.2460		1.5895	
	Adjusted t*	−0.8390	0.2007	5.1401	1.0000

Continued

Droitspolititques	Unadjusted t	−8.6086		−6.9804	
	Adjusted t*	−3.1097	0.0009	−3.5707	0.0002
Indicedelibertconomique	Unadjusted t	−8.8921		−3.0063	
	Adjusted t*	−1.8222	0.0342	1.4549	0.9272
TauxInteret	Unadjusted t	−12.6523		−8.8302	
	Adjusted t*	−5.1812	0.0000	−3.8334	0.0001
TauxInteretReel	Unadjusted t	−13.0458		−13.6138	
	Adjusted t*	−5.9069	0.0000	−9.4877	0.0000
Totalresourcesnaturalrent	Unadjusted t	−9.5978		−5.9301	
	Adjusted t*	−2.5310	0.0057	−1.6661	0.0478
ProductionEnergiePrimair	Unadjusted t	−7.0203		−2.4437	
	Adjusted t*	14.7052	1.0000	1.1753	0.8801
Population	Unadjusted t	−8.0678		3.6000	
	Adjusted t*	−5.6567	0.0000	8.2991	1.0000
ConsMen	Unadjusted t	−2.5292		3.9821	
	Adjusted t*	2.9206	0.9983	8.7111	1.0000

Appendix 2. Hausman Test

Test: Ho: difference in coefficients not systematic	
chi2(12) = (b-B)'[(V_b-V_B)^(-1)](b-B)	Prob > chi2
51.56	0.0000

Appendix 3. Breusch and Pagan Homoscedasticity Test

					Number of obs = 420	
					$F_{(20, 399)} = 75.82$	
Source	SS	df	MS		Prob > F = 0.0000	
Model	2.8712e+47	20.000	1.4356e+46		R-squared = 0.7917	
Residual	7.5543e+46	399.000	1.8933e+44		Adj R-squared = 0.7813	
Total	3.6266e+47	419.000	8.6553e+44		Root MSE = 1.4e+2	
residus2	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
DConsGouv	−1.91E+12	2.94E+11	−6.510	0.000	−2.49E+12	−1.33E+12
DConsMen	−1.93E+11	1.12E+11	−1.710	0.088	−4.14E+11	2.85E+10
DPIB_habitant	1.17E+20	1.35E+19	8.700	0.000	9.07E+19	1.44E+20
DCreditauPrive	4.73E+09	1.74E+09	2.730	0.007	1.32E+09	8.15E+09
DDette	−1.28E+13	5.11E+11	−25.080	0.000	−1.38E+13	−1.18E+13
DTaux_change	−7.41E+18	4.97E+18	−1.490	0.137	−1.72E+19	2.36E+18
DFBCF	5.74E+11	5.22E+11	1.100	0.272	−4.52E+11	1.60E+12

Continued

Termes_Echange	1.45E+20	2.33E+19	6.250	0.000	9.97E+19	1.91E+20
DService_Dette	−2.50E+13	1.69E+12	−14.810	0.000	−2.83E+13	−2.17E+13
D2Degre_Ouverture	−4.91E+18	1.91E+19	−0.260	0.797	−4.25E+19	3.26E+19
tauxCr	−1.46E+22	9.12E+21	−1.600	0.110	−3.25E+22	3.31E+21
DTbsSecondaire	4.13E+20	2.22E+20	1.860	0.064	−2.45E+19	8.50E+20
DTbsPrimaire	−2.93E+20	1.26E+20	−2.320	0.021	−5.42E+20	−4.42E+19
Indicedelibertconomique	2.82E+18	1.35E+20	0.020	0.983	−2.62E+20	2.67E+20
TauxInteretReel	−1.35E+19	3.95E+19	−0.340	0.733	−9.12E+19	6.42E+19
TauxInteret	−1.76E+20	1.39E+20	−1.270	0.206	−4.50E+20	9.75E+19
InflationAnnuelle	−2.56E+19	4.74E+19	−0.540	0.590	−1.19E+20	6.77E+19
Totalresourcesnaturalrents	5.65E+20	6.15E+19	9.180	0.000	4.44E+20	6.86E+20
DProductionEnergiePrimair	−8.11E+07	1.16E+07	−7.010	0.000	−1.04E+08	−5.84E+07
Population	3.18E+14	3.21E+13	9.900	0.000	2.55E+14	3.81E+14
_cons	−1.65E+22	8.20E+21	−2.020	0.044	−3.27E+22	−4.31E+20

Hypothèse nulle	F-statistique	P-value
Les coefficients des variances sont globalement non significatifs.	F(19,415) = 75.10863	5.39e−127

Appendix 4. Second Homoscedasticity Test

Modified Wald test for groupwise heteroskedasticity in fixed effect regression model		
Hypothèse nulle	chi2 (15)	P-value
H0: sigma(i)^2 = sigma^2 for all i	54448.10	0.0000

Appendix 5. Intra-Individual Autocorrelation Tests

Wooldridge test for autocorrelation in panel data		
Hypothèse nulle	F(1,14)	Prob > F
H0: no first orderautocorrelation	68.613	0.0000

Appendix 6. Estimation Results

(a)	
Coefficients: generalized least squares	Number of obs = 420
Panels: heteroskedastic	Number of groups = 15
Correlation: panel-specific AR(1)	Time periods = 28
Estimated covariances = 15	Wald chi2(20) = 501.36
Estimatedautocorrelations = 15	Prob > chi2 = 0.0000
Estimated coefficients = 20	

(b)

FDI	Coef.	Std. Err.	z	P > |z|	[95% Conf.	Interval]
DLConsGouv	0.0243368	1.381481	0.02	0.99	−2.683317	2.731991
DLConsMen	1.647798	0.9890435	1.67	0.10	−0.2906913	3.586288
DLPIB_habitant	1.18E+07	3923 376	3.01	0.00	4,105,352	1.95E+07
DLCreditauPrive	0.0105764	0.0020246	5.22	0.00	0.0066083	0.0145445
DLDette	0.5367067	0.7990319	0.67	0.50	−1.029367	2.10278
DLTaux_change	3,785,462	3,698,078	1.02	0.31	−3,462,639	1.10E+07
DLFBCF	1.325459	1.85047	0.72	0.47	−2.301395	4.952313
LTermes_Echange	−2.49E+07	8,295,883	−3.01	0.00	−4.12E+07	−8,681,506
DLService_Dette	−7.828796	9.286481	−0.84	0.40	−26.03	10.37237
D2LDegre_Ouverture	−8179 375	4917 111	−1.66	0.10	−1.78E+07	1,457,984
tauxCr	6.03E+09	2.48E+09	2.44	0.02	1.18E+09	1.09E+10
DLTbsSecondaire	−4.43E+07	3.81E+07	−1.16	0.25	−1.19E+08	3.04E+07
DLTbsPrimaire	3.04E+07	2.18E+07	1.39	0.16	−1.24E+07	7.32E+07
LIndicedelibertconomique	1.29E+08	2.61E+07	4.92	0.00	7.73E+07	1.80E+08
LTauxInteretReel	9,056,738	5665 875	1.60	0.11	−2048 173	2.02E+07
LTauxInteret	−1.37E+08	4.64E+07	−2.95	0.00	−2.28E+08	−4.59E+07
LInflationAnnuelle	1.10E+07	1.08E+07	1.02	0.31	−1.02E+07	3.23E+07
LTotalresourcesnaturalrents	−2.64E+07	3.87E+07	−0.68	0.50	−1.02E+08	4.95E+07
LProductionEnergiePrimair	0.00008	0.0000155	5.35	0.00	0.0000526	0.0001134
LPopulation	1308.81	1488167	8.79	0.00	1017.13	1 600.48