The Development of Chinese Investments in Central African Countries Exceed that of France

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Author's contribution

The sole author designed, analysed, interpreted and prepared the manuscript.

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ABSTRACT

The purpose of this article is to study the role that market potential plays precisely in the attractiveness of territories. We will try to analyze and compare the localization of Chinese and French green fDI in Central Africa. The econometric study identifies the main factors on which the economic attractiveness of the territories is based. Our results indicate that the choice of mode and country of establishment will depend on the combination of the advantages of the firm and the host area. The impact that market potential has in particular is fundamental, particularly in Central Africa.

1. INTRODUCTION

The current context of the globalization of economic relations places foreign investments at the heart of government policies. The directors now pay particular attention to the policies of economic attractiveness and competitiveness in favor of international investors. Attractiveness is of major importance because all countries, without exception, make the establishment of

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foreign firms a priority of their industrial policy. If the territories need the MNCs, companies also depend on the territories [1]. Economic attractiveness can be defined as the ability to attract new activities and mobile factors of production, in particular capital, skilled workers in a territory. The territory can refer to the city, region, nation or an economic zone such as CEMAC or CEEAC[1]. As such, attractiveness can also be defined as a set of economic, fiscal, customs and institutional policies that the authorities have developed in order to make the Central Africa region attractive to investors [2].

Attractiveness becomes a major component of the competitiveness of an economy. Whatever the geographic dimension, a territory which is no longer competitive is exposed to loss of populations, to phenomena of disinvestment, to relocation of companies. On the contrary, a competitive territory must, to remain so, continually attract new investors, new skills.

Foreign investments contribute to economic development (job creation, improvement of the productive structure of economies, increase in productivity, etc.) of the host countries and induce strong positive externalities (technological transfers, know-how transfers, control of quality, improvement of infrastructure). The key role of MNCs in the world economy is justified by their capacity to enrich the national externalities offered to domestic businesses, and in the knock-on effects they exert in terms of economic growth and competitiveness of countries [3]. In doing so, FDI has become a key element in the development process, and the Central Africa region a preferred destination for investors.

In the late 1990s, with the rapid growth of the Chinese economy, Chinese investment in Africa began to expand. In 2017, China strengthened its screening and control of investments abroad and overall, Chinese investments abroad decreased. According to MOFCOM, in 2018, Chinese direct investment (FDI) flows to CEMAC fell by $ 103 million, compared to 2017 when they amounted to $ 193 million (Fig. 1). This correspond to 0.14% of total Chinese FDI or 0.42% of total FDI received by Africa in the past year. In other words, Chinese FDI plays a very important role for CEMAC countries because of their disposition to unlock the continent's

weaknesses in infrastructure (road, rail, hydroelectric dams) even if in absolute terms their amount remains extremely low and this especially as this sum is intended for 6 countries. However, the interest of Chinese investors in CEMAC countries tends to decrease throughout the 2003-2018 period.

The Chinese regulations relating to outgoing investments, illustrated by an "exit authorization", have limited utility in the promotion, facilitation, and protection of investments. This is explained by their fragmentation and the multiplicity of their legislators. For example, the definition of investment abroad, the starting point for regulation, by the National Commission for Development and Reform is not the same as that of MOFCOM.

According to Han Xiuli[2], there is a need to organize a suitable system for the resolution of investment disputes between China and African countries, because the International Convention would be unsuitable for Sino-African relations. The new rules enacted in 2017 have undoubtedly caused a fall in Chinese investment in the region. In addition, 4 of the 6 CEMAC countries have signed a bilateral investment treaty with China which sets legal protections for investments. In doing so, only 2 countries: Gabon and Congo apply these treaties. The difficulties encountered are explained by the limited prerogatives of arbitrary courts and their narrow specializations, absence of impunity of practices which harm Chinese investments in CEMAC.

However, the region has made considerable efforts to enhance its attractiveness. However, the results expected by structuring projects supposed to revitalize this region are far from satisfying the populations, and call into question the effectiveness of the measures taken to encourage companies to set up in the region. All this translates into a loss of attractiveness in this region, undermined by factors of economic uncertainty. Besides, Etienne Giros[3] said that "the progressive isolation of Central Africa and its loss of attractiveness are challenges that must be tackled without delay". Indeed, insecurity and political instability are proven, in the Central African Republic, but also in the north and west of Cameroon. The companies located in the

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[1] *CEMAC : Economic and Monetary Community of Central African Countries*
 ECCAS : Economic Community of Central African States

[2] *Professor & Doctor* Xiuli Han *currently works at Law School of Xiamen University and International Economic Law Institute of Xiamen University*
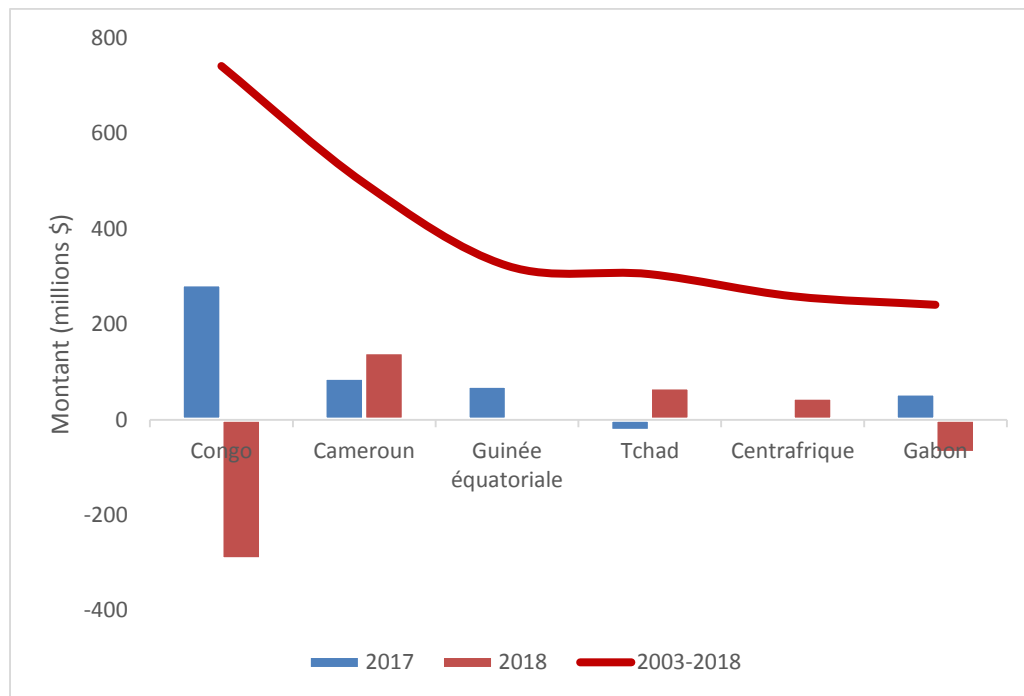[3] *Deputy Chairman of CIAN (French Council of Investors in Africa)*

Fig. 1. Evolution of Chinese flows to CEMAC, 2003-2018
author's calculation

Central Africa region complain all the time about the fiscal harassment to which they are subjected. In Cameroon, some entrepreneurs even speak of confiscatory taxation. In Congo, arrears of payment weaken the treasury of companies, while in Gabon, the breach of concession contracts negotiated with the private sector reflects the weakness of the legal framework.

The objective of this paper is to evaluate the attractiveness of the Central Africa region in relation to China through quantitative economic indicators from the main statistical sources (OECD, IMF, ILO, etc.). However, the reality is much more complex, because several Franco-Chinese entrepreneurial cooperations have multiplied in the infrastructure sector. It is this reality that our modeling will try to illustrate by comparing the location of French and Chinese companies.

In this paper, we contribute to the literature by analyzing the location determinants in sub saharian africa. We do so by studying the location choices investment decisions from 2003 to 2020. We began by analyzing the location determinants of chinese activities. The question is to see if there is an interdependence between the chinese location decisions and potential market an central african countries.

Do Chinese greenfield FDI help improve the attractiveness of Central African countries through their economic development? To what extent does the presence of an African market impact the location choices of subsidiaries? Does country taxation have an impact?

This article is structured as follows. The first section is focus es on stylized facts and the research question. The second section presents the theoretical foundations of the chosen choice model. The third section proposes the different variables and the empirical data used. The fourth section presents resulting interpretations and comments. Finally, the last section is that of policy recommendations inspired by the results.

2. CHINA PRESENTS IN AFRICA BUT WHAT COOPERATION WITH FRANCE

While most multinational firms come from developed countries, China has now proof of their capacity to invest abroad. More Chinese firms are entering each year in Africa and some of them are at this day become world leaders.

Franco-Chinese cooperation in Africa can be considered a failure, because China's approach has failed to meet trade objectives. The cooperation was first offered in 2013 by Xi Jinping to French President François Hollande.

In 2015, without much French enthusiasm, a joint declaration on Franco-Chinese partnerships in third markets has been published[4].

After this statement, the differences became clearly apparent. Where China wanted to create a financing fund of around US $ 10 billion, France only conceded two billion. China considered the financing of consortiums of French and Chinese companies, while French government has given priority to intergovernmental operations including African partners. In addition, the French private sector was reluctant. In December 2016, Pierre Gattaz, the patron of the French Business Movement, has explicitly rejected any attempt to official cooperation with China in Africa, although he accepted cooperate with Chinese enterprises.

In July 2020, France and China held their 7th high level of Economic and financial dialogue. China then communicated on the results of the dialogue[5]. He said that "the two sides are waiting for China-France.Third business cooperation fund to develop viable projects be part of sustainable development initiatives.

China makes more proposals than the French side for the cooperation in Africa ". France has not issued its own document. No project has yet been developed. The future of all cooperation seems to belong to the business sector, and with individual companies.

The charts below use available data (Eurostat, US Bureau of Economic Analysis, MOFCOM) to compare the direct investment stock of the European Union, France, China, the United Kingdom and the United States in Africa.

3. METHODOLOGY

The decision to locate a firm and the form it takes mainly respond to a microeconomic logic specific to each company. The choice of mode and country of establishment will depend on the combination of the advantages of the firm and the host area: access to natural resources, cost and qualification of the workforce, tax incentives,

preferential access to certain foreign markets, research and innovation, etc. The question of choosing the location of Chinese companies is a priority for managers. The challenge is to attract foreign investments that create jobs, a major player in boosting and industrializing regions.

In order to present the internationalization of Chinese firms in SSA, I will rely on the fDI Markets Library database produced by the Financial Times. This database is made up of individual decisions to set up Chinese firms in Africa since 2003. Our econometric study uses a Logit and / or Probit model using panel data. These are discrete choice models (qualitative models) which are used to analyze the individual data on location choices [4] of firms. These models are based on the theory of profit maximization [5].

3.1 A Specific Tool for Analyzing the Flows of Foreign Investment Projects

3.1.1 Purpose of the specification

Our goal is to use the fDI Markets Library database produced by the Financial Times to identify Chinese investment projects creating sustainable jobs in SSA mainly in Central Africa.

-It is based on firm investment decisions and accounts for the number of associated jobs.
-It provides detailed statistics by activity sector, by type of operation, by function, country of origin and host region.
-It provides the amount of greenfield FDI projects concerned.

3.1.1.1 Principle

This involves defining and comparing the expected profits of a Chinese subsidiary in each of the possible locations in order to determine the probability that a Chinese firm will invest there. The model is based on the idea that firms choose to locate in the SSA region where their profit expectation is the highest.

3.1.1.2 Theoretical foundations

The analysis of location choices is based on the theory of maximizing profit functions: Chinese investors maximize their profit function and choose to locate themselves in the region where the expectation of profit is highest. The theoretical model, derived from the Krugman [5] model and the new geographic economy.

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[4]   https://www.gouvernement.fr/partage/4648-declaration-conjointe-sur-les-partenariats-franco-chinois-en-marches-tiers
[5] "China-France Joint Fact Sheet on the 7th High Level Economic and Financial Dialogue," July 21, 2020, https://www.gouvernement.fr/en/china-france-joint-fact-sheet-on-the-6th-high-level-economic-and-financial-dialogue.
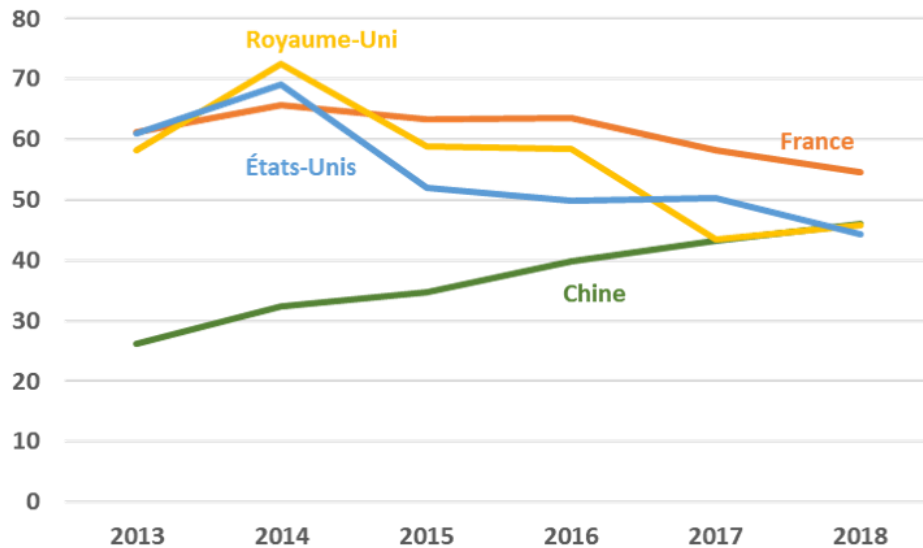
Fig. 2. Stock of direct investment in Africa: France, China (2013-2018) in billions of dollars
author's calculation

The model of Paul R. Krugman (winner of the Nobel Prize in economics in 2008), also called the Dixit - Stiglitz - Krugman model, associated with the Lancaster models and that of Shaked - Sutton, form the trilogy of the fundamentals of the theory of international trade in monopolistic competition with product differentiation. The results of this basic model were collected in Krugman (1979, 1980, 1981). For a presentation of the three models, one can usefully consult Siroën (1988).

In this study, we use the theoretical analysis framework and the approach proposed by Head and Mayer [6].

The simplified format we want to test will be estimated using the logit model. The investor will decide on a certain country to locate its R&D activities according to a number of alternatives. The dependent variable takes the value 0 or 1 depending on whether the company is located in the sample area. The principle is to assume that a firm's location decisions are based on maximizing a profit function that is subject to uncertainty.

We note the location choices made by firms in countries with observable characteristics.
R = (1,…, r,… N) all potential locations. Each potential location offers to country i profit $\Pi_{i,r}$"expressed as:

$$\Pi_{i,r} = \beta_0 + X_{i,r}\,\beta \;+ \mu_{i,r} \;(E0)$$

3.2 Hypotheses

-Chinese firms produce differentiated goods, their returns to scale are increasing.
-The usefulness of consumers in SSA countries increases with the number of varieties that exist on the market.
-There are R possible locations.
- We note σ the elasticity of constant substitution between 2 goods: σ> 1

- Iceberg transport cost: $p_{ij} = p_i T_{ij}$

Using the empirical framework proposed by the works of Dixit and Stiglitz [7], we obtain the equation :

$$Ln\Pi_i = \alpha Ln(MP_i) + \beta Ln(w_i) + (\delta LnP_{s,i} + \gamma Lnz_i) \tag{1}$$

The proposed theoretical framework thus makes it possible to break down the profit of a subsidiary into three main components: demand or access to markets; production costs (labor and prices of intermediate inputs); and a final component comprising all of the factors contributing to increasing or decreasing production costs in a region, such as agglomeration effects, the presence of externalities, etc.

We estimated the adjustment based on the following form:

$$\Pi_{i,t} = \alpha + \beta_1 PM_{i,t} + \beta_2 GREEN_{i,t} + \beta_3 CHO_{i,t-1} + \beta_4 TAXE + \beta_5 RD + \beta_6 INFRA + \mu_{i,t}$$

(2)

Or $\mu_{i,t}$, is the term of the error; the indices i and t are respectively the country of SSA and the year t.

We estimate the parameters of the profit equation using a discrete choice model. We generate a dichotomous dependent variable, equal to 1 if the Chinese firm decides to choose the Central Africa region. This variable is equal to 0 otherwise. In other words, I create a cluster of countries with Chinese activity (CEMAC) and another without Chinese activity (non CEMAC);

Little research exists on business engagement between French and Chinese companies in Africa. While African governments want to carry out infrastructure projects at the lowest cost, they also want to ensure projects are carried out according to certain technical standards they are familiar with. Hence, at least in French-speaking countries, we see the choice of Chinese contractors to build and French engineering firms to supervise and manage (CARI, 2020.).

French companies have belatedly implemented their globalization process. Since the 1980s, France has played a major role in investments in sub-Saharan Africa. It is generally considered that the arrival of Chinese companies in Africa has come at the expense of Western companies, particularly French ones. Certainly, some of them may have lost markets, but the reality is much more complex, because many Franco-Chinese entrepreneurial cooperations have emerged and have multiplied to such an extent that these cooperations are gradually becoming the norm in Africa in the infrastructure sector. It is this reality that our modelization will try to illustrate by comparing the location of French and Chinese firms.

3.3 Characteristic of the Database

The econometric study is carried out based on the observation of the localization values of the investment projects of Chinese companies from 49 SSA countries distributed between 10 countries in Central Africa over the recent period from 2003-2020. Site extension projects are not subject to a location decision since they depend on previous location choices. Our database contains the precise location of investments (country, region, city), which makes it possible to analyze the effects of agglomeration. Finally,

there is a double functional and sectoral dimension which contains information relating to both the nature of the project and the sector of activity of the company, which allows an appreciation of the degree of technological intensity of the investment projects in the Central Africa region.

In order to explain the location of Chinese firms in SSA, our basic equation will be based on six explanatory variables coming, for the most part, from the scientific literature. These are the market potential, agglomeration variables, taxation, unemployment rate, infrastructure as well as research and development. Using these variables reduces the sample size due to missing observations.

Table 1 below presents all the variables used in our specification as well as the sources of the database used.

3.3.1 Explanatory variables

The explanatory variables are taken from the "WDI" of the World Bank, the ILO, the CEPII (Center for Prospective Studies and Information) and the *f*Di Markets database are mostly drawn from the decision-making literature. of setting up companies in a territory, in particular:

3.3.1.1 Demand variables

Of course, special attention will be paid to the market potential (PM). According to the economic literature, the GDP of an economy is often used to assess demand [6]. However, it turns out that the Central African countries are small and the objective of companies once established on the territory is to export to other SSA countries or regions of the world. In doing so, it would be incongruous to reduce the demand faced by Chinese firms to the region's GDP for our modeling.

The solution adopted to circumvent the problem was then to turn to another variable to assess demand : market potential.

To correct these different biases, in order to analyze the importance of markets as a factor of industrial location, Harris [8] proposed an index to measure the accessibility of the market, according to the following expression :

Table 1. Summary of the variables used

Abbreviation	Variable	Source
Π	Indicator variable taking the value 1 for Angola, Burundi, Cameroon, Congo, Gabon, Equatorial Guinea, Democratic Republic of Congo, Central African Republic, Sao Tome and Principe, Chad and zero for the rest.	Carrère, 2004 & 2008.
PM	Harris Merchant Potential (1954, 321) of a country or region per year $$MP_r = PIB_r + \sum_{j \neq r}^{R} \frac{PIB_j}{d(r,j)}$$	Author's calculation using the SLAM-CEPII GDP (distance dataset).
GREEN	The value of greenfield FDI projects (in current dollars) compared to GDP	Author's calculation from fDI Markets, Mergermarket Group.
CHO	Unemployment rate	World Economic Outlook, IMF International Labor Organization, ILO
INFRA	Basic infrastructure	African development bank
R&D	Research and Development expenses	Institute for Statistics of the United Nations Educational, Scientific and Cultural Organization (UNESCO).
TAX	Taxation	International Monetary Fund and World Bank and OECD estimates.

$$MP_r = \sum_s \frac{M_s}{d_{rs}}$$

Based on this equation, the potential of a region r in the market can be expressed as the ratio between, a measure of economic activity (usually GDP) in the province, and d_{rs}, distance or bilateral costs of transportation between *r* and s. This indicator can be interpreted as the volume of economic activity to which a region has access after subtracting the transportation costs necessary to cover the distance to reach all the other provinces.

In this way, a theoretical basis provided by the approach borrowed from Harris [8] [6], where demand is measured using the market potential taking into account an internal component, which corresponds to regional demand, and an external component which refers to the size of neighboring markets is adopted.

The internal market potential in a host country is therefore calculated by correcting the country's GDP (at constant prices) by the internal

distances to that country. With c = 1, 2, C the countries, and r_c = 1,2,…, R_c the regions. The market potential as a proxy for the request addressed to a company located in the region r:

$$MP_r = PIB_r + \sum_{j \neq r}^{R} \frac{PIB_j}{d(r,j)}$$

In the same way, we define the market potential of a country c:

$$MP_c = \underbrace{\frac{PIB_c}{d(c,c)}}_{Composante\ Interne} + \sum_{j \neq c}^{c} \underbrace{\frac{PIB_j}{d(c,j)}}_{Composante\ Externe}$$

3.3.1.2 Agglomeration variables

In order to take into account, the size of the Central African countries in our analysis, we will relate each series of greenfield to GDP at current prices [7]. Greenfield's statistics come from the Financial Times titled "*f*DI Markets". The latter traces the value of greenfield FDI projects (in millions of dollars). It is carried out based on the

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[6] Harris (1954) defines the demand for producers in a region as the sum of the expenses of each of the regions weighted by the cost of transportation.

[7] Our GDP data at current prices are taken from the IMF's World Economic Outlook Databases.

collection of information in the press and official announcements of the opening of sites. I will remember that the values of greenfield FDI projects corresponding to site creations or establishments from scratch. We should expect a positive impact of this variable on the decision to set up Chinese firms in SSA. The variable chosen is the ratio between "the value of greenfield FDI projects and GDP at current prices" (GREEN).

3.3.1.3 The labor cost variable

The unemployment rate (CHO) is taken into account in order to reflect the degree of flexibility of the labor market and / or the availability of labor in the economies, these two indicators playing in opposite directions. Indeed, a low unemployment rate suggests that the possibilities of hiring and firing are rather favorable to the companies there. This may mean that there is little labor available and that they will be less willing to work for low wages. It is a priori difficult to predict the impact of this variable. To assess its impact on the decision to set up firms, we will use the variable "unemployment" rate which refers to the share of the active population who is unemployed but available for job search. The data come from the World Bank's WDI.

3.3.1.4 The tax variable

The tax burden on companies is generally considered to have a negative impact on the location decisions of firms. The rate of fiscal pressure makes it possible to measure the effort of fiscal mobilization, it should take into account the level of development of each country which constitutes the main factor of fiscal potential. The tax pressure on companies is apprehended here by a variable representing the weight of capital taxation (paid by the employer) in the GDP. The Tax-Capital variable corresponds to the annual income of the country's tax administration relating to the taxation of capital, including capital income and commercial business income, as a percentage of GDP. This variable comes from the IMF and World Bank and OECD estimates. We expect a negative impact of this variable on the decision to invest in firms.

3.3.1.5 Human capital

Investing in R&D is still a key element in setting up. A lot of studies see the internationalization of R&D activities as "a means of transferring technology from a parent company to a host country but, better still, an opportunity to learn and develop science and technology from the outside". The R&D variable reflects "research and development expenditure as a percentage of GDP". This variable comes from the UNESCO Institute for Statistics. We expect a positive effect on the decision to invest.

3.3.1.6 Infrastructure

By enabling a reduction in transaction costs, the quality of a country's public infrastructure should positively influence investors. In addition to economic stimulation and short-term jobs, continued investment in transport, energy and communication networks is essential to link markets (and enable integration); Reduce the cost of delivery of goods; Help people to move around; Eliminate productivity constraints; Generate enough electricity to support development; And improve the overall competitiveness of the region. We have taken as an infrastructure proxy the number of Internet users per 100 people. This variable is available in the AfDB data. The probability of setting up in a region is all the greater since the latter has a quality network. The quality of a country's basic infrastructure should positively influence Chinese investors.

4. RESULTS AND DISCUSSION

The estimation results as presented in the table in appendix 1 are not marginal impacts, only their signs can be interpreted. In addition, there is a certain stability on the value of the coefficients and their impacts.

4.1. The Logit/probit Model

The marginal impact in a Logit model varies from one observation to another (SSA country in our case), it depends on the values of the explanatory variables. The marginal impact of an explanatory variable x_i continuous is given by the following formula:

$$\frac{\partial P}{\partial x_i} = \beta_i * \text{Pr} * (1 - \text{Pr})$$

β_i is the coefficient of the variable x_i given by Stata with the logit command and Pr is the predicted probability.

However, since the marginal impact of each variable varies from one country to another, it is

therefore necessary, for the purposes of interpreting the results, to calculate an average marginal impact which will be that of a fictitious country. There are two methods for calculating the average marginal impact of a variable.

-Calculate the marginal impact for a fictitious country which has the average characteristics of the entire sample (Annex 2).
-Calculate the marginal impact using the average over the entire sample of the expression $\mathrm{Pr} * (1 - \mathrm{Pr})$

In addition, Stata has the mfx command[8] which provides the marginal effects of a Logit model.

The coefficient of the market potential variable can be interpreted as follows : an additional unit of the market potential of SSA countries increases the probability that a Chinese firm sets up in Central Africa by 5%. Similarly, we show that an additional unit of the market potential of SSA countries increases the probability that a French firm sets up in Central Africa by 8%. To this end, with an additional unit of the equivalent market potential of SSA countries, the probability that a Chinese firm sets up in Central Africa is lower than the French firm.

The probit command on Stata is used to estimate Probit models. This command works the same as the logit command: the syntax is the same and the options are almost identical. To obtain the marginal effects in a Probit model, it is necessary to use the command dprobit preprogrammed on Stata. This command uses the method of calculating the marginal impacts at the mean values of the explanatory variables of the model.

4.2 Framework for Analyzing the Determinants of Location Choice : China Versus France

The estimation of the logit model is very close to the probit model. The market potential, the agglomeration forces and the unemployment rate in SSA countries positively influence the choice of location for Chinese investors.

4.2.1 Central Africa region with low market potential is less attractive

Our results underline the importance of demand in the choice of the location of investors : the

probability of setting up a Chinese firm in the Central Africa region will be all the higher as the market potential of this region is high. In the specific case of Central African countries, the narrowness of national markets linked both to the small size of the population and to the very uneven distribution of wealth makes investment costly and profitability uncertain [9].

This positive impact underlines the attractiveness not only of the domestic market but also of the markets of neighboring areas [10,6]. The key role of market potential (income, size of final demand, size of the population) is consistent with the results obtained by Fontagné and Py [11], who show that access to larger world markets is the main driving the internationalization strategies of Chinese firms.

4.2.2 The agglomeration is decisive in the choice of location

Effects of the agglomeration of establishments (spatial concentration of activities, labor pool, exchange of information, etc.) and the agglomeration of activities (degree of labor mobility, costs of trade, savings in scale, degree of product differentiation) influence the localization strategies of firms in SSA. In fact, the value of greenfield FDI projects (in current dollars) compared to the given GDP increases the attractiveness of the region for new investors. Thus, the likelihood that Chinese firms, like French companies, will set up in the Central Africa region will be all the greater when the value of greenfield FDI projects is high.

Greenfield FDI projects generate positive externalities. These externalities pass either through the exchange of ideas and technologies, the sharing of gains linked to a larger market for production factors, notably the labor factor or for intermediate consumption. The concentration of similar activities (production, R & D, etc.) in the Central Africa region should have a positive impact on the location of investments.

4.2.3 The cost of setting up on the job market is positive

Our estimates show a positive impact of the unemployment rate on the decision to invest. Investors thus interpret the level of unemployment as an indicator of the availability of labor and ready to work (young people) in SSA for reduced wages ; which is preferable to the bad signal sent by this variable in terms of

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[8] The use of this command is not limited only to the calculation of the marginal effects of a Logit model.

rigidity. The effect is greater for the Chinese firm compared to the French firm. Studies have shown that the cost of labor in Central Africa is higher compared to other SSA regions.

Labor costs must be reduced to make the market more flexible. In fact, the restrictions affect labor productivity and strengthen the duality between the formal and informal sectors. The regulation must be able to uncover overtime which is a necessity for the company. It must be more lenient on the quota of employment of foreigners because according to the statutes of the CEMAC zone, there must be a free movement of people in each of the member countries, which is not yet the case in reality.

4.2.4 Tax pressure has a negative impact on the location decisions of firms

The variable measuring taxation significantly and negatively affects the location choices of foreign investors. The empirical literature confirms that differences in taxation on profits affect the location of firms [12]. Thus, the tax pressure on capital has a negative impact on the choice of activities with low added value. However, the negative impact observed from the tax burden is greater for French companies. The heavy tax burden, the complex administrative and regulatory environment discourage international investors and reduce the possibility of repaying the debts of Central African countries.

4.2.5 Poor quality of infrastructure reduces the attractiveness of economies

The quality of infrastructure has an impact on the attractiveness of the Central Africa region : the probability of setting up in the region is all the lower since the latter does not have a quality network.

Central African countries are far behind in the development of their infrastructure. For example, the price of electricity is very often twice as high in central Africa precisely in the CEMAC zone than in other SSA regions. The additional costs of energy transport and distribution infrastructure failures have a negative impact on private investment, particularly on the diversification of production. The lack of infrastructure delays the development of the industrial fabric, hinders the creation of small businesses, for which electricity is already a major constraint.

The Central Africa region is very limited with regard to NICTs, particularly in terms of digital,

even if mobile telephony eclipses the lag in the economic development of fixed telephony. Central African countries are still lagging behind in subscriptions and are far removed from the "digital revolution". Internet access remains limited and prohibitive. It very often dissuades the establishment of foreign companies which remains a priority for the authorities. The Central Africa region is considered one of the most difficult for the transport of goods. Priority must therefore be given to the development of transit corridors. Improve transport infrastructure to reduce delays at ports and borders.

4.2.6 Human capital reduces the attractiveness of AfSS countries

LR&D expenditure (as a percentage of GDP) reflecting the ability of countries to develop innovation and research activities negatively affect the location choices of Chinese and French investors. These results reveal that technological delays in SSA countries are a constraint on the establishment of firms. In other words, regions where there is a lack of skilled workers like in Central Africa are not particularly attractive for R&D. In addition, the location of an R&D activity for a company depends more on the characteristics of the chosen territory. Thus, the competitiveness clusters, the presence of a network, are all elements favoring the establishment of companies.

Regarding technology transfer, Chinese firms do not bring much to the countries of Central Africa. Indeed, it is in the interest of these firms to use the least technical technologies to have as much cheap labor as possible. However, China is now committed to strengthening technology transfer in Central Africa. For example, at the *Memve'ele* power plant, Cameroonian engineers receive training in order to take over from operations [...]. "Technology transfer is also the other important area of sino-cameroonian cooperation," declared President Xi Jinping in March 2013.

5. CONCLUSION AND RECOMMENDA-TIONS

Very little work exists on the engagement of French and Chinese companies in Africa. If African governments want to carry out infrastructure projects at the lowest cost, they also want to ensure that the projects are carried out according to certain technical standards that they know. Thus, in the countries of Central Africa, we observe that Chinese entrepreneurs

have a preference to build while French entrepreneurs supervise and manage design offices.

French and Chinese companies should continue to get to know each other in order to diversify and develop their business strategies in Africa.

French and Chinese firms must define their respective divisions of labor. Currently, the French generally bring technical skills and local knowledge, and the Chinese are helping to cut costs and find funding. However, this division is not fixed and the roles can sometimes be reversed.

Even if official cooperation between France and China in Africa is difficult to establish, because of their sometimes divergent political and economic objectives, the best way to curb this situation is to involve their African counterparts in this cooperation.

It appears that the choice of location depends on the degree of adequacy of the firm's objectives and the attractiveness factors offered by the countries. Compared to several empirical studies analyzing the location choices of firms, we can say that there are strong similarities between the strategies of Chinese and French investors. Market potential, agglomeration effects and the unemployment rate are key elements in the choice of location of firms. Besides these factors positively affecting the establishment of firms, the negative influence of taxation, human capital and infrastructure is also highlighted.

Our results show that for Chinese investors, even more than for those from France, the choice of location is very influenced by the characteristics of the host countries. Indeed, for Chinese investors, the Central African countries seem not to have similar characteristics so that their strategies are affected by the significant disparities between African countries and regions. In 2017, the GDP per capita in purchasing power parity of the AfSS (230,159 US $) is almost three times that of Central Africa (78,925 U $). The disparity in GDP per capita between CEMAC countries is relatively large (US $ 66,416) and has widened over the past two decades.

While it is always difficult to draw lessons in terms of economic policy, it nevertheless appears that attractiveness policies based on the targeted development of the assets of the territories should have a positive impact in order to attract investment. In reality, the solutions provided differ according to the nature and the priorities of the investors, which themselves change over time.

The objective of this paper was to understand the reasons which push Chinese firms to set up in Central Africa. Leaders must therefore establish an objective diagnosis of the attractiveness of Central African countries. They should give priority to the emergence of partnerships between the various actors (firms, public authorities, universities, research centers); the aim being to offer companies the best conditions for the development of new knowledge, skills and products. This objective can be achieved by various means, in particular technological cooperation programs making it possible to bring together actors belonging to the same sector, in the same place, etc.

As a result, the governments of Central African countries must prioritize industrialization, create a high number of jobs, limit unemployment among graduates and anticipate the brain drain, attract high-tech activities and horizontal investments. To do this, they must develop a policy framework favorable to lower transport costs, eliminate formal and informal constraints that hamper investment in the region, increase the flexibility of the labor market, and ensure that competition policy is effective. In the absence of a clear strategy and long-term development, there will be a reluctance to attract investors.

The authorities of the Central Africa region have very recently reaffirmed their desire to put in place the policies necessary to reduce budgetary and financial vulnerabilities, strengthen regional institutions, in particular CEMAC and ECCAS while making efforts to remove structural obstacles to the competitiveness. All of these reforms aim to help the countries of Central Africa to withstand existing shocks, strengthen their resilience and the ripple effects they exert in terms of economic growth and competitiveness of the countries.

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COMPETING INTERESTS

Author has declared that no competing interests exist.

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APPENDICES

Annex. Logit / Probit model estimation result

(Variable dependent, equal to 1 if the firm decides to choose the Central Africa region. This variable is equal to 0 otherwise).

	LOGIT		PROBIT	
	Chine	**France**	**Chine**	**France**
Market Potentiel	0.516(1.68)	0.735**(3.27)	0.319(1.91)	0.410***(3.30)
Agglomeration	0.305***(4.14)	0.268***(4.69)	0.189***(4.48)	0.155***(4.72)
Chômage	0.444*(2.08)	0.224(1.01)	0.262*(2.28)	0.131(1.08)
Tax	-0.351(-1.55)	-0.769**(-2.88)	-0.223(-1.62)	-0.485**(-3.13)
Infrastructure	-0.0863(-0.86)	-0.00627(-0.08)	-0.0528(-0.97)	-0.00142(-0.03)
R&D	-0.370(-1.22)	-0.266(-0.84)	-0.207(-1.17)	-0.154(-0.89)

*Z statistics in parentheses: * p <0.05, ** p <0.01, *** p <0.00; Reading : All variables are in logarithm (except the qualitative variable)*

Board. Signs obtained after estimation by the logit/probit model

Abbreviation	Variable	Expected effects	Effects obtained
PM	Harris Merchant Potential (1954, 321) $$MP_r = PIB_r + \sum_{j \neq r}^{R} \frac{PIB_j}{d(r, j)}$$	+	+
GREEN	Greenfields projects related to GDP (current §)	+	+
CHO	Unemployment rate	+/-	+
TAX	Taxation	–	–
INFRA	Basic infrastructure	+	–
R&D	R&D expenses	+	–

Annex 2.

Calculation of marginal impacts :

	(1) Chine	(2) France
Dependent variable equal to 1, if the firm decides to set up in Central Africa, 0 otherwise		
Market Potentiel	0.0577(1.64)	0.0897***(3.48)
Agglomération	0.0341***(3.48)	0.0327***(4.74)
Chômage	0.0496*(2.02)	0.0273(1.01)
Tax	-0.0392(-1.50)	-0.0939**(-2.80)
Infrastructure	-0.0096(-0.86)	-0.00627(-0.08)
R&D	-0.0413(-1.23)	-0.0324(-0.84)
Observations	263	369

*Z statistics in parentheses: * p <0.05, ** p <0.01, *** p <0.001 respectively indicate that the variable is significant at the threshold of 5%, 1% and 0.1%; Reading: All the variables are in logarithm (except the qualitative variable)*