Skilled Labor: A Lever for Foreign Direct Investment Inflows?

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Summary / Abstract
The aim of this study was to demonstrate the existence of a possible link between workforce quality and foreign direct investment inflows. We used a panel model to control for the heterogeneity of the observations in their individual dimensions, by considering a specific effect assumed to be certain. The results of this fixed-effects model show that FDI inflows are greater in countries where there is a movement of labor from low-productivity to high-productivity economic activities. This movement is possible when the labor force varies in qualitative intensity. It also emerges that an influx of FDI is linked to the ease of cross-border trade, which requires a focus on institutions, particularly those aspects that affect the expense, ease and reliability of doing business in a country.

Keywords: Quality Workforce, Foreign Direct Investment Inflow, Human Capital, Structural Transformation.

JEL Code : O12, O15, F21.

1. Introduction

In a world where production requires both capital and labor, Krugman (2000:73) believes that "...foreign investment is becoming increasingly important and is having a very visible influence on the global economy" [1]. This influence on the global economy manifests itself in the fragmentation of production processes, and in a growing range of goods and services that can now be produced far from the markets they are intended to serve [2]. In the 1980s, structural adjustment programs advocated the removal of barriers to make African countries more attractive. The same arguments were put forward by the Heavily Indebted Poor Countries Initiative (HIPC). However, African countries are not a destination for foreign investment. The low attractiveness of foreign investment in certain regions of the world is due more to a lack of sources of efficiency than to real barriers.

Reflecting on the new capitalism, Plihon (2009: 14) elaborates on the conditions favorable to investment, pointing out that in the industrial world, the two sources of corporate efficiency are technical creativity and commercial know-how [3]. Thus, it is interesting to note that the rise in offshoring in advanced countries mainly concerns imports of inputs from sectors with qualified labor rather than from sectors with unskilled labor [2]. The transformations brought about by this new capitalism therefore generate complexity in production and/or progress in physical and/or human capital. Foreign direct investment inflows, for example, go hand in hand with organizational change, which requires recipient countries to develop high-performance education systems. According to Crifo (2003: 352), "organizational change goes hand in hand with the employment of a skilled workforce, benefiting from greater autonomy, training resources and versatility, while at the same time requiring new individual skills" [4]. And permanent innovation, since in this process of convergence, innovation is a joint production of human capital accumulation, according to Van Elkan (1996).

For Krugman (2000: 76), "the export of capital to the Third World attracts attention because it exudes a perfume of exoticism, but the sums are small compared with those of the budget deficits of developed countries" [1]. By way of illustration, Africa's average annual share of the world's net foreign direct investment (FDI) inflows is 3.14% over the period 1970-2019, with 0.89% for northern Africa and 2.25% for sub-Saharan Africa. While West Africa received 1.02%, FDI inflows were evenly distributed between the other regions, with 0.41% for East and Central Africa and 0.40% for Southern Africa.

Data on FDI inflows to Africa show that the proportion of sub-Saharan Africa (70.8%) is higher than that of northern Africa (29.2%). West Africa ranks first with 30.7%, followed by Central Africa (14.4%), East Africa (14.0%) and Southern Africa (11.6%). Looking at the regional economic communities recognized by the African Union (AU), we note that the Community of Sahel-Saharan States (CEN-SAD) ranks first

for FDI inflows worldwide (1.7%), followed by the Economic Community of West African States (ECOWAS) and the Common Market for Eastern and Southern Africa (COMESA) with the same percentage (1.0%). Next come the Southern African Development Community (SADC) (0.8%), the Economic Community of Central African States (ECCAS) (0.4%), the Arab Maghreb Union (AMU) (0.4%), the Intergovernmental Authority on Development (IGAD) (0.2%) and the East African Community (EAC) (0.1%).

Unsurprisingly, intra-Community trade statistics place the CEN-SAD at the top of all African communities. Indeed, FDI inflows to Africa are concentrated in this sub-region, with a percentage of 51.4%. It is followed by COMESA (32.2%), ECOWAS (30.2%) and SADC (25.9%). For the other communities, the proportion of FDI inflows was below 15%. These were ECCAS (14.9%), UMA (7.6%), IGAD (6.5%) and EAC (4.7%). The low proportion of FDI (3.14%) destined for Africa, in a context marked by the growing importance of foreign investment and the commitment of African countries to building a continental free-trade zone, motivated this study.

Insofar as we know that "investing in Third World countries raises the productivity of their economies", our research has been enriched by the O-Ring approach. In so doing, we seek to demonstrate the existence of a possible link between the quality of the workforce and the flow of foreign direct investment inflows [1]. The underlying question is: can skilled labor be a lever for FDI inflows? This paper is divided into five main sections. The first part sets out the figures for FDI inflows. The second part attempts to highlight the approaches to foreign investment and ORing economic development. The third part provides an overview of the issue of workforce qualification. The fourth part attempts to show the link between skilled labor and outward investment. The final section looks at the implications for economic policy.

2.Analysis of Foreign Direct Investment Inflow Statistics
2.1 Share of Fdi Inflows Worldwide
The inflow of foreign direct investment is a major challenge for African economies, as this capital creates wealth. However, Africa is not a destination for FDI compared to other regions of the world. Between 1990 and 2022, FDI inflows to Africa averaged less than 3% of global FDI inflows. Across all continents, Europe is the leading destination, accounting for an average 34.6% of inflows. It is followed by the Americas with 30.2%.
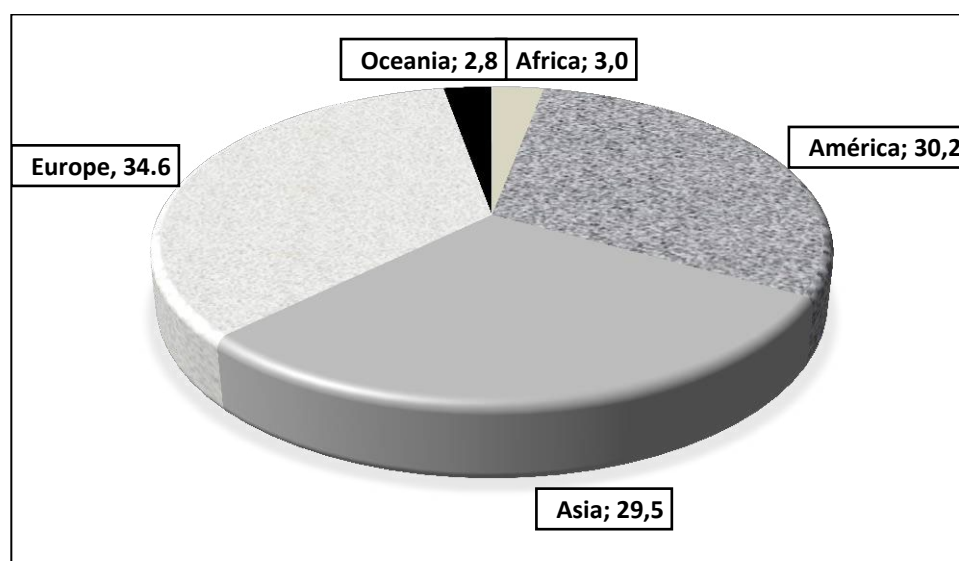

Graph 1: Fdi Inflows as A Proportion of World Fdi Inflows From 1990 to 2022
Source: Author's calculations based on UNCTAD_STAT data

Western Europe is the destination region for foreign direct investment flows into Europe (41.8%). This situation can be explained, among other things, by the absence of discriminatory barriers to foreign investment in new businesses or mergers and acquisitions. Indeed, capitalism has never ceased to evolve, and the driving force behind a company's wealth creation, according to Plihon (2009, 11), is its intellectual capital [3].

2.2 202 Fdi Inflows Worldwide Over the Period 1990-2022
FDI inflows (in millions of current dollars) averaged 1,053,445.1 worldwide. These inflows, for the different continents, were $364,284 million for Europe, $318,181.6 million for the Americas, $310,469.0 million for Asia, $31,296.0 million for Africa and $29,214.5 million for Oceania.
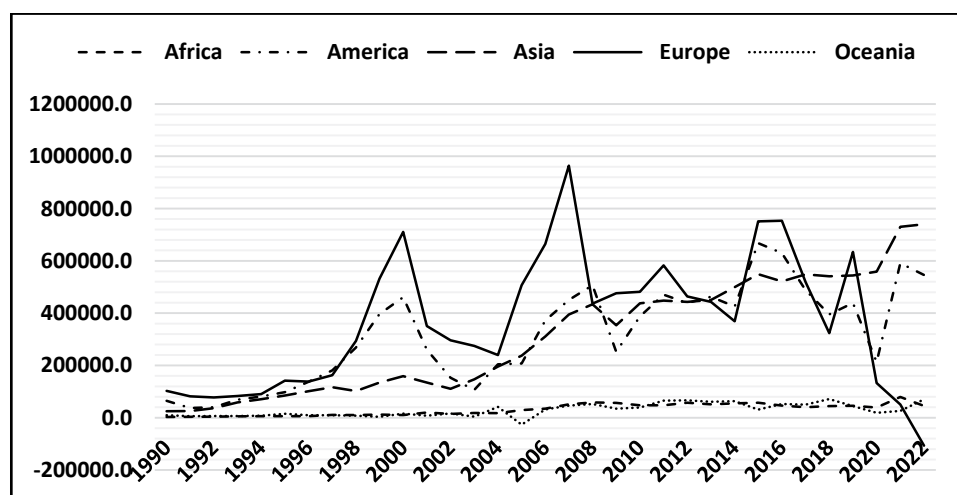
Graph 2: FDI inflows over the period 1990-2022
Source: author based on UNCTAD_STAT data

The graph shows that Asia is the continent where FDI inflows follow an upward trend over the entire period. In Africa and Oceania, FDI inflows remained stable until 2004, and increased slightly from 2006 onwards. Despite the high volume of FDI inflows in Europe and the Americas, the trend has been erratic.

2.3 Fdi Inflows: A Community and Regional Breakdown

Table 1 shows that the Community of Sahel-Saharan States (CEN-SAD), with an average annual share of 49.6%, and the Common Market for Eastern and Southern Africa (CMESA), with 38.1%, accounted for the highest shares of FDI inflows over the 2010-2019 period. The countries of the Central African Economic and Monetary Community (CAEMC), all members of ECCAS, accounted for the bulk of ECCAS FDI inflows over the period, on an annual average basis. The countries of the West African Economic and Monetary Union (WAEMU), on the other hand, are not a destination for FDI inflows from ECOWAS countries.

	2010	2011	2012	2013	2014	2015	2016	2017	2018
UMA	15,9	15,1	15,2	15,9	12,3	7,3	10,7	13,0	13,6
CEN-SAD	54,4	49,4	53,1	50,7	40,6	41,0	50,6	56,2	49,9
CEPGL	6,8	4,0	6,3	4,7	4,4	3,6	3,3	4,1	4,1
CMESA	44,6	23,1	38,6	35,9	31,4	33,9	42,2	49,0	43,9
CAE	8,2	8,1	8,4	7,5	7,1	5,7	5,4	8,3	10,1
ECCAS	9,8	5,5	7,0	-3,4	16,6	32,2	11,2	4,1	6,8
ECOWAS	25,5	40,2	27,2	26,7	21,6	17,0	26,8	25,6	20,7
IGAD	9,3	10,8	9,8	10,1	10,2	10,8	14,8	19,0	18,2
SADC	25,1	26,5	33,3	32,3	40,9	41,0	21,3	5,8	16,7
CAEMC	9,8	8,1	3,3	6,1	5,4	10,9	8,2	17,8	15,1
WAEMU	4,9	7,2	4,5	5,6	4,9	4,2	4,7	6,7	6,9

Source: Author's calculations based on UNCTAD_STAT data

Table 1: Share of Fdi Inflows from Communities (% of Total Fdi Inflows from Africa)

The economic communities in the top two places have the largest number of member countries, with 29 countries for CEN-SAD and 19 for COMESA . In 2010, CEN-SAD alone attracted more than half (54.4%) of total FDI inflows to Africa. The same was true in 2012 (53.1%), 2013 (50.7%), 2016 (50.6%), and 2017 (56.2%). These figures indicate the extent of these communities' markets. However, it seems risky to explain FDI inflows by the number of member countries.

Over the period, we note that the CEPGL has not managed to reach the 2010 level of FDI inflows. The same is true of the UMA, which has failed to reach the 2013 level. On the other hand, CEN-SAD is the only community to have attracted more than half of FDI inflows to Africa.

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Northern Africa	33,3	16,0	27,3	25,0	21,9	21,4	30,0	32,9	34,7	30,0	25,0	11,9	33,2
Sub-Saharan Africa	66,7	84,0	72,7	75,0	78,1	78,6	70,0	67,1	65,3	70,0	75,0	88,1	66,8
East Africa	23,1	26,8	27,2	32,7	28,1	24,5	27,9	32,2	27,7	24,3	26,4	17,6	26,4
central Central	9,1	5,1	6,6	-3,8	15,5	31,1	10,6	3,0	5,7	9,6	18,3	2,2	-1,2
Southern Africa	9,1	11,9	10,4	18,3	12,6	5,6	6,1	6,3	13,6	11,3	7,7	52,1	22,8
West Africa	25,4	40,3	28,5	27,8	21,9	17,3	25,4	25,7	18,2	24,8	22,6	16,3	18,8

Source: Author's calculations based on UNCTAD_STAT data

Table 2: Share of Fdi Inflows (% of Africa's Inflows)

FDI inflows also show that certain regions manage to attract a significant proportion of FDI inflows to Africa (table 2). Over the period 2010-2022, Sub-Saharan Africa (73.7%) has accounted for a higher proportion of FDI inflows than North Africa (26.3%) over the past ten years. East Africa (26.5%) is the sub-region with the highest average proportion of net FDI inflows, followed by West Africa (24.1%). Southern Africa and West Africa accounted for only 14.4% and 8.6% respectively of net FDI inflows over the 2010-2022 period. These figures show that, for the past 7 years, Central African countries have been struggling to reach the 2015 level of FDI inflows. West African countries have been unable to reach the 2011 level (40.3%) for over 10 years.

3. Ideas about Skilled Labor
3.1 Definition of Skilled Labor
According to the 2014 Larousse dictionary, "the workforce is a set of employees, especially workers, of an establishment, a region, a country". However, this definition is very restrictive if we want to grasp the importance of labor in the productive mix. The question of manpower lies at the heart of social life in every country. Adam Smith (1776) already pointed out that "perfected dexterity, in a workman, may be considered under the same point of view as a machine or instrument of industry which facilitates and shortens labor, and which, notwithstanding the expense it has cost, returns that expense with a profit."

However, the workforce includes not only workers (employees or salaried workers), but also individuals of working age seeking employment. The "work" referred to in this labor force is work that has been done (or is yet to be done), which goes well beyond its market dimension in terms of employment. A country's ability to internalize and promote innovation depends, among other factors, on the skills of its workforce. And this qualification of the workforce can only be understood once it is inscribed in the specific context in which it is produced. Thus, we can attempt to define a skilled workforce as a category of individuals of working age engaged in paid work, or seeking paid work of an intellectual and/or technical nature requiring in-depth knowledge in a particular given field. For the OECD (2009: 40), the highly-skilled workforce is measured by the proportion of the working population with tertiary education, i.e. short, medium or long university degrees [5].

3.2 Skilled Labor and Human Capital
The notion of skilled labor refers us to the concept of human capital, which "designates a stock of physical and intellectual characteristics that enable an individual to participate in productive activity. This stock is made up in part of acquired characteristics (knowledge resulting from education, training, know-how acquired through productive activity, etc). [6]. The World Bank (2009:146), points out that "skilled labor, which embodies human capital, personal education, skills and talents, generates higher economic profitability where it is abundant." It is accepted that investment in education enables each individual to accumulate human capital, made up of knowledge, know-how and experience [7,8]. For an individual, this investment in human capital involves expenditure on education, vocational training or health [6].

The World Bank has recently developed a human capital index that measures the contribution of health and education to the productivity of a country's next generation, based on microeconometric studies. It reflects a country's productivity level in relation to its potential. On the other hand, a human capital index has been published by UNCTAD on its "unctactad statistics database" site since the 2000s.

These UNCTAD statistics show that Tunisia is the only African country to have recorded a human capital index above 50 since 2002, with an average index of 53.8 over the period 2000-2018. Algeria has recorded a human capital index above 50 since 2012. Mauritius and Morocco respectively recorded human capital indices above 50 from 2013 and 2017. However, from 2001 to 2018, all these countries have a human capital index above 40. Of the 49 African countries, just 8 have a human capital index above 40 over the period 2000-2018, namely: Tunisia, Mauritius, Algeria, Seychelles, Libya, South Africa, Egypt and Botswana. These include Tunisia, Mauritius, Algeria, Seychelles, Libya, South Africa, Egypt and Botswana. Morocco's index has been above 40 since 2001, with an average index of 46.1.

Schultz T. W. (1981), pointed out that "there is little doubt that investment, which improves people's capabilities, creates differences in economic growth and in satisfaction with consumption [9]. We now know that the neglect of human capital skews the analysis of economic growth." A number of works have been inspired by Schultz's understanding that progress in health and education are key variables in explaining economic development in the 20th century. This work has attracted a great deal of interest, judging by the number of Nobel Prize winners among its main authors. The new growth theories teach us that

the differences observed in both GDP per capita and productivity growth rates (in the short and medium term) from one country to another are largely due to differences in research and development (R&D) systems and policies, and also to differences between education systems insofar as these systems condition the supply of skilled labor capable of generating technical progress [10].

An illustrative example of the role of education and research in technology diffusion is that of the "green revolution". Starting with a fundamental innovation in the hybridization of plant seeds, the developing countries with the most highly qualified workers, research facilities and universities were the best placed to produce new qualities of rice and wheat adapted to local conditions [10]. By associating an individual's level of qualification with the probability of efficiently carrying out a productive task, Kremer (1993: 551) revives the economics of micro-development [11]. However, as Krugman (2000: 214) points out, governments don't necessarily act in the national interest, especially when it comes to cutting-edge microeconomic interventions [1]. After all, half of the wealth produced in our societies is publicly appropriated or redistributed. So, if such sums are not capable of resolving pauperism, it's because we lack the political will to do so [12].

The situation of impoverished populations in certain oil-rich or resource-rich countries is not the result of a real gap between the official discourse of the political authorities and the various actions taken. Improving this situation therefore depends on the real aims pursued by the political authorities, in particular political will. In Central Africa, for example, economic growth has not significantly reduced unemployment and inequality. In 2018 the unemployment rate reached 4.7%, in line with the CEMAC oil countries, Gabon with an unemployment rate of 20%, followed by Congo (11%), Equatorial Guinea (7.6%), Chad (5.9%) and Cameroon (4.2%) (AfDB, 2019: 17). A model of society that keeps a large part of the population in poverty can have a considerable impact on the quality of the workforce, since this category of the population is unable to invest in education and health.

Poverty is a deprivation of capabilities. And capability is a set of vectors of functioning which indicate that an individual is free to lead such and such a life (Sen, 2000: 77). Sen's notion of capability promotes the freedoms of each individual, and makes it the duty of every society to encourage them, so that poverty and inequality can be reduced. As a person's capability has a relevant relationship with his or her well-being (Sen, 2000: 77), a poor household, deprived of capability, cannot achieve well-being, since it cannot assemble all the vectors of functioning. For this author, it's a question of rethinking inequality through the fight against social inequalities in order to achieve real equality.

Progress in the field of education is recognized as an essential variable, as the strengthening of the education system conditions the supply of skilled labor. An illustrative example of the role played by education and research in technological diffusion in developing countries is the "green revolution" (in China, for example). Similarly, countries rich in natural resources (e.g. oil) that have succeeded in raising their level of development are those

that have strengthened their human capital (e.g. the Netherlands). However, according to Transparency International, oil-rich African countries are among the most corrupt. In 2020, there are ten (10) countries among the major African oil producers, with only Tunisia ranking 69th (score of 44). Libya is the leading producer, ranking 173e (score of 17), Nigeria 149e (score 25), Algeria 104e (score 36), Angola 142e (score 27), South Sudan 179e (score 12), Egypt 117e (score 33), Congo 165e (score 19), Gabon (score 30), Chad 160 (score 21), Sudan 174e (score 16) and Equatorial Guinea 174e (score 16).

In countries with high levels of corruption, spending on education is lower. As a result, these countries are unable to promote research and development (R&D) systems and policies, as well as education and healthcare systems that condition the supply of skilled labor. For D. Acemoglu and J. A. Robinson, inclusive economic institutions "also pave the way for the two engines of prosperity, technology and education". However, inclusive economic institutions must be set up by the state, by promoting the creation of market institutions, building infrastructure and providing public services. In the vast majority of African countries, especially those with a high level of corruption, the state has been divesting itself of these functions for decades.

In this context, the promotion of a skilled workforce depends on each household's ability to finance the training of its members. According to the World Bank (1995: 44), households do not hesitate to invest in the health and education of their members, as the benefits generally outweigh the costs. Thus, all other things being equal, the higher the per capita final consumption expenditure of households, the greater the human capital and therefore the more abundant the skilled workforce for these households. However, the World Bank (1995: 44), underlines households often under-invest in human capital.

While education is a good thing for training a skilled workforce, according to the World Bank (2009: 155), education also has the effect of increasing the speed of mobility of skilled workers, and this migration has been on the rise since the 1970s in the developing countries of Africa, the Caribbean and Central America. With the African world suffering from education problems and seemingly condemned to remain in unskilled labor sectors, there is no guarantee that foreign investment will flow into these economies, especially as the few skilled workers migrate abroad.

4. Econometric Approach

The aim here is to show the possible links between the explained variable (foreign direct investment inflows) and the various explanatory variables. While the explained variable is known, the explanatory variables are difficult to grasp, since the authors are not unanimous. However, it has been shown that large FDI inflows are concentrated in countries where the conditions for FDI are favorable (World Bank, 2009). These conditions include a skilled workforce, linked to education and health systems (D. Acemoglu and J. A. Robinson). New motivations for FDI inflows include the presence of information and communication technologies (ICT), energy (IMF (2007), World Bank (2009))

and structural change (Amable et al., (1997), World Bank (2009)) [2,13]. Among the oldest motivations for FDI inflows are those associated with control over raw materials (natural capital) and those linked to Vernon's product life cycle, including the presence of a private sector (presence of domestic and/or foreign companies), energy and transport (quality of infrastructure).

4.1 Explanatory Variables for Foreign Direct Investment Inflows

The United Nations Conference on Trade and Development (UNCTAD), through its UNCTAD STAT database, has developed a number of indicators, including the eight categories of the Productive Capacity Index: human capital, natural capital, energy, transport, ICT, institutions, private sector and structural change. The productive capacity index is the geometric mean of the values of the eight categories that enable a country to achieve maximum production. Our sample comprises five countries: Cameroon, Central African Republic, Chad, Congo and Equatorial Guinea. The sample is based on macroeconomic data covering the period 2000 to 2022.

The gravity model, which has been very successful in explaining regional trade flows, has been used by some authors to explain FDI inflows. However, while in trade flows goods move from one country to another, capital flows from one country (investor) to another (recipient), and the distance is zero, since financial transactions take place via open-ended investment companies, mutual funds and bonds. Yang (1999: 43), seeking to model the impact of human capital on the geographical distribution of FDI in China, used a Cobb-Douglas production function with a constant-return technology of the form $y = Ax^\beta$ where y and x represent income per worker and capital per worker respectively [14].

A well-known simple function is consumption as a function of income (C=aY), to which we associate autonomous consumption. This function can be used to explain FDI inflows. Assuming that FDI inflows represent consumption for the recipient country, and that favorable conditions have to be met, which in the consumption function represent income. Autonomous consumption can be assimilated to FDI inflows intended to serve regional markets.

4.2 Model Presentation
Thus, the model to be specified can be written as follows:

$$EIDE_{it} = f(CH_{it}, CN_{it}, EN_{it}, TP_{it}, TIC_{it}, INS_{it}, SP_{it}, CS_{it})$$

With,

$EIDE_{it}$, FDI inflows from country i at time t as a percentage of FDI inflows to Africa ;

CH_{it}, the human capital of country i at time t ;

CN_{it}, the natural capital of country i at time t ;

EN_{it}, the energy of country i at time t ;

TP_{it}, transportation in country i at time t ;

TIC_{it}, the information and communication technologies of country i at time t ;

INS_{it}, the institutions of country i at time t ;

SP_{it}, the private sector of country i at time t ;

CS_{it}, the structural change in country i at time t.

4.3 Model Application
Model verification and validation are carried out by means of tests, in particular model verification tests and model validation tests. Pre-tests include stationarity, if possible, cointegration and model selection.

4.3.1 Study of Variable Stationarity
Unit root tests are used to analyze the stationarity of time series. However, the application of these tests to panel data is recent. The most frequently used tests are those of Levin and Lin (LL) and Im, Pesaran and Shin (IPS). The Levin and Lin test are based on estimating the long-term variance of residuals using a Bartlett-type kernel function and a truncation parameter common to all countries [15]. This test is only robust when its kernel function is modified by the method of Newey and West (1994) [16]. Thus, Levin and Lin's test leads to a rather counter-intuitive result.

The most suitable test is the IPS test, as it considers the heterogeneous dimension of the autoregressive root. Applying the IPS test to the study variables, we note the rejection of non-stationarity whatever the hypothesis formulated on the deterministic component (model with individual effects with or without deterministic trends). And the test on first difference variables reassures us that, in general, the variables are stationary to degree 1 (integrated to order 1). However, it should be noted that the rejection of non-stationarity does not imply the stationarity of the variables of the five countries in the sample, but means that there is at least one country for which there is no unit root.

Variables	Level variables		First difference variables	
	Trendless model	Trendy model	Trendless model	Trendy model
CH	0.9999	0.1114	0.0000	0.0009
CN	0.2527	0.6898	0.0001	0.0105
CS	0.4266	0.2349	0.0000	0.0000
EIDE	0.0902	0.4450	0.0000	0.0000
EN	0.4050	0.6019	0.0017	0.0614
INS	0.3316	0.3085	0.0000	0.0000
SP	0.3453	0.0167	0.0002	0.0348

TIC	0.9939	0.8423	0.0002	0.0211
TP	0.1064	0.0021	0.0000	0.0000

Table 3: Stationarity Test for Study Variables

4.3.2 Study of the Cointegration of Variables

The existence of stationarity for all panel variables leads us to study the existence of a longterm relationship between these variables. In other words, we study the existence of a cointegrating relationship by applying Kao's cointegration tests to panel data. These tests consist in testing for the presence of a unit root in the estimated residuals.

```
Kao Residual Cointegration Test
Series: EIDE CH CN CS EN INS SP TIC TP
Date: 11/07/23   Time: 18:52
Sample: 2000 2022
Included observations: 115
Null Hypothesis: No cointegration
Trend assumption: No deterministic trend
User-specified lag length: 1
Newey-West automatic bandwidth selection and Bartlett kernel
```

	t-Statistic	Prob.
ADF	-1.737950	0.0411

Residual variance	0.000299
HAC variance	0.000214

Table 4: Cointegration Test

From the results of the cointegration tests, we see that all the statistics are below the critical value of the normal distribution for a threshold of 5% (-1.74). As a result, all these tests require the existence of a cointegrating relationship. Since the aim is to carry out cointegration tests on panel data and obtain an estimate of the cointegrating vectors, it is necessary to apply an efficient estimation method, particularly one that considers the long and short term.

4.3.3 Choosing the Right Model

Panel models make it possible to control the heterogeneity of observations in their individual dimensions, either by considering a specific effect assumed to be certain (fixed effects), or by considering a specific unobservable effect (random effects). The choice between the fixed-effects model and the random-effects model is made using the Hausman test. Applying the Hausman test, our results show that the P-value is less than 5%. This means that the null hypothesis of the test has been rejected. In other words, we accept the hypothesis that the fixed-effects model is the consistent model.

```
Correlated Random Effects - Hausman Test
Equation: Untitled
Test period random effects
```

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Period random	34.038729	17	0.0083

```
** WARNING: estimated period random effects variance is zero.
```

Table 5: Hausman Test

After running the fixed-effects model, the result is as follows.

```
Dependent Variable: D(EIDE)
Method: Panel EGLS (Cross-section SUR)
Date: 11/07/23   Time: 20:20
Sample (adjusted): 2001 2022
Periods included: 22
Cross-sections included: 5
Total panel (balanced) observations: 110
Linear estimation after one-step weighting matrix
```

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(CH)	-0.001418	0.000946	-1.499715	0.1373
D(CN)	-0.000379	0.000685	-0.553311	0.5815
D(EN)	-0.000146	0.000588	-0.248256	0.8045
D(TP)	-0.000599	0.000275	-2.176201	0.0322
D(TIC)	-0.000513	0.000652	-0.786999	0.4334
D(INS)	-3.92E-05	0.000681	-0.057620	0.9542
D(SP)	1.95E-05	0.000687	0.028373	0.9774
D(CS)	0.000469	0.000204	2.295497	0.0241
C	0.008788	0.040460	0.217209	0.8285
EIDE(-1)	-0.641663	0.090472	-7.092367	0.0000
CH(-1)	-0.000791	0.000701	-1.127699	0.2625
CN(-1)	-0.000772	0.000476	-1.622323	0.1083
EN(-1)	-0.000715	0.000492	-1.452435	0.1499
TP(-1)	-0.000540	0.000203	-2.655694	0.0094
TIC(-1)	8.65E-05	0.000430	0.201108	0.8411
INS(-1)	0.000262	0.000588	0.444983	0.6574
SP(-1)	0.002010	0.000526	3.819564	0.0002
CS(-1)	0.000352	0.000117	3.011609	0.0034

Table 6: Model Estimation

The Jarque-Berra test and the non-correlation test on the model residuals show that they follow the normal distribution (Appendix 1) and are non-correlated (Appendix 2). The results of the model can therefore be interpreted.

4.3.4 Interpretation of Results
Analysis of the model results reveals that:
- In the short term, only transport and structural change have a negative and positive effect respectively on FDI;
- In the long term, we note that the correction mechanism governing the dynamics of the variables is indeed present, as the coefficient of the model's restoring force is significantly negative and less than 1 in absolute value. The results show that only three variables out of eight significantly explain long-term FDI. These are transport (negative impact), private sector and structural change. The last two variables explain FDI positively.

5. Economic Policy Implications
In view of the results of the econometric estimates, a number of economic policy implications can be envisaged. The results show that, in both the short and long term, structural change has a positive effect on FDI inflows. According to the OECD, the indicator structural change refers to the movement of labor and other productive resources from low-productivity to high-productivity economic activities. This shift is currently reflected in the sophistication and variety of exports, fixed capital intensity and the share of industry and services in total GDP.

African countries therefore need to implement the best policies to encourage the emergence of the sectors most likely to bring about the productive transformation of the economy as a whole. Lectard (2017: 21), indicates that export diversification and sophistication have emerged as the two indicators for measuring and quantifying industrial transformation. However, over the period 1995-2020, UNCTADstat data on extra- and intra-Community exports of manufactured goods and intra-group trade in goods as a percentage of total trade confirm the difficulties of Central African countries highlighted by de Sylviane Guillaumont Jeanneney and Patrick Guillaumont (2017: 1) [17].

Structural transformation also means achieving economies of scale, and therefore reducing production costs. These production costs can be captured through the real effective exchange rate (REER). Indeed, the calculation of the real effective exchange rate (REER), "aims to compare the evolution of production costs of internationally traded goods at home and abroad". With the exception of Gabon, the evolution of the REER from 1995 to 2016 indicates difficulties for the other CEMAC countries in their efforts to reduce the production costs of exported manufactured goods, particularly over the period 2012 to 2016. This situation may explain the wide disparity highlighted by authors Sylviane Guillaumont Jeanneney and Patrick Guillaumont (2017: 1) for the trade performance of CEMAC and UEMOA countries [17].

In the long term, the private sector has a positive impact on FDI

inflows. According to UNCTAD, the private sector is defined by the ease of cross-border trade, which includes the time and monetary costs of exporting and importing, and business support in terms of domestic credit, speed of contract execution and time to start a business. CEMAC countries therefore need to improve their business environment in order to attract more FDI. However, initiatives to improve the business climate have been taken at both African (NEPAD) and regional (CEMAC and UEMOA) levels.

However, these initiatives have not focused on the institutions that form part of the business climate, namely those aspects that affect the expense, ease and reliability of doing business in a country [18]. Similarly, these aspects may be known, but difficult to address adequately because of poor governance. Corruption, for example, one of the social factors affecting the business climate, is a weapon of political management for some African decision-makers. According to Transparency International, the CEMAC countries have low corruption perception indices, which means that they are countries with high levels of corruption. As CEMAC countries are underdeveloped, the disincentives associated with infrastructure investment and opportunism are constraints that cost economic agents (companies and households), as they have a negative impact on the economy as a whole. The risk of opportunism increases transaction costs, i.e. the cost of negotiating a contract [19]. As a result, contracts will most often be incomplete, failing to consider all possible events.

6. Conclusion

This study validated the analyses of micro-development economics, in particular the behavioral problem that characterizes bad faith behavior aimed at individual gains beyond the normal profit of the exchange. The results confirm that FDI inflows are greater in countries where there is a movement of labor and other productive resources from low-productivity to high-productivity economic activities. This movement of labor is only possible when it varies in qualitative intensity. And it is this skilled workforce that is most in demand in manufacturing - a sector more capable of bringing about the productive transformation of the economy as a whole. The results also show that an inflow of FDI is linked to the ease of cross-border trade, which includes the time and monetary costs of exporting and importing, and business support in terms of domestic credit, speed of contract execution and the time needed to start up a business. For these factors, the imperative is to focus on institutions, particularly those aspects that affect the expense, ease and reliability of doing business in a country. However, poor governance and the disincentives associated with infrastructure investment and opportunism are constraints that cost economic agents (businesses and households) because they have a negative impact on the economy as a whole. Skilled labor is therefore a lever for FDI inflows, as it is more in demand in manufacturing, a sector more likely to bring about the productive transformation of the economy as a whole [19-31].
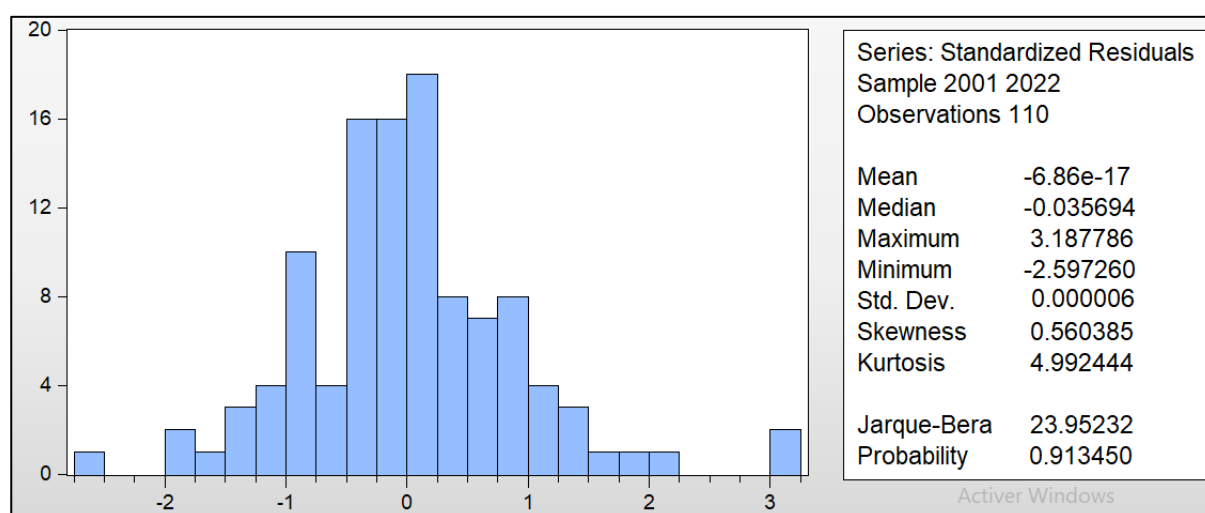
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Appendices

Appendix 1: Residual normality test

Appendix 2: Residual non-correlation test