# Drivers of foreign direct investment: new evidence from West African regions

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## Abstract

**Purpose** – This paper aims to empirically investigate the factors attracting foreign direct investment (FDI) inflows into emerging economies.

**Design/methodology/approach** – This study uses secondary data from the World Bank and the Global State of Democracy Indices of 16 West African countries (WACs) over the period from 1989 to 2018. Fixed- and random-effects econometric regression models are used to assess the nexus between 12 macroeconomic indicators (including political risk and cultural factors) and FDI inflows into WACs.

**Findings** – The critical drivers of FDI inflows into WACs are the richness of natural resources, market size or gross domestic product (GDP), imports and exports of goods and services, trade openness and the currency's strength as measured by the exchange rate. The result also reveals that French-speaking countries attract more FDI than other English-speaking countries. The previously cited determinants of FDI, such as infrastructural development, inflation, tax and political stability, are insignificant in determining FDI inflows into WACs.

**Originality/value** – This study uncovers the critical drivers explaining the FDI inflows into WACs, where FDI accounts for 39% of external finance. The study's contribution is that Francophone WACs attract more FDI than Anglophone WACs. The most important drivers of FDI are abundant natural resources, GDP, imports, exports, trade openness and exchange rate.

**Keywords** Foreign direct investment (FDI), West Africa, Sub-Saharan Africa, Fixed and random effects

**Paper type** Research paper

## 1. Introduction

Foreign direct investment (FDI) is a key driver of the economic development of both developed and developing economies (Udemba and Keleş, 2022). The past years have witnessed an increase in FDI inflows into the African countries, representing 39% of their external finance (Jaiblai and Shenai, 2019; Martins *et al.*, 2021). A substantial body of studies tried to attribute this increase to several divergent factors (Ajide *et al.*, 2022). For instance, Anyanwu (2012) reported that the quality of electricity, roads, and other telecommunication infrastructures influence FDI in Africa. Jaiblai and Shenai (2019) argued that the increase in FDI in Africa is attributed to better infrastructure, a lower income level, and a smaller market size. Durmaz (2017) reported that economic growth or market size, level of democracy, and trade openness influence FDI. However, Siddiqui and Iqbul (2018) concluded that trade openness does not seem to have an influence on FDI inflows into Africa. Tocar (2018) argued that policies geared towards stimulating export, employment, expertise, and knowledge are important drivers of FDI in developing countries. Despite the abundant studies investigating

the determinants of FDI, West African countries (WACs) are greatly understudied in the FDI literature. Furthermore, there is a need to assess whether the existing literature and the FDI's determinants previously found in the African region are exerting the same impact on FDI inflows into WACs.

This study fills the gap and contributes to the existing literature on FDI by providing insight into the current determinants of FDI into WACs, where 39% of their external finances come from FDI. In order to bridge this research gap, this paper investigates the impact of 12 key factors on FDI inflows into 16 WACs using a period ranging from 1989 to 2018. The 12 factors are telephone subscription, tax rates, gross domestic product (GDP), GDP growth rate, inflation, natural resource rent, exchange rate, trade openness, political risk, culture, exports and imports of goods and services. The panel data are taken from the World Bank (World Development indicators) and the Global State of Democracy Indices. For econometric analysis, the current study employs the random-effects and fixed-effects regression models in addition to the descriptive statistics.

The rest of the paper is structured as follows. Section 2 reviews the relevant literature. Section 3 provides the methodology used to investigate the factors attracting FDI into WACs. Section 4 presents and discusses the results. The theoretical and practical implications, limitations and suggestions for further research, and the conclusion are presented in Sections 5, 6 and 7, respectively.

## 2. Literature review

### 2.1 Context

FDI is the process whereby citizens of one country (usually called the source country) gain ownership of assets located in another country (traditionally called the host country) to control production, distribution and other activities of a business in that country (Ghahroudi *et al.*, 2018; Yoo and Reimann, 2017). With FDI, the investor, who is usually not a resident of the host country, aims at acquiring a lasting interest and control in an industry (Ajide *et al.*, 2022). When FDI involves transferring the capital from a source country to a host country, the transfer should control substantial equity shareholdings (Areneke *et al.*, 2022), and some assets should be shifted into the host country (Padmanabhan *et al.*, 2020). FDI can be classified into different types depending on the investor/the source country or the host country's perspectives (Yoo and Reimann, 2017).

From the source country's perspective, Caves (1971) classifies FDI into horizontal, vertical or conglomerate FDI. Horizontal FDI is when the source country produces similar products/services to the host country. Vertical FDI is further classified into backward and forward FDI. Backward FDI is when the source country exploits raw materials from the host country, whereas the forward FDI is when the source country establishes distribution outlets for its products in the host country. Conglomerate FDI is a combination of both horizontal and vertical FDI.

From the host country's perspective, Moosa (2002) classifies FDI as import-substituting, export-increasing or government-initiated FDI. The import-substituting involves the production of goods imported by the host country. The export-increasing involves investments geared toward exporting raw materials and other intermediate goods to the source country. The government-initiated FDI is when the governments provide initiatives to invest in the country to reduce the balance of payment deficits (Tocar, 2018).

Lastly, FDI is classified as expansionary or defensive. FDI is expansionary when it is designed to exploit firm-specific advantages in the host country. However, it is defensive when it aims to seek cheap labor in the host country to reduce production costs (Chen and Ku, 2000).

*2.2 Theories*
Given the significant importance of FDI, financial analysts and economists have developed
various theories to explain the determinants of FDI, what makes a country attractive for FDI
inflows and why some entry modes are preferred to others (Paul and Feliciano-Cestero, 2021).
These theories explain why some countries are more successful in receiving FDI than other
countries (Moosa, 2002). In this paper, the different theoretical frameworks are grouped into
four main theories: the ones assuming perfect markets, imperfect markets, other theories of
FDI and theories based on other variables.

*2.2.1 Theories assuming perfect markets.* These theories are built around three
hypotheses: output and market size, differential rates of return and portfolio
diversification. Differential rates of return assume that capital flows from countries with
lower rates of return to those with higher rates of return. Thus, this study examines the
association between the magnitude of FDI flowing into countries and their rates of return.
However, this theory is not consistent since some countries might experience simultaneous
FDI in the form of inflows and outflows. Moreover, profit maximization is not the only reason
explaining FDI; there may be other cogent reasons (Mody, 2006).

The diversification hypothesis postulates that risk cannot be ignored, and investors
need to form a well-diversified portfolio. As a result, investors are not always driven by the
high expected rates of return but also by the possibility of reducing risk, which may explain
FDI inflows into other countries. However, this theory has limited predictive ability given
that both measures of risk and return are based on historical data (Bajrami and
Zeqiri, 2019).

The market size hypothesis assumes that FDI inflows into a host country are dependent
on the host country's market size proxied by the size of GDP. This hypothesis further
explains that when countries achieve a remarkable increase in their market size, they become
the target for FDI inflows as they warrant the exploitation of economies of scale. This theory
supports the neoclassical's model of domestic investment. It further explains that FDI of this
nature mainly supports import-substituting investments (Park, 2000). Thus, this study tests
the output and market size hypothesis to ascertain whether the market size of WACs proxied
by the GDP drives FDI inflows into the region. Given that high inflation rates, taxes and
exchange rates can affect investment returns in a country, this study also uses inflation and
exchange rate (as proxies for differential rates of return and risk) to determine whether they
drive FDI inflows into the WACs.

*2.2.2 Theories assuming imperfect markets.* Hymer (1976) developed these theories that
consist of several hypotheses, from which industrial organization, international, eclectic and
location are explained in this study. The industrial organization hypothesis assumes that
foreign firms face several disadvantages when competing with domestic ones. As a result,
firms in the source country should have specific comparative advantages associated with
specific intangible assets, such as managerial skills, patent-protected skills and a famous
brand name, contributing to a monopolistic industry (Moosa, 2002).

The international hypothesis assumes that FDI inflows are triggered by firms seeking to
replace the market transactions with international ones. It further explains that firms invest
in host countries to save certain market costs associated with imperfect markets of their
intermediate products, such as buyer uncertainty, bargaining problems and time lags
(Bajrami and Zeqiri, 2019).

The eclectic theory assumes that when FDI flows into the host country, the source country
identifies the demand for a particular commodity in the host country by establishing a local
firm in the same region. Otherwise, the source firm expands using other channels, and the
most efficient channel is by developing foreign subsidiaries (Mody, 2006).

The location hypothesis finally assumes that FDI inflows are based on the fact that some
factors of production (such as natural resources and labor) are internationally immobile. For

example, a factory would be possibly located in a host country endowed with gold if gold is an important raw material for this factory in the source country (Mody, 2006). According to this theory, FDI could also be driven by cheaper labor costs in the host country as compared to the source country (that is, factors established by the USA in China) (Horst, 1972).

To conclude, this study examines the impact of macroeconomic factors, such as telephone subscribers, exchange rate, natural resource rent, trade openness and exports and imports of goods and services, on FDI inflows, contributing to the organizational, international, eclectic and location hypotheses.

*2.2.3 Other theories.* In addition to the above two theories, this study discusses the currency area, the political risk and country risk hypotheses. Aliber (1970) proposes that FDI can be explained based on the relative strength of the host countries' currencies. This hypothesis postulates that firms located in countries with strong currencies have a higher propensity to invest abroad than firms located in weaker currency countries. The theory further explains that the weaker the currency, the easier it is for the source country to export from the host country, thereby attracting more FDI (Gottschalk and Hall, 2008).

The political risk and country risk theories argue that political instability discourages FDI inflows. The hypothesis explains that the host country's political risks are not conducive to FDI given the unanticipated legal or fiscal framework modifications, which may adversely impact an investment's economic outcome. Examples include adverse tax policies, repatriation restrictions, currency depreciation, trade barriers and inflation (Moosa, 2002). Thus, this study adds to the international debate by examining the impact of the exchange rate, tax rates and other ignored variables, such as political risk and culture, on the FDI inflows into WACs.

*2.2.4 Theories based on other variables.* This part discusses the importance of several other variables in attracting FDI, which are divided into three major hypotheses. First, a politically stable country and a conducive business environment are effective in enticing FDI. The empirical findings investigating the impact of political stability on FDI are unclear and inconclusive. The business environment plays a crucial role in business development, and investors prefer to invest in safe environments to protect their beings and properties. Besides political stability, the rules and regulations that govern businesses in a country can determine the size of businesses' operational costs (Buckley *et al.*, 2007). According to Buckley *et al.* (2007), profit-seeking investors usually prefer countries with appropriate rules and regulations that support the well-function of the market. Some researchers such as Hausmann and Fernandez-Arias (2000) and Jaspersen *et al.* (2000) support the view that there is no correlation between the political stability index and FDI, while Loree and Guisinger (1995) conclude that a negative political index harms FDI.

Second, countries with natural resource endowments are successful in attracting more FDI. Investors sometimes invest in countries that can supply them with the raw materials needed for their production. Through backward integration, investors can invest in countries endowed with the natural resources that can provide the basic raw materials needed for production in the source country. ODI (1997) believes that even if other determinants of FDI are negatively correlated and do not attract FDI, the presence of natural resources can bring in more FDI irrespective of the presence of other factors. Lastly, countries with larger market sizes and higher market growth rates tend to attract more FDI than their counterparts. Investors are expected to show a preference to invest in countries with larger market sizes and growth rates. According to Charkrabarti (2001), foreign investors considering investing abroad usually prefer to invest in large and fast-growing markets. Although Nigh (1985) records a weak positive correlation between GDP growth rate and FDI in developing countries, UNCTAD (1998) suggests that some investors prefer to invest in relatively smaller market size countries but are more open to external trade.

Thus, the study extends the FDI knowledge by using recent data on macroeconomic indicators, such as GDP growth rate, GDP market value, natural resources rent, trade openness and political risk, to investigate their impacts on FDI inflows into WACs. Given that most prior studies ignore the political risk and cultural factors that might have detrimental effects on FDI inflows into WACs, our study expands the existing literature on FDI by taking into account these two variables.

### 2.3 Empirical review

There are a large number of studies analyzing the drivers of FDI with inconclusive results. For instance, Demirhan and Masca (2008) found that telephone lines, per capita growth rate and trade openness are statistically significant with a positive impact on FDI. Furthermore, the tax rates and inflation are found to be statistically significant but with a negative impact. Habib and Zurawicki (2019) argued that corruption defers FDI, while Gupta and Ahmed (2018) found a nonsignificant relationship between corruption and FDI, concluding that corruption does not drive FDI in emerging economies. Moreover, Mottaleb and Kalirajan (2010) highlighted the importance of GDP, its growth level and the presence of a good business environment in stimulating FDI. Furthermore, Buckley et al. (2007) found that high levels of political risk, the cultural proximity throughout host countries, the market size, natural resources endowment and geographical proximity contribute to the outwards direct investment in China.

In addition, Wang and Swain (1995) found that the market size of the host country positively impacts FDI inflows while the cost of capital and the political instability negatively impact FDI. However, they found little evidence related to the effects of import variables and tariff barriers. Using data from 2004 to 2013 on 20 emerging and advanced economies, Saini and Singhania (2018) found that trade openness, gross fixed capital formulations and efficiency variables positively affect FDI in emerging economies. In contrast, freedom index, trade openness and GDP growth increase FDI in advanced economies. Siddiqui and Iqbul (2018) reported no relationship between trade openness and FDI in developing economies.

Dimitrova et al. (2020) review study highlighted the drivers of FDI by focusing on the Middle East and North Africa (MENA) countries and ignoring WACs and other African regions. Onyeiwu (2003), cited in Dimitrova et al. (2020), reported that trade openness has a positive relationship with FDI, while corruption negatively affects FDI. Mina (2007) concluded that institutional and infrastructure qualities and trade openness are the key drivers of FDI, whereas human capital, oil prices, oil production and reserves negatively affect FDI. Durmaz (2017) reported that trade openness, market size and level of democracy stimulate FDI, whereas labor costs, GDP growth, taxes and external debts defer FDI. Aziz (2018) reported a negative relationship between the exchange rate and FDI. However, Aziz and Mishra (2016) concluded that the exchange rate, trade openness, human capital, market size, GDP growth, preferential trade agreements and institutional quality drive FDI in developing economies. Salem and Baum (2016) concluded that the most critical drivers of FDI in developing economies are GDP growth, market size and political stability.

### 3. Data and methodology

#### 3.1 Data

The study uses secondary data from the World Bank (World Development indicators) and the Global State of Democracy Indices. The study is for 30 years from 1989 to 2018. Based on the research hypotheses, theories of FDI and data availability, the study is limited to 12 variables

covering all the 16 countries in West Africa. Due to data constraints which are typical for developing countries, some variables are used as proxies for other variables (Korsah and Gyimah, 2019). The growth rate of the local market is operationalized using the GDP growth rate, the market size is proxied by GDP, the cost factor is represented by the inflation rate, the local currency valuation is represented by the exchange rate of the dollar and infrastructure is proxied by access to telephone subscription. For more information, Table 1 presents the sources of data and the definition of each variable.

### 3.2 Methodology

Fixed-effects and random-effects models are used to ascertain the drivers of FDI inflows into WACs. For the fixed-effects model (Equation 1), the study tests for the individual entity effect in the model, and dummy/binary variables are formed for each country. Given 16 entities (i.e. country), 15 binary variables are included, with one entity used as the reference category. Furthermore, the models must be designed to make a reasonable conclusion about their objectives. As a result, a time effect is added to the entity effect to get both time and entity effects. Equation (2) is developed based on the assumptions of the random-effects model.

$$
\begin{aligned}
Foreign\ Direct\ Investment_{it} = {} & \beta_0 + \beta_1 Tax\ Rates_{it} + \beta_2 GDP\ Growth\ Rate_{it} \\
& + \beta_3 Inflation_{it} + \beta_4 Natural\ Resource_{it} \\
& + \beta_5 Exchange\ Rate_{it} + \beta_6 Trade\ Openness_{it} \\
& + \beta_7 Telephone\ Subscription_{it} + \beta_8 Political\ Risk_{it} \quad (1) \\
& + \beta_9 Exports_{it} + \beta_{10} Imports_{it} \\
& + \beta_{11} Gross\ Domestic\ Product_{it} + \beta_{12} Culture_{it} \\
& + Y_2 E_2 \ldots Y_{16} E_{16} + \delta_2 T_2 \ldots \delta_{30} T_{30} + \varepsilon_{it}
\end{aligned}
$$

$$
\begin{aligned}
Foreign\ Direct\ Investment_{it} = {} & \lambda_0 + \lambda_1 Tax\ Rates_{it} + \lambda_2 GDP\ Growth\ Rate_{it} \\
& + \lambda_3 Inflation_{it} + \lambda_4 Natural\ Resource_{it} \\
& + \lambda_5 Exchange\ Rate_{it} + \lambda_6 Trade\ Openness_{it} \\
& + \lambda_7 Telephone\ Subscription_{it} + \lambda_8 Political\ Risk_{it} \quad (2) \\
& + \lambda_9 Exports_{it} + \lambda_{10} Imports_{it} \\
& + \lambda_{11} Gross\ Domestic\ Product_{it} + \lambda_{12} Culture_{it} \\
& + Z_2 F_2 \ldots Z_{16} F_{16} + \mu_2 U_2 \ldots \mu_{30} U_{30} + \mathcal{E}_{it}
\end{aligned}
$$

Where

(1) *Foreign direct investment$_{it}$* represents the dependent variable where $i$ = entity (or country) and $t$ = time.

(2) $\beta_0 \ldots \beta_{12}$ or $\lambda_0 \ldots \lambda_{12}$ represent the coefficient for each variable included in the study.

(3) $\varepsilon_{it}$ or $\mathcal{E}_{it}$ denotes the error term for the regression equation.

(4) Variables for $\beta_0 \ldots \beta_{12}$ or $\lambda_0 \ldots \lambda_{12}$ are defined in Table 1.

(5) $Y_2 \ldots Y_{16}$ or $Z_2 \ldots Z_{16}$ are the coefficients for the binary variables representing the entities (countries).

(6) $E_2 \ldots E_{16}$ or $F_2 \ldots F_{16}$ represent the entities for which the binary variable is created. In total, 15 binary variables are formed, with one used as the reference category.

| Variable | Description | Source |
| --- | --- | --- |
| Foreign direct investment (FDI) | These consist of the net inflows of all investments by source countries to the host country to obtain a long-term management interest (usually about 10% or more of voting right) in a firm operating in the host country. The FDI includes the aggregate of all investments in equity investment, retained earnings reinvested, long-term capital and short-term capital. This is calculated as the difference in the change in assets less the change in liabilities. This figure is quoted in the current US dollar | The World Bank (World Development indicators) |
| Telephone subscription (Tel) | This variable consists of all mobile or telephone subscriptions, public telephone or mobile services. The indicator for this variable included: the number of prepaid and post-paid subscriptions that have been active for the last three months. It is restricted to the only subscription that offers voice communications and is measured per 100 people | The World Bank (World Development indicators) |
| Tax rates (Tax) | The tax rate measures the sum of the total tax and contributions paid by businesses of net profit before tax (net profit before tax is total revenue less allowable deductions and exemptions). This rate does not include withholding taxes such as personal income, value-added, sales and goods or services | The World Bank (World Development indicators) |
| GDP growth rate (GDPR) | The annual GDP growth rate is the market prices based on constant local currency expressed in percentages, and this is used as a proxy for the market growth rate | The World Bank (World Development indicators) |
| Gross domestic product (GDPM) | The GDP comprises the summation of all the value-added by resident producers in a country. It also includes product taxes less any subsidy not included in a product's value. In calculating the GDP, depreciation of assets, natural resource degradations or depletions are not considered. This is used as a proxy for market size | The World Bank (World Development indicators) |
| Inflation (Inf) | The inflation rates equal the consumer price index (that is, the calculation is based on the average consumer's percentage change in acquiring a basket of goods and services. The percentage change could be fixed or may change at specific intervals, usually yearly). The inflation rate for the study was based on the Laspeyres formula | The World Bank (World Development indicators) |
| Natural resource rent (NRR) | The natural resource rent consists of all the rent income received by the country from all its natural resources. This usually consists of rent of forest, mineral, oil, coal and natural gas | The World Bank (World Development indicators) |
| Exchange rate (ExR) | The exchange rate for this study represents the rates that either a country's national authority or authorized exchange market quotes for translating cost/revenue from or into the home currency. The figure for this study is an annual average from a monthly exchange rate average. All figures are quoted in home US$ to home currency | The World Bank (World Development indicators) |

Table 1.
Variable construction
and description

| Variable | Description | Source |
|---|---|---|
| Trade openness (Open) | Trade openness is the sum of exports of goods and services and imports of goods and services expressed as a percentage of GDP | The World Bank (World Development indicators) |
| Political risk (Pol) | This variable is obtained by finding each country's score under 192 attributes of democracy, sub-attributes, subcomponents, and indicators assessed by the Global State of Democracy | The Global State of Democracy |
| Culture effect (Eng, Fren) | Due to data constraints, the researcher assumed language as the main indicator of cultural similarities among the various countries for the study. The major official languages are French, English, Portuguese and Arab. Dummy variables were formed for English (as one) and other languages (French, Arab, and Portuguese) as zero and used as the reference category | The World Bank (World Development indicators) |
| Exports of goods and services (Exp) | The export of goods and services is made up of goods and services a country sends to the rest of the world. This mainly includes travel, freight, transport, merchandise value, license fees, insurance, royalties and other services, such as information, communication, business, financial, personal, construction and government services. Items such as investment income, employee compensation and transfer payments are excluded. The figures are expressed in current US dollars | The World Bank (World Development indicators) |
| Imports of goods and services (Imp) | The import of goods and services is made up of goods and services a country receives from the rest of the world. This mainly includes travel, freight, transport, merchandise value, license fees, insurance, royalties and other services, such as information, communication, business, financial, personal, construction and government services. Items such as investment income, employee compensation, and transfer payments are excluded. The figures are expressed in current US dollars | The World Bank (World Development indicators) |

**Table 1.**

(7) $\delta_2 \ldots \delta_{30}$ or $\mu_2 \ldots \mu_{30}$ represent the coefficients for the time dummy variables.

(8) $T_2 \ldots T_{30}$ or $U_2 \ldots U_{30}$ represent the dummy variables created for the time variables. In total, 29 dummy variables are designed, with one used as the reference category.

*3.3 Summary statistics*
Table 2 presents the summary statistics for the entire variables, except the binary variables, to have a fair understanding of our variables and decide whether the variables need any transformation. Table 2 shows the average FDI of all the countries for the entire sample period ranging from 1989 to 2018. The averages show an apparent size disparity regarding the FDI inflows into West Africa. Nigeria and Ghana receive an average of 47.4 and 18.57%, respectively, of all the FDI flowing into West Africa. Together, both countries receive about two-thirds (65.87%) of all FDI into WACs. This disproportionate magnitude of FDI among WACs makes it difficult to analyze the countries since the result could be dominated by Nigerian and Ghanaian situations. However, expressing FDI as a percentage of GDP helps to reduce the size disparities in the definition of FDI, serving to clearly understand FDI inflows in West Africa.

| Variables | Mean | SD | p1 | p99 |
|---|---|---|---|---|
| Foreign direct investment | 4.210 | 1.100 | −4.630 | 6.040 |
| Tax rates | 63.765 | 57.463 | 30.700 | 285.900 |
| GDP growth rate | 4.014 | 4.814 | −15.096 | 15.376 |
| Inflation | 7.758 | 11.742 | −3.100 | 57.595 |
| Natural resource rent | 11.321 | 8.674 | 0.470 | 47.744 |
| Exchange rate | 678.100 | 1339.858 | 0.065 | 7485.517 |
| Trade openness | 64.416 | 30.981 | 26.348 | 179.121 |
| Telephone subscription | 29.496 | 39.168 | 0.000 | 134.489 |
| Political risk | 58.949 | 14.503 | 27.000 | 86.225 |
| Exports | 4.620 | 1.441 | 2.570 | 9.301 |
| Imports | 4.360 | 1.011 | 8.930 | 6.421 |
| Gross domestic product (GDP) | 1.981 | 6.731 | 2.360 | 4.101 |

Table 2.
Summary statistics of
variables

### 3.4 Estimation procedures

The data are panel data encompassing the 16 WACs over 30 years from 1989 to 2018. The study includes one dependent variable and 12 independent variables. The dependent variable is explored in a line graph plotting individual countries to understand FDI in the various WACs.

The nature of the data sample requires running random-effects and fixed-effects regression models to account for individual heterogeneity among the entities. The model difference depends on how the intercepts correlate with the regressors (Gyimah *et al.*, 2021). If the intercepts correlate with the independent variables, then the fixed-effects model is consistent and efficient, and vice versa (Wooldridge, 2015). As part of the fixed-effects model, we test for the presence of both the time-fixed effect and the entity-fixed effect to determine whether the model varies across years and entities, respectively. In the fixed-effects model, we assume that variations within the individual entities might bias or impact our outcome, which requires the need to control them. Since the entities are unique, time-invariant characteristics should not be correlated with the error term (Wooldridge, 2015).

In running the random-effects model, we assume that the time-invariant variables are uncorrelated and random with the predictor and hence play a vital role in explaining the dependent variable. The Hausman test is used to decide whether to adopt the fixed or random-effects models (Appiah *et al.*, 2020). The null hypothesis is "the preferred model is the random effects" while the alternative hypothesis is the "the preferred model is the fixed effects." The fixed-effects model is chosen when the probability value of the $\chi^2$ is significant at 95%. All the estimations are performed using StataMP 15.0 statistical software.

## 4. Result and discussions

### 4.1 FDI analysis and correlations

Table 3 represents the average FDI inflows for the entire sample period (1989–2018) for each of the 16 countries. Results show a disparity in the amount of FDI, favoring Ghana over Nigeria. When combined together, FDI represents about two-thirds (2/3) of all FDI inflows into WACs. The FDI relative to GDP is particularly low, not exceeding 10% for all countries except Liberia (21%). While this ratio is not homogeneous across WACs, the result shows that WACs are failing to attract a growing share of FDI inflows. Moreover, Table 4 indicates that some of the variables are negative at the 1st percentile, suggesting the impracticability of transforming them into a natural log form. Finally, Table 5 shows the correlations between country-level variables. Notably, FDI is highly correlated with natural resource rent (NRR),

| Country | Average FDI | Share of FDI (%) | FDI/GDP (%) |
|---|---|---|---|
| Benin | 62.74 | 0.93 | 0.96 |
| Burkina Faso | 88.94 | 1.32 | 1.30 |
| Cape Verde | 69.98 | 1.04 | 6.71 |
| Cote D'Ivoire | 334.08 | 4.95 | 1.57 |
| Gambia | 30.94 | 0.46 | 3.05 |
| Ghana | 1252.43 | 18.57 | 5.60 |
| Guinea | 190.45 | 2.82 | 3.62 |
| Guinea Bissau | 9.62 | 0.14 | 1.56 |
| Liberia | 415.70 | 6.16 | 21.00 |
| Mali | 184.78 | 2.74 | 2.58 |
| Mauritania | 245.27 | 3.64 | 6.60 |
| Niger | 239.48 | 3.55 | 4.40 |
| Nigeria | 3196.99 | 47.40 | 1.52 |
| Senegal | 219.00 | 3.25 | 1.87 |
| Sierra Leone | 137.23 | 2.03 | 6.84 |
| Togo | 67.33 | 1.00 | 2.57 |
| *Total* | *6744.97* | *100* | *100* |

**Table 3.**
Analysis of FDI
inflows from 1989
to 2018

infrastructure proxied by telephone subscription (Tel), exports, imports and GDP, consistent with the study's hypotheses.

### 4.2 Empirical results

Table 7 presents the fixed-effects model, random-effects models and Hausman's specification test results. The result of the fixed-effects model based on Equation (1) reveals that trade openness, exports, imports and market size (GDP) are significant drivers of FDI inflows into WACs ($p < 0.05$). Although the $p$-value for the entire fixed-effects model is very significant, the $R$-squared is 48.3%, suggesting that the independent variables can

| Panel A: For only 2018 year | | Panel B: For 1989 to 2018 | |
|---|---|---|---|
| Country | FDI/GPD % | Country | FDI/GPD % |
| *Top 5 rankings* | | *Top 5 rankings* | |
| Cabo Verde | 5.49 | Liberia | 21.00 |
| Sierra Leone | 5.33 | Sierra Leone | 6.84 |
| Ghana | 4.56 | Cabo Verde | 6.71 |
| Liberia | 3.96 | Mauritania | 6.60 |
| Senegal | 3.65 | Ghana | 5.60 |
| *Average* | | *Average* | |
| Niger | 3.63 | Niger | 4.40 |
| Guinea | 2.89 | Guinea | 3.62 |
| Mali | 2.72 | Gambia, The | 3.05 |
| Gambia, The | 2.03 | Togo | 2.59 |
| Burkina Faso | 1.66 | Mali | 2.58 |
| Guinea-Bissau | 1.41 | Senegal | 1.87 |
| *Least 5 rankings* | | *Least 5 rankings* | |
| Cote d'Ivoire | 1.07 | Cote d'Ivoire | 1.57 |
| Mauritania | 1.00 | Guinea-Bissau | 1.56 |
| Benin | 0.99 | Nigeria | 1.52 |
| Nigeria | 0.50 | Burkina Faso | 1.30 |
| Togo | −3.38 | Benin | 0.96 |

**Table 4.**
Rank by country based
on FDI/GDP%

| Variables | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (1) Foreign direct investment | 1.000 | | | | | | | | | | | |
| (2) Tax rates | −0.220** | 1.000 | | | | | | | | | | |
| (3) GDP growth rate | 0.124 | −0.108 | 1.000 | | | | | | | | | |
| (4) Inflation | 0.117 | 0.024 | 0.014 | 1.000 | | | | | | | | |
| (5) Natural resource rent | 0.180*** | −0.124 | −0.022 | 0.268*** | 1.000 | | | | | | | |
| (6) Exchange rate | −0.062 | 0.067 | 0.056 | 0.053 | 0.191*** | 1.000 | | | | | | |
| (7) Trade openness | −0.069 | −0.218** | 0.010 | −0.019 | 0.208*** | 0.038 | 1.000 | | | | | |
| (8) Telephone subscription | 0.279*** | −0.119 | 0.092 | −0.186*** | 0.181*** | 0.139** | 0.168*** | 1.000 | | | | |
| (9) Political risk | 0.123 | 0.353*** | 0.295*** | 0.263*** | −0.284*** | −0.026 | 0.200*** | 0.338 | 1.000 | | | |
| (10) Exports | 0.867*** | −0.154 | 0.075 | 0.072 | 0.080 | 0.080 | 0.131 | 0.200 | 0.047 | 1.000 | | |
| (11) Imports | 0.881*** | −0.195** | 0.090 | 0.066 | 0.074 | −0.059 | 0.104 | 0.301 | 0.114 | 0.944*** | 1.000 | |
| (12) GDP | 0.814*** | −0.125 | 0.051 | 0.078 | 0.046 | −0.079 | −0.180*** | 0.196 | 0.049 | 0.932*** | 0.951*** | 1.000 |

**Note(s):** Significance Level: *** $p$-value < 1%; ** $p$-value < 5%

**Table 5.**
Matrix of correlations

explain less than 50% of the changes in the dependent variable. In line with the assumptions of the fixed-effects model, the binary variables proxying culture are omitted due to collinearity issues.

Table 6 tests the presence of time- and entity-fixed effects where the null hypothesis is that the coefficients of all years or entities are jointly equal to zero. Notably, the $p$-value of the $\chi^2$ test for the time effect is 0.1342 (greater than 0.05), concluding that no time effect is needed. However, the $p$-value of the $\chi^2$ for the entity effect is 0.000 (less than 0.05), suggesting that the entity effect is needed when running the fixed effect model. Thus, the fixed-effects model should be analyzed for each entity (i.e. country). However, since the $p$-value of the Hausman test $\chi^2$ in Table 7 is greater than 0.05, the null hypothesis cannot be rejected. Therefore, the random-effects model is chosen, and all interpretations and conclusions are based on this model's results.

The random-effects model result reveals that significant drivers of FDI are abundant natural resources, exchange rate, trade openness, exports, imports and GDP (all with a $p$-value < 0.05). Also, the cultural factor reduces the flow of FDI to Francophone countries in WACs. Interestingly, the previously cited FDI drivers, such as tax rates, economic growth (GDP growth rate), inflation, infrastructural development and political stability, do not significantly contribute to FDI inflows into WACs.

As robustness tests, the study proceeds by (1) reestimating the models using lagged covariates to address the joint endogeneity concerns; (2) estimating a dynamic version by lagging the FDI and (3) restricting the sample to Ghana and Nigeria, whose FDI accounts for two-thirds of all FDI inflows into WACs. The robustness tests show similar results to the random-effects model.

### 4.3 Discussion of results

First, imports influence FDI, in line with the eclectic hypothesis. The result indicates that source countries that are importers from WACs are willing to provide direct investment to the host countries to take over ownership of resources, production and other operational activities (Yoo and Reimann, 2017). The result disagrees with Wang and Swain

| Time fixed effect | Entity fixed effect |
|---|---|
| −1 _IYear_2005 = 0 | −1 _ICountry_2 = 0 |
| −2 _IYear_2006 = 0 | −2 _ICountry_4 = 0 |
| −3 _IYear_2007 = 0 | −3 _ICountry_6 = 0 |
| −4 _IYear_2008 = 0 | −4 _ICountry_7 = 0 |
| −5 _IYear_2009 = 0 | −5 _ICountry_8 = 0 |
| −6 _IYear_2010 = 0 | −6 _ICountry_9 = 0 |
| −7 _IYear_2011 = 0 | −7 _ICountry_10 = 0 |
| −8 _IYear_2012 = 0 | −8 _ICountry_11 = 0 |
| −9 _IYear_2013 = 0 | −9 _ICountry_12 = 0 |
| −10 _IYear_2014 = 0 | −10 _ICountry_13 = 0 |
| −11 _IYear_2015 = 0 | −11 _ICountry_14 = 0 |
| −12 _IYear_2016 = 0 | −12 _ICountry_15 = 0 |
| | −13 _ICountry_16 = 0 |
| $\chi^2$ (12) = 17.43 | $F$ (13, 166) = 3.83 |
| Prob > Ch = 0.1342 | Prob > $F$ = 0.000 |

**Table 6.**
Results of test of time and entity fixed effect

**Note(s):** (1) For time effect, $H_0$ = the coefficients of all years are jointly equal to zero; $H_1$ = the coefficients of all years are not jointly equal to zero. (2) For country effect, $H_0$ = the coefficients of all the entities or countries are jointly equal to zero; $H_1$ = the coefficients of all the entities or countries are jointly equal to zero

| Variables | Fixed-effect model coefficient (standard errors) | Random-effect model coefficient (standard errors) |
|---|---|---|
| Tax rates | −0.118 (0.078) | 0.126 (0.073) |
| GDP growth rate | 0.126 (0.068) | 0.121 (0.068) |
| Inflation | −0.609 (0.799) | 0.131 (0.776) |
| Natural resource rent | 0.445 (0.510) | 0.113*** (0.041) |
| Exchange rate | 0.140 (0.540) | 0.570** (0.287) |
| Trade openness | 0.574*** (0.140) | 0.415*** (0.121) |
| Telephone subscription | 0.211 (0.121) | −0.103 (0.100) |
| Political risk | 0.641 (0.665) | −0.904 (4.290) |
| Exports | 0.044*** (0.015) | 0.026** (0.010) |
| Imports | 0.241*** (0.029) | 0.182*** (0.019) |
| GDP | 0.010** (0.004) | 0.010*** (0.002) |
| Cultural effects (o.FREN) | 0.000 | −0.432** (0.190) |
| Cultural effects (o.ENG) | 0.000 | 0.130 (0.189) |
| Constant | 0.540 (0.441) | 0.478 (0.411) |
| *Model results* | | |
| Number of observation | 193 | 193 |
| *R*-squared | 0.483 | 0.849 |
| Model significance (Prob > *F*) | 0.000 | 0.000 |
| *Hausman test* | | |
| Chi-square test value | −4.183 | |
| *p*-value | 1.000 | |

**Note(s):** (1) For the Hausman's test, $H_0$ = The preferred model is the random effect. $H_1$ = The preferred model is the fixed effect. (2) Significance level: *** *p*-value < 1%; ** *p*-value < 5%

**Table 7.**
Empirical results

(1995), who found no significant association between imports and FDI in developing countries.

In terms of GDP, the study reports a positive impact on FDI, in line with the market size hypothesis. Aziz (2018) and Salem and Baum (2016) reported similar results, indicating that a country's GDP increases the FDI inflows into the host country. However, the result disagrees with Durmaz's (2017) study, which found a negative relationship between GDP and FDI.

Trade openness also drives FDI, consistent with the political and country risk hypothesis. The result agrees with Mina (2007), who found that trade openness positively affects the FDI inflows to the host regions but disagrees with the study of Siddiqui and Iqbul (2018) that reported no relationship between trade openness and FDI.

Regarding the natural resource rent, the result is in line with the location hypothesis expecting a direct relationship between natural resources and FDI. The host nations' richness or abundance of natural resources induces external stakeholders to invest in the country. The result agrees with Mohamed and Sidiropoulos (2010), who reported a significant positive relationship between natural resources and FDI. However, Onyeiwu (2003) stated that abundant natural resources in host countries do not drive FDI inflows.

For the exchange rate, the study records a positive and significant relationship between the strength of the exchange rate and FDI, which is in line with currency area theory. While Aziz and Mishra (2016) found the significance of the exchange rate in attracting FDI inflows, Aziz (2018) found that the exchange rate decreases FDI inflows.

Another significant positive determinant of FDI inflows into WACs is export, consistent with the currency area hypothesis. The result agrees with Wang and Swain (1995), who found

that net exporter countries attract FDI; however, Mina (2007) concluded that exports have no effects on FDI inflows.

The final significant driver is the cultural factor (French-speaking countries) as depicted by the significant $p$-value ($p < 0.05$). The result shows that Francophone countries are favorites in attracting FDI; however, this conclusion could be biased since there are more French-speaking countries than any other language-speaking countries in WACs.

## 5. Implications

We extend the existing literature debate on the factors influencing FDI from the perspective of WACs. Our findings support that natural resources, market size, imports, exports, trade openness and exchange rate increase FDI inflows into WACs.

Based on the results, we recommend that policymakers could implement policies that stimulate market growth. Policymakers can end their deadly hostilities and also create political stability to provide an enabling environment for market growth.

The study further reveals that natural resources boost FDI inflows into WACs. As a result, government agencies should be vigilant to mitigate corruption while permitting administrative to operate in the extractive sector.

A stable exchange rate regime also influences FDI; thus, governments in WACs have to ensure that most local trades are made in the local currency to reduce demand for foreign currency, especially the dollar. In addition, governments must ensure that there is less repatriation of profits in foreign currency (especially the dollar) to reduce its supply.

Again, the governments in WACs should move into industrialization by building more factories or providing low credit and should support the private sector to induce exports of goods to other countries. Moreover, the study reveals that FDI in the West African economy support import-substituting investments to the detriment of export-substituting investments. Thus, policymakers should ensure the implementation of subsidies, special credit lines and tax exemptions for export-driven companies to attract more export-oriented FDI to boost the economy.

## 6. Limitations and further studies

We present two main limitations along with suggestions for further studies. First, this study neglects other regions in Africa, such as North Africa, Central Africa, East, Northeast and Southern Africa. The study suggests that future studies should consider comparative studies of all other African countries to ascertain the determinants of FDI using recent macroeconomic indicators. Second, the study disregards other indicators such as governance and corruption indices. The study recommends that future studies consider the impact of these proxies on FDI inflows into WACs and other African regions.

## 7. Conclusion

This study examines the critical drivers of FDI inflows into the WACs using panel data from 16 countries covering 30 years from 1989 to 2018 using fixed- and random-effects models. Findings reveal that the previously cited determinants of FDI, such as infrastructural development, inflation, tax and political stability, are insignificant in determining FDI inflows into WACs. Furthermore, taxation, telephone subscription and inflation do not influence FDI. Our contribution is that Francophone countries attract more FDI than other Anglophone countries, and the most significant critical drivers of FDI are the richness of natural resources, high market size or growth of GDP, imports and exports of goods and services, trade openness and the currency's strength (proxied by the exchange rate).

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