Impact of Chinese Foreign Direct Investment on the growth of West African Economic and Monetary Union (WAEMU) countries

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Abstract

The objective of this paper is to analyze empirically the effect of Chinese FDI on economic growth of countries of the West African Economic and Monetary Union (WAEMU). The data used in this paper come from World Bank except for FDI data, which were taken from the Statistical Bulletins of China's Outward Foreign Direct Investment, covering the period 2006 to 2018. Using the theoretical framework of the endogenous growth model, this paper performed an econometric approach of fixed-effects and random effects regressions with instrumental variables to make the estimates. The results of our estimates showed that Chinese FDI inflows have negative impact on host countries' growth, based on the random effects regression, which is appropriate and fits well the data used. In addition, our results indicate that exports of primary goods are negatively correlated with the overall annual growth in the region. Further, infrastructure development and industrialization were found to be one of the critical factors for growth of the countries under investigation. Our findings suggest that Governments of WAEMU countries need to intensify their investment in health and education in order to boost the quality of human capital stock. More importantly, there is a need to promote the production of manufactured goods that are currently imported rather than increasing exports of primary goods. Finally, investing more in infrastructure and industrialization process is fundamental to positively impact the growth of countries in the union.

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Introduction

Foreign direct investment (FDI) flows can arouse economic growth through employment generation, capital formation, and environmental sustainability (Liu et al. 2017). The positive impact of FDI on economic growth has been widely accepted in the economic literature (e.g. Ndiaye and Xu, 2016; Gutiérrez-Portilla et al. 2019; Akisik et al. 2020; Zeng and Zhou, 2021). However, many countries have been very reluctant to consider FDI as part of the fundamental determinants of economic growth. In the aftermath of their independence, FDI was viewed with great distrust by most developing countries. It was considered as a threat to national sovereignty, and multinational firms were suspected of reducing social welfare through the manipulation of price and repatriation of their profits. While faced with the trends of globalization, production and monetary policies internalization, radical changes in the attitude have been noted in many developing countries, which are now compelled to look for sources of non-traditional and non-debt generating investments. Accordingly, they have begun to explore the FDIs, which are called upon to support development via productivity intensification and improved technologies in the host countries (Mahembe et al. 2016; Iamsiraroj et al. 2015). Such international investments often made by direct investors from foreign firms that acquires a lasting interest (Sanda and Dana, 2007; Kolstad and Villanger, 2008), were seen to be stable investments and less sensitive to financial crises. As such, they are supposed to create additional financing opportunities that can help to improve the external debt situation of those countries, rather than make it worse. Indeed, FDI are now seen to be a major channel for technology transfer and innovation, rather than a tool and mean of domination by both developed and developing countries.

Changes in the global economy have led to an increasingly intertwined environment where FDI is increasingly qualified as a new way of financing economic growth (Malikane et al. 2017). Since the early 1990s, the most important investors in Africa were France, Germany, United Kingdom and the United States of America (UNCTAD, 1999). However, from 2002, inward FDI in Africa originate more and more from emerging countries such as China, India, and Malaysia (UNCTAD, 2007). Over the last decades, China has received special attention among emerging economies, for several key reasons: China's sustainable economic growth for the last decade, the political challenge for the West model, world's largest goods trading nation (Woetzel, et al, 2019) and the heterogeneity of the countries where Chinese FDI is allocated (Zhang, 2005; He, 2010). It is worth noticeable that since China's Reform and opening up in 1978, Chinese FDI is widely distributed around the globe and the number of countries that benefit from Chinese inward FDI has increased steadily and will continue to grow. In 2018, the value of outward FDI from China amounted to 143 billion U.S dollars (Fig.1) covering 188 countries and regions around the world, with a historic high reached in 2016, followed by a decline due to stricter regulation measures taken by the Chinese government to control capital flows (SBCFDI, 2019).

From theoretical perspectives, three motivations and drivers can at least be distinguished for Chinese FDI outwards. First, one could argue that Chinese FDI is attracted by countries that are endowed with large natural resources (e.g. Hong & Sun, 2006; Frynas and Paolo, 2007; Cheng & Ma, 2008; Morck et al., 2008; Abid and Bahloul. 2011). A second reason is that Chinese outward FDI is attracted to countries that represent large markets (Kolstad and Wiig, 2012). Another motive for China's FDI outwards, especially in Africa is the high economic growth rates some African countries are witnessing recently. For, a country's high economic growth rate is often associated with higher returns from investments (Osinubi et al., 2010). Accordingly, WAEMU member states, which are all developing countries, also saw the Chinese FDI increase substantially towards them (Fig.1). The relative openness of investment regimes

also matters in attracting investment (Cooray and Vadlamannati, 2012; Mistura and Roulet, 2019), particularly for host countries relatively more distant from investors or parent Multinational Enterprises (MNEs). As some location advantages that a host country can offer a firm, this may be one of the factors driving FDI (Dunning, 1993).

Additionally, FDI can have positive effect both at the macro level through an increase in the investments, employment, tax revenue and foreign exchange, and at the micro level through the positive spillovers by improving the stock of knowledge of the host country (Paus and Gallagher, 2007). Findlay (1978) in the framework of a classical model showed that FDIs convey technological progress in the countries receiving them. FDI may sometimes only have effects on domestic capital formation (Crankovic and Levine, 2002). Advanced technology resulting from FDI can lead to the growth if it interacts with a certain absorption capacity in the host country. In reverse, FDI can have negative effects in countries with low levels of human capital (Blomstom et al., 1994). This means that FDI could be an important driver for technology transfer, contributing to growth relatively more than domestic investment and its higher productivity only applies when the host country has a minimum stock of human capital stock (Borensztein et al., 1998). Besides, the *endogenous growth theory* considers several factors such human capital, capital accumulation, international trade and government policy and FDI as contributing to the growth. This theory assumes that FDI is generally more productive than domestic investments by pointing out that FDI is supposed to stimulate growth by creating dynamic comparative advantages leading to technology transfer, human capital accumulation and intensification of international trade (Otchere et al., 2016). These dynamic advantages, often known as spillovers, are interrelated and complementary. Durham (2004), Alfaro et al. (2004) and recently Baiashvili and Gattini (2020) found that countries with good financial market systems, strong regulations and higher control of corruption have achieved higher growth rates derived from FDI. Using a system GMM estimation in panel data comprising 11 Arab countries over the period 1988–2012, Aziz (2020) concluded that quality of institutions plays an important role in fostering growth via indirect impact by absorbing spillovers of FDI inflows. It is remarkable that in the increasingly abundant literature on the FDI and the impact of Chinese globalization on the European market, North American economies and Asian countries as well, no attention was paid to the effects of Chinese FDI inflows on growth of WAEMU countries. To our knowledge, the only previous works about the Chinese FDI in Africa have focused on the reasons of Chinese FDI in the continent as a whole (e.g. Asiedu, 2006; Wang, 2007; Holslag, 2011). Again, it needs to be emphasized that its impact have not been equal across countries (Alvarado et al. 2017; Folawewo & Adeboje, 2017; Makun, 2017; Sunde, 2017). Moreover, the only studies carried out on WEAMU have considered FDI inflows from all over the world, and not explored in isolation the effects of Chinese FDI on the growth of these countries. This paper therefore, aims to fill in this gap by analyzing the effects of Chinese FDI on the growth of WAEMU countries.

Literature review

The relationship between foreign direct investment and economic growth has long been discussed in economic development literature and it is generally accepted that FDI can promote growth. While one side supports the FDI-led growth notion, other opposes its reality. A number of recent studies that have been carried out on this notion are summarized in this section. Abdouli and Hammami (2017) investigated the impact of FDI inflows and environmental quality on economic growth for MENA countries. Their empirical results showed a country-based general impact of FDI inflow on economic growth. Sothan (2017) also tested the causal relationship between FDI and economic growth for Cambodia using annual time series data over the period 1980–2014. His findings based on the Granger

causality test do not confirm causality from economic growth to FDI. The study by Doku et al. (2017) showed that an increase in China's FDI stock in Africa significantly increases GDP growth of the host countries. Their work reveals that a causal link exists between GDP growth in Africa and China's FDI and that the nature of causality is unidirectional in both the short and long run. Chen et al. (2018) similarly investigate whether FDI has positive economic growth effect in different regions and they find the effects vary. Similarly, Hayat (2018) investigated the foreign direct investments (FDI)-growth nexus and the impact of natural resource abundance in the host country on the FDI-growth nexus. He found a positive and significant effect of FDI inflows on economic growth of the host country. However, the impact of FDI inflows on economic growth changes with the changes in the size of the natural resource sector. Gamariel and Hove (2019) have demonstrated that FDI can improve the competitiveness of companies located in the host country's domestic market and may have a positive impact on foreign trade, especially exports. FDI can contribute significantly to an increase in the stock of knowledge in the host country by improving the level of qualifications to local firms while offering a new management expertise. Such improvement of qualifications can take place through formal training for workers or through learning-by-doing within foreign affiliates. Akadiri et al. (2019) applied Dumitrescu and Hurlin Granger non-causality test based on data for the period 1980-2018 in 25 African countries and found that there is bidirectional relationship between FDI and economic growth. Similarly, Sokhanvar (2019) investigated the EU countries and found that FDI inflow and tourism were the determinant factors for growth in the union. A study by Kalai and Zghidi (2019) carried out on MENA economies using the dynamic Autoregressive Distributed Lag (ARDL) confirmed a one-way causal link running from FDI inflow to economic growth of the MENA economies. Their findings further pointed out that there is a long run co-movement of the series of investigation. In their study, Ausloos et al. (2019) investigated 43 countries grouped according to the Inequality-Adjusted Human Development Index over the period 1970-2015 to analyze the relationship between GDP and FDI. Their findings showed that there is a time lag dependence effect in FDI-GDP correlations. Vojtovic et al. (2019) examined linkages between FDI and GDP in 11 Central and Eastern European (CEE) countries over the period 1997-2004 to demonstrate that that FDI has an impact on growth, which is also enhanced by financial market development. Ganawi et al. (2020) examined the impact of Foreign Direct Investment (FDI) on the sustainable economic development in China. They found that FDI proves itself a force in economic growth, most importantly in the later phase of industrialization. A study by Baiashvili and Gattini. (2020) has concentrated on the impact of FDI inflows on growth and their effect mediated by income levels and the quality of the institutional environment. They found supporting evidence, that controlling corruption mediates the impact of FDI on GDP growth, indicating that higher control of corruption enables a positive impact of FDI on growth.

In contrast to these studies, other empirical investigations reported negative influence of FDI on growth by challenging the idea that FDI leads to growth. For instance, Owusu-Manu et al. (2019) argues that FDI adversely influence GDP, with evidence from Ghanaian economy. Wu et al. (2020) utilized panel data at city level in China to study the effect of FDI on economic growth. Their findings provide new empirical evidence by pointing out that FDI's growth effect is neither positive nor negative but rather exhibits an inverse U shape. Likewise, Bilas (2020) examined the relationship between foreign direct investment (FDI) and growth in 13 EU countries. He found that GDP growth leads to FDI growth, whereas FDI growth does not cause the GDP growth, implying that there is no evidence of positive impact of FDI on GDP

growth in the most recent European Union member countries. Akisik et al. (2020) have examined the relationships of FDI, human development and economic growth in Anglophone and Francophone African countries between 1997 and 2017. They found that FDI has a positive impact on economic growth, and that this positive impact is enhanced by the adoption and implementation of greater transparency and reporting procedures referred to as the International Financial Reporting Standards (IFRS). Recently, Zeng and Zhou (2021) assessed FDI's impact on economic growth, technological innovation, and environmental pollution in China. They reported that FDI has a significant and positive direct impact on China's economic growth and technological innovation, and can furthermore have a significant pull effect on the domestic economy through the backward spillover channel.

Although the literature has documented that FDI can spur economic growth through channels such as capital formation, improving human capital, technology spillover, and knowledge transfer, studies on the relationship between FDI and growth are still mixed. The extent to which FDI can boost the host country's growth seems to depend on characteristics that may be unique to the specific country or group of countries. Thus, we explicitly focus on the effects of Chinese FDI on growth of WAEMU countries here, given China's influence on global OFDI that has been expanding (Fig.1).
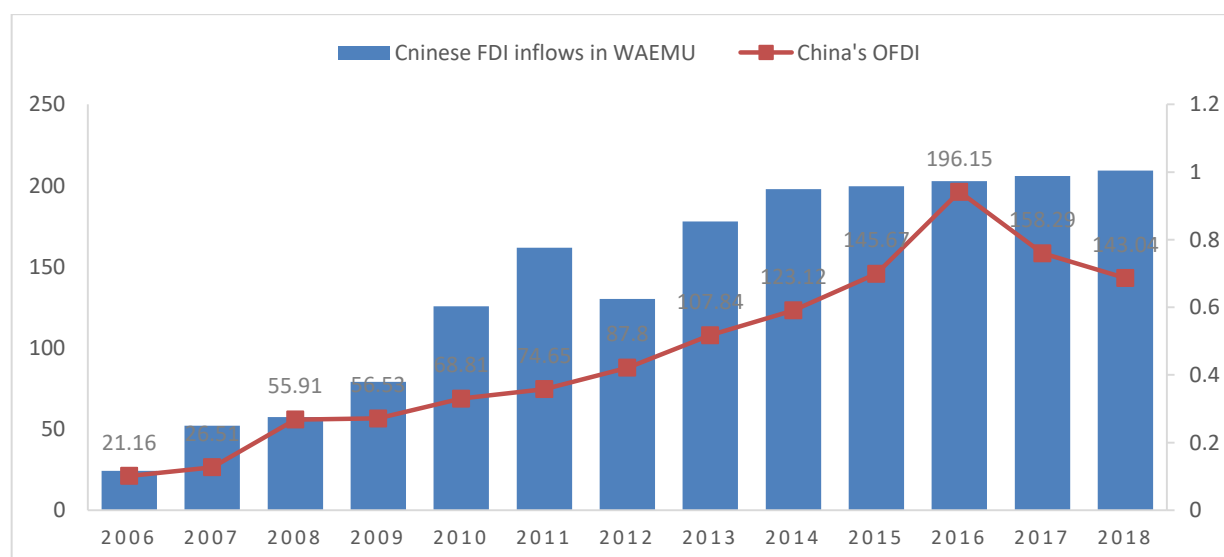
Fig.1: Evolution of Chinese FDI inflows in WAEMU countries and China's total OFDI around the world from 2006-2018 (in billions of U.S dollars)

Materials and methods
The model
Borrowing from the endogenous growth theory of Romer (1990), Borensztein et al. (1998) and Alaya (2004) have pointed out that FDI can contribute to economic growth directly through technology transfer and human capital. On the other hand, the endogenous growth theory argues that FDI can indirectly lead to the growth through infrastructure development, innovation and public expenditure. Based on the endogenous growth theory, this study applies an empirical specification, which consists of a structural model comprised of five simultaneous equations, each of which explains an endogenous variable by other explanatory variables. Each of the endogenous variables can be an explanatory variable in another equation of the model. As such, there are two types of variables: endogenous variables and exogenous variables. The former refer to the increase in the overall productivity of the factors

such as capital accumulation, stock of human capital and technological progress and their effect on the growth (Baro and Sala-I-Martin, 1995). The latter consists of the exogenous variables that can explain the endogenous variables and the characteristics of the countries considered. Theoretically, simultaneous equations model might be solved simultaneously. To do that, one might respect the elementary rule: the number of endogenous variables must equal to that of the equations. The main equation of the model can be written as follows:

$$GROWTH = f(FDI, HK, EXPORTS, DI) \tag{1}$$

This equation thus presents the variables, which seem to be determining factors in economic growth of the countries considered, based on the endogenous growth theory. More precisely, the structure of the model that assumes a linear equation for our empirical model is given as:

$$g_{i,t} = a_0 + a_1 FDI_{i,t} + a_2 HK_{i,t} + a_3 EXPORTS_{i,t} + a_4 DI_{i,t} + \varepsilon_{i,t} \tag{2}$$

where *i* denotes the individual dimension (country in this study) and *t*, the time dimension; *FDI*, *HK*, *EXPORTS* and *DI* represent foreign direct investment, human capital, exports and domestic investment, respectively. Authors such as Grossman and Helpman (1991), Barro and Sala-I-Martin (1997), Borensztein et al. (1998) have improved the endogenous growth model initiated by Romer (1990) with technical progress. The FDI introduced later into the model in the form of capital produced by foreign companies located locally in the host country. The effect of direct investment on the growth rate of the host economy depends upon the level of the human capital of that country. In other words, the greater the human capital of the host country, the higher the effect of direct investment on the growth rate of the economy. Equation (3) of our model depends on the following variables: economic growth, foreign direct investment flows, domestic credit granted to private sector and the gross domestic savings. To identify the stimulating impact of FDI on the domestic investment, it is necessary to introduce the variable that represents FDI flows into this equation. The variables '' credit granted to the private sector '' and '' domestic savings '' are incorporated in the business environment and the

$$DI = f(GROWTH, FDI, CREDIT, SAVINGS) \tag{3}$$

Exports depend on foreign direct investment and the exchange rate of the currency and can be expressed as follows:

$$EXPORT = f(FDI, EXCHG) \tag{4}$$

Several work have explored the nature of the links between FDI and exports. They essentially have identified the direct and indirect effects that FDI can have on foreign trade (Fontagné and Pajot, 1999; Fontagné, 1999). Those empirical works revealed the complexity of the links between FDI and trade, with trade potentially leading to FDI, or vice versa. Exchange rate seems to be an important variable for the specificity of the equation (4), considering its stimulating role in exports flows. Equation (5) represents the human capital, which is function of FDI, government expenditure in education, and the level of industrialization. The presence of the FDI variable in this equation allows us to analyze both the contribution and effect of foreign companies on the human capital of host countries. Given human capital formation represents a necessary investment in society, expenditure in education is considered as an efficiency factor (OECD, 2007; Hansson, 2008; Barro and Lee, 2013). It contributes on the one hand to improve the stock of human capital and on the other hand to

increase the level of productivity of the future labor force (workers). It is therefore important to include the expenditure in education as one of the critical variables of the equation. Public investment has always played an important role in building a country's human capital stock. In particular, the presence of a good and adequate basic infrastructure seems to be a key contributing factor to the human capital accumulation and to its quality improvement as well. Besides, factors including good infrastructure can attract FDI into a country (Asiedu, 2006). Thus, by integrating the level of industrialization including both infrastructure construction and urbanization thereafter referred to as ''*INDUSTRY*'' leads to rewrite the equation as follows:

$$HK = f(FDI, EDUC, INDUSTRY) \tag{5}$$

Considering the reciprocal effect between growth and FDI flows, the role of natural resources and human capital as key reasons behind inward FDI in developing countries both in terms market penetration and in resource reallocation strategies by multinational corporations (Mankiw et al., 1992), the equation of FDI is given as:

$$FDI = f(GROWTH, NAT\_RES, HK) \tag{6}$$

Estimation method

We estimate the simultaneous equations model using the Two-Stage Least Squares (2SLS). First, we will discuss the determinants of Chinese FDI (equation (6)). Then, we will estimate the effects of Chinese FDI inflows in WAEMU zone on the different variables as specified: on the exports (equation (4)), on the Gross fixed capital formation as a proxy for DI (equation (3)), on the human capital (equation (5)) and on the growth (equation (2)), respectively.

Source of data

Annual data for seven countries of West African Economic and Monetary Union (WAEMU) excluding Guinea Bissau from our sample, due to higher level of missing data for this country, are collected. The dataset used in this study spans from 2006 to 2018 based on data availability and come from different sources. All data are from World Bank: World Development Indicators (2019) except for FDI data, which are taken from the Statistical Bulletin of China's Outward Foreign Direct Investment (SBCOFDI, 2016) covering the period 2006 to 2014, then (SBCOFDI, 2019) for the period 2015 to 2018. The data source and the variables used in the model are presented as follows:

Table 1: Definition of the variables and data source

Variables	Definitions	sources
GDP	Gross Domestic Product at constant prices	WDI, 2019
GROWTH	Growth rate (% of GDP)	WDI, 2019
FDI	China's outward FDI toward WAEMU zone (millions of US dollars)	SBCOFDI, 2016 &2019
CREDIT	Domestic credit to private sector (% of GDP)	WDI, 2019
EXPORTS	Exports of goods and services (% of GDP)	WDI, 2019
EDUC	Government expenditure in education (% of GDP)	WDI, 2019
DI	Domestic investment, with Gross fixed capital formation as proxy (% of GDP)	WDI, 2019
SAVINGS	Gross domestic savings (% of GDP)	WDI, 2019
HK	Human capital, with educational attainment (High school completed) as proxy (% of total)	WDI, 2019
INDUSTRY	Level of industrialization (% of GDP)	WDI, 2019
EXCHG	Official exchange rate	WDI, 2019
NAT_RES	Total natural resources rents (% of GDP)	WDI, 2019

Results

Table 2 provides summary statistics for the variables used in our empirical analysis. The variables include *GROWTH, FDI, EXPORTS, DI, HK, EDUC, CREDIT, EXCHG, NAT_RES, SAVINGS,* and *INDUSTRY*.

Table 2: Summary statistics of the variables

Variables	Obs.	Mean	Standard deviation	Min	Max
GDP	91	1121.53	2805.28	7.13e-07	9707.43
GROWTH	91	4.42	2.72	-4.39	10.71
FDI	91	96.18	101.81	0.00	429.57
CREDIT	91	21.05	8.18	4.08	44.29
EXPORTS	91	28.70	10.36	9.97	53.82
EDUC	91	4.65	1.01	3.23	7.40
DI	91	22.78	6.47	8.95	38.90
SAVINGS	91	12.66	8.31	-4.65	34.66
HK	91	7.24	3.85	1.01	15.96
INDUSTRY	91	37.01	10.61	16.86	56.25
EXCHG	91	520.26	52.40	447.81	596.13
NAT_RES	91	11.13	6.143	2.43	30.93

Note: *Both GDP and FDI are in millions of USD; the exchange rate (EXCHG) is local currency unit per USD, average within the period considered.*

Over the period 2006 to 2018, the GDP of the countries in the WAEMU zone is, on average, USD 1.122 billon per annum. With some periods of recession in countries of the union, often due to political instabilities, all the countries in the zone have enjoyed growth in real GDP of up to 4.42%. The Chinese FDI inflows were, on average, USD 96 million per annum in the countries of the union within the study period. In addition, it may be noted that the domestic credit to private sector, gross domestic savings and exports, on average, increased by 21%, 13% and 29%, respectively, as a proportion of GDP. Government spending in in education in the union increased by 4.6% of the GDP. Over the same period, it appears that domestic investment continues to increase though weak, with a minimum annual rate of 6.5% per year. Likewise, there is a rise in government expenditures for the human capital and industrialization in the WAEMU member states. It should further be noted that the exchange rate fluctuated between 447.8 and 520.3 for a USD over the same period. The results about the motivations and drivers of Chinese FDI inflows in the union showed that human capital does not attract Chinese FDI in WAEMU countries, as expected. Rather, a one percent increase in the human capital would result in a decrease of Chinese FDI in WAEMU zone by 4.8 percent (**Table 3**). In particular, this estimation finds no effect of host countries' natural resources or growth on Chinese FDI inflows in WAEMU zone.

Table 3: Estimating the determinants of Chinese FDI inflows in WAEMU countries

Variables	Coefficients.	Std. Error	P-Value
GROWTH	-4.39e-11	1.17e-09	0.970
NAT_RES	1.814	1.817881	0.321
HK	-4.791*	2.816436	0.092
Constant	111.153***	37.88567	0.004

Note: *** $p < 0.01$, * $p < 0.10$. Source: Authors' estimates.

The impact of China's FDI inflows is found to be significant and negatively correlated with exports by WAEMU countries, meaning that an increase in the Chinese FDI inflows into the union, would lead to a reduction in the host countries' exports of goods and services by 0.002%, all other thing being equal (See **Table 4**).

Table 4: Effect of Chinese FDI inflows on WAEMU countries' exports from 2006-2018

Variables	Coefficients.	Std. Error	P-Value
FDI	-0.020*	0.011	0.070
EXCHG	0.011	0.022	0.599
Constant	24.744**	11.009	0.027

Note: *** and * denote 5% and 10% levels of significance, respectively.* Source: Authors' estimates.

With regards to the effects of Chinese FDI inflows on the stock of capital formation, our findings revealed that such an effect is significant and positive (**Table 5**). In other words, 1% increase in the Chinese FDI inflows in the host countries leads to an increase of 0.02% in domestic investments. In addition, the impact on the domestic savings is found to be significant and positive. In contrast, the results shows that Chinese FDI inflows are adversely associated with economic growth in the host countries of the union.

Table 5: Effect of Chinese FDI inflows on WAEMU countries' domestic investment from 2006 to 2018

Variables	Coefficients.	Std. Error	P-Value
FDI	0.020***	0.006	0.001
GROWTH	-4.11e-10***	7.36e-11	0.000
CREDIT	0.079	0.073	0.281
SAVINGS	0.402***	0.087	0.000
Constant	18.520***	2.094	0.000

Note: **** indicates significance at 1% level.* Source: Authors' estimates.

In terms of impact on human capital accumulation, the results showed that Chinese FDI inflows appear to have no effect on the human capital accumulation in the host countries. In addition, Government expenditure and industrialization level are positively associated with human capital accumulation (**Table 6**).

Table 6: Estimating the effect of Chinese FDI inflows on human capital accumulation in WAEMU zone (2006-2018)

Variables	Coefficients.	Std. Error	P-Value
FDI	-0.002	0.003	0.442
EDUC	0.561**	0.275	0.044
INDUSTRY	0.254***	0.027	0.000
Constant	-4.562***	1.581	0.005

Note: **** $p < 0.01$, **$p < 0.05$.* Source: Authors' estimates.

Table 7 presents the results of the econometric estimates obtained with the simultaneous equations model. Column one of **Table 7** shows the independent and endogenous variables of our model. Then, fixed effect results estimates obtained by instrumental variables are presented in the second column. The last column of the table reports the outcomes for random effect estimators.

From **Table 7** it could be seen that, the probability value of Fisher is not significant ($Prob > F = 0.1176$) meaning that there is no significant difference between the WAEMU countries, based on the fixed effects estimates. In addition, the results of our estimates show that the coefficient of our interest variable *(FDI)* is not significant. Although not significant, the negative sign for this variable means that Chinese FDI adversely impacts the growth of WAEMU countries as a whole. In other words, 1% increase in China's FDI inflows in WAEMU

zone though negligible will reduce the overall growth by 0.0005% in the union, all things being equal. Except the coefficient for ''*INDUSTRY*'' variable, which is statistically significant, the results showed that the other variables such as '' *FDI, EXPORTS, DI, HK, NAT_RES, EDUC, CREDIT,* and *SAVINGS* '' seem to have no influence on the economic growth of the countries considered, based on the fixed effect model. This finding revealed that 1% increase in the level of industrialization of WAEMU countries would lead to an increase in the overall annual growth in the union by 0.49%.

Table 7: Fixed-effect and random effects estimates

	Fixed effect estimates		Random effect estimates	
	Coefficients	Std Err.	Coefficients	Std Err.
Constant	-15.87214*	8.333159	-3.967507	4.395218
FDI	-0.0005429	0.0050367	-0.005748**	0.0028369
EXPORTS	-0.0522778	0.0591372	-0.1134604***	0.0386423
DI	0.1026829	0.0729134	0.0757447	0.062333
HK	0.0921782	0.1982161	-0.1142972	0.1195014
CREDIT	-0.0994659	0.1150472	0.1074948	0.0745586
EDUC	0.160017	0.4986859	-0.48512	.3646995
SAVINGS	0.0859875	0.0672337	0.0585946	0.0413401
INDUSTRY	0.4908533*	0.260377	0.168237***	0.064823
EXCHG	0.0045867	0.0074522	0.0063444	0.0065882
NAT_RES	-0.130558	0.119031	0.0919196	0.0789838
No of obs.	91		91	
No of groups	7		7	
No. of Instruments	10		10	
Wald Chi² (10)	381.34		43.51	
***Prob* > Chi2**	0.0000		0.0000	
R-Square: Within	0.2982		0.2201	
Between	0.2099		0.9394	
Overall	0.1011		0.3523	

Note: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$. The dependent variable is the economic growth. Source: Authors' estimates.

With the random effects regression, the Wald Chi-square test ratio with a value of 43.51 ($P\_value = 0.0000$) is significant, indicating that the random effect model is correctly specified and thus fits well the data. Unlike the fixed effects model, three coefficients are statistically significant using the random effects model. Contrary to our prior expectations, the Chinese FDI stock has a negative impact on countries' growth rate in WAEMU zone. This means that 1% increase in China's FDI stock in WAEMU zone would result in 0.0057 % reduction of GDP growth. Furthermore, the coefficient of *EXPORTS* variable is negative and statistically significant, indicating that a 1% increase in the WAEMU countries' exports value would reduce their overall GDP growth by 0.113% per annum, all things being equal. This is somewhat surprising and is contrary to all expectations. Like the findings of the fixed effect regression in this paper, again good infrastructure and its development, which are proxied by industrialization level are found to be a significant determinant of growth in WAEMU zone, based on the random effects regression. Indeed, this result reflects the idea as the level of infrastructure, industrialization increases the probability of economic growth increases as well, and which is in line with the priori expectation of this study. Moreover, the coefficients of the other variables '' *DI, HK, NAT_RES, EDUC, CREDIT,* and *SAVINGS* '' have remained insignificant. The estimation results obtained by the composite error model are better than that of fixed effects regression. This suggests that the hypothesis of absence correlation

between the individual random term u_i and the explanatory variables of the model needs to be verified. To that end, the Haussman test thus is performed to confirm these presumptions.
H_0: Random-effects model is appropriate
H_1: For the alternative hypothesis, we assume that fixed-effects model is appropriate.

The Hausman test ($P\_value = 37.42\% > 5\%$) does not allow the rejection of the null hypothesis, implying that *Random-effects model* is appropriate for our data. This diagnostic test showed that there is no correlation between the error term and the explanatory variables of the model. The Chi-square test is at 10 degrees of freedom because, under the null hypothesis, there are 10 restrictions relating to the equality of the coefficients of the two models for the factors variable in the time. Fixed-effects model estimators are biased. Random-effects model is appropriate.

Discussion
Referred to the endogenous growth theories, several factors such as human capital, capital accumulation, international trade, government policy and technology transfer, which account for long-run growth, are often driven by FDI. Thus, FDI is expected to stimulate growth through the creation of dynamic comparative advantages (OECD, 2001), known as spillovers that are related to each other, complementary, and should not be studied separately (Alaya, 2006). Indeed, the benefits from FDI on a particular factor of growth are likely to stimulate the development of other factors, thus forming a kind of synergy (Bende-Nabende, 2002). For developing countries, foreign direct investment is increasingly seen as a source of capital in their development process. As such, it is supposed to boost employment, exports, domestic investment and the integration of new technologies to the private sector, and thus a source of productivity gains and growth. Developing countries tend more and more to attract FDI. However, the measurement of effects from FDI is not obvious. They depend on the technology transferred by foreign companies, as well as the capacity of the host country to absorb the know-how and new technology transfer.

In contrast to other studies (e.g. Woo, 2009; Mahmoodi, M., and Mahmoodi, E. 2016; Ndiaye and Xu, 2016; Malikane and Chitambara, 2017; Ciobanu, 2020), which showed that FDI has a positive impact on growth, the results presented in this study demonstrate that Chinese FDI inflows has a negative impact on WAEMU countries' growth on the basis of random effects model. Possible explanation for this could be that the absorption capacity is quite lower in most of WAEMU countries. The dominating effect of the parent foreign company may sometimes discourage the local firms from developing their own R & D activities, leading therein to a negative effect of FDI on economic growth (Brewer, 1991). Similarly, Alfaro et al. (2004) found that FDI negatively affect growth. Again, our finding is also in line with the study by Herzer (2012) who demonstrated that FDI was adversely correlated with economic growth in developing countries. This is comparable to other works who argue that there is no evidence for FDI to stimulate economic growth (Blalock et al., 2009, Carbonell and Werner, 2018). Indeed, the more a country invests into the education and health systems, the more human capital stock it obtains. Again, the higher the human capital stock, the greater the FDI likelihood to result in positive effects on growth (Sandjong, 2015; Ekodo et al., 2020). This seems not to be the case of most of the countries in WAEMU zone.

The coefficients for *EXPORTS* are negative and significant, indicating that 1% increase in the total exports of goods and services by countries of the union as a whole, would lead to about 0.113 % reduction of the growth. This finding is similar to the empirical study of Guei and Roux. (2019), which found that trade openness has negative effect on GDP per capita (GDP),

in the long run. Possible reason for our finding is the deteriorating terms of trade as observed through the secular decline in real commodities prices. Indeed, WAEMU is comprised of countries that are all developing countries, which export only raw materials. In order to gain more, they reinvest surpluses on the production of the same primary goods, and supply increased a lot. Meanwhile, monopoly power of firms in developed countries and their unions prevented the prices of industrialized goods from dropping causing therein for primary goods exporting countries the deterioration of their terms of trade (Prebisch, 1950). Instead of continuing to export raw materials and primary commodities, these countries should rather promote the industrialization by producing the manufactured goods that are imported. More investments in new industries could lead to the growth. The industry sector then would become the main component of GDP.

Concerning the impact of infrastructure development and industrialization, our analyses show positive and significant effect on growth. Similarly, Sahoo et al. (2010) in their work found that infrastructure development in China has significant positive contribution to growth. Likewise, the influence of development of physical infrastructure on the growth was found to be positive by Grundey (2008). Other authors argue that public infrastructure are a foundation on which a country can build the economic growth (Macdonald, 2008; Burinskiene and Rudzkiene, 2009). Indeed, modernization theory states that economic process and its advancement, which is endogenous in nature, depend on technological improvement and human capital development. In their studies, Kalai and Zghidi (2019), Sokhanvar (2019), and Sarkodie and Strezov (2019) pointed out that FDI inflow comes with its spillover effect in form of technological transfer. They further demonstrated that human capital development is a key to economic expansion in the host countries, particularly the developing ones. Recently, Udi et al. (2020) studied the FDI inflow in the economic expansion of South Africa and demonstrated that industrialization a positively contribute to economic growth process.

Conclusion
The global economy has evolved significantly in recent years, especially movements of goods, services and capital. Thus, foreign direct investment has become a crucial factor of globalization and opportunity that arose for many developing countries. The FDI-led growth notion is still very much subject to empirical verification. In this context, we used theoretical framework of the endogenous growth model to perform fixed-effects and random effects regressions with instrumental variables to make the estimates, based on data from World Development Indicators (WDI) and Statistical Bulletins of China's Outward Foreign Direct Investment, covering the period 2006 to 2018. Our research contributes to the large literature on the FDI and economic growth by providing evidence on the effects of Chinese FDI on growth of WAEMU countries. Our findings showed that Chinese FDI in WAEMU zone is significant and negatively correlated with the growth of these host countries, based on the random effects regression. In addition, we found that the coefficients of *EXPORTS* variable are negative and statistically significant, indicating a negative impact for exports of primary goods on WAEMU countries' growth. Further, *infrastructure development and industrialization* were found to be one of the critical factors for growth of the countries under investigation.

Based on these findings, the study recommends Governments of WAEMU countries to intensify their investment on health and education in order to boost the quality of human capital stock, which in turn would increase absorptive capacity, necessary to benefit from technological transfer via FDI in general (Sandjong, 2015), particularly the Chinese FDI

towards these countries. In addition, policies should promote the production of manufactured goods that are imported rather than increasing primary goods exports. More importantly, investing in infrastructure and industrialization process is fundamental to positively impact the growth in the region.

References

Abdouli, M., & Hammami, S. (2017). The impact of FDI inflows and environmental quality on economic growth: an empirical study for the MENA countries. J Knowl Econ 8(1):254–278.

Abid, F., & Bahloul, S. (2011). Selected MENA countries' attractiveness to G7 investors. Economic Modelling, 28(5), 2197–2207.

Akadiri, A.C., Gungor, H., Akadiri, S.S., & Bamidele-Sadiq, M. (2019). Is the Causal Relation between Foreign Direct Investment, Trade, and Economic Growth Complement or Substitute? The Case of African Countries. Journal of Public Affairs e2023. https://doi.org/10.1002/pa.2023

Akisik, O., Gal, G., & Mangaliso, M. P. (2020). IFRS, FDI, economic growth and human development: The experience of Anglophone and Francophone African countries. Emerging Markets Review, 100725. https://doi.org/10.1016/j.ememar.2020.100725.

Alaya, M. (2004). L'IDE contribue-t-il réellement à la croissance économique des pays du Sud et de l'Est de la méditerranée ? C.E.D, Université Montesquieu-Bordeaux IV.

Alaya, M. (2006). Investissement direct étranger et croissance économique: une estimation à partir d'un modèle structurel pour les pays de la rive sud de la Méditerranée. 7èmes journées scientifiques du réseau « Analyse Economique et Développement de l'AUF ».

Alfaro, L., Chanda, A., Kalemli-Ozcan, S., & Sayek, S. (2004). FDI and economic growth: the role of local financial markets. J. Int. Econ. 64, 89–112.

Alvarado, R., Iñiguez, M., & Ponce, P. (2017). Foreign direct investment and economic growth in Latin America. Economic Analysis and Policy, 56, 176–187. https://doi.org/10.1016/j.eap.2017.09.006.

Asiedu, E. (2006). Foreign direct investment in Africa: The role of government policy, institutions and political instability. World Economy, 29(1), 63–77.

Ausloos, M., Eskandary, A., Kaur, P., & Dhesi, G. (2019). Evidence for Gross Domestic Product growth, time delay dependence over Foreign Direct Investment. A time-lag dependent correlation study. Physica A: Statistical Mechanics and Its Applications, 527, 121181, 1–22. https://doi.org/10.1016/j.physa.2019.121181.

Aziz, O.G. (2020). FDI inflows and economic growth in Arab region: The institutional quality channel. International Journal of Finance and Economics. https://doi.org/10.1002/ijfe.2197.

Baiashvili, T., & Gattini, L. (2020). Impact of FDI on economic growth: The role of country income levels and institutional strength, EIB Working Papers, No. 2020/02, ISBN 978-92-861-4574-2, European Investment Bank (EIB), Luxembourg. http://dx.doi.org/10.2867/846546.

Barro, R. J. &. Sala-I-Martin, X. (1995). Economic Growth. New York, McGraw Hill.

Barro, R.J. & Lee, J.W. (2013). A new data set of educational attainment in the world, 1950-2010, Journal of Development Economics, 104, 184-198.

Barro, R.J. & Sala-I-Martin, X. (1997). Technological Diffusion, Convergence, and Growth. Journal of Economic Growth 2, 1–26. https://doi.org/10.1023/A:1009746629269.

Bende-Nabende, A. (2002). Foreign Direct Investment Determinants in Sub-Saharan Africa: A Co-Integration Analysis, Economics Bulletin, 6 (4), pp. 1-19.

Bilas, V. (2020). FDI and Economic Growth in EU13 Countries: Cointegration and Causality Tests. Journal of Competitiveness, 12(3), 47–63. https://doi.org/10.7441/joc.2020.03.03.

Blalock, G., Gertler, P. (2009). How firm capabilities affect who benefits from foreign technology. J. Dev. Econ. 90(2), 192–199.

Blomström, M., Kokko, A. & Zejan. M. (1994). Host Country Competition and Technology Transfer by Multinationals, Weltwirtschaftliches Archiv, Band 130, 521-533.

Borensztein, E., De Gregorio J., & Lee J.W. (1998). How does the foreign investment affect economic growth? Journal of International Economics (45), 115-135. https://doi.org/10.1016/S0022-1996(97)00033-0.

Brewer, T. L. (1991) .Foreign direct investment in developing countries: patterns, policies, and prospects" (Vol. 712): World Bank Publications.

Burinskiene, M., & Rudzkiene, V. (2009). Ploˇtros krypþiǐ vertinimoir valdymo informaciniai modeliai. Vilnius: Technika.

Carbonell, J.B. &. Werner, R.A. (2018). Does Foreign Direct Investment Generate Economic Growth? A New Empirical Approach Applied to Spain, Economic Geography, 94(4), 425-456. https://doi.org/10.1080/00130095.2017.1393312.

Carkovic M. & Levine, R. (2002). Does Foreign Direct Investment Accelerate Economic Growth? Institute of International Economics Press, Washington DC, p. 195-221.

Chen, F., Zhang, Q., & Wang, X. (2018). Entrepreneurship, FDI dependence and economic growth. Management World (in Chinese) 2:178–79.

Cheng, L. K. & Ma, Z. (2008). China's outward foreign direct investment, Paper presented at the Indian Statistical Institute, 12 December 2008, http://www.isid.ac.in/pu/seminar/12_12_2008_Paper.doc (Accessed March 7, 2021).

Ciobanu, A. (2020). The Impact of FDI on Economic Growth in Case of Romania, International Journal of Economics and Finance, 12(12) 81. https://doi.org/10.5539/ijef.v12n12p81.

Cooray, A. & Vadlamannati, K. C. (2012). What drives FDI policy liberalization? An empirical investigation. CAMA Working Paper Series (27).

Doku, I., Akuma, J., Owusu-Afriyie, J. (2017). Effect of Chinese foreign direct investment on economic growth in Africa. Journal of Chinese Economic and Foreign Trade Studies 10(3):00-00. https://doi.org/10.1108/JCEFTS-06-2017-0014.

Dunning, J. H. (1993), The Globalization of Business, London: Routledge.

Durham, J.B. (2004). Absorptive capacity and the effects of foreign direct investment and equity foreign portfolio investment on economic growth. Eur. Econ. Rev. 48 (2), 285.

Ekodo, R., Ndam M., & Ousmanou, K. (2020). Investissement direct étranger et croissance économique en zone CEMAC: Le rôle du capital humain, Revue Marocaine d'Économie, (3).

Findlay, R. (1978). Relative backwardness, direct foreign investment, and the transfer of technology: a simple dynamic model. Q. J. Econ. 92, 1–16.

Folawewo, A. O. & Adeboje, O. M. (2017). Macroeconomic determinants of unemployment: Empirical evidence from economic community of West African states. African Development Review, 29(2), 197–210. https://doi.org/10.1111/1467-8268.12250.

Fontagné, L. & Pajot, M. (1999). Foreign direct investment and foreign trade: a greater impact in the United States than in France. Economie et Statistique, 326-327, 31-52.

Fontagné, L. (1999). Foreign Direct Investment and International Trade: Complements or Substitutes? OECD Science, Technology and Industry Working Papers, 1999/03, OECD Publishing. http://dx.doi.org/10.1787/788565713012.

Frynas, J.G. & Paolo, M. (2007). A new scramble for African oil? Historical, political, and business perspectives. African Affairs, 106(423), 229–251.

Gamariel, G. & Hove, S. (2019). Foreign Direct Investment and Export Competitiveness in Africa: Investigating the Channels. Journal of African Trade 6 (1-2), 30-46. https://doi.org/10.2991/jat.k.191115.001.

Ganawi, N.K., Zaboon, A.A., & Gatea, S.K. (2020). The impact of foreign direct investment (FDI) on the sustainable economic development. Opción, Año 36, Especial 27, 607-623 ISSN 1012-1587/ISSNe: 2477-9385.

Grossman, G.M. & Helpman, E. (1991). Trade, Knowledge Spillovers, and Growth", European Economic Review 35, 517-26.

Grundey, D. (2008). Managing sustainable tourism in Lithuania: Dream or reality? Technological and Economic Development of Economy, 14(2), 118-129.

Guei, K.M., & Roux, L. P. (2019). Trade openness and economic growth: Evidence from the economic community of Western African States region. Journal of Economic and Financial Sciences, 12(1).1-9. https://doi.org/10.4102/jef.v12i1.402.

Gutiérrez-Portilla, P., Maza, A., & Villaverde, J. (2019). A spatial approach to the FDI-growth nexus in Spain: Dealing with the headquarters effect, International Business Review (2019) 28(6). https://doi.org/ 10.1016/j.ibusrev.2019.101597.

Hansson, B. (2008). Job-related Training and Benefits for Individuals, OECD.

Hayat, A. (2018). FDI and economic growth: the role of natural resources? *Journal of Economic Studies*, 45(2), 283-295. https://doi.org/10.1108/JES-05-2015-0082.

He, X. (2010). Noteworthy discrepancies in China's GDP accounting. China & World Economy, Institute of World Economics and Politics, Chinese Academy of Social Sciences, 18(s1), 88-102.

Herzer, D. (2012). How Does Foreign Direct Investment Really Affect Developing Countries' Growth? Review of International Economics, 20(2), 396–414. https://doi.org/10.1111/j.1467-9396.2012.01029.x .

Holslag, J. (2011). China's evolving behavior in Africa and the options of cooperation with Europe. Journal of Current Chinese Affairs - China actual, Institute of Asian Studies, GIGA German Institute of Global and Area Studies, Hamburg, 40(4), 3–16.

Hong, E. & Sun, L. (2006). Dynamics of internationalization and outward investment: Chinese corporations' strategies. The China Quarterly, 187: 610–634.

Iamsiraroj, S. & Ulubasoglu, M.A. (2015). Foreign direct investment and economic growth: A real relationship or wishful thinking? Econ. Model. 51, 200–213.

Kalai, M., & Zghidi, N. (2019). Foreign direct investment, trade, and economic growth in MENA countries: empirical analysis using ARDL bounds testing approach. J Knowl Econ 10(1):397–421

Kolstad, I. & Villanger, E. (2008). Determinants of foreign direct investment in services. European Journal of Political Economy, 24(2), 518–533.

Kolstad, I. & Wiig, A. (2012). What determines Chinese outward FDI? Journal of World Business 47 (2012) 26–34. https://doi.org/10.1016/j.jwb.2010.10.017.

Liu, Y., Hao, Y., & Gao, Y. (2017). The environmental consequences of domestic and foreign investment: Evidence from China. Energy Policy, 108, 271–280. https://doi.org/10.1016/j.enpol.2017.05.055.

Macdonald, R. (2008). An Examination of Public Capital's Role in Production. Economic Analysis Research Paper Series. No. 50. Ottawa: Statistics Canada.

Mahembe, E.E. & Odhiambo, N.M. (2016). Does foreign direct investment cause economic growth? A dynamic panel data analysis for SADC countries. Int. J. Emerg. Mark. 11, 316–332

Mahmoodi, M., & Mahmoodi, E. (2016). Foreign direct investment, exports and economic growth: evidence from two panels of developing countries. Economic Research-Ekonomska Istraživanja, 29(1), 938–949. https://doi.org/10.1080/1331677x.2016.1164922.

Makun, K. K. (2017). Imports, remittances, direct foreign investment and economic growth in Republic of the Fiji Islands: An empirical analysis using ARDL approach. Kasetsart Journal of Social Sciences, 1–9. https://doi.org/10.1016/j.kjss.2017.07.002.

Malikane, C. & Chitambara, P. (2017). Foreign Direct Investment, Productivity and the Technology Gap in African Economies, Journal of African Trade 4(1-2), 61–74, DOI: https://doi.org/10.1016/j.joat.2017.11.001.

Malikane, C. & Chitambara, P. (2017). Foreign Direct Investment, Democracy and Economic Growth in Southern Africa. Afr. Dev. Rev. 29, 92–102.

Mankiw, N.G., Romer, D., & Weil, N.D. (1992). A Contribution to the Empirics of Economic Growth, Quarterly Journal of Economics, 107, 407-437.

Mistura, F. & Roulet, C. (2019).The determinants of foreign direct investment: do statutory restrictions matter? OECD Working Papers on International Investment (01). https://dx.doi.org/10.1787/641507ce-en.

Morck, R., Yeung, B., & Zhao, M. (2008). Perspectives on China's outward foreign direct investment. Journal of International Business Studies, 39: 337–350

Ndiaye, G. & Xu, H. (2016). Impact of Foreign Direct Investments (FDI) on Economic Growth in WAEMU from 1990 to 2012, International Journal of Financial Research, vol 7, N° 4. http://dx.doi.org/10.5430.ijfr.v7n4p33.

OECD, (2001). OECD Reviews of Foreign Direct Investment: Estonia, Paris.

OECD, (2007). Education at a Glance: OECD Indicators – 2007 Edition", OECD, Paris. Psacharopoulos, G. (1994), "Returns to investment in education: A global update", World Development: Elsevier, 22(9), 1325-1343.

Osinubi, T. S., & Amaghionyeodiwe, L. (2010). Foreign private investment and economic growth in Nigeria. Applied Econometrics and International Development, Euro-American Association of

Otchere, I., Soumaré, I., & Yourougou, P. (2016). FDI and financial market development in Africa. World Econ. 39 (5), 651–678.

Owusu-Manu, D.G., Edwards, D.J., Mohammed, A., Thwala, W.D., & Birch, T. (2019). Short run causal relationship between foreign direct investment (FDI) and infrastructure development. https://doi.org/10.1108/JEDT-04-2019-0100.

Paus, E. & Gallagher, K. (2007). Missing Links: Foreign Direct Investment and Industrial Development in Costa Rica and Mexico. St Comp. Int. Dev. 43, 53-80.

Prebisch, R. (1950). The Economic Development of Latin American and Its Principal Problems (Lake Success, NY: United Nations, Department of Economic Affairs). Reprinted in Economic Bulletin for Latin America 7 (1962): 1-22.

Romer, P. M. (1990). Endogenous Technological Change, Journal of Political Economy, Vol. 98, No. 5, Part 2: The Problem of Development: A Conference of the Institute for the Study of Free Enterprise Systems. pp. S71-S102.

Sahoo, P., Dash K.R., & Nataraj, G. (2010). Infrastructure Development and Economic Growth in China. Institute of Developing Economies, IDE Discussion Paper N°126.

Sanda, C., & Dana, L. (2007). Foreign direct investment incentives. Revista Tinerilor Economisti (The Young Economists Journal), 1(7), 149–154.

Sandjong, T.D.G.E. (2015). Foreign direct investment, economic growth and structural transformation: The case of West African Economies and Monetary Union Countries.

Sarkodie, S.A., & Strezov, V. (2019). Effect of foreign direct investments, economic development and energy consumption on greenhouse gas emissions in developing countries. Sci Total Environ 646, 862–871.

SBCOFDI, (2016). Statistical Bulletin of China's Foreign Direct Investment. Ministry of Commerce of the People's Republic of China, National Bureau of Statistics of the People's Republic of China, State Administration of Foreign Exchange.

SBCOFDI, (2019). Statistical Bulletin of China's Foreign Direct Investment. Ministry of Commerce of the People's Republic of China, National Bureau of Statistics of the People's Republic of China, State Administration of Foreign Exchange.

Sokhanvar, A. (2019). Does foreign direct investment accelerate tourism and economic growth within Europe? Tour Manag Perspect 29, 86– 96.

Sothan, S. (2017). Causality between FDI and Economic Growth for Cambodia. Cogent Economics and Finance 5 (1), 1277860. https://doi.org/10.1080/23322039.2016.1277860.

Sunde, T. (2017). Foreign direct investment, exports and economic growth: ADRL and causality analysis for South Africa. Research in International Business and Finance, 41, 434–444. https://doi.org/10.1016/j.ribaf.2017.04.035 .

Udi, J., Bekun, S.V., Adedoyin, F.F. (2020). Modeling the nexus between coal consumption, FDI inflow and economic expansion: does industrialization matter in South Africa? Environmental Science and Pollution Research 27:10553–10564. https://doi.org/10.1007/s11356-020-07691-x.

UNCTAD, United Nations Conference on Trade and Development. (1999). Foreign direct investment in Africa: performance and potential. UNCTAD/ITE/IIT/Misc. 15. New York and Geneva.

UNCTAD, United Nations Conference on Trade and Development. (2007). Asian foreign direct investment in Africa – Towards a new era of cooperation among developing countries. (New York and Geneva).

Vojtovic, S., Klimaviciene, A., & Pilinkiene, V. (2019). The Linkages between Economic Growth and FDI in CEE Countries. Ekonomický časopis, 67 (3), 264–279.

Wang, J.Y. (2007). What drives China's growing role in Africa? IMF working papers 07/211International Monetary Fund.

WDI, World Development Indicators. (2019). Database of the world development indicators. Washington: World Bank.

Woetzel, J., Seong, J., Leung, N., Ngai, J., Manyika, J., Madgavkar, A., Lund, S., & Mironenko A. (2019). China and the world: Inside the dynamics of a changing relationship. McKinsey Global Institute.

Woo, J. (2009). Productivity Growth and Technological Diffusion through Foreign Direct Investment. Economic Inquiry, 47(2), 226-248.

Wu, W., Yuan, L., Wang, X., Cao, X., & Zhou, S. (2020). Does FDI Drive Economic Growth? Evidence from City Data in China, Emerging Markets Finance and Trade, 56:11, 2594-2607. https://doi.org/10.1080/1540496X.2019.1644621.

Zeng, S., & Zhou Y. (2021). Foreign Direct Investment's Impact on China's Economic Growth, Technological Innovation and Pollution. International Journal of Environmental Research and Public Health. 18(6):2839. https://doi.org/10.3390/ijerph18062839.

Zhang, J. (2005). An explanatory study of bilateral FDI relations: The case of China. Journal of Chinese Economic and Business Studies, 3(2), 133–150.

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