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# SPILLOVERS OF CHINESE FOREIGN DIRECT INVESTMENT IN AFRICA: AN EMPIRICAL PERSPECTIVE

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## ABSTRACT

In the last decade, there has been a continuous rising of China`s involvement in terms of investment and trade relation in Africa. Against this backdrop, this study examined the spillover effects of Chinese FDI inflows on African economic growth over the period of 1990 to 2018 within the framework of Autoregressive Distributed Lag model and Bounds test. This study utilized secondary data from UNCTAD investment report and World Development Indicator. Consequently, the results from this empirical study indicate that the past economic growth rate has a significant positive impact on the present economic growth rate in Africa. Further evidence shows that Chinese FDI inflow has a significant positive relationship with the rate at which the African economy is growing. However, gross capital formation has an insignificant negative relationship with economic growth rate. In the same vein, the openness of the economy has a significant negative relationship with economic growth rate. Consequently, the following recommendations are made based on the discovery in this study; the policy makers in African countries should embark on sustainable partnership with Chinese investors. Also, policy makers in Africa should give a preferential treatment such as free visas and less bureaucratic processes to Chines investors, this would facilitate sporadic inflows of investment from China.

 **Keywords:** Chinese; FDI; Spillovers; Growth Rate; ARDL; Africa

**JEL Classification**: F21, O16

## 1. INTRODUCTION

In the past decade, there has been a continuous rising of China`s involvement in African economy. In terms of trade relation, China is now the biggest Africa`s export partner surpassing the European countries that used to be the biggest export partners of the continent. Historically, Sub Saharan Africa`s exports were overwhelmingly oriented toward Western markets, but the region's trade relationships are continuously shifting. In 2013, China became SSA's most important export partner. China now accounts for 27 percent of Sub Saharan Africa's exports, compared with 23 percent for the European Union and 21 percent for the United States. However, in the process of time, African countries would be highly vulnerable to the dynamics of global prices of goods and demand level of China because China-SSA trade relationship is highly asymmetrical. For instance, SSA has been importing a large quantum of capital goods and consumer goods on a continuous basis while exporting primary products, like oil, minerals, and other natural resources in return. Despite the fact that African economies are continuously accommodating Chinese products, China`s investment in Africa cannot be undermined as well. This shows that China`s investment and trade involvement in Africa are growing simultaneously.

Consequently, Africa received US$24 billion FDI inflow from China in 2013. The annual China's FDI stock in SSA between 2004 and 2013 has been estimated to be 50% (MOFCOM 2003-2014; Copley, Maret-Rakotondrazaka, and Sy 2014). In the same vein, the inflows of FDI from China to Africa rose by more than 30 times between 2003 and 2011(UNCTAD, 2014). It has been argued in the literature that one of the strategic factors propelling China's relations with African countries is the large reserves of abundant natural resources in Africa in which the country needs to support its economic development. (Renard, 2011). Little wonder, Chinese FDI inflows are in favour of oil rich African countries. South Africa, Nigeria, Zambia,

Algeria, Sudan, and Angola were the top destinations of Chinese FDI outflows in Africa in 2012. These countries accounted for over 50% of total inflows of FDI in Africa (Leung& Zhou, 2014).

However, the answer to the question whether Chinese investment in Africa has benefited the continent largely remains controversial. It has been documented that decline in production and employment in some sectors of African economies has been attributed to the intense competition orchestrated by Chinese investment in Africa (Ademola et al 2009). In another perspective, positive spillovers of Chinese FDI have been reported in terms of low investment cost in Africa because capital goods and transport equipment were purchased at lower prices from China than products imported from Europe (Renard, 2011). Against this backdrop the study on the spillovers of Chinese FDI in Africa becomes imperative because there is a critical need for the maximization of spillovers of China's FDI on African development.Besides the introduction, the rest of this study is organized as follows; section two presents the review of literature and section three addresses methodology, discussion of results and policy recommendation.

## 2. LITERATURE REVIEW

An attempt has been made in this section to review the past studies on nexus between FDI inflows and other macro-economic variables in order to observe the trend and submissions of different renowned scholars on this subject matter.Anyanwu (2012) submitted that market size, the openness of the countries to foreign trade, rule of law, foreign aid, natural resources, and past FDI were the dominant factors causing the inflows of FDI in Africa while examining the factors orchestrating FDI inflows from 1996 to 2008 in 53 African countries. While investigating the variables that propel Chinese FDI in Africa, Cheung et al (2012) opined that Chinese FDI flows to Africa as a result of African market size, risk factor, and resource endowments in the continent.

Also, China's intensity of trade with Africa and project contracts in Africa are major determining factors of Chinese FDI in Africa. In another study, Klaver &Trebilcock (2011) investigated whether Chinese investment benefited African continent, it was reported in the study that Chinese investment benefited growth of economies in Africa in the following ways; in terms of commodity prices, there was a rise in the prices of commodity in the continent due to demand for resources from China. Increment of the African capacity to extract their own resources, development of infrastructural facilities in Africa. Another benefits could be seen in the development of Africa's manufacturing sector, generation of employment, improvement of Africa's access to its market and reduction of prices of manufactured goods and food. Verachia (2010) concluded that Chinese investment in Africa was as a result of larger markets in which the continent has to accommodate the products from China.

In another related study, Weisbrod & Whalley (2011) adopted growth accounting techniques to estimate the response of Sub-Saharan Africa's elevated growth to FDI from china from 1990 to 2008. The authors submitted that three years before the global financial crisis of 2007 and two years after the crisis 2008 and 2009, certain portion of the elevated growth in sub Saharan Africa could be arrogated to FDI inflows from China. Boakye-Gyasi & Li (2015) assessed the nexus between China's FDI and employment creation in Ghanaian building and construction sector with the aid of a robust regression model. It was discovered from the study that FDI inflows from China generated employment in Ghana via direct effects on building and construction sector.

Otchere et al. (2016) applied Granger causality technique to examine the direction of the causality between FDI and development of financial market in Africa. The study discovered that FDI has a significant direct link with economic growth in Africa. Kariuki (2015) utilized the Least Squares Dummy Variable model to investigate variables that facilitate the inflows of FDI in Africa between 1984 an in the continent. Isaac, John and John (2017) adopted a panel least square and Granger causality approach to investigate the impact of Chinese FDI inflows on economic growth in Africa. It was discovered from the study that inflows of FDI from China has a significant impact on African economic growth. And also, a unidirectional feedback exists between GDP growth and Chinese FDI inflows in Africa. Taqadus et al (2014) employed OLS and Granger causality technique to do a comparative analysis of how foreign direct investment affects the South Asian economies and China. It was submitted in the study that economy of China was at faster growth pace than the economies of South Asia sub region.

Consequently, Aveh et al. (2013) adopted a two-stage least square to estimate the relationship between FDI and economic growth between 2004 and 2011 in Ghana. It was discovered from the study that FDI and economic growth have an insignificant direct relationship. Meanwhile, financial development and exports growth have a significant inverse relationship in the country. In conclusion, the above reviewed empirical studies show that studies on the nexus between Chinese FDI and growth of African economies are very scanty. This shows that studies have not fully explored this subject matter in the recent times. Hence, the relevance of this study.

## 3. METHODOLOGY

### 3.1 Introduction

Secondary data from 1990 to 2018 would be utilized in this study. It is assumed that 29 years are long enough for the spillovers of inflows of Chinese FDI to be felt in African continent. FDI data were extracted from UNCTAD database published by World Bank and GDP, GDP Growth rate, GDP per capita and openness of the economy were sourced from World Development Indicator.

### 3.2 Model Specification

To estimate the spillovers of Chinese FDI in Africa, the study takes the Cobb–Douglass production function in which output (Y) is determined by two factors, namely capital (K) and labor (L) as spelt out in the Solow's model. Y is defined as output per worker and K as capital per worker (k), the production function is therefore specified as $Y=f(K)$. In econometric form the model could be specified as follows;

GDPR = F (FDI, GCF, OPEN) -----------------------------------------------------------------------1

The model 1 can be linearized to form model 2

$$GDPR_t = \alpha + \beta 0 LnFDI_t + \beta 1 LnGCF_t + \beta 2 OPEN_t + \varepsilon_t \text{----------------------------------------2}$$

$$\Delta GDPR_t = \delta_0 + \sum_{i=1}^{p} \delta_1 \, \Delta GDPR_{t-1} + \sum_{i=1}^{p} \delta_2 \Delta Ln\,FDI_{t-1} + \sum_{i=1}^{p} \delta_3 \, \Delta LnGCF_{t-1} + \sum_{i=0}^{p} \delta_4 \, \Delta OPEN_{t-1} + Ut \text{--------------------------------------------------------------------------3}$$

Where $GDPR$ is average GDP growth rate in Africa and is used to proxy the rate of economic growth in Africa, is measured in percentage. LnFDI is log of aggregate China's FDI in Africa, is measured in billions dollar. LnGCF is log of aggregate capital formation in Africa, is measured in billions dollar. OPEN is openness of African economy to the rest of the world is measured by addition of aggregate African exports and imports as percentage of GDP, and is measured in percentage.

Meanwhile $\propto$ is an intercept and β1, β2 and β3 are slope parameters, t= 1990---2018. By

The aprori expectation is β0, β1, β2>0

### 3.3 Results and discussion

**Table 1: Descriptive Statistics of Annual Data Series (1990-2018)**

| Descriptive Statistics | LnFDI | LnGCF | OPEN | GDPR |
|---|---|---|---|---|
| Mean | 23.20463 | 22.33784 | 10.94483 | 3.593103 |
| Median | 22.65267 | 22.61743 | 10.00000 | 3.600000 |
| Maximum | 26.00214 | 24.72150 | 18.80000 | 6.600000 |
| Minimum | 20.53694 | 19.55530 | 5.400000 | -0.900000 |
| Std. Deviation | 1.865011 | 1.334545 | 4.954477 | 2.067768 |
| Skewness | 0.125072 | -0.335239 | 0.208745 | -0.386487 |
| Kurtosis | 1.442726 | 2.274968 | 1.361729 | 2.397794 |
| Jargue-Bera | 3.005940 | 1.178382 | 3.453695 | 1.160172 |
| Probability | 0.222468 | 0.554776 | 0.177844 | 0.559850 |
| Sum | 672.9344 | 647.7974 | 317.4000 | 104.2000 |
| Sum. Sq. Deviation | 97.39142 | 49.86832 | 687.3117 | 119.7186 |
| Observation | 29 | 29 | 29 | 29 |

*Source: Author`s Computation 2020*

The above table shows the descriptive characteristics of various variables of interest in this paper. It is evident in the table that the mean values of all the variables are greater than the values of their standard deviations. This implies that these variables are moderately dispersed from the mean. Also, the mean values and median values of the variables are very close. This shows that distribution of the data is fairly symmetrical. In a case of perfect symmetrical distribution, the mean value and median value must be identical (Karmel and Polasek, 1980). The values of skewness of FDI and openness of economy data indicate that the data are positively skewed with Kurtosis values that are less than 3. This implies that the data partially agree with symmetrical distribution assumption. However, gross capital formation and GDP growth rate data are negatively skewed with Kurtosis values that are close 3. This implies that the data fairly agree with the symmetrical distribution assumption. Therefore, it could be inferred that the data fairly support the normal distribution assumption that is required for the econometric analysis.

**Table 2: Unit Root Test**

| Variables | ADF Test | | | | |
|---|---|---|---|---|---|
| | Level | Probability | 1st Diff | Probability | Remark |
| GDPR | -2.971853*** | 0.2820 | -2.976263 | 0.0001 | I(1) |
| LnGCF | -2.971853 | 0.0147 | - | - | I(0) |
| LnFDI | -2.971853 | 0.7523 | -2.976263 | 0.0000 | I(1) |
| OPEN | -2.971853 | 0.8609 | -2.976263 | 0.0165 | I(1) |
| Variables | PP Test | | | | |
| | Level | Probability | 1st Diff | Probability | |
| GDPR | -2.971853*** | 0.2956 | -2.976263 | 0.0001 | I(1) |
| LnGCF | -2.971853 | 0.0132 | - | | I(0) |
| LnFDI | -2.971853 | 0.7523 | -2.976263 | 0.0000 | I(1) |
| OPEN | -2.971853 | 0.8156 | -2.976263 | 0.0187 | I(1) |

*Source: Authors` Computation (2020) ,\*\*\* %5 level*

It has been argued in the literature that spurious regression could be the aftermath effect of non-stationary data in empirical analysis. This could render the policy implication of such study inefficient. As such, efforts were made to avert the problem of spurious regression in this study by investigating the stationarity property of the employed data through the application of the standard Augmented Dickey-Fuller (ADF) and Phillips-Perron tests. From table 2, the estimated results indicate that three variables are stationary after first differencing, while one variable is stationary at level. This shows that the variables are combination of I(1) and I(0). However, when variables are mixture of I(0) and I(1), Autoregressive Distributed Lag model (ARDL) has been argued to be the appropriate estimation technique. Hence, this study adopts ARDL for its analysis. (Pesaran, Shin and Smith, 2001: Pesaran and Pesaran, 1997

**Table 3: ARDL Bounds Test**

| Sample: 1993 2018 | | |
|---|---|---|
| Included observations: 26 | | |
| Null Hypothesis: No long-run relationships exist | | |
| Test Statistic | Value | k |
| F-statistic | 3.764570 | 3 |
| Critical Value Bounds | | |
| Significance | I0 Bound | I1 Bound |
| 5% | 3.83 | 4.35 |

*Source: Authors` Computation (2020)*

The above table shows the results from the test of the long run relationship between FDI and other macroeconomic variables within the Bounds Test. It is shown in table 4 that the Null hypothesis could not be rejected because the value of F-Statistic is lower than the upper and lower Critical Value Bounds at 5% level of significance. Hence, the variables of interest do not have a long run convergence.

**Table 4: Parsimonious Short Run Regression Estimates of Chinese FDI Spillovers in Africa**

Dependent Variable: GDPR

| Short Run | Coefficient | T-Statistics | Prob. Value |
|---|---|---|---|
| DGDPR(-1) | 0.452427** | 2.986490 | 0.0087 |
| DLnFDI | 1.137500 | 2.642110 | 0.0178 |
| DLnGCF | -0.280250 | 0.984929 | 0.3393 |
| DOPEN | -0.619756* | 1.991498 | 0.0638 |
| R-Squared | 0.788538 | | |

*Source: Authors` Computation (2019)*
*\*Significant at 10%, \*\*Significant at 5%*

Table 4 presents the estimated results of the short run impact of Chinese FDI inflows in Africa. It should be established that the estimated parameters of gross capital formation and openness of economy did not agree with the aprori expectation. Meanwhile, R-Squared result shows that 78% of variation in dependent variable was explained by the set of explanatory variables in the model. This implies that the estimated model in this study is relatively efficient. Consequently, the coefficient value of the lagged GDPR shows that the past economic growth rate has a significant positive relationship with the present economic growth rate in Africa. In the same vein, Chinese FDI inflows has a significant positive relationship with economic growth rate in Africa. A unit change in Chinese FDI inflows leads to 0.01% increment in economic growth rate in the

continent. This finding is tandem with the submission of Isaac, John and John (2017) and Klaver &Trebilcock (2011) in a related studies despite the fact that different methodology was utilized in this work. However, gross capital formation has an insignificant negative relationship with economic growth rate. The openness of the economy has a negative relationship with economic growth rate, the relationship is significant at 10 percent level of significance. A unit change in openness of the economy leads to a reduction in the growth rate of the economy.

## 3.4 Conclusion and recommendation

In this study, the spillover effects of Chinese FDI inflows on African economic growth has been examined over the period of 1990 to 2018 within the framework of ARDL and Bounds test. The results from the empirical study could be submitted as follows; the past economic growth rate has a significant positive impact on the present economic growth rate in Africa. Further evidence shows that Chinese FDI inflows has a significant positive relationship with economic growth rate in Africa. Whereas, gross capital formation has an insignificant negative relationship with economic growth rate. The openness of the economy has a negative relationship with economic growth rate, which is significant at 10 percent level of significance.Consequently, the following recommendations are made based on the discovery in this study; the policy makers in African countries should embark on sustainable partnership with Chinese investors. Also, policy makers in Africa should give a preferential treatment such as free visas and less bureaucratic processes to Chines investors, this would facilitate sporadic inflows of investment from China.

## REFERENCES

Ademola, O., Bankole, A.S. and Adewuyi, A.O. (2009). China-Africa trade relations: insight from AER Cscoping studies. European Journal of Development Research, 21(4):485-505

Anyanwu, J.C. (2012). Why Does Foreign Direct Investment Go Where It Goes? New Evidence from African Countries. Annals of Economics and Finance 13(2): 433-70

Aveh, F.K., Krah, R.Y. and Dadzie, P.S. (2013). An evaluation of sustainability and subsidy dependence of microfinance institutions in Ghana, International Business and Management, 6(1): 55-63.

Boakye-Gyasi, K. and Li, Y. (2015). The impact of Chinese FDI on employment generation in the building and construction sector of Ghana. Eurasian Journal of Social Sciences, 3(2): 1-15.

Copley, A., Maret-Rakotondrazaka, F and Sy, A. (2014). The US-Africa Leaders' Summit: A Focus on Foreign Direct Investment." Brookings, Washington, DC. http://www.brookings.edu/blogs/africa-in-focus/posts/2014/07/11-foreign-directinvestment-us-africa-leaders-summit.

Dickey, D. A. & Fuller, W. A. (1981). Likelihood Ratio Tests for Autoregressive Time Series with aUnit Root. Econometrica, 49:1057 -1072

Isaac, D, John, A. & John, O. (2017). Effect of Chinese foreign direct investment on economic     growth in Africa. Journal of Chinese Economic and Foreign Trade Studies, 10(2):162-171

Kariuki, C. (2015). The determinants of foreign direct investment in the African union,    Journal of Economics, Business and Management, 3(3): 346-351.

Karmel P. H. and Polasek M. (1980). Applied statistics for economists

Klaver, M. and Trebilcock, M. (2011). Chinese Investment in Africa. The Law and Development  Review, 2011, 4(1): 168-217.

MOFCOM 2003–2014. Statistical Bulletin of China's Outward FDI. MOFCOM, Beijing
    of these economies displacing the USA and Europe as the major players on the continent? Paperpresented at the Gordon Institute of Business Science. Conference on the business of  Africa 2010: Looking  back  to  2000, forward to 2020. Illovo, 19 October.

Pesaran, M. and Pesaran, B. 1997. Microfit 4.0 (windows version). New York: Oxford University Press Inc.

Pesaran, M. H., Shin, Y., & Smith, R. J. (2001). Bounds Testing Approaches to the Analysis of Level Relationships. Journal of Applied Econometrics, 16, 289-326.

Phillips, P. C. & Perron, P. (1988Testing for a Unit Root in Time Series Regression. Biometrika, 75: 335-346

Renard, N.T.M. (2011). FDI convergence and spatial dependence between Chinese provinces.

Solow, R. M., (1956). A Contribution to the Theory of Economic Growth. The Quarterly Journal of Economics, 65-94.

Taqadus, B., Ayesha, M. R. and Zulfiqar, R. R. (2014). Impact of FDI on Economic Growth: A     Comparison   of   South Asian States & China) European Scientific Journal, 10(1): 446-468

UNCTAD (2018): Handbook of Statistics, available on-line at (http://www.unctad.org)

UNCTAD (United Nations Conference on Trade and Development). (2014). World Investment     Report 2014: Investing in the SDGs: An Action Plan. Geneva: United Nations.

Verachia, A.H. (2010). Brazil, India and China in Africa — what are the implications for Africa

Weisbrod, A, & Whalley, J. (2011). The Contribution of Chinese FDI to Africa's Pre Crisis Growth Surge. NBER Working Paper No. 17544, National Bureau of Economic Research, Cambridge, MA

World Bank (2018). World Development Indicators. Washington D.C.