



## CHINESE FOREIGN DIRECT INVESTMENT IN GHANA: IMPACT ANALYSIS

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### **Abstract**

*Foreign direct investment is scholarly considered as the main factor behind the economic growth of developing and developed economies. Foreign direct investment is always expected to directly affect economic growth by adding to the country's fixed capital formation. Foreign direct investment is anticipated to complement domestic investments and is seen to be an effective supplement for capital and investment scarcities. Therefore, this study assesses the impact of China's foreign direct inflow on Ghana's economic growth. Chinese investors over the past decades have found comfort in Africa and investing in almost all areas of production. The variables for the study are; foreign direct investment inflow from China to Ghana, gross domestic product per capita, construction revenue from Chinese companies to Ghana, and export from China to Ghana. The data for the study is from 2000 to 2020. The study uses FMOLS and Canonical Cointegration Regression to assess the effect. The study further uses GMM and Two-Stage Least Squares as a robustness check. The result of the study indicates that, foreign direct investment inflow from China has a significant negative impact on Ghana's economic growth. The revenue from Chinese construction companies in Ghana does not significantly affect Ghana's economic growth. The export from China to Ghana has a significant positive effect on Ghana's economic growth. Ghana is to strengthen her trade with China and make available companies attractive for foreign investors.*

*Keywords: Foreign direct investment flow, economic growth, export, Construction revenue*



## INTRODUCTION

The world has been experiencing tremendous economic growth for the past two decades as a result of globalization and the many opportunities it comes with for countries, especially in trade. It is likely that more people are active than at any other moment in history. Income growth has most likely be faster and more consistent than ever. Every economy seeks to achieve its macroeconomic objective of economic growth. In the past years, most governments have adopted varieties of channels to implement this objective.

In every economy, investment is a vital component of aggregate expenditure and essential for growth through employment and productivity Okwu, Oseni & Obiakor, (2020).

Most developing countries use FDI to improve their economic growth and have undertaken governance, legal, political, and regulatory frameworks to attract investors Bissoob, 2011. As part of Ghana's initiatives to attract investors, the 1983 introduction of the Economic Recovery Programm (ERP) consists of the attraction of FDI as a significant objective, the 1990s Ghana Privatization Programme and the 1994 establishment of Ghana Investment Promotion Center.

Ghana, in its quest to be a hub for foreign investors in West Africa has hosted Ghana Investment Summit; the significant sectors or areas that attract FDI in Ghana are the oil exploitation and the mining and infrastructure industry

There has been an increase in the growth of Chinese Foreign Direct Investment (FDI) in Africa and Ghana. The reason will be the Chinese government's active promotion of investment activities in Africa. However, there have been varied opinions on the impact of Chinese FDI in Ghana from different scholars in academics and media. These discourses have been coherent; however, there is fear and Sinophobia.

Internationally, China has emerged by providing a new development approach that probably "exercises no political pressure" based on investment and bilateral exchanges, as postulated by (Frimpong and Nubuor 2013:118).

China's FDI and FDI inflows to Africa have increased from \$200million to \$2.9 billion in 2000 and 2011, making China the most significant investing country in Africa (UNCTAD, 2013; MOFCOM). However, following Africa's experience of a negative growth rate in the 1980s and 1990s, the Gross Domestic Product (GDP) per capita increased by an annual average of 2.4 percent in 2000-2009 and 1.8 percent in 2010-2012 (World Bank Report, 2014)

Irrespective of China's intentions, there is unprecedented growth in Africa that Chinese FDI expedites in several ways: employment of labor, especially in the construction industry,

infrastructure development, market access, increasing commodity prices, benefits to consumers, and the development of Ghana's manufacturing sector.

Several studies argue that Chinese FDI in Africa is detailed beneficial; other studies, however, pose challenges in the transfer of technology and skills, the deindustrialization of Africa, and high cost and limited benefit in some infrastructure projects.

Hence, this study, therefore, focuses on understanding the impact of Chinese foreign direct investment given the variables; foreign direct investment inflow from China to Ghana, gross domestic product per capita, construction revenue from Chinese companies to Ghana, and export from China to Ghana on the economic growth of Ghana.

### **Problem Statement**

Chinese foreign direct investment is a legitimate source of funding for the Government of Ghana. However, there are mixed views surrounding Chinese investment's impact on Ghana's economic growth, while others are positive and others are negative. Prior studies on FDI are geographically bounded, used different variables, methodologies while others focused on specific sectors of the economy.

The engagement of the Chinese in Africa has raised attention in policy studies (Goldstein et al., 2006, Broadman, 2007; Asche & Schuller, 2008; Kaplinsky et al., 2007; Morrissey & Zgoju, 2011). Few analyses are using econometric models on this topic, and with this, most of the comments are centered on the determinants, FDI /aid and trade. The study on the impact of African resource export to China by Meyersson et al. (2008) shows positive benefits in terms of economic growth and investment when Africans export their natural resources to China than to the world. Consistent with this is Balimoune-Lutz's (2011) findings that Africans benefit from economic growth when exporting primary products to China and benefit from imports from China. However, a contrary view from Giovannetti & Sanfilippo (2009) shows that Chinese exports displace African exports in other markets like the United States and European Union.

In relation to resource endowment, Kolstad & Wiig (2011) found out that Chinese FDI considerably flows to African countries with enormous natural resources. Cheung et al. (2012) also confirmed that by saying China's investment and resource seeking motives and other conditions like trade intensity, market potential and presence of Chinese contracted projects as necessary conditions to attract FDI. This is also consistent with Sanfilippo's (2010) findings that the main determinants of Chinese FDI is resource endowment and market size, he also added that Chinese economic cooperation is based on the same motives and some more. Contrary to this is the work by Biggeri and Sanfilippo (2009)

## LITERATURE REVIEW

This chapter expands on prior research to examine housing and the housing shortage in depth. The theoretical and conceptual framework of the study, the concept of housing deficit, the housing situation in Africa, an overview of the housing deficit in Ghana, factors causing housing deficit in Accra, challenges facing Accra's urban housing delivery, housing policy response, empirical review, and conceptual framework for the study will all be covered in this chapter.

### Definition of Concepts

#### ***Foreign Direct Investment (FDI)***

FDI simply means purchasing an interest of a company by another company that is located in a foreign country. An important feature of FDI is that, it utilizes effective control over the foreign firm or exerts control over its decision making. According to International Monetary Fund (IMF, 1993) as it appears in the manual of the balance of payment Fifth edition, FDI refers to an investment made to acquire lasting interest in an enterprise operating outside of the economy of the investor. FDI can improve the economic growth rate of the country making the investment and the country where that investment is made. We have three main types of FDI, such as horizontal (operate a similar business in a foreign country as the one that operates in the home country), vertical (when a complementary business is establish in a foreign country sometimes because of raw materials) and conglomerate (this usually takes the form of joint venture, it could be a business the investor establishes in a foreign country that is unrelated to the main business it operates in the home country) FDI. Until 2020, the leading countries in attracting FDI is US which is second to China. There is global fall in FDI in 2020 from \$1.5 trillion to 859 billion due to the coronavirus outbreak (United Nation Conference on Trade and Development, 2020).

#### ***Foreign Direct Investment Inflows***

This simply means a capital that is received from a nonresident or from a foreign investor. It can also be the value out of foreign direct investment by a foreign investor in a different economy, this can be assets or liabilities transfer between a resident and a foreign investor. The FDI of most developing countries summed up to \$671 billion in 2017. FDI inflows global trends in 2017 were reduced by 23 percent. FDI flow got to its peak in 2015 with total value of \$1.92 trillion.

## ***Economic Growth***

This simply means an increase in a country capacity to produce more goods and services from one period to another. It is vital to note that, emphases should not be made on only the quantity of goods and services but the value of goods and services. This is often measured by using GDP estimates and others

## **Climate and Investment Regime in Ghana**

### ***Regulatory and Investment Regime***

The GIPC has outlined in Act 1994 (Act 478) provisions regulating foreign investment and laws and regulation relating to specific sectors of the economy. All businesses or firms with foreign ties are supposed to be registered with the GIPC, including the details regarding their operations such as the amount of foreign capital they wish to invest and their activities. The standard time period for the registration is five (Five) working days and fees to be paid for joint-ventures are US\$1000, zero for mainly Ghanaian businesses and US\$2500 for foreign companies. The timeline subject for renewal is every two years with an amount of US\$1500 and additional fees to be paid by foreigners before they can get work permit. It is important to note that foreigners who are investing or wish to invest must provide evidence of the capital transferred and presents details of information about the investment project proposed, as well as the major activity intended, equity structure, employment, and its impact on environment. These areas of business are prohibited for foreigners to invest in, such as barber and beauty salons, retail business, engaging in taxi and car rental services with fleet of less than ten vehicles.

For FID in Ghana, ownership dictate the legal minimum contribution, an ownership that is fully foreign owned business is \$50,000, an ownership that is a joint venture with a local partner is \$10,00 and that of a trading partner is \$300,00

On immigrant quotas, if an enterprise has a paid-up capital within \$10,000 and \$100,000 range are entitle to an initial automatic one-person immigrant, the range of paid-up capital from \$100,000 to \$500.000 have a quota of two persons and above \$500,000 has immigrant quota of four persons. The additional requirement of the trading partners category to provide employment to not less than ten Ghanaians.

Unconditional transferability is guaranteed in the foreign investors Act (Act 478) such as net profit or dividends, remittance of liquidation of businesses or the proceed of sale. But there are currently attempts to update he minimum capital requirement and outline specific exemptions and incentives that applied to some specific sectors of the economy. These se t of

rules are applied to companies listed in the Ghana Stock Exchange, minerals, fishing, maritime transport and postal services subsectors.

For the mineral and oil industry, government is entitled to receive 10% equity in the particular venture at no cost. Foreigners are highly prohibited to engage in small-scale mining. Whole local participation is compulsory.

With the fishing industry, ownership base on the fishers Act (2002) restricts only Ghanaians in fishing operations but non- Ghanaians can own up to 50% of tuna vessels when fished. Access of ownership of firms listed in Ghana Stock Exchange can be 75% for foreigners when a single foreigner can own 10% maximum.

On postal services, it is only government owned Ghana company has the only right. Only local companies are permitted to operate maritime cobotage

There are also incentives for both local and foreign investment. Some particular equipment, and machinery attract reduced VAT and tariffs. There also availability of Tax rebates for investment in some particular regions in Ghana and special investment incentives od businesses located in the free zones.

Protection agreements and investment promotion with some countries. These agreements are kept in place to supplement the investment legislation in order to attribute FDI. Also, there is a forum to settle dispute as established in1996 by Arbitration Center, a private initiative to further boast the confidence. Again, Ghana is also part of a Multilateral Investment Guarantee Agency (MIGA) and also part of International Center for Settlement of Investment Disputes (ICSID)

### ***Investment Climate***

One major government priority aspect of economic policy is to attract FDI. To help government efforts, the Ghana Investment Advisory Council (GIAC) was established with the support of the World Bank. This consist of institutional observers from IMF, World Bank and the United Nations Development Program and multinational and local companies.

In the year 2000, 300 state-owned enterprises were privatized out of 350, also, government has initiated the partial privatization through the sale of equity stakes in state own enterprises on the Ghana Stock Exchange Market

The body in charge of overseeing the privatization effort is the Divestiture Implementation Committee (DIC). It is the goal of the government is in providing an enabling legal environment for investors and the removal of regulations that looks unfriendly.

The GIPC is in charge of overseeing the investment in all sector in the Ghanaian economy excluding oil and gas, mining and minerals, and free zones. However, there are other

laws in each sector that also regulate insurance, securities, banking, energy, financial institution, real estate, and telecommunication. The Centre performs several tasks that includes reducing delays in setting up new ventures, streamlining procedures, help investors to get established, and enjoy important incentives. There is no discrimination or bias towards foreign investors.

Registration in general is quite simple but the whole process of establishing a firm in Ghana is convoluted and demands that the business should meet compliance and regulation from government agencies such as GIPC, Ghana Immigration Service, Social Security and National Insurance Trust (SSNIT), Registrar General Department and Internal Revenue Service (IRS)

According to World Bank Doing Business Report, 2009, the average time to establish a firm is 34 working days in Ghana which has improved from 2003 report of 129 working days this will be aligned with the government reforms in that area. However, the World bank still ranks Ghana at 137th out of 181 economies. Ghana is on 87th rank as compare to the previous of 82nd rank of ease of doing business.

### **Trends of FDI Growth**

The report by the World Investment in 2008 showed that there was an increase in global FDI inflow by 30 percent to get to 2007 record high of US\$1979 billion. This could not materialize because there was a decline of 14% in in 2008 to an amount of US\$1697 billion and continued in 2009 to an amount of US\$1114 billion. The story turns when there was a bit of increase by 5 percent in 2010 to an amount of US\$1169 billion. The report indicated that the increase experience of the FDI inflow was as a result of relative strong corporate performance and relatively high economic growth in most part of the world and most especially developing economies.

For advance countries, the united State maintained its position as a country receiving the highest FDI inflows, follows with the United Kingdom, France, Canada and the Netherlands with an amount of US\$1248 billion

For Developing economies, the FDI inflows increased by 21 percent with an amount of US\$500 billion, this was more than the 2006 and was also the highest level ever obtained.

For less developed countries, the obtained the highest record ever in 2007 with FDI inflow of US\$13

China, Hongkong and the Russia were the three largest economies that received more FDI inflows among the transition countries and the developing countries.

For Africa, a new record was obtained in 2007 from FDI inflows of US\$53 billion. This FDI inflows were as a result of improved policy environment, vibrant community market and among others. Africa also experience an increase large level of outward FDI by US\$6 also as a



result of commodity price increase, extraction of natural resources, and projects launch to attract FDI.

The 2009 financial and credit crises have greatly affected FDI flow globally according to UNNCTAD, 2011. Developing countries and the transition countries has the largest share of FDI for both recipient and outward investors. In 2010, African countries recorded more than half of FDI inflows and was part of the top 20 investors. It is observed resource seeking is mainly the pattern of FDI growth in Sub-Saharan countries such as South Africa, Nigeria and Angola

### Chinese FDI Sectorial Distribution for 2001-2008

Ghana noticed an increase in FDI in 2006 for the first time ever, the manufacturing sector, building and construction, service and general trade all experienced growth with about \$1million FDI inflow. The important aspect was the Chinese had diversified into other sectors they had initially showed interest in. The Chinese FDI in the manufacturing industry exceeded other sectors in 2017, with an amount of \$134.4 million to the Sunon Asogli power Ltd. Project. From each year from 2002 to 2008, general trade and the manufacturing industry received the larger proportion of Chinese FDI.

In as much as there are benefits in terms of job creation, low-cost infrastructure for economic growth, there is also possibility an increase in the general trade will lead to most local firms to fold up as a result of intense competition, it could also lead to an indirect effect when they disinvestment and relocate to different sectors.

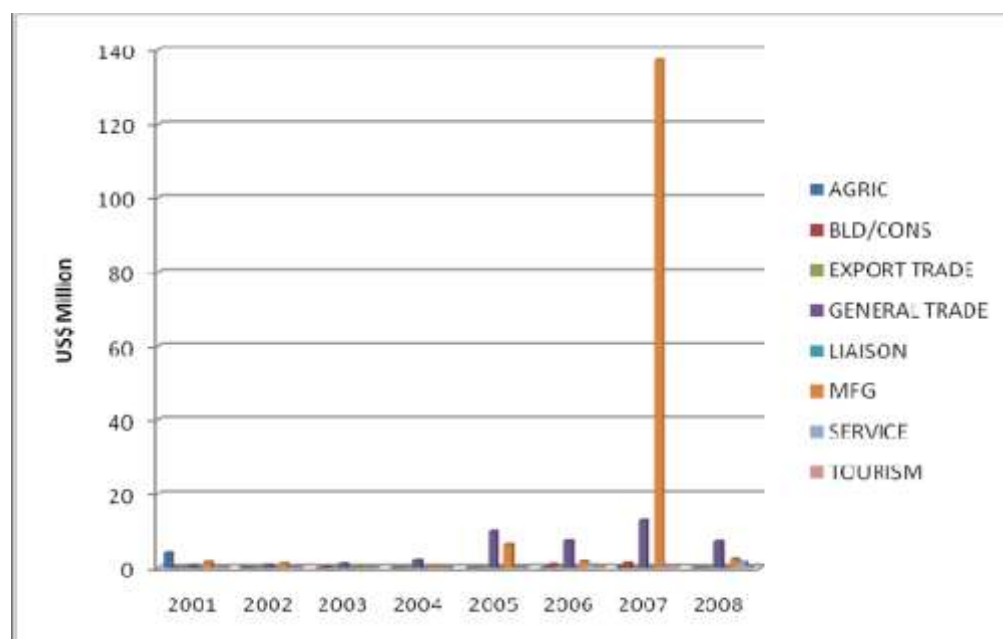


Figure 1. Chinese FDI Sectorial Distribution for 2001-2008 Source: Dela Tsikata et al., 2010



The diagram below shows that a percentage of the Chinese FDI from the total FDI inflows to Ghana is usually below 2.5% except for 1995, and 2007 that received a percentage of 2.5% and 2.7%. It can be analyzed that the distribution of Chinese FDI to Ghana has been cyclical, it falls and rises but the sharpest was the 2004 to 2008.

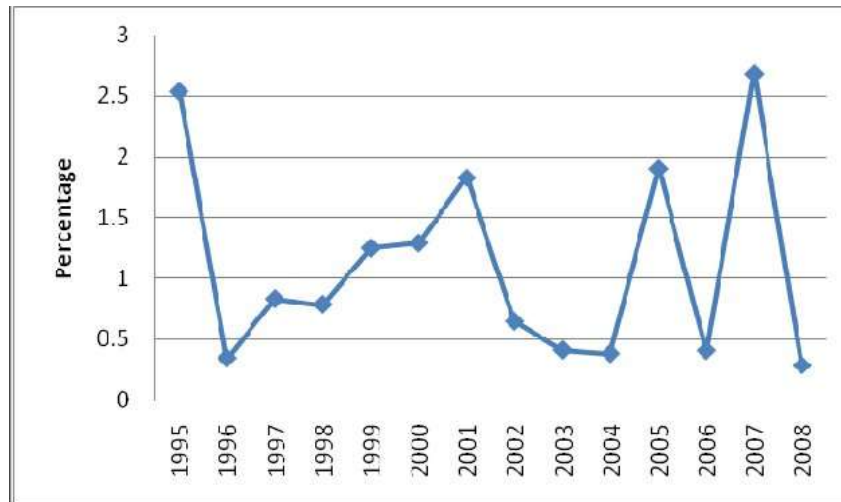


Figure 2. Chinese shares of total FDI in Ghana for 1995-2008 Source: Dela Tsikata et al., 2010

### Chinese FDI and Ghana's Economic Growth

Ghana is often referred to the gateway to Africa, a nation state of west Africa with a sound political tolerance. The nature of Ghana's sound political atmosphere has made it easy for Ghana to adopt the policy strategies by international organizations such as world bank and IMF. Ghana's market reforms started way back the 1980s which positioned the private sector as an engine to growth. In 1983, Ghana launched the Structural Adjustment Program (SAP) and market orientation. The combined innovation of introducing the macroeconomic and SAP in 1984 has resulted in sustained economic growth and improvement in private sector activities.

The country's annual economic growth rate has average 8 percent in 2009 and 7.7 percent in 2020 in the last 3 decades. This has helped the country achieve its vision 2020 in turning the country to a middle-income country "Transforming the economy into middle-income country by the year 2020"

The study by (Alemayuhu, 2002) relating the determinants of FDI consist a wide range of thoughts including Krugman, 1979 and Vernon, 1966 theory known as the product life cycle and the pure capital movement theory by Tobin 1958, Iversen, 1935. These theories were cited in the works of MacDougall, 1960 and Garwal, 1980. The reverse is discussed by Peters and

Jenkins, 2006 that for sub-Saharan countries the motivation of seeking FDI should be considered.

Chinese FDI in grew for about US\$20 million in the early 1990 in Africa and increase by over US\$1 billion in the year 2006. This shortest time frame and its source was different from Japan and the Western world FDI.

FDI and its role of improving economic growth had received a lot of attention in a number of studies. Barro, 1990 and Lucas, 1998 pointed out in their study the role FDI play in an economic using technology diffusion model. Also, consistent with this study is Finlay, 1978, he argues that FDI improves the rate of technology advancement in the recipient country through a contagious effect of technological progress and management practices on the investing country.

FDI results in positive economic growth however, there should be a level of income threshold in the recipient country above which FDI can have a positive effect, below the threshold means there won't be any positive effect on economic growth and this scenario was same for technology transfer, that to absorb the benefit of technology that those countries have to attain a certain level of income according to Blomstrom et al., 1994, he also postulated in his earlier study that difference in the response to FDI could be as a result of human capital and income levels because it take a literate population to adopt and spread new innovation in an economy.

Aside these, there's also a number of studies regarding FDI, GDP and investment its positive relationship according to Glass & Saggi, 1998. In the period of 1970-1989, developing countries experienced a 1percent point ratio of FDI to GDP increase, this was correlated to a 0.4 to 0.7 percent point GDP per capita income increase, the increase varied from one country to another using educational level attained as the ability of the country to absorb technology according to Borensztein et al., 1998. Consistent with these finding were Bosworth and Collins, 1999, where their analysis was base 1979-1995 time period of 58 developing countries found that FDI (capital inflows) is linked with increase with a coefficient of one in domestic investment, this indicates an increase growth. The argument advanced by Markussen & Vernables, 1998 shows that FDI impact on economic growth is influenced by trade. Deeds, 1998 as indicated in his work that the major influencer of Chinese economic growth if FDI. The empirical study of Wai-Mun et al., 2008 on the relationship between FDI and economic growth in Malaysia found that each 1 percent increase in FDI led to a 0.046 increase in Malaysia economic growth and 0.045 percent in real gross national investment.

However, Stephen, 2012 has a contrary finding in his study of finding China's outward foreign direct investment impact on economic growth in developing countries: empirical

evidence from Ghana using ordinary least squares regression model showed that FDI has a negative significant impact on Ghana's economic growth, however, it had a different effect on the value added in three economic sectors. The relationship between FDI and Ghana's economic growth is hypothesized as follows,

**H1:** *There is a positive relationship between FDI and Ghana's economic growth*

### **Chinese Export to Ghana and Ghana's Economic Growth**

There is increasing demand for consumer goods in Africa especially toward Chinese products because of its cost effectiveness as compare to local and or the European products.

Export from China to Ghana is positive and significant to Ghana's economic growth. Export from China contributes to Ghana's economic growth. Every country depends on both internal and external trade for its economic growth. Studies have provided empirical results to support the argument that, trade openness helps promote economic development in both developed and developing countries (Stojkov, 2012). In the view of Adedoyin et al. 2020 economic growth does not basically depend on an increase in labor and capital but an expansion of export plays a role.

According to November 2021 report on exports from China to Ghana, China exported up to 727 million US dollars and imported up to 55.3 million US dollars from Ghana. This resulted in a positive trade balance of up to 672 million US dollars. The exports in 2021 decreased from 776 million US dollars in 2020 to 727 million US dollars, and the imports decreased from 74.7 million US dollars in 2020 to 55.3 million US dollars (OEC, 2021). However, China in the year 2019 exported up to 4.35 billion US dollars to Ghana according to the same report. These have proven the positive effect of export from China on Ghana's economic growth. The is hypothesized as follows;

**H2:** *Chinese export to Ghana has a positive relationship on Ghana's economic growth*

Table 1. Ghana's Total Import and From China from 2000 to 2006

Year	Ghana's Import to China	Ghana's total Import	% Of China's share
2000	96.12	2438.47	3.94
2001	122.2	2666.39	4.58
2002	116.95	2452.95	4.77
2003	179.63	3210.19	5.60
2004	364.81	4632.89	7.87
2005	364.81	5661.20	7.38
2006	502.82	7223.14	6.96

Source: Ghana Ministry of Trade and Industry

It can be noticed that there has been consistent increase of Chinese export to Ghana from 2000 to 2006. The highest were recorded in 2004-2005 however, declined in 2006.

### **Chinese Construction Revenue and Ghana's Economic Growth**

Over the past decades, Chinese companies have flooded the African continent for all kinds of businesses. According to the data from China Africa Research Initiative, Chinese companies in Africa in the year 2020 totaled a gross annual revenue of 38 billion dollars. However, this amount was reduced by 17% compared to the previous year. According to the statistics, Africa earned about 24.6% of the total 2020 revenue from these global companies against 38.9% in the year 2010.

Unfortunately, Ghana was not part of the five (5) top countries that enjoyed 45% of the total gross revenue from Chinese companies in Africa in 2020. Nigeria, Ethiopia, Algeria, Egypt, and Kenya are the five countries and only Algeria enjoyed up to 12%. However, the 2020 gross revenue was the fifth time gross revenue from Chinese companies to Africa has declined. The formulated hypothesis is as follows;

**H3:** *There is a positive relationship between Chinese construction revenue and Ghana's economic growth*

### **Theories of Foreign Direct Investment**

#### ***Production Cycle Theory of Vernon***

Vernon developed the production cycle theory in the year 1966 to provide explanation to certain types of foreign direct investment encountered in some U.S companies located in Western Europe in the manufacturing industry after the World War two (Vernon 1966). The theory emphasizes on the existence of four main stages of production cycle. The innovation, growth, maturity, and decline are the four production cycle stages. The innovation stage is where manufacturing companies create new products for local consumption but export the surplus to serve as foreign market.

The Vernon production theory indicated that the increased demand for goods after the World War two brought about technology advancement and international competition. Having the advantage to possess new technology is the first stage of the production cycle. The technology becomes exposed and known when the product develops. Product developers will standardize their product but some companies will get means to copy the product.

### ***The Theory of Exchange Rates on Imperfect Capital Markets***

The theory tried to explain foreign direct investment from the point that, initial foreign exchange risk was tackled from the angle of international trade. The effect of uncertainty was explained as a factor of FDI by Cushman (1985).

The only empirical analysis made by Cushman on theory so far indicated that, real exchange rate increase encouraged foreign direct investment made by USD but American FDI was reduced by the appreciation of foreign currency. However, the theory was not able to explain how simultaneous FDI between different nations with different currencies will be like.

### ***The Internalization Theory***

The theory turns to give reasons to the growth and motivation of transactional companies for achieving FDI. Buckley and Casson developed the theory in the year 1976 and then Hennart in the year 1982. Initially, the internalization theory was launched in a national context by Coase in the year 1937 and international context by Hymer in the 1976. Hymer pointed out two main determinants of foreign direct investment; the removal of competition and the other advantages of some firms. The theory indicates that, transactional companies organize internal activities to improve defined advantages and later exploit. Dunning also has commented on the importance of the internalization theory and used it in the eclectic theory but further argues that the theory explains a part of FDI flows (Dunning 1980)

### ***The Eclectic Paradigm of Dunning***

Dunning developed the eclectic theory and the theory is a mixed of three different theories of FDI which are O-L-I. The "O" is the ownership advantages. It is the intangible assets which are not part of the company possessions but transferred within transactional companies at a cheap cost resulting to higher income or reduced costs. However, transactional companies operate differently in different countries which might cause extra cost. Therefore, certain characteristics is needed to enter the international market and these advantages are the benefits of the company. The companies use their monopolized advantages for higher profits (Dunning, 1973, 1980, 1988). The "L" is the location of the company. Location advantage are very key to countries to determine their transactional corporation activities. The "I" is the internalization. It analyzes the different ways a company will monopolize to exploit its power through selling of goods and services and signing of agreement between companies.

## RESEARCH METHODOLOGY

The chapter gives a detailed explanation of the method used for the study. The chapter first provides empirical evidence as the basis and confirmation to the selected econometric model. The source of the data for the study has been provided and various equations have been outlined to show how the models were run.

### Empirical Evidence

Empirically different methods have been used to address the effect of foreign direct investment on other variables. The Fully Modified Ordinary Least Squares (FMOLS), Dynamic Ordinary Least Squares (DOLS), Cross Section -Autoregressive Distributed Lag (CS-ARDL), Augmented Mean Group (AMG), Common Correlated Effects Mean Group (CCEMG) and the rest have been in the existing literature to determine the effect of FDI on economic growth or other variables that contribute to economic growth.

To establish the impact of FDI on economic growth in BRICS countries, Azam and Haseeb employed FMOLS, DOLS, CS-ARDL, AMG, CCEMG models (Azam & Haseeb, 2021). Silajdzica and Mehic used a panel data estimation to analyze the impact of FDI on economic growth, and the result turned out to be a positive impact (Silajdzic & Mehic, 2015). Nistor using the Durbin-Watson test to assess the impact of FDI on economic growth through the autocorrelation using the regression, the result turned positive (Nistor, 2014). Fadhila and Almsafir employed Hierarchical Multiple Regressions Analysis to assess the effect of FDI on economic growth in Malaysia (Fadhil & Almsafir, 2015). Hong employed GMM to examine the effect of FDI on economic growth in 254 prefecture-level cities in China (Hong, 2014). Muhammad and Khan employed GMM, OLS, and fixed and random effect estimations to assess the effect of FDI on economic growth in 34 host Asian countries, and the results indicated that FDI plays a very vital role in the development of these countries' economies (Muhammad & Khan, 2019).

Demir and Duan employed two-stage least square and GMM models to assess the impact between the two variables (Demir & Duan, 2018). Salahuddin et al. employed cointegration and ARDL and VECM Granger causality to assess the same effect (Salahuddina, Alam, Ozturk, & Sohag, 2017). Fan and Hossain employed ARDL and Toda–Yamamoto Granger Causality for the same test (Fan & Hossain, 2018).

### Research Method

The study imitates the empirical model of (Gyimah, Yao, Tachega, Sam Hayford, & Opoku-Mensah, 2022) and (Acheampong, Adams, & Boateng, 2019) to analyze the effect

of foreign direct investment from China to Ghana on Ghana's economic growth. To prevent the study from estimating a spurious regression, augmented Dickey-Fuller test was employed to check the stationarity of the variables for the study (Dickey & Fuller, 1979). When some of the used variables are not stationary, there is an assumption that there is an existence of one or more cointegration relationships among the variables (Engle & Granger, 1987). Therefore, there is a need to test for the cointegration relationship among the variables, and Johansen and Juselius maximum likelihood test is employed for the test (Johansen & Juselius, 1990).

$$q_t = \beta x_{t-1} + \omega_t \quad 1$$

Equation one of the Dickey-Fuller test is used to test the first-order of the variables. The equation implies that  $q_t$  depends on only its past value, implying  $q_t$  is described by its past lag. The  $\omega$  denotes the coefficient of interest for the determination of stationary. Equation one (1) could be further written with the first difference as

$$\Delta q_t = (\beta - 1)q_{t-1} + \omega_t = \eta q_{t-1} + \omega_t \quad 2$$

The upfront assumption for the second equation (equation 2) denotes that, the series is not stationary, and because of this reason, the model is estimated in a different form. Value for the interest coefficient to determine the stationarity is  $\eta$ . The next equations (3&4) denote the equation with intercept and intercept with trend respectively.

$$\Delta q_t = \theta_o + \eta q_{t-1} + \omega_t \quad 3$$

$$\Delta q_t = \theta_o + \theta_{it} + \eta q_{t-1} + \omega_t \quad 4$$

In order to determine the levels and first difference of the Johansen and Juselius cointegration test, equations 5 and 6 are developed respectively

$$m_t = \omega_1 \eta_{t-1} + \dots + \omega_q \eta_{t-q} + \nu V_t + \varepsilon_t \quad 5$$

The variable  $m_t$  denotes k – vector of non-stationary  $I(1)$  variables,  $V_t$  denotes d-vector of deterministic variables,  $\varepsilon_t$  = vector of innovations, and the formula could be further presented as

$$\Delta m_t = \Pi m_{t-1} + \sum_{i=1}^{X-1} \phi \Delta m_{t-i} + \nu V_t + \varepsilon_t \quad 6$$



The  $\Pi$  is equal to  $\sum_{i=1}^x \omega_i - 1$ , and the  $\phi$  represents  $\sum_{a=i+1}^x \omega_a$

Equation 7 represents the effect of the independent variables on the dependent variable

$$\ln ec_{it} = \beta_0 + \beta_1 \ln f_{it} + \beta_2 \ln ex_{it} + \beta_3 \ln cr_{it} + \varepsilon_{it} \quad 7$$

The  $\ln ec$  represents Ghana's economic growth, the  $\ln f$  represents the foreign direct investment inflow from China to Ghana, the  $\ln ex$  represents export from China to Ghana, and the  $\ln cr$  represents the construction revenue from Chinese to Ghana. The  $\varepsilon$  stands for the error term, the  $t$  stands for the time which is from 2000 to 2020, the  $i$  is the total number of years which is from 2000 to 2020, the  $\beta_0$  stands for the constant-coefficient, and the  $\beta_1 - \beta_4$  stands for the coefficient value.

### Data and variable

The purpose of the study is to establish the influence that FDI flow from China to Ghana has on economic growth in Ghana. These are the variables for the study, economic growth which is represented by GDP per capita, is the dependent variable, foreign direct investment which is the flow of Chinese FDI to Ghana. Export represents the total export of goods and services from China to Ghana. Lastly, the construction revenue which represents the total revenue Ghana government gets from Chinese companies in Ghana. The data for the study is from the year 2000 to 2020. The data for the economic growth (GDP per capita) was obtained from world development indicators (WDI) and the data for the rest of the variables was obtained from China Africa Research Initiative (CARI). Tables 2 gives the summary of the used data for the study, and figure 3 provides the direction of the study.

Table 2. Variables of the study

Variable		Measurement	Source
Economic growth ( $\ln ec$ )	Dependent variable	Current US\$	WDI
Foreign direct investment ( $\ln f$ )	Independent variable	US\$ Mn	CARI
Construction Revenue ( $\ln cr$ )	Independent variable	US\$ Mn	CARI
Export ( $\ln ex$ )	Independent variable	US\$ Mn	CARI

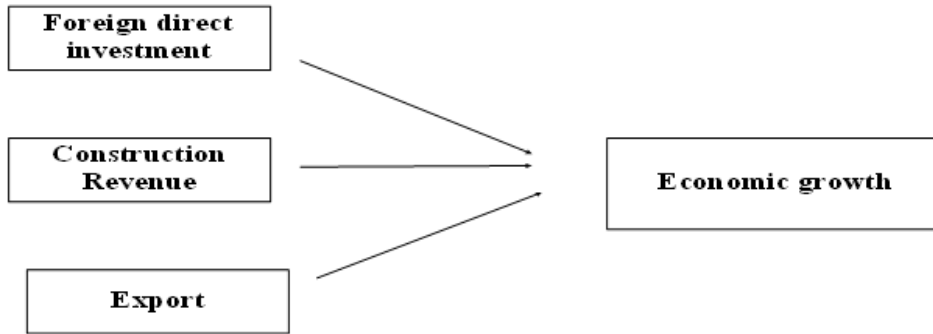


Figure 3. Direction of the study

**The comparison of the variables**

Figure 4 shows the trend of Ghana’s economic growth which is measured in gross domestic product per capita and the revenue that Ghana government has received from Chinese companies in Ghana from 2000 to 2020. Both variables attained the highest level in the year 2013 however, there are many instances that the two variables do not correlate and have an opposite reaction. The foreign direct investment flow from China to Ghana has not been stable.. There are instances the growth for the two variables is correlated but the growth of the FDI is very slow. In the year 2020, Ghana had a negative value for FDI from China to Ghana. This could be associated with the pandemic (COVID-19). Export from China to Ghana has been stable recently and has risen sharply in 2020 as presented on figure 4. Export and economic growth are not mostly correlated but Ghana has experienced a growth in her exports from China.

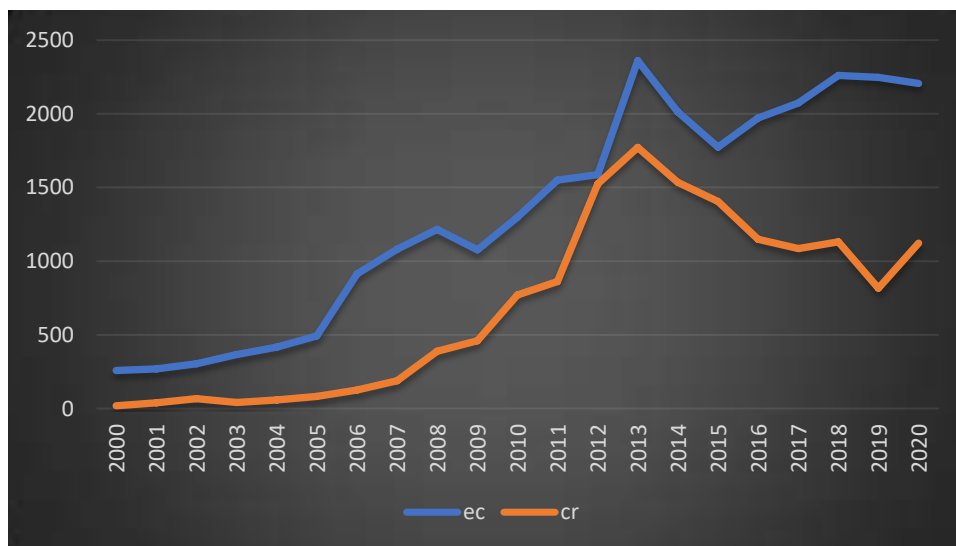


Figure 4. Trend of Construction Revenue from Chinese companies to Ghana and Ghana’s Economic Growth from 2000 to 2020

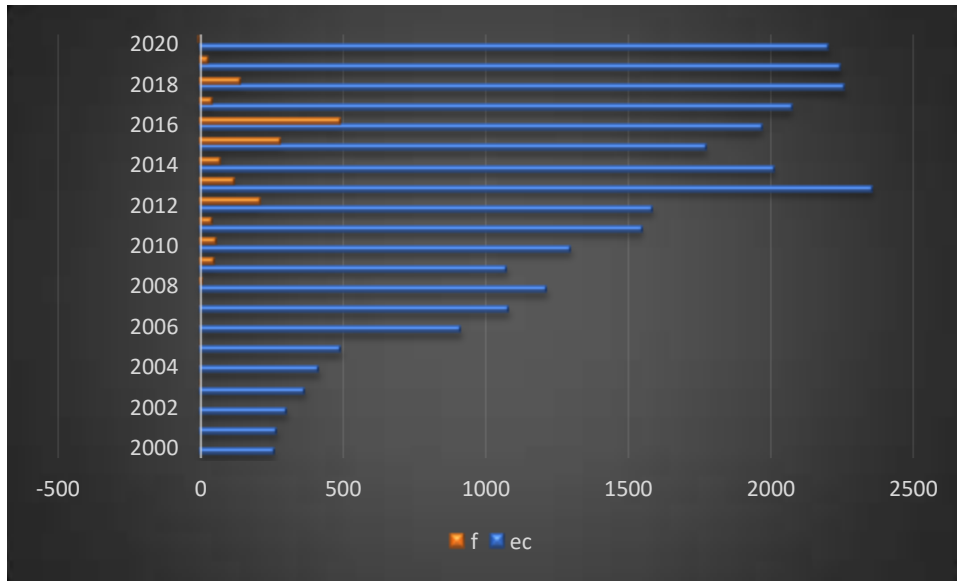


Figure 5. Trend of FDI flow from China to Ghana and Ghana's Economic Growth from 2000 to 2020

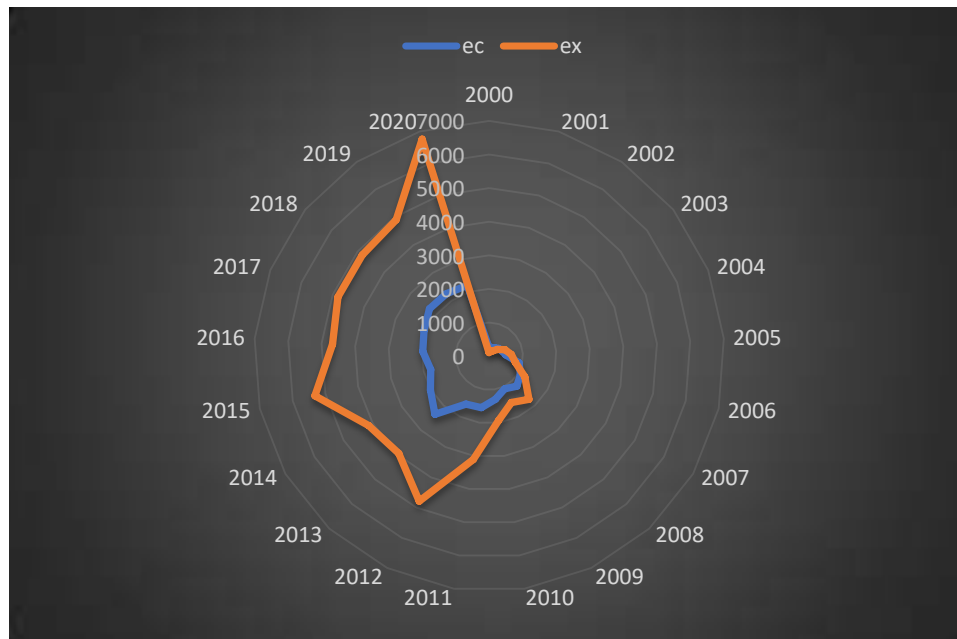


Figure 6. Trend of Export from China to Ghana and Ghana's Economic Growth from 2000 to 2020

**Statistical Description of the Variables**

To check the strength of the variables for the study, the descriptive statistics of the variables have been checked and presented on table 3. The result gives the mean, median, maximum and minimum value and standard deviation of the variables.

Table 3. Statistical Descriptive

	$\ln ec$	$\ln f$	$\ln cr$	$\ln ex$
Mean	6.952541	3.133331	5.848799	7.331906
Median	7.169616	3.788725	6.647390	7.566762
Max	7.766879	6.195650	7.479452	8.818195
Mini	5.554784	-1.078810	2.955431	4.662794
Std. Dev	0.781611	2.215957	1.478457	1.317407

### Pearson Correlation

In order to test the correlational relationship between the used variables, the Pearson correlation test was employed. From the results presented on table 4, it indicates that all the variables used for the study are positively correlated. Export from China to Ghana ( $\ln ex$ ) and construction revenue from Chinese companies to Ghana ( $\ln cr$ ) have the highest and strongest correlation (0.9695). Foreign direct investment flow from China to Ghana ( $\ln f$ ) and Ghana's economic growth ( $\ln ec$ ) have a strong positive correlation but it is the weakest among the result (0.7921). Economic growth and export from China to Ghana have a positive stronger correlation (0.9613). Economic growth and construction revenue from China have a positive stronger correlation (0.9505). FDI flow from China to Ghana and export from China to Ghana have a very strong correlation (0.8647), and construction revenue and FDI have a stronger correlation (0.9016).

Table 4. Pearson Correlation

	$\ln ec$	$\ln f$	$\ln cr$	$\ln ex$
$\ln ec$	1			
$\ln f$	0.7921*	1		
$\ln cr$	0.9505*	0.9016*	1	
$\ln ex$	0.9613*	0.8647*	0.9695*	1

## ANALYSIS AND PRESENTATION

The chapter gives a detailed account on the econometric models used for the study. Series of test are conducted to check if the variables are suitable for the study. The main findings of the study are discussed after running the models.

### Stationary Test

The Dickey-Fuller Test is employed to assess the stationary of the variables used for the study. The hypothesis for the Dickey-Fuller Test is

- I. Null hypothesis: the variable has unit root (not stationary)

II. Alternative hypothesis: the variable has no unit root (stationary)

Therefore, the rule is, to reject the null hypothesis and accept the alternative hypothesis, the test statistics must be greater than the critical value at 5% or reject the null hypothesis and accept the alternative hypothesis when the probability is greater than 5%. However, accept the null hypothesis when the test statistics is less than the critical value or the probability is less than 5%.

For variables to be accepted for cointegration test, the variables must not be stationary at level (has unit root) and must be stationary at first difference. Based on the results presented on table 5, indicate that the study variables meet the condition to run cointegration test.

Table 5. Dickey-Fuller Test

Variable	t-statistics	Critical value (0.05)	Prob
$\ln ec$	-0.907555 <sup>b</sup>	-3.658446 <sup>b</sup>	0.9944
$\Delta \ln ec$	-3.925902 <sup>a</sup>	-3.029970 <sup>a</sup>	0.0082
$\ln f$	-1.489294 <sup>a</sup>	-3.065585 <sup>a</sup>	0.5130
$\Delta \ln f$	-5.784240 <sup>c</sup>	-1.966270 <sup>c</sup>	0.0000
$\ln cr$	-0.426772 <sup>b</sup>	-3.690814 <sup>b</sup>	0.9773
$\Delta \ln cr$	-2.318909 <sup>c</sup>	-1.961409 <sup>c</sup>	0.0235
$\ln ex$	-1.362678 <sup>b</sup>	-3.690814 <sup>b</sup>	0.8365
$\Delta \ln ex$	-5.635337 <sup>b</sup>	-3.690814 <sup>b</sup>	0.0014

Note: values with (a) denotes constant only, (b) constant and trend, and (c) none.

The variables with ( $\ln$ ) at the beginning denote variables at level,  
and variables with ( $\Delta$ ) denote variables at first difference.

### Cointegration Test

The hypothesis for the Johansen cointegration test

- I. Null hypothesis: the variables have no cointegration
- II. Alternative hypothesis: there is cointegration among the variables

The rule for the cointegration test is, to accept the null hypothesis, the test statistics and the max-eigen statistics must be less than the critical value (0.05) if not, accept the alternative hypothesis. The number (0) indicates no cointegration among the variables, and the numbers (1, 2, 3) indicate the number of cointegration existing among the variables. Based on the data presented on table 6, the first number (0), the test statistics is greater than the critical value (0.05) therefore, reject the null hypothesis and accept the alternative hypothesis. The variables used for the study are cointegrated, meaning there is an existence of a long-term relationship among the variables.

Table 6. Johansen cointegration test

	t-Statistics	Critical value (0.05)	Max-Eigen statistics	Critical value (0.05)
0	94.62003	47.85613	70.86330	27.58434
1	23.75673	29.79707	12.35258	21.13162
2	11.40415	15.49471	9.798673	14.26460
3	1.605476	3.841466	1.605476	3.841466

## Effects of the Independent Variables on the Dependent Variable

### *Foreign Direct Investment Flow from China Effects on Ghana's Economy*

The result from the FMOLS analysis presented on table 6 indicates that foreign direct investment flow from Ghana has a significant negative effect on Ghana's economic growth. The result means that FDI flow from china to Ghana does not contribute to her economic growth. There are some literature which support the argument that foreign direct investment helps promote economic growth in the recipient country (Gyimah et al., 2022). There are other studies that argue that, FDI contributes to economic growth of the recipient country however it reduces the quality of the environment (Salahuddina et al., 2017; Shahbaz, Balsalobre-Lorente, & Sinha, 2019). In the view of Osei and Kim 2020 (Osei & Kim, 2020), FDI is considered as one of the pillars of a country's economic development when leaders make necessary policies to govern it.

Nevertheless, some literature provide empirical evidence to support the result of the study that FDI flow does not contribute to economic growth (Alfaro, 2003). The result reflects the data presented on figure 4, 5 and 6, the data provides some reasons behind the result. The FDI flow from China to Ghana was not stable base on the data used for the analysis. Ghana experienced a negative score for the FDI flow from China in 2020. This might be as the result of the effect of the pandemic (COVID-19). The lockdown policies restricted foreign investors from moving from country to country which slowed down international businesses. The result can further be associated with the failure of the Ghanaian government to control environment and check the quality of the available institutions. These two factors have a role to play in determining the economic prosperity of a country (Ali et al., 2010).

### *Construction Revenue from Chinese Companies to Ghana's Economy*

The result presented on table 6 indicates that construction revenue has no significant effect on Ghana's economy. Over the past decades, Chinese companies have flooded the African continent for all kinds of businesses. According to the data from China Africa Research Initiative, Chinese companies in Africa in the year 2020 totaled a gross annual revenue of 38 billion dollars. However, this amount was reduced by 17% compared to the previous year.

According to the statistics, Africa earned about 24.6% of the total 2020 revenue from these global companies against 38.9% in the year 2010.

Unfortunately, Ghana was not part of the five (5) top countries that enjoyed 45% of the total gross revenue from Chinese companies in Africa in 2020. Nigeria, Ethiopia, Algeria, Egypt, and Kenya are the five countries and only Algeria enjoyed up to 12%. However, the 2020 gross revenue was the fifth time gross revenue from Chinese companies to Africa has declined. Therefore, these statistics provide support to the result of our study and further explain the reason why construction revenue from Chinese companies is insignificant to Ghana's economic growth.

Irrespective the several impacts the construction industry has provided to the Ghanaian economy over the past two decades like infrastructures, the sector is still not developed due to the absence of comprehensive policy framework. Ghana is considered as one of the African countries that has benefited from revenue from the construction industry (from China) however, the revenue is channeled to road development instead of improving the economy (Boakye-Gyasi and Li 2018). The situation has resulted in improving some major road networks in Ghana but the impact on the economy is not significant.

### ***Export from China to Ghana Effects on Ghana's Economic Growth***

Export from China to Ghana is positive and significant to Ghana's economic growth. Export from China contributes to Ghana's economic growth. Every country depends on both internal and external trade for its economic growth. Studies have provided empirical results to support the argument that, trade openness helps promote economic development in both developed and developing countries (Stojkov, 2012). In the view of Adedoyin et al. 2020 (Adedoyin, Bekun, Driha, & Balsalobre-Lorente, 2020) economic growth does not basically depend on an increase in labor and capital but an expansion of export plays a role.

According to November 2021 report on exports from China to Ghana, China exported up to 727 million US dollars and imported up to 55.3 million US dollars from Ghana. This resulted in a positive trade balance of up to 672 million US dollars. The exports in 2021 decreased from 776 million US dollars in 2020 to 727 million US dollars, and the imports decreased from 74.7 million US dollars in 2020 to 55.3 million US dollars (OEC, 2021). However, China in the year 2019 exported up to 4.35 billion US dollars to Ghana according to the same report. These have proven the positive effect of export from China on Ghana's economic growth. China over the past two decades is considered to be the second largest exporter to the Ghanaian economy. Ghana trade with China is gaining more weight due to the recent discovery of the crude oil in



Ghana. The trade relation has created more employment in Ghana causing positive effect on Ghana economic growth.

Table 7 FMOLS

Variable	Coefficient	t-statistics
$\ln f$	-0.104140**	-2.317915
$\ln cr$	0.221742	1.576252
$\ln ex$	0.582020*	3.683830
$R^2$	0.926097	
Adjusted $R^2$	0.907621	
Mean dependent var	7.220538	
S.D. dependent var	0.522895	

### Result from Canonical Cointegration Regression

The result indicates that foreign direct investment flow from China to Ghana has a significant negative effect on Ghana's economic growth. The gross revenue from Chinese construction companies does not have a significant effect on Ghana's economic growth. Although the sign is positive but the probability is above 5%. Lastly, export from China to Ghana positively affects Ghana's economic growth. The signs are maintained for the variables used for the study.

Table 8. Canonical Cointegration Regression (CCR)

Variable	Coefficient	t-Statistic
$\ln f$	-0.115493**	-2.098762
$\ln cr$	0.182938	1.090108
$\ln ex$	0.653336*	3.500403
$R^2$	0.914493	
Adjusted $R^2$	0.893116	
Mean dependent var	7.220538	
S.D. dependent var	0.522895	

### Robustness Check

To further check and confirm the result from the two used models (FMOLS and CCR), Two-Stage Least Squares, GMM, and Robust Least Squares are employed as a robustness check. When using GMM as an estimator, there is no place for endogeneity because the model is able to check and control endogeneity and all arbitrary heteroscedasticity of all unknown forms (Baum, Schaffer, & Stillman, 2003). The results presented on table 8 & 9 confirm the result of the study. However, there are slight changes in the statistical and magnitude significant levels but they do not change the position and signs of the result.

Table 8. Two-Stage Least Squares

Variable	Coefficient	t-Statistic
$\ln f$	-0.140415*	-2.658380
$\ln cr$	0.029123	0.162209
$\ln ex$	0.964800*	7.571666
$R^2$	0.886241	
Adjusted $R^2$	0.869990	
J-statistic	14.00000	
Mean dependent var	7.143306	
S.D. dependent var	0.598106	

Table 9. GMM

Variable	Coefficient	t-Statistic
$\ln f$	-0.169764*	-3.300852
$\ln cr$	0.121138	0.634752
$\ln ex$	0.901572*	6.709506
$R^2$	0.883445	
Adjusted $R^2$	0.866795	
J-statistic	4.974467	
Mean dependent var	7.143306	
S.D. dependent var	0.598106	

Table 10. Robust Least Squares

Variable	Coefficient	t-Statistic
$\ln f$	-0.144428*	-2.597023
$\ln cr$	0.048619	0.257200
$\ln ex$	0.950450*	7.084462
$R^2$	0.787307	
Adjusted $R^2$	0.756922	
Mean dependent var	7.143306	
S.D. dependent var	0.598106	

## CONCLUSION

The study aimed to address the effect FDI inflow from China to Ghana has on Ghana's economic growth. In other to achieve the result of the study, a thorough study was made on the existing literature to address the issue. The related theories of foreign direct investment, empirical evidence, the contribution of FDI in other countries, and the state of current FDI in Ghana have been addressed.

The study first gathered data from World Development Indicators and China Africa Research Initiative. The variables used for the analysis are; FDI flow from China to Ghana (independent variable), construction revenue from Chinese companies in Ghana (independent variable), export from China to Ghana (independent variable) and Ghana's GDP per capita

(dependent variable). The study first assessed the strength of the data by checking their descriptive statistics. The correlational relationship among the variables was checked using Pearson correlation. The stationarity of the study was assessed, and the variables were stationary and good to check their cointegration. The cointegration test indicated that the variables are cointegrated. The study used FMOLS and CCR to check the effect of the independent variables on the dependent variable. GMM and Two-Stage Least Squares were used as a robustness check. The result of the study indicated that FDI flow from China to Ghana has a negative and significant impact on Ghana's economic growth. The revenue from construction companies in Ghana does not have a significant impact on Ghana's economic growth. However, export from China to Ghana has a positive and significant impact on Ghana's economic growth.

## **POLICY IMPLICATIONS**

The result of the study provides policy implications to policymakers on how to positively promote the effect of foreign investors on the recipient's economic growth. First, the effect of the pandemic (COVID-19) has moved many investors back to their country which is making the impact of FDI irrelevant in Ghana's economic growth. The government or the individuals who have companies are to restructure and make their companies more attractive for investors. They should update their companies to meet the ICT demands. Lastly, Ghana should take advantage of her relationship with China to strengthen her trade policies with China. Ghana should make trade policy that would be more lucrative to increase exports and imports in the country and this would be another pulling factor for foreign investors. This study will not only add to our understanding on the impact of foreign direct investment, but it will also act as a guide for policymakers in Ghana and other developing countries.

Recommendations from the study will also assist in the Identification and analysis of the key features, patterns, and developments in the main channels through which the impact of growth of China are transmitted to Ghana.

It is also vital to note that the findings from the study will add to existing body of literature concerning foreign direct investment economic growth of Ghana and will also serve as a guide for further research relating to FDI in developing countries

## **LIMITATIONS**

This paper provides a comprehensive analysis of FDI's effect on economic growth however, the study is subject to various limitations. The study does not include technology transfer from China to Ghana and labor mobility to the variables used for the study. Lastly, the

study uses a time duration of two decades. Future studies can add these two variables to their study and expand the time duration if there is availability of data.

## REFERENCES

- Acheampong, A. O., Adams, S., & Boateng, E. (2019). Do globalization and renewable energy contribute to carbon emissions mitigation in Sub-Saharan Africa? *Sci Total Environ*, 677, 436-446. doi:10.1016/j.scitotenv.2019.04.353
- Adedoyin, F. F., Bekun, F. V., Driha, O. M., & Balsalobre-Lorente, D. (2020). The effects of air transportation, energy, ICT and FDI on economic growth in the industry 4.0 era: Evidence from the United States. *Technol Forecast Soc Change*, 160, 120297. doi:10.1016/j.techfore.2020.120297
- Alemayehu Geda, 2002. *Finance and trade in Africa: Macroeconomic response in the world economy context*. Palgrave Macmillan Publishing Company, New York
- Alfaro, L. (2003). *Foreign Direct Investment and growth: Does the Sector Matter*. Harvard Business School, Boston.
- Ali, F. A., Fiess, N., & MacDonald, R. (2010). Do Institutions Matter for Foreign Direct Investment? *Open Economies Review*, 21(2), 201–219. <https://doi.org/10.1007/s11079-010-91704>
- Asche, H. and M. Schüller, (2008) *China's Engagement in Africa: Opportunities and Risks for Development*. Gesellschaft für Technische Zusammenarbeit (GTZ)..
- Azam, M., & Haseeb, M. (2021). Determinants of foreign direct investment in BRICS- does renewable and non-renewable energy matter? *Energy Strategy Reviews*, 35. doi:10.1016/j.esr.2021.100638
- Baliamoune-Lutz, M. (2011) 'Growth by Destination (Where You Export Matters): Trade with China and Growth in African Countries', *African Development Review*, 23 (2): 202–218.
- Barro, Robert J. 1998. *Determinants of Economic Growth: A Cross-Country Empirical Study*. Cambridge, Mass.: MIT Press
- Baum, C. F., Schaffer, M. E., & Stillman, S. (2003). Instrumental variables and GMM: Estimation and testing. *The Stata Journal*, 1–31.
- Biggeri, M., & Sanfilippo, M. (2009). An empirical analysis of the Chinese moves into Africa. *Financial Sector Reform and the International Integration of China*, 170.
- Bissoon, C. (2011). Better Institutions Attract More Foreign Direct Investment (FDI)? Evidence from Developing Countries. [J] *Journal of European Economy*. Vol 11(3) 35
- Blomstrom, Magnus, and Ari Kokko. 1996. *The Impact of Foreign Investment on Host Countries: A Review of the Empirical Evidence*. Policy Research Working Paper 1745. Washington, D.C.: World Bank
- Chen, M-X, A. Goldstein, N. Pinaud and H. Reisen (2005). "China and India: What's in it for Africa?", mimeo, Paris: OECD Development Centre.
- China. 2006. *China's African Policy*
- Boakye-Gyasi, K. & Li, Y. (2016). The Linkage between China's Foreign Direct Investment and Ghana's Building and Construction Sector Performance. *Eurasian Journal of Business and Economics*, 9 (18), 81-97
- Broadman, Harry, G. 2006. *Africa's Silk Road: China and India's New Economic Frontier*. International Bank for Reconstruction and Development/The World Bank. Washington DC.
- Buckley, P.J. and Casson, M.C. (1976): "The Future of the Multinational Enterprise", Homes & Meier: London.
- Cheung, Y.-W., J. de Haan, X. Qian and S. Yu (2012) 'China's Outward Direct Investment in Africa', *Review of International Economics*, 20 (2): 201–220.
- Chionis, D. and Tobins. (2004). *Multinational Enterprises: The Implications for Direct Foreign Investment*. *International Journal of Applied Econometrics and Quantitative Studies*, 1, 2.
- Coase, R.H. (1937). "The Nature of the firm", *Economica*, vol. 4, No. 16.
- Cushman, D.O. (1985): "Real Exchange Rate Risk, Expectations and the Level of Direct Investment " in *Review of Economics and Statistics*, 67 (2), 297-308.
- Demir, F., & Duan, Y. (2018). Bilateral FDI Flows, Productivity Growth, and Convergence: The North vs. The South. *World Development*, 101, 235-249. doi:10.1016/j.worlddev.2017.08.006
- Dickey, D. A., & Fuller, W. A. (1979). Distribution of the Estimators for Autoregressive Time Series with a Unit Root. *Journal of the American Statistical Association*, 74(366a), 427-431. doi:10.1080/01621459.1979.10482531

- Dunning, J. H. (1973): "The determinants of international production", Oxford Economic Papers 25.
- Dunning, J. H. (1980): "Toward an eclectic theory of international production: Some empirical tests" in Journal of International Business Studies issue 11.
- Dunning, J. H. (1988): "The Eclectic Paradigm of International Production: A restatement and some possible extensions", in Journal of International Business Studies issue 19 (Spring).
- Engle, R. F., & Granger, C. W. J. (1987). Co-Integration and Error Correction: Representation, Estimation, and Testing. *Econometrica*, 55, 251–276.
- Fadhil, M. A., & Almsafir, M. K. (2015). The Role of FDI Inflows in Economic Growth in Malaysia (Time Series: 1975-2010). *Procedia Economics and Finance*, 23, 1558-1566. doi:10.1016/s2212-5671(15)00498-0
- Fan, H., & Hossain, M. I. (2018). Technological Innovation, Trade Openness, CO2 Emission and Economic Growth: Comparative Analysis between China and India. *International Journal of Energy Economics and Policy*, 8, 240-257. doi:10.32479/ijeep.7171
- Franses, P. H., Kloek, T., & Lucas, A. (1998). Outlier robust analysis of long-run marketing effects for weekly scanning data. *Journal of Econometrics*, 89(1-2), 293-315.
- Frimpong, S. K and Nubuor S. A (2013). Research on the Chinese Investment in Ghana. [J] *Journal of Economics and Sustainable Development*, Vol4. No 4
- Ghana Investment Promotion Center (GIPC). 2005. International Monetary Fund (IMF). 2006. Direction of Trade Statistics Institute of Statistical, Social and Economic Research (ISSER).
- Giovannetti, G. and M. Sanfilippo (2009) 'Do Chinese Exports Crowd-out African Goods? An Econometric Analysis by Country and Sector', *European Journal of Development Research*, 21 (4): 506–530.
- Goldstein, Andrea, et al. 2006. China and India: What's in It for Africa? Paris: OECD. Greenpeace. 2000. "Four Activists Arrested as Greenpeace Continues its Protests." July 14. <http://archive.greenpeace.org>.
- Gyimah, J., Yao, X., Tachega, M. A., Sam Hayford, I., & Opoku-Mensah, E. (2022). Renewable energy consumption and economic growth: New evidence from Ghana. *Energy*, 248. doi:10.1016/j.energy.2022.123559
- Hennart J.F. (1982): "A theory of multinational enterprise". University of Michigan Press.
- Hong, L. (2014). Does and How does FDI Promote the Economic Growth? Evidence from Dynamic Panel Data of Prefecture City in China. *IERI Procedia*, 6, 57-62. doi:10.1016/j.ieri.2014.03.010
- Hymer, S., 1976 (1960 dissertation): "The International Operations of Nation Finns: A Study of Foreign Direct Investment", Cambridge, MLT Press.
- Jenkins, R., Peters, E. D., & Moreira, M. M. (2008). The impact of China on Latin America and the Caribbean. *World Development*, 36(2), 235-253.
- Johansen, S., & Juselius, K. (1990). Maximum likelihood estimation and inference on cointegration - with applications to the demand for money. *Oxford Bulletin of Economics and Statistics*, 52, 169-210.
- Kaplinski, R., D. McCormick and M. Morris (2006). "The Impact of China on Sub Saharan Africa. Paper prepared with support from the DFID China Office.
- Kolstad, I. and A. Wiig (2011) 'Better the Devil You Know? Chinese Foreign Direct Investment in Africa', *Journal of African Business*, 12 (1): 31–50.
- Krugman, P. R. (1979). Increasing returns, monopolistic competition, and international trade. *Journal of international Economics*, 9(4), 469-479.
- Meyersson, E., G.P. i Miquel and N. Qian (2008) 'The Rise of China and the Natural Resource Curse in Africa', London School of Economics and Political Science, Economic Organisation and Public Policy Programme, [http://personal.lse.ac.uk/padro/meyersonpadroqian\\_20080407\\_all.pdf](http://personal.lse.ac.uk/padro/meyersonpadroqian_20080407_all.pdf)
- Ministry of Foreign Affairs of the People's Republic of China. Available at <http://www.fmprc.gov.cn/eng/zxxx/t230615.htm>
- Muhammad, B., & Khan, S. (2019). Effect of bilateral FDI, energy consumption, CO2 emission and capital on economic growth of Asia countries. *Energy Reports*, 5, 1305-1315. doi:10.1016/j.egy.2019.09.004
- Nduru, M. 2006. "Economy: The Curate's Egg that is Africa-Asia Trade" Webpage: <http://www.ipsterraviva.net/Africa/viewstory.asp>
- Nistor, P. (2014). FDI and Economic Growth, the Case of Romania. *Procedia Economics and Finance*, 15, 577-582. doi:10.1016/s2212-5671(14)00514-0

OEC. (2021). China-Ghana Export Retrieved from <https://oec.world>

Okwu, A., Oseni, I., and Obiakor, R. (2020) "Does Foreign Direct Investment Enhance Economic Growth? Evidence from 30 Leading Global Economies" [J] *Global Journal of Emerging Market Economies*, Vol 12. No14

Osei, M. J., & Kim, J. (2020). Foreign direct investment and economic growth: Is more financial development better? *Economic Modelling*, 93, 154-161. doi:10.1016/j.econmod.2020.07.009

Salahuddina, M., Alam, K., Ozturk, I., & Sohag, K. (2017). The effects of electricity consumption, economic growth, financial development and foreign direct investment on CO2 emissions in Kuwait. *Renewable and Sustainable Energy Reviews*, 1-9. doi:10.1016/j.rser.2017.06.009

Sanfilippo, M. (2010) 'Chinese FDI to Africa: What Is the Nexus with Foreign Economic Cooperation?', *African Development Review*, 22 (S1): 599–614.

Shahbaz, M., Balsalobre-Lorente, D., & Sinha, A. (2019). Foreign direct Investment–CO2 emissions nexus in Middle East and North African countries: Importance of biomass energy consumption. *Journal of Cleaner Production*, 217, 603-614. doi:10.1016/j.jclepro.2019.01.282

Silajdzic, S., & Mehic, E. (2015). Knowledge Spillovers, Absorptive Capacities and the Impact of FDI on Economic Growth: Empirical Evidence from Transition Economies. *Procedia - Social and Behavioral Sciences*, 195, 614-623. doi:10.1016/j.sbspro.2015.06.142

Stojkov, A. (2012). The role of international trade and financial integration in the development model of the BRIC economies. *Int. J. Economics and Business Research*, 4, 606–621.

Trade and Development Report. 2013. United Nations Conference on Trade and Development. *Current Trends and Challenges in the World Economy*. United Nations, Newyork, Geneva, 2013

Vernon R. (1966). International Investment and International Trade in the Product Cycle, [J], *The Quarterly Journal of Economics*, Volume 80, Issue 2, Pages 190–207, <https://doi.org/10.2307/1880689>

World Bank (2014) *World Development Indicators*, <http://data.worldbank.org/datacatalog/world-development-indicators>.