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The Impact of Foreign Direct Investment and Trade Openness on The Ghanaian Economy[1]

Abstract. Foreign direct investment (FDI) and trade openness serve as macroeconomic indicators that support economic growth. Numerous studies conducted in recent years have empirically demonstrated the significance of FDI and trade liberalisation. Historical data illustrates that Ghana operates as a net importer, posing several challenges for domestic firms due to the comparative advantage of multinational enterprises and economies of scale. However, the full extent of the theories surrounding FDI and trade openness remains incompletely understood across all economies. This study aims to uncover the impact of FDI and foreign trade on economic growth in Ghana. The study utilised time series data sourced from the World Bank spanning from 1985 to 2021, on an annual frequency. The econometric methods employed include a unit root test (ADF), Engle-Granger cointegration test, and multiple regression analysis (Ordinary Least Squares). The ADF unit root test indicated that the variables were non-stationary and integrated at first-order difference. The Engle-Granger cointegration test revealed that the variables are cointegrated. Regression analysis results demonstrated that both FDI and trade openness exert a positive influence on economic enhancement in Ghana, with GDP serving as a proxy for growth. Furthermore, the analysis showed that FDI has a positive impact on GDP per capita, whereas trade openness negatively affects it, utilising GDP per capita as the explained variable. Based on these findings, the study recommends that policymakers implement sound FDI and trade policies to foster economic growth in the country.

Keywords: FDI, trade openness, GDP per capita, Ghana, economic growth, cointegration

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RESEARCH ARTICLE

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Влияние прямых иностранных инвестиций и открытости торговли на экономику Ганы

Аннотация. Прямые иностранные инвестиции (ПИИ) и открытость торговли — макроэкономические показатели, способствующие экономическому росту. Многочисленные современные исследования подтверждают важность прямых иностранных инвестиций и либерализации торговли. Согласно историческим данным, Гана является нетто-импортером, что создает ряд проблем для местных компаний из-за сравнительных преимуществ многонациональных компаний и эффекта масштаба. В то же время вопрос влияния прямых иностранных инвестиций и открытости торговли на различные экономики остается не до конца изученным. Цель статьи — выявить влияние прямых иностранных инвестиций и внешней торговли на экономический рост в Гане. Для этого были проанализированы ежегодные данные Всемирного банка за период с 1985 г. по 2021 г. В процессе исследования были использованы такие методы, как тест на единичный корень (расширенный тест Дики — Фуллера), тест Энгла — Грейнджера на коинтеграцию и множественный регрессионный анализ (метод наименьших квадратов). Расширенный тест Дики — Фуллера выявил, что переменные нестационарны. Тест Энгла-Грейнджера показал, что переменные коинтегрированы. С помощью регрессионного анализа обнаружено, что как ПИИ, так и открытость торговли оказывают положительное влияние на экономический рост в Гане, показателем роста являлся валовой внутренний продукт. В модели, где в качестве объясняемой переменной используется ВВП на душу населения, влияние ПИИ на этот показатель положительно, а влияние открытости торговли — отрицательно. Полученные результаты свидетельствуют о необходимости проведения рациональной политики в области прямых иностранных инвестиций и торговой политики в целях содействия экономическому росту в Гане.

Ключевые слова: ПИИ, открытость торговли, ВВП на душу населения, Гана, экономический рост, коинтеграция

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1.Introduction

Despite certain acknowledged limitations, gross domestic product (GDP) per capita remains a key measure of economic success, often utilised as a general indicator of average living standards or economic development.1 Countries with high GDP per capita typically experience economic prosperity, although it is important to note that disparities in GDP per capita among countries reflect varying levels of material living standards (Mumford, 2016). According to the Organisation for Economic Co-operation and Development (OECD)2, this perspective is useful for dissecting per capita growth into two components: labour productivity growth (measured as GDP per hour worked) and labour utilisation growth (measured as hours worked per capita). However, while GDP, as a measure of the value of all market goods and services produced within a country in a year, is widely used, an average GDP per capita fails to illustrate how GDP is distributed across the population. Nevertheless, without considering distributional factors, dividing GDP by the nation's population offers a solid starting point for assessing prosperity. In the case of Africa, many developing and least-developed countries exhibit lower GDP per capita; however, most developing nations in Africa have yet to realise the significance of achieving high GDP per capita. Gross domestic product measures the value added by producing goods and services within a country during a specified period. While GDP is a crucial indicator of economic activity, it does not accurately cap-

[1] OECD. (2013). "GDP per capita", in National Accounts at a Glance 2013. Paris: OECD Publishing. Retrieved from: https://www.oecd-ilibrary.org/docserver/na_glance-2013-5-en.pdf?expires=1664276658&id=id&accname=guest&checksum=2625661A876CF18B2FC8AAB2B63DB513 (Date of access: 09.27.2022)

[2] OECD. (2024). GDP per hour worked (indicator). Retrieved from: https://www.oecd-ilibrary.org/economics/gdp-per-hour-worked/indicator/english_1439e590-en (Date of access: 19.02.2024)

ture people's material well-being. Per capita GDP is determined by the size of the population and GDP itself. Foreign direct investment (FDI) and trade openness are key factors supporting economic growth, directly contributing to GDP over time. The benefits of industrialisation and modern technology are disseminated from developed to underdeveloped nations through the multilateral trading system, employing various channels to diffuse technology (Mumford, 2016). The acquisition of human capital through international study, adoption of foreign technology, and importation of high-tech items are indispensable tools for global technology dissemination.

According to the OECD, FDI refers to a type of cross-border investment in which an investor establishes a lasting interest in and influence over an enterprise from another country.1 FDI plays a crucial role in international economic integration by fostering long-term links between economies and facilitating technology transfer, international trade, and economic development. Trade openness and FDI enhance a country's human capital (Johnson & Stafford, 1993). However, the theory of trade liberalisation and FDI supporting economic growth has been a significant focus for economists, with the new strand of endogenous growth theories providing a conceptual framework for analysing the impact of trade openness and FDI on growth (Kaushal & Pathak, 2015). Trade openness refers to the degree to which a country engages in trade with other nations, encompassing various activities such as exporting, importing, FDI, lending, borrowing, and repatriating money from abroad (Goldberg et al., 2009; Intisar et al., 2020). Regarding the relative effects of economic crises on international trade, examining exports and imports as a percentage of GDP between 2008 and 2009 reveals the adverse impact on many countries, although GDP was severely affected.2 Empirical studies have shown a positive impact of trade openness, including works by Karras (2003), Rao and Rao (2009), and Chang and Mendy (2012). On the contrary, Eris and Ulasan (2013) and Babatunde (2011) found no significant impact of trade openness.

The significance of the present study on Ghana lies in the post-structural adjustment programme period, during which policymakers implemented numerous investment and trade policies to stimulate economic growth. It is essential to investigate the effects of these policies. Previous empirical studies on FDI and trade openness have indicated a positive relationship with growth. This study aims to determine whether FDI inflows and trade openness support economic growth in Ghana, contributing to existing theories on the effect of FDI and trade liberalisation on economic growth. The study comprises an introduction, literature review, methodology, results and discussions, and conclusion.

2. Literature Review

Numerous researchers have investigated the impact of foreign direct investment (FDI) and trade liberalisation on economies using various econometric models, yielding diverse outcomes. Some empirical studies have found both positive and negative relationships between FDI, trade openness, and economic growth. This review highlights several past studies relevant to this subject. Nketiah et al. (2020) found that trade openness positively supports economic growth, whereas FDI did not exhibit a significant impact. Conversely, Sakyi et al. (2015) identified FDI and trade openness as crucial factors for economic growth. Additionally, Ofori and Asumadu (2017) established a causal link between FDI and GDP, suggesting that FDI could stimulate growth. On the contrary, Kulu et al. (2021) used the ARDL model and discovered that both FDI and an institutional quality index jointly have a significantly beneficial impact on a nation's economic growth compared to their separate effects, in both the short and long runs. Similarly, Bouchoucha and Ali (2019) confirmed that FDI has both short – and long-run positive impacts on economic development in Tunisia.

Owusu-Antwi et al. (2013) identified trade openness, exchange rate, natural resources, and infrastructure as the primary factors influencing FDI in Ghana. Conversely, Djokoto (2013) found that FDI inflows and trade openness negatively impact Ghana's agricultural sector. In contrast, Sokang (2018) revealed that FDI inflows positively affect economic growth in Cambodia through multiple regression analysis. There is a clear statistically supported relationship between FDI and globalisation, as well as between FDI and trade openness (Dima, 2016). However, Nguyen et al. (2022)

[1] OECD. (2023). OECD International Direct Investment Statistics 2022. OECD Publishing, Paris. Retrieved from: https://www.oecd-ilibrary.org/finance-and-investment/oecd-international-direct-investment-statistics-2022_deedc307-en (Date of access: 19.02 2024)

[2] OECD. (2011). OECD Science, Technology and Industry Scoreboard 2011. OECD Publishing, Paris. https://doi.org/10.1787/sti_scoreboard-2011-en. Retrieved from: https://www.oecd-ilibrary.org/science-and-technology/oecd-science-technology-and-industry-scoreboard-2011_sti_scoreboard-2011-en .(Date of access: 09.27.2022)

found that while exports and imports do not statistically significantly affect growth, FDI considerably encourages it in the long run. Ozturk and Radouai (2020) concluded that trade openness has a statistically significant but small impact on economic growth, with no significant short – or long-run effect on economic development in Morocco. Malefane and Odhiambo (2018) concluded that trade openness significantly affects economic growth when total trade to GDP is used as a proxy but not when other proxies are utilised. Hye et al. (2016) found that both individual trade indicators and the composite trade openness index have a long-term and short-term relationship with economic growth. Furthermore, Mudiyanselage et al. (2021) discovered negative, statistically significant long – and short-term correlations between FDI inflows into Romania and trade openness. The Granger causality test indicated a one-way relationship between trade openness and FDI in Romania, with trade openness following FDI in the causal chain of events.

2.1. Exports and Imports Impact on Economic Growth

Foreign trade plays a critical role in fostering economic growth, offering nations the opportunity to import goods and services that they cannot produce domestically or would be too costly to manufacture. Scholars and policymakers have shown a keen interest in understanding the impact of imports and exports on economic growth (Ali et al., 2018). Through the multiplier effect, exports and imports are pivotal for boosting a nation's economy (Rai & Jhala, 2015). Particularly in developing and least-developed countries, exports have played a significant role in transitioning from least-developed to middle-income status by implementing export-oriented policies. By exporting a surplus of products and services to earn foreign currency, nations create more employment opportunities, foster economic resilience, and enhance international competitiveness (Bhagwati & Srinvasan, 1978).

Exports enable economies to specialise in producing goods and services in which they have a comparative advantage, leading to the efficient allocation of resources and an expansion of aggregate productivity. This specialisation can facilitate competition, access to new technology, ideas, and entrepreneurial skills, thereby increasing production possibilities (Nidugala, 2000). Export-led growth strategies aim to encourage manufacturers to export their goods through various economic and governmental initiatives. However, Usman et al. (2012) found that exports, government spending, and education expenditure are positively correlated with economic growth.

Conversely, Zakaria (2014) concluded that while trade liberalisation boosts both exports and imports, the latter benefits more, leading to a worsening of the trade balance. Similarly, Uddin and Khanam (2017) found a negative relationship between GDP growth rate and imports, indicating that imports negatively impact GDP growth. On the other hand, Chaudhary and Amin (2012) reported that trade openness has a favourable impact on both export and import growth, although import growth outpaces export growth, resulting in a deterioration of the trade balance. In contrast, Adel (2015) suggested that exports and imports have a positive and significant relationship with GDP, with imports exerting a major influence. Gondaliya and Dave (2015) noted a positive correlation between exports and exchange rates, while imports showed a negative correlation with exchange rates. Additionally, excessive imports are often associated with claims that they eliminate jobs in the local manufacturing sector, leading to concerns about unsustainable trade deficits (Mensah & Okyere, 2018). Maintaining a long-term balance between exports and imports is ideal for both developed and emerging economies. However, Blavasciunaite et al. (2020) highlighted the challenge of consistently high import volumes leading to trade deficits and outflows of cash flows.

Furthermore, while trade openness facilitates the easy movement of goods and services across borders and reduces tariffs, it can also have short – and long-term effects on domestic industries. Tariffs, designed to protect local businesses by raising the cost of imports, may still be necessary for safeguarding vulnerable industries or maintaining revenue sources in developing nations. A high level of trade openness with lower restrictions on taxes and tariffs can have significant implications for domestic industries in both the short and long run.

2.2. Ghana's Trade

Non-diversified economies, particularly those in developing countries, heavily rely on advanced nations for the majority of their raw materials (Yennu, 2018). These nations typically export these materials to advanced nations while simultaneously importing goods from them. In the case of Ghana, primary exports include gold, cocoa beans, timber products, cola nuts, as well as secondary exports such as tuna, aluminium, manganese ore, diamonds, bauxite, Veneer sheets, and horticulture (Enu et al., 2013). Conversely, the

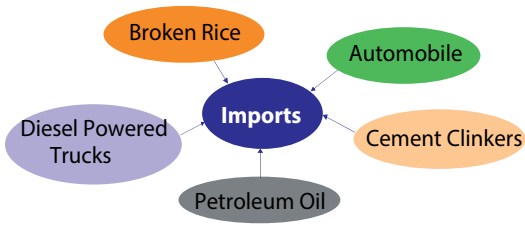

Fig. 1. *Ghana's import structure (top five products)*
Source: the author's own plot

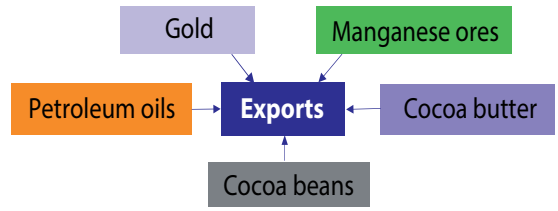

Fig. 2. *Ghana's export structure (Top five exported products)*
Source: the author's own plot

country imports various products including agricultural products, manufactured goods, and services. Notably, petroleum and related products, motor vehicles, and communications and sound recording equipment constituted a significant portion of Ghana's annual imports from 1995 to 2014 (Vacu & Odhiambo, 2017).

Trade policy changes in Ghana have primarily involved the removal and adjustment of trade tariffs (Vacu & Odhiambo, 2017). The nation has made considerable progress in opening its economy by reducing tariffs, effectively aligning its import policies. According to the World Integrated Trade Solution (WITS) data,1 Ghana recorded total exports of USD 16.8 billion and imports of USD 10.43 billion in 2019, resulting in a positive trade balance of USD 6.32 million. Ghana's effectively applied tariff weighted average (custom duty) stands at 10.02 %, with a Most Favoured Nation (MFN) weighted average tariff of 10.53 %. Despite a global trade growth rate of – 1.13 %, Ghana's trade growth is slightly lower at – 1.42 %. Ghana's GDP reached USD 67.2 billion in 2019. The country's services exports were valued at USD 9.9 billion, while services imports amounted to USD 13.5 billion. The GDP share of Ghana's exports of goods and services stands at 35.84 %, while the GDP share of imports of goods and services is slightly lower at 35.27 %. Ghana has consistently posted a trade deficit, with imports exceeding exports for many years. For instance, in 2016, Ghana imported goods worth eleven billion dollars while exporting goods worth ten and a half billion dollars, resulting in a deficit of fifty-eight million dollars (Ibrahim & Haiyun, 2019).

Ghana conducts trade with both developing and developed nations, with the majority of its imports originating from industrialised countries. Notably, Ghana's imports from China have experienced rapid growth in recent years compared to its other trading partners. Figure 1 illustrates the country's top five major imports, Figure 2 highlights the top five export products, while Figure 3 depicts the top five major trading partners.

2.3. Investment Incentives in Ghana

Investment inflows into Ghana's economy originate from both developed and developing countries, with a significant portion coming from European Union (EU) nations. However, China and India emerge as the leading investing nations, boasting a higher number of FDI-registered projects. Notably, contributions from the United States and the United Kingdom to the overall FDI are on a declining trajectory (Yeboah & Anning, 2020). The Ghana Investment Promotion Centre (GIPC) is a government agency, re-established under Act 478 of 1994, tasked with promoting.2 The functions of the GIPC encompass a range of services, including investment advisory, joint venture facilitation, identification of specific investment projects, granting of investment incentives, registration of technology transfer agreements, negotiation of Bilateral Investment Treaties, and provision of other support services. To improve the investment climate, Ghana has enacted several legal and regulatory laws, including the GIPC Act 478, the Ghana Free Zones Act 504, the Minerals and Mining Act 703, the Petroleum Law, PNDC Law 188, and the Security Industry Amendment Act, Act 590. The GIPC Act 478 offers various investment incentives and guarantees to investors, such as customs duties exemption for machinery, equipment, and parts, reasonable corporate taxes, location incentives, tax holidays, immigrant quotas, relief from double taxation, full repatriation of dividends and profits, transfer of funds for servicing foreign loans, guarantee against expropriation, and remittance of proceeds from investment sale or liquidation.

Under the Free Zone Programme, companies must export at least 70 % of their products.

These incentives have significantly boosted investment inflows into Ghana in recent years, mak-

[1] WITS. (2019). Ghana's Trade Summary. Retrieved from: https://wits.worldbank.org/CountryProfile/en/Country/GHA/Year/LTST/Summarytext (Date of access: 01.08.2022)

[2] GIPC. (2013). Investment Opportunities in Ghana and Doing Business in Ghana. Accra: The Ghana Investment Promotion Centre. Retrieved from: https://gipc.gov.gh/the-centre/ (Date of access: 09.27.2022)

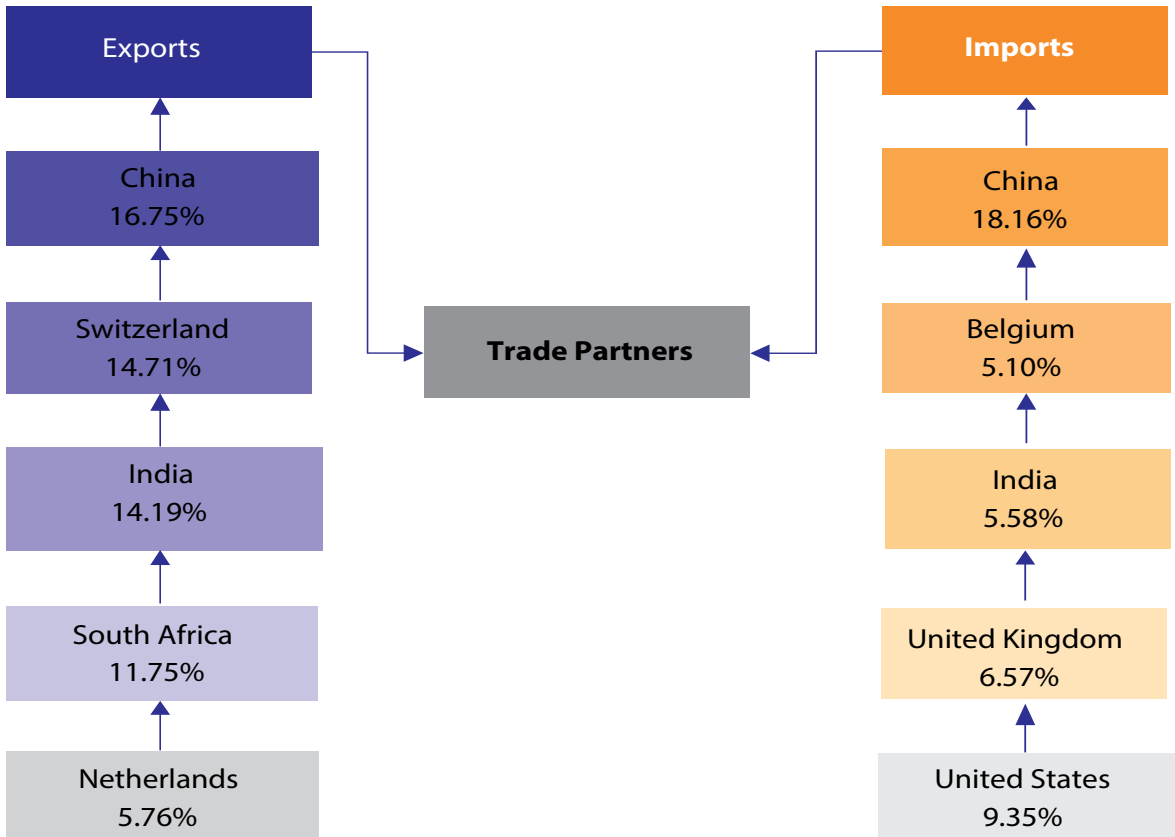

Fig. 3. *Ghana's top five trading partners*

Source: the author's own plot

ing it the largest recipient of FDI inflows in the West African sub-region, surpassing Nigeria before the widespread of the COVID-19 pandemic. According to the United Nations Conference on Trade and Development (UNCTAD), FDI flows into Ghana experienced significant growth in the early 2000s, rising from USD 636 million in the 90s to USD 6.821 billion within two years after 2010.1 However, there was a decline in FDI to Ghana from USD 3.88 billion in 2019 to USD 1.88 billion in 2020. Interestingly, while the value of FDI flows increases, the number of registered projects decreases. GIPC investment reports indicate a peak in registered projects in 2011, followed by a continuous decline in subsequent years, encompassing wholly foreign-owned ventures and joint ventures involving Ghanaians and their foreign partners.

2.4. Ghana's GDP Evolution

The government initiated an Economic Recovery Programme (ERP) in 1983, aiming to revitalise the economy by leveraging foreign direct investment and capitalising on the opportunities presented by the new, free-trade global environment (Awunyo-Vitor & Sackey, 2018). According to the Ministry of Finance of the Republic of Ghana,2 the projected output for the period is GHS 440,869.4 million, an increase from GHS 391,940.7 million reported in 2020. The estimated nominal GDP for 2021 is GHS 459,130.9 million, nearly GHS 18 billion higher than the projected outturn. The nominal non-oil GDP is anticipated to reach GHS 437,975.2 million in 2021, up from GHS 378,147.9 million in 2020. Ghana's public debt stock, expressed as a percentage of GDP, now stands at 76.6 % at the end of 2021, compared to the earlier stated 80.1 %. This indicates that the rate of debt growth has slowed to pre-pandemic levels, as the 2020 debt stock decreased from 76.1 % to 74.4 %. Historical data reveals that Ghana's GDP experienced negative growth rates of 4.26 % in 1966, 2.49 % in 1972, 12.43 % in 1975, 3.53 % in 1976, 2.51 % in 1979, 3.50 % in 1981, 6.92 % in 1982, and 4.56 % in 1983, respectively. However, positive economic advancement began in 1984 and has persisted to the present period. The country witnessed a notable GDP

[1] Kusi, G. (2012). Regulatory Framework for Investing in Ghana. Accra: Ghana Investment Promotion Centre. Retrieved from: http://mci.ei.columbia.edu/files/2013/10/GIPC-presentation.pdf (Date of access: 09.27.2022)

[2] MOF. (2021). The 2021 Consolidated MDAS Annual Budget Performance Report. Retrieved from: https://mofep.gov.gh/reports/2022-07-20/the-2021-consolidated-MDAS-annual-budget-performance-report. (Date of access: 10.02.2022)

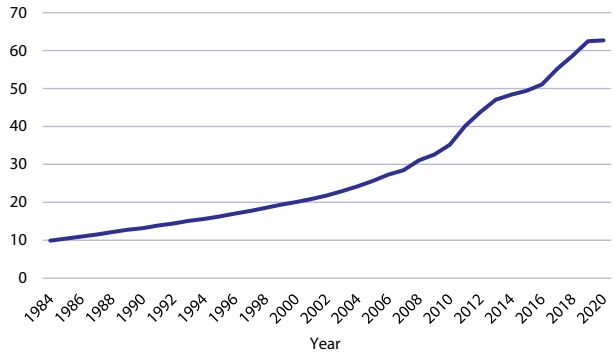

Fig. 4. *Ghana's GDP trend*
Source: the author's own plot

growth rate in 2011, with an estimated growth of 14.05 %. Since its economic reform, Ghana's GDP experienced its lowest growth of 0.51 % in 2020. This decline was primarily due to the outbreak of COVID-19, which disrupted the circular economy. Conversely, the Ghana Statistical Service indicated that real GDP increased by 7 % in the fourth quarter of 2021 compared to the 4.3 % growth in the same period in 2020. Figure 4 illustrates the trend of GDP growth in Ghana.

2.5. Sectoral Directions of FDI and Imports

Ghana's rich endowment in gold, aluminium, bauxite, timber, diamonds, manganese, and the exploration of oil and natural gas serves as a strong attraction for investors. During the late and early 2000s, approximately 70 % of all foreign direct investment was directed towards natural resources. According to the United Nations Conference on Trade and Development (UNCTAD), a significant portion of FDI in manufacturing is resource-based, evident in activities such as processing fish for canning and exporting cut pineapples to European markets. Foreign companies play a substantial role in Ghana's banking and construction industries, contributing to the construction of hotels, public works projects, and highways, often with the support of public funds and development assistance. Recently, the energy sector has experienced a surge in FDI. While diamonds and gold remain primary industries in Ghana, mining, particularly for aluminium, bauxite, and manganese, accounts for the majority of FDI in the country. However, there has been a shift in this trend, with most FDI projects now focusing on manufacturing activities. The manufacturing sector has absorbed the largest share of all registered projects, especially evident in the first three quarters of 2017 (Yeboah, 2018). The service sector has generated approximately 53 % of all new jobs, while the manufacturing sector accounts for around 20.5 %. In terms of the estimated value of FDI inflows, manufacturing and construction have consistently attracted the largest shares, with the export trade sector receiving the lowest amount over time (Apana & Yeboah, 2018). Conversely, Ghana imports various products, including agricultural, energy, and mining products, manufactured goods, and other goods. In 2015, the breakdown of imports revealed that manufactured goods constituted 63.1 % of the total value of imported goods, while fuels and mining products accounted for 1.8 %, agricultural products for 11.7 %, and other goods made up 23.3 % (Apana & Yeboah, 2018).

2.6. FDI Inflow in West Africa

In African countries, foreign direct investment can act as a catalyst for economic diversification, assisting these economies in moving away from reliance on natural resources and serving as a crucial source of long-term funding for investment in infrastructure and alternative developmental initiatives (Anyanwu & Yameogo, 2015). FDI inflows into Africa increased by 4 % to USD 57 billion in 2010, thanks to infrastructure investment and global and regional market research. Despite reaching 3.1 %, 3.9 %, and 5.2 % in 2005, 2006, and 2008 respectively, Africa's share of FDI inflow remained lower than that of other parts of the world (Eregha, 2015). However, FDI experienced a 10 % decline to USD 12.8 billion due to dropping commodity prices and security issues in West African nations.1 According to the UNCTAD's World Investment Report 2022,2 FDI inflows to African nations reached a record USD 83 billion in 2021, more than twice the amount reported in 2020 when the COVID-19 pandemic significantly impacted regional investment. Investment flows increased in Southern Africa, East Africa, and West Africa, while remaining unchanged in Central Africa and declining in North Africa. FDI in West Africa surged by 48 % to USD 14 billion, with Nigeria emerging as the largest economy and recipient of FDI flows in the region. Nigeria witnessed a doubling of its flows to USD 4.8 billion, primarily due to increased investments in the oil and gas industries, including international project financing transactions totalling USD 7 billion,

[1] UNCTAD. (2015). World Investment Report: Reforming International Investment Governance. New York and Geneva: United Nations Conference on Trade and Development Retrieved from: https://unctad.org/system/files/official-document/wir2015_overview_en.pdf (Date of access: 11.01.2022)

[2] UNCTAD. (2022), World Investment Report 2022. Retrieved from: https://unctad.org/publication/world-investment-report-2022 (Date of access: 09.10.2022)

such as the USD 2.9 billion Escravos Seaport industrial complex construction project. Conversely, FDI to Ghana rose by 39 % to USD 2.6 billion, largely attributed to projects in the extractive sectors. Senegal also experienced a significant increase of 21 % in FDI, reaching USD 2.2 billion, with the country witnessing a 27 % rise in greenfield project announcements.

2.7. Disadvantages of FDI

FDI is often viewed as highly advantageous for the host country. However, it is not without its challenges, and unrest has frequently accompanied increases in FDI inflows. Until recently, many developing nations were cautious about FDI due to the dominant position held by large Multinational Enterprises (MNEs), which are perceived to have little accountability to domestic governments (Kurtishi-Kastrati, 2013). Critics of FDI argue that it can have negative political and economic impacts on the host nation. One drawback of FDI is that it is subject to the oversight and regulation of various policymakers, leading to increased political risk. The purported negative economic effects of FDI, especially in heavy industries, include deficits in the balance of payments, reduced domestic research and development, decreased competitiveness, displacement of domestic enterprises, reduced employment opportunities, and potential adverse effects on the environment (Kurtishi-Kastrati, 2013). Remedying investor disadvantages in Ghana's economy is crucial for overall improvement. Despite the country's increasing production capacity, Ghana's population still has an extremely low per capita income, leading to periodic saturation and challenges for businesses (Bose, 2012). Conversely, FDI may enhance import capacity and widen the current account deficit. A high import content could result in lower domestic value-added and limited local linkages (Asafu-Adjaye, 2005). Additionally, FDI may harm competitiveness as new local businesses compete against established international competitors, potentially causing indigenous industries to lose market share to foreign competitors (Yeboah & Kyeremeh, 2021).

3. Methodology

Examining the relationship between GDP, FDI, GDP per capita, and trade openness in terms of economic growth necessitates a systematic approach to address the research question. This entails conducting various tests including analyses for multicollinearity, unit root, and cointegration. In this study, GDP and GDP per capita serve as proxies for economic growth to evaluate their connection with the selected variables, FDI, and trade openness, within Ghana's economy. The econometric methods employed encompass unit root testing, cointegration analysis, and multiple regression utilising Ordinary Least Squares (OLS). The unit root test is pivotal for evaluating the trends and properties of the time series variables and was conducted using the Augmented Dickey-Fuller (ADF) unit root test. This test assesses whether a time series exhibits a unit root or follows a random walk pattern (Dickey & Fuller, 1979). Additionally, the Engle-Granger (EG) test was utilised to verify the presence of cointegration among the multivariate system of two or more non-stationary time series. This test, proposed by Engle and Granger (1987), examines the stationarity of residuals to ascertain a long-run relationship. Cointegration seeks to align the degrees of non-stationarity in time series to render residuals stationary, thereby avoiding spurious regression. It implies that individual time series possess a unit root, indicating they are first-order integrated, while the residuals from cointegration regression lack a unit root (Adamec, 2014). By checking the stationarity of residuals, the cointegration test evaluates the existence of a long-term relationship among the variables under consideration.

3.1. Data Collection

The study utilised annual time series data sourced from the World Bank spanning the years 1985 to 2021. Data on FDI, GDP, GDP per capita, and trade openness were extracted from the World Bank's country profiles, although alternative sources were also considered.1 The World Bank is widely recognised as a reputable and dependable open-source provider of country-specific statistics, making it a preferred choice for academics, researchers, and policymakers for analytical purposes. GDP, representing the total output of a country, was measured in real terms in this study, using constant prices with 2015 as the base year. Real GDP measurement in constant prices enables the assessment of actual changes in output over time, as subsequent years' GDP is evaluated using the price levels of the base year. FDI inflow, measured in current prices, refers to the net inflow of foreign direct investment into the country. Conversely, GDP per capita, calculated annually, is derived by dividing the total gross value contributed by resident producers of the economy by the mid-year population, adjusted for any prod-

[1] Data on FD inflows, trade openness, GDP, and GDP per capita. Retrieved from: https://data.worldbank.org/ (Date of access: 01.04.2022)

uct taxes and subsidies. These variables GDP, FDI, and GDP per capita are denominated in United States dollars (USD), a widely accepted currency for measuring global economic and financial activities, facilitating ease of comparison across countries.

3.2. Model Framework

Over recent years, Ghana's GDP per capita has exhibited a slower rate of increase alongside a rapidly growing population. The study delves into the correlation between trade openness, FDI inflows, GDP per capita, and Ghana's gross domestic product. Initially, to ascertain whether FDI, trade openness, and GDP per capita have any impact on economic growth, real GDP was utilised as the dependent variable, as depicted in equation 1. The degree of openness, representing the actual volume of the Import-Export ratio, serves as a metric increasingly employed by political economists to scientifically analyse the effects and consequences of trade on a nation's socioeconomic standing. Conversely, with the premise that as GDP expands, GDP per capita increases, the interplay between FDI inflows and trade openness was examined using GDP per capita as the dependent variable, as illustrated in equation 2. This investigation seeks to understand how FDI inflows and trade openness influence GDP per capita, as it indicates the distribution of aggregate GDP among individuals in the country. Consequently, GDP per capita provides a fundamental measure of output volume per individual, indirectly reflecting per capita income since sustained economic growth augments average income, thereby contributing to poverty reduction. According to the World Bank, multidimensional poverty indicators encompass monetary factors (daily consumption or income below USD 2.15 per person), education (lack of school enrolment for at least one school-age child up to grade 8 and no completion of primary school for any adult in the household after grade 9), and access to basic infrastructure (lack of access to improved drinking water, sanitation facilities, and electricity). Using 2017 price levels, the global poverty line was established at USD 2.15 per person per day, with individuals earning less considered to be in extreme poverty. In 2019, approximately 648 million people worldwide were identified as living in extreme poverty. Conversely, economic prosperity is intrinsically linked to the well-being of the majority of the population, necessitating measures to ensure that all members of society benefit from an enhanced quality of life. Governments and policymakers globally are committed to fostering prosperity for both present and future generations, with decisions made today intended to benefit both current individuals and future cohorts. Indicators such as economic growth, security, and competitiveness are pivotal aspects of economic prosperity, impacting overall quality of life and a nation's ability to compete in the global arena. Moreover, for correct econometric model specification, GDP and FDI were transformed into natural logarithms, as per equation 1.

Table 1

Summary Statistics

Variable	Mean	Median	S.D.	Min	Max
Log of GDP	3.23	3.13	0.574	2.34	4.19
Log of FDI	-1.35	-1.79	2.33	-5.45	1.36
Trade	69.8	70.0	21.4	24.2	116.
GDP per capita	975	434	770	258.	2445

Source: the author's calculations

$$\ln GDP_t = \beta_0 + \beta_1 \text{trade openness}_t + \beta_2 \ln FDI_t + \beta_3 GDP\text{percapita}_t + \mu_t \quad (1)$$

Where $\ln GDP_t$ is the gross domestic product, $\ln FDI_t$ is the total foreign direct investment inflows, and GDP per capita represents the total gross domestic product divided by the population. Real GDP is measured in constant prices (USD), whereas FDI is measured in USD billions at the current price, and GDP per capita is measured in USD thousands. Trade openness is measured as a ratio between the aggregate of exports and imports and GDP.

$$\ln GDPpercapita_t = \beta_0 + \beta_1 \ln FDI_t + \beta_2 \ln trade\ openness_t + \mu_t \quad (2)$$

Under the estimation of the significance of FDI and trade openness on GDP per capita, all the variables were transformed into their natural logarithms for a correct function of the model since the relationship and function may not be always linear. β_1, β_2, and β_3 are the regression coefficients, and μ_t represents the error term. The β_0 stands for the constant term obtained from the model.

$\ln GDP_t$ = log of gross domestic product
$\ln FDI_t$ = log of *FDI* inflows
$\ln GDPpercapita_t$ = log of *GDP per capita*
$\ln trade\ openness_t$ = log of trade openness

4.Results and Discussion

The summary statistics show that GDP per capita has the highest mean and median, followed by trade openness and GDP. However, FDI has a negative mean and median value as indicated in Table 1. The mean logarithm of GDP is 3.23, with a median of 3.13, indicating a slightly

Table 2

ADF Unit Root Test at Level and First difference

Variables	Sample period	ADF T-Stat	p-value	Critical Value (5%)	ADF T-Stat	p-value	Critical Value (5%)
Log of GDP	1989-2021	–0.433	0.986	–0.017	–4.428	0.002	–1.185
Log of FDI inflow	1987-2021	–0.441	0.524	–0.019	–5.295	0.000	–1.256
Trade openness	1986-2021	–2.443	0.129	–0.209	–5.821	0.000	–1.392
GDP per Capita	1986-2021	–1.747	0.730	–0.148	–5.866	0.000	–1.018

Source: Author's calculations

Table 3

Engle-Granger cointegration test

Unit-root H_0: $a = 1$	estimated value of $(a - 1)$: -0.875
model: $(1 - L)\, y = (a - 1) \times y\,(-1) + e$	test statistic: *tau_ct* (4) = -5.116 *P*-value = 0.006

Source: the author's calculations

right-skewed distribution. The standard deviation of 0.574 suggests moderate variability around the mean. The range of logarithmic GDP values observed is from 2.34 to 4.19, indicating substantial variability in GDP across the observed time period.

For the logarithm of FDI, the mean is – 1.35, with a median of – 1.79, suggesting a left-skewed distribution. The standard deviation of 2.33 indicates substantial variability around the mean. The range of logarithmic FDI values observed is from – 5.45 to 1.36, indicating significant fluctuations in FDI over the observed period.

The average trade value is 69.8, with a median of 70.0, suggesting a relatively stable distribution. The standard deviation of 21.4 indicates moderate variability in trade values around the mean. The range of trade values observed is from 24.2 to 116., reflecting substantial variation in trade activities over time.

Regarding GDP per capita, the average is 975, with a median of 434, indicating a right-skewed distribution. The standard deviation of 770 indicates substantial variability in GDP per capita around the mean. The range of GDP per capita values observed is from 258. to 2445, reflecting significant differences in income levels across the observed time period.

Table 4

Collinearity test

Variables	Variance Inflation Factor
Trade openness	1.921
Log of FDI	5.656
GDP per capita	4.639

Source: the author's calculations

4.1. Unit Root Test

Table 2 presents the results of the Augmented Dickey-Fuller (ADF) unit root testing conducted on the selected variables at both the level and after taking the first difference. The null hypothesis tested in this analysis is whether there is a presence of a unit root in the variables, indicating non-stationarity. The rejection of this null hypothesis is contingent upon the significance level, typically set at 5 %. In this case, the null hypothesis is not rejected for the variables at the level, as their p-values exceed 5 %. This suggests evidence of unit root presence and non-stationarity in these variables. However, after taking the first difference in the time series, the variables exhibit stationary properties. This implies that they are integrated at the first-order difference, indicating stationarity following this transformation. The ADF unit root testing results indicate that while the variables were non-stationary at the level, they became stationary after the first difference, which is essential for ensuring the validity of statistical models.

4.2. Cointegration Test

The cointegration test was conducted with the gross domestic product as the dependent variable, while GDP per capita, FDI inflows, and Trade openness were used as the regressors. Table 3 shows the cointegration test relationship of the residuals using the Engle-Granger test. The Engle-Granger cointegration test assesses whether a linear combination of non-stationary time series variables is stationary, implying a long-term relationship between them. In this test, the null hypothesis (H_0) is that the coefficient a in the model is equal to 1, suggesting that there is no cointegration between

Table 5

Model 1 estimation

Variables	Coefficient	Std. Error	Test-ratio	p-value
constant	2.221***	0.102	21.45	0.000
Trade openness	0.007***	0.001	8.538	0.000
Log of FDI	0.047***	0.013	3.459	0.002
GDP per capita	0.001***	0.000	15.35	0.000
R^2 = 0.98	Adjusted R^2 = 0.98	*DW*=1.532		

Significance codes: *** 1%; DW= Durbin Watson
Source: the author's calculations

Table 6

Model 2 estimation

Variables	Coefficient	Std. Error	Test-ratio	p-value
Constant	11.582***	0.769	15.04	0.000
Log of FDI	0.370***	0.178	14.27	0.000
Log of Trade openness	–1.074***	0.025	–6.02	0.000
R^2=0.86	Adjusted R^2 = 0.85	*DW* = 1.643		

Significance codes: *** 1%; *DW*= Durbin Watson
Source: The author's calculations

the variables. The estimated value of $(a - 1)$ is – 0.875, indicating that the model estimates the coefficient to be slightly less than 1. The test statistic, tau_ct (4), is calculated to be – 5.116. This value is compared to critical values to determine the statistical significance of the test. The obtained p-value is 0.006, which is less than the conventional significance level of 0.05. Therefore, we reject the null hypothesis and conclude that there is evidence of cointegration between the variables at the 5 % level of significance.

4.3. Collinearity Test

The collinearity test of the model estimation in Table 4 shows no multicollinearity among the variables using the variance inflation factor. For trade openness, the VIF is 1.921, indicating that there is minimal multicollinearity associated with this variable. The VIF for the log of FDI is 5.656, which falls within an acceptable range and suggests a moderate degree of multicollinearity. While this value is somewhat elevated, it does not exceed the threshold of 10, indicating that multicollinearity with other variables is present but may not be severe enough to cause concerns about the reliability of the regression results. Similarly, the VIF for GDP per capita is 4.639, also falling within an acceptable range and indicating a moderate level of multicollinearity associated with this variable.

4.4. Regression Results

Model 1 coefficients were estimated using GDP as the dependent variable (Table 5). The regression results provide valuable details into the relationship between economic variables. The significant coefficient of the constant term suggests that even in the absence of trade openness, FDI, or GDP per capita, there is a baseline level of economic activity. Trade openness has a statistically significant positive impact on economic growth (0.007), implying that an increase in trade openness leads to a proportional increase in economic output. Similarly, FDI exhibits a positive association with economic growth (0.047), indicating that higher levels of FDI inflows contribute to greater economic expansion. Moreover, GDP per capita emerges as a significant predictor of economic growth (0.001), suggesting that higher levels of per capita income are linked to increased overall economic activity. The high R-squared value (0.98) indicates that the model effectively explains 98 % of the variation in economic growth, further validating the robustness of the findings. The results underscore the importance of trade openness, FDI, and GDP per capita in driving economic growth in the context of the examined economy.

The outcomes of various statistical tests conducted to evaluate the robustness and validity of regression Model 1 are as follows. Firstly, the Breusch-Pagan test for heteroskedasticity aimed at determining whether the variability of the error terms in the model remains constant across observations yielded a test statistic of 5.681 with a corresponding p-value of 0.128. This result indicates that the null hypothesis of no heteroskedasticity is not rejected at the 5 % significance level. Secondly, the normality test, which assesses whether the residuals of the regression model conform to a normal distribution, produced a Chi-square statistic of 1.493 with a p-value of 0.474. This suggests that there is no significant departure from normality in the error terms. Additionally, the model specification test, specifically Ramsey's RESET test, typically used to detect omitted variables or potential nonlinearities in the model, shows that the model is correctly specified.

However, the results from Model 2 estimation, where GDP per capita serves as the dependent variable, unveil several significant insights (Table 6). Initially, the model's constant term is estimated at 11.582, suggesting a substantial baseline level of GDP per capita even in the absence of FDI and trade openness. This constant is highly statistically significant because its p-value is lower than 1 %. The coefficient for FDI stands at 0.370, with a standard error of 0.178. This indicates that an increase

in FDI correlates positively with GDP per capita, and the coefficient is statistically significant at a 5 % significance level, evidenced by a test ratio of 14.27 and a p-value less than 1 %. Conversely, the coefficient for trade openness is estimated at – 1.074, with a standard error of 0.025. This negative coefficient suggests that as trade openness rises, GDP per capita tends to decline. This coefficient is statistically significant, supported by a test ratio of – 6.02 and a p-value lower than 1 %. The model demonstrates a strong explanatory power, reflected in the high R-squared value of 0.86. This implies that approximately 86 % of the variability in GDP per capita can be elucidated by the independent variables incorporated into the model.

The diagnostic tests conducted on Model 2 provide valuable insights into the model's specification and the behaviour of its residuals. Firstly, Ramsey's RESET test indicates that the model is correctly specified, implying that there are no omitted variables or incorrect functional forms present at a 5 % critical value. This suggests that the chosen independent variables adequately capture the relationship with the dependent variable, GDP per capita. Secondly, the test for the normality of residuals yields a test statistic with a Chi-square value of 2.652 and a corresponding p-value of 0.265. This result suggests that the assumption of normality for the model's errors cannot be rejected at conventional levels of significance. It shows that the distribution of residuals appears to be approximately normal, which is a desirable characteristic for regression analysis. Thirdly, the Breusch-Pagan test for heteroskedasticity produces a p-value of 0.266. This result indicates that there is no evidence of heteroskedasticity in the model, implying that the variance of the residuals is constant across different levels of the independent variables. This assumption is important for ensuring the reliability of coefficient estimates and hypothesis tests in regression analysis.

4.5 Discussion

The study explores the role of Foreign Direct Investment (FDI) and trade openness in supporting economic growth within the Ghanaian economy. The cointegration analysis suggests a positive association between GDP per capita, FDI inflows, and trade, indicating their potential contribution to long-term economic growth. Specifically, the coefficients of trade openness and FDI inflows suggest that changes in these variables can lead to an expansion of the gross domestic product (GDP). This finding aligns with Babatunde's (2011) assertion that FDI has a positive and significant impact on economic growth, which is corroborated by the present study's results.

Similarly, Yusoff and Nuh (2015) emphasised the significance of both FDI and trade openness for economic growth, a sentiment echoed in the empirical findings of Shah and Samdani (2015), who highlighted the importance of trade liberalisation and FDI for the economies of developing countries. Additionally, Constant and Yaoxing (2010) underscored the significance of FDI and trade openness in explaining GDP growth, further supporting the premise of this study. Moreover, the findings of Keho (2017) suggest that trade openness yields favourable long – and short-term benefits for economic growth. While a short-term correlation between trade openness and economic growth exists, Khalid and Hayder (2016) showed that this association becomes statistically negligible over the long term. However, Model 2 reveals that trade openness has a negative impact on GDP per capita, suggesting that an increase in exports and imports leads to a decline in GDP per capita, despite the positive influence of trade openness on overall GDP. Conversely, Guei and Le Roux's (2019) estimation suggests a long-term negative effect of trade openness on GDP per capita. This could be attributed to the country's heavy reliance on imports for local production and consumption, which adversely affects GDP per capita by reducing people's purchasing power, particularly for imported products with high costs.

5. Conclusion

Many countries, including Ghana, aspire to achieve economic success and prosperity by implementing sound macroeconomic policies aimed at ensuring sustainable development. Developed nations have historically experienced growth through foreign direct investment and trade liberalisation, which have facilitated the ease of exports and imports through lower tariffs, enabling access to goods and services that may not be domestically produced. Trade policies are influenced by various economic and political factors, with developed economies often having lower trade tariffs due to the benefits derived from economies of scale and comparative advantages enjoyed by their industries and multinational companies. In contrast, developing countries often maintain higher tariffs to protect their domestic and infant industries from stiff competition from foreign counterparts. Ghana's trade data indicates a net importer status, with increasing imports posing challenges to local industries and potentially leading to a decline in gross domestic product over time. While Ghana attracts a meaningful por-

tion of FDI inflows in the West African sub-region, its share compared to larger global economies remains modest. Empirical findings suggest that efficiently managing FDI and trade openness can indeed support economic growth.

This study aimed to investigate the effects of FDI inflows and trade openness on economic growth, using GDP and GDP per capita as proxies for growth. Two models were estimated: Model 1 assessed the impact of FDI and trade openness on economic development using aggregate GDP as the dependent variable, while Model 2 examined the effect of FDI and trade on GDP per capita as the dependent variable. Utilising annual time series data from the World Bank spanning from 1985 to 2021, the study employed various statistical techniques including summary statistics, the Augmented Dickey-Fuller (ADF) unit root test, the Engle-Granger cointegration test, and Ordinary Least Squares (OLS) regression. The ADF unit root test revealed that the variables exhibited non-stationarity at the level but became stationary at the first difference, indicating first-order integration of the time series. The Engle-Granger cointegration analysis among GDP, GDP per capita, FDI, and trade openness demonstrated a long-run positive relationship trend toward economic growth. Model 1, with aggregate GDP as the dependent variable, found that both FDI and trade openness had a positive impact on economic development. In Model 2, which used GDP per capita as the dependent variable, the results indicated a positive effect of FDI on GDP per capita, while trade openness had a negative influence on the dependent variable.

The study confirmed the hypothesis that FDI positively stimulates economic growth in both estimated models, whereas trade openness had a positive effect on aggregate GDP but a negative impact on GDP per capita. To leverage these findings, policymakers are urged to ensure that trade openness and investment policies benefit the economy and that FDI is channelled towards the industrial and primary sectors to support long-term growth. This could be achieved by providing investment incentives and fostering a business-friendly environment to attract more investors. However, it is important to note that this study may have limitations in fully explaining the dynamics of Ghana's economic growth, and future research could expand the scope by increasing sample size and incorporating additional variables.

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