

Does China's Outward Direct Investment Reduce Youth Unemployment in West Africa? Panel Evidence From 13 Countries

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Abstract

This paper investigates the effect of China's outward foreign direct investment on youth unemployment in West Africa by using a modified labour demand model to clarify whether Chinese investment is helpful in reducing youth unemployment in the region, and whether local human capital and institutional quality influence the studied outcome. The model is applied for a panel of 13 countries for the period 2003-2022, using fixed-effect, FGLS-parks and dynamic system GMM estimators. Our results suggest that Chinese FDI has a significant reducing effect on youth unemployment in West Africa region, and this effect is strongly dependent upon the local stock of human capital and institutional quality. Explanations are provided for the results and policy implications are highlighted, especially the need to attract more Chinese greenfield FDI in labor-absorbing activities and to improve the domestic absorptive capacity. The study reveals other variables that affect youth unemployment in the region together with their policy implications.

Keywords: China's outward FDI; West Africa; Greenfield FDI; Youth Unemployment.

JEL Classification: E24, N37, Q27.

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1. INTRODUCTION

The rise in outward foreign direct investment (OFDI) from China since the turn of the new century has been a subject of debate among researchers and policy makers globally. China's annual OFDI has grown from 2.70 billion dollars in 2003 to 192.2 billion dollars in 2024 (MOFCOM *et al.*, 2025, p87). Its OFDI now ranks among the global top-3.

The rise of Chinese OFDI in developing countries provides host countries with additional sources of finance, technology and management resources for investment, new firms and job creation. The determinants of this OFDI have been examined. The literature shows that Chinese OFDI has various motivations, including expanding market presence, securing access to natural resources, acquiring strategic assets, and enhancing geopolitical influence (Buckley *et al.*, 2007; Liu *et al.*, 2017; and Yao *et al.*, 2017). However, the understanding of Chinese OFDI's impact on host developing economies is limited due to the unique structural and institutional characteristics of Chinese multinational enterprises (MNEs). While some aspects of Chinese MNEs align with traditional MNEs, Chinese MNEs stand out in two ways when conducting OFDI (Peng, 2012). First, the home government played

significant role as an institutional force. For example, State authorities in China implemented the 'Go-Global' policy designed to incentivize domestic enterprises to engage in OFDI. The state intermittently extended capital subsidies to targeted enterprises and provided directional guidelines, thereby steering Chinese OFDI toward preferred host countries and strategic industries. Second, like in other emerging market MNEs, there is the challenge of going abroad without superior technological and managerial resources compared to MNEs from developed countries. These two differences can have implications on how China's OFDI impacts host developing countries. On the one hand, the technologies transferred by Chinese MNEs may be more appropriate to the technology level of developing countries. This can result in faster technology diffusion. On the other hand, Chinese MNEs, may have limited experience in creating linkages with domestic enterprises. This may inhibit technology spillover. Moreover, having strong home institutional backing coupled with incentives and financial support, Chinese investors can provide more capital investments to host countries by investing in critical areas overlooked by traditional investors. Considering these structural and institutional differences, the rise in China's outward FDI prompts the following question: How does Chinese outward FDI

affect host developing economies? This paper addresses this issue with a focus on the impact of Chinese outward FDI on youth unemployment in West Africa.

The case of Chinese outward FDI's impact on youth unemployment in West Africa is considered for several reasons. First, youth unemployment is a serious issue in West Africa and Africa as a whole. While around 12 million youths enter the labor force annually, only about 3 million jobs are generated by African economies, leaving majority of youth unemployed (AfDB, 2016). This slows the progress on poverty reduction, and contributes to conflicts and insecurity in the region. It is therefore necessary to identify investment sources for job creation. Second, China is a leading investor economy in Africa. According to data, China provides greenfield projects that create thousands of jobs annually (e.g., see Ernst & Young, 2021). It is therefore important to confirm the role of China through empirical analysis. Third, existing literature on the employment effect of Chinese FDI in Africa are mostly qualitative studies (e.g., Sun *et al.*, 2017; Wegenast *et al.*, 2019), and the empirical ones provide mixed results. Thus, there is an empirical research gap on the employment effects of Chinese outward FDI in Africa.

This paper fills this empirical gap by using the most recent cross-country panel data for the 2003-2022 period. Although cross-country analyses possess inherent limitations, the findings of this study offer a comprehensive overview of the employment effects of Chinese OFDI in West Africa, thereby advancing the broader literature on the impacts of South-South FDI. Apart from using the most recent data and a panel of 13 countries, this study has several distinct contributions. First, it examines the impact of Chinese OFDI on youth unemployment in West Africa and the factors that moderate the relationship. Second, it uses a labour demand framework grounded in the Cobb-Douglas production function to model the relationship between FDI and employment. Third, consistent with previous studies, the empirical model accounts for other established factors that influence unemployment in West Africa. Fourth, the study focuses on youth unemployment, a critical socio-economic challenge facing sub-Saharan Africa in recent years. Consequently, the empirical findings of this study provide insight into a critical issue and offer vital guidance for policymakers designing sustainable employment policies in West Africa. Finally, the study performs rigorous robustness checks to ensure the specifications are not sensitive to the estimation models used. The results indicate that Chinese OFDI has a significant reducing effect on youth unemployment, and the reducing effect is strongly dependent on host country institutional quality.

The rest of the paper is organized as follows. Section 2 reviews the literature, Section 3 describes model and methodology, Section 4 describes data and

variables, Section 5 presents and discusses the results, and section 6 concludes the paper.

2. LITERATURE REVIEW

There is a relationship between investment and employment. Traditional Keynesian theory suggests that increased investment activity, induced by positive demand shocks (resulting from expansionary fiscal and monetary policies), should lead to an increase in the level of employment (Keynes, 2018). Although Keynesian employment theory does not specifically address the role of FDI, it creates the expectation that FDI should affect employment, as FDI involves not only flows of capital but also a long-term commitment to a productive activity in the host country. In this connection, researchers have studied the relationship between FDI and employment. However, there is still significant divergence in opinion among economists as regards the employment effects of FDI. The issue is there are several factors that influence the effects of FDI on employment (UNCTAD, 1999), and there are various diverse channels through which these effects are transmitted (Saurav *et al.*, 2020).

First, FDI can boost employment growth directly when foreign subsidiaries and affiliates of MNEs create new jobs in their productive facilities. However, this depends on whether FDI involves greenfield investment or simply mergers and acquisitions (Baldwin, 1995). Realized greenfield FDI has the greatest potential to directly generate new employment demand, as it creates extra capacity by setting-up new productive facilities. By comparison, the short-run effects of M&As may be insignificant, as it does not generate new employment demand (Ietto-Gillies, 2019), at most it can preserve employment by acquiring and restructuring ailing firms (Moosa, 2002). Direct employment generation also depend upon the ratio of labor to capital used by FDI firms in production. More jobs are expected to be created where foreign firms engage in labour-intensive activities (Jenkins, 2006), especially when the size of such FDI is large, the host country has abundant low-cost labour and a policy of attracting export-oriented FDI (UNCTAD, 1999). However, foreign entry in labour-intensive sectors through privatization can lead to job losses in the short run when the privatized firm restructures or lays off its excess labour to increase efficiency (Jude & Silaghi, 2016). Direct employment creation effect of FDI may also be altered by the extent to which FDI substitutes for domestic investment (Baldwin, 1995). Job losses are expected in the short-term when FDI replaces planned domestic investment. This occurs when domestic investors withdraw or reduce planned investment because they cannot compete with foreign investors (Ietto-Gillies, 2019).

Second, FDI can decrease employment through higher productivity due to higher productive capacity per unit of labour. MNEs are believed to possess ownership advantages, such as new technologies, expertise and management know-how, which enables them to generate

higher productivity. Insofar as these ownership advantages are transferred to their foreign subsidiaries, the subsidiaries will gain higher productivity per worker, making their production process less labour intensive (Girma *et al.*, 2002; Huttunen, 2007; Desbordes & Franssen, 2019). In this regard, foreign firms with higher labour productivity may create less employment than domestic firms.

Third, FDI can affect employment indirectly by influencing domestic firms' demand for employment through the channels of competition, productivity spillovers, and upstream market linkages. First, when FDI increases demand for locally produced inputs, domestic firms in supply sectors will increase output to serve this demand, potentially leading to employment growth (Blalock and Gertler, 2008). Second, through interactions with foreign firms, domestic firms in supply markets may gain productivity spillovers that make their production processes less labour-intensive, thereby reducing their demand for employment (Saurav, 2020). Third, entry of foreign firms can increase competitive pressure which may force some domestic firms in the same sector to exit the market, thereby lowering the overall employment demand from local competitors (Jenkins, 2006). Additionally, domestic firms can benefit indirectly from the presence of foreign firms even without direct linkages. For example, when domestic firms purchase inputs from local suppliers that enjoy linkages with foreign firms, or when they recruit local workers who have received training and experience from foreign firms, they may gain knowledge spillovers and access to high quality and cheaper inputs. These benefits can enhance domestic firms' output and, thus, their demand for labor (Dunning & Lundan, 2008; Gorg and Strobl, 2016).

As the different influencing factors and diverse transmission channels result in opposite effects, the net employment effect of FDI depends on the net creation of new capacity, productivity enhancements, and knowledge spillovers. Borensztein *et al.*, (1998) and De-Mello (1999) argue that FDI can promote long-term growth in developing countries through knowledge spillovers and human capital development. De Mello adds that the growth enhancing effect of FDI depends on the extent to which FDI complements or substitutes domestic investment, while Borensztein *et al.*, argues that realizing the growth benefits of FDI depends on the stock of human capital. Following from that, Pigato (2000) point out that for most African countries, the FDI that enhances domestic investment are those that provide human capital development, backward linkages, and physical, scientific and institutional infrastructure. In this regard, for West African countries, employment effect of FDI may depend mainly on net additions to physical capital and knowledge spillovers.

Empirical studies on the effect of FDI on employment provide conflicting results. Panel studies

have been conducted for cross section of countries in different regions. Among the panel data studies, Vacaflores *et al.*, (2017) examine the effect of FDI on employment in host countries using a global dataset comprising 897 MNEs and 5,641 foreign subsidiaries during 2006-2008 period. Their findings reveal that FDI exerts positive and strong direct effect on employment in foreign affiliates that: (1) are not subjected to high levels of FDI disinvestment, (2) operate in host countries that have low FDI to GDP ratio, and (3) operate in manufacturing and mining sectors. This positive direct effect decreases as the affiliate firm grows. Further, their results suggest that the positive direct effect of FDI on employment creation based on the size of FDI, and differences in foreign subsidiaries, home and host countries. FDI between developing countries generates employment in host countries within foreign affiliates. FDI from developed to developing countries and vice versa also has positive direct effect on employment in the foreign affiliates. This finding reflects the heterogenous effects of FDI on employment.

In Asia, Farooq *et al.*, (2024) applied ARDL regressions on 30 years of annual data from South Asian economies over the period 1990 to 2019. They reported that FDI inflow has strong positive impact on employment rate in south Asian region. In contrast, Mehmood *et al.*, (2018) found that FDI has a significant and negative long-run effect on employment in South Asian countries, due mainly to FDI's enhancement of growth through the channel of increased productivity, which lead to jobless growth. Their study employed Fully Modified OLS techniques on a panel of south Asian economies from 1980-2017. However, Rizvi and Nishat (2009) examined the impact of FDI on employment in Pakistan, India and China. They found that FDI does not have a significant effect on employment in the 3 Asian countries. They argued that although FDI filled the investment gaps and probably created jobs, but this was offset by fall in labour demand due to increased productivity and rationalization by foreign firms, especially in M&As FDI.

In Central and Eastern Europe, Jude and Silaghi (2016) applied fixed effects and GMM estimators on a sample of 20 CEEC countries during 1995-2012 for the purpose of investigating the impact of FDI on aggregate employment. Their results suggest that FDI has a negative short-run effect and a positive long-run effect on employment. They argued that competition pressure and labour cost saving strategies lead to a negative short run effect on employment. However, the effect becomes positive in the long run, as foreign subsidiaries progressively create linkages with domestic firms and increase the local content of their production. Additionally, they argued that human capital played a critical role in enhancing the employment impact of FDI. The impact on employment is also affected by the type of FDI. Marinescu (2020) finds in the case of CEEC that greenfield FDI has very significant effect on job creation,

while the effect of M&As FDI is uncertain, due to loss of jobs arising from efficiency measures.

In Latin America, Vacaflares *et al.*, (2011) examines the role of FDI in improving employment rates during 1980-2006. Their findings reveal that FDI has a positive and significant effect on employment creation in host countries, driven mainly by its effect on male labour force. Additionally, the positive effect is very significant for less developed countries, times of low inflation, and for the long run. However, only countries with high levels of informality and below average FDI inflows gain from this effect.

In the case of Africa, Wall *et al.*, (2018) explored the impact of three aspects of FDI, greenfield FDI, FDI flows and FDI stock, on total employment in Africa. Their results reveal that both FDI inflow and FDI stock have very significant positive impact on total employment, while greenfield FDI has insignificant but positive impact on employment. They argue that the reason greenfield FDI does not have a significant impact on employment is because a large share of greenfield FDI to Africa is concentrated in extractive activities, which does not generally lead to significant employment creation and technology transfer. However, results from their sectoral analysis show that greenfield FDI, FDI inflow and FDI stock all have significant and positive effect on manufacturing employment, while for agricultural employment the impact is not significant but positive. Additionally, they show that human capital absorptive capacity is weak, while that of institutional quality is strong in enhancing FDI's impact on employment. Their findings also point to the importance of developing domestic absorptive capacity in order to reap the benefits from FDI. While Wall *et al.*, (2018) focused on the impact of different aspects of FDI on total employment and sectoral employment, the source of FDI is equally important for employment in Africa. Coniglio *et al.*, (2015) examined the effect of FDI on employment and wages in sub-Saharan Africa, using micro-level dataset covering 19 countries. Their findings suggest that FDI creates more employment than domestic investment, but majority of the employment created are not skill-intensive. They also find that nationality of foreign firms matters for job creation in host countries, and there are differences between developed and developing country FDI in terms of the skill-intensity of their labour demand. Particularly, MNEs from global south created less skilled jobs, while those from global North created more high paying jobs. Additionally, they suggest that Chinese firms generate more jobs but pay lower wages for both skilled and less-skilled jobs compared to both domestic firms and other foreign firms.

Mixed evidence has been found in different subregions of Africa as well. Woldetensaye *et al.*, (2022) explored the relationship between FDI and unemployment in five East African IGAD countries using data for the 1996-2021 period. Applying random

effect estimator, they found significant negative relationship between FDI and unemployment rate, suggesting that inward FDI promotes employment in the region. In contrast, Mkombe *et al.*, (2021) found that the effect of FDI on youth unemployment is not significant in the case of southern Africa SADC region. Their study applied FDGLS-Parks and PCSE estimators on a dataset covering 4 SADC countries during 1994-2017. They argued that the insignificant effect of FDI on youth unemployment was influenced by the mode of entry of FDI in the region such as M&As which causes less job creation compared to greenfield FDI. Finally, Aderemi *et al.*, (2022) explored the long-run and short-run impact of FDI inflows on employment generation in Economic Community of West African States (ECOWAS) countries between 1990 and 2019. Their results indicate positive long-run relationship between FDI and employment in the region, driven mainly by capacity creation and linkage effects.

Studies of employment impact of Chinese OFDI in Africa also produce mixed results. Boakye-Gyasi and Li (2015) estimated the impact of Chinese FDI on job creation in Ghana's building and construction sector during 2000 to 2012. They find that Chinese FDI has significant direct positive effect on employment growth, mainly through the capital investment and capacity creation in area of infrastructure. Supporting the above finding, Weng and Buckley (2016) argued that not only did Chinese firms create new jobs and absorbed local employees, they also promoted gender balance in employment. In an interview-based study involving relevant host government officials in 5 African countries, Shen (2015) found that Chinese firms are perceived to create jobs through their heavy investments in labour-intensive sectors. Furthermore, Khodeir (2016) applied fixed-effect regression on a panel dataset of 38 countries during 2007-2012 period with the objective to find the effect of Chinese FDI on employment in Africa. He found a significant positive relationship between Chinese FDI and employment in Africa as whole and in sub-Saharan Africa as a region. He highlighted the crucial role of education in the relationship, which increased employment by 5%.

Conversely, part of the literature associate Chinese OFDI in Africa with reduced production and employment in specific industries. Ademola *et al.*, (2016) argued that influx of cheap Chinese products in some cases displaced locally manufactured goods, leading to factory closures and job losses in specific sectors in several countries. Zhang (2022) points to debt trap and lack of job creation as a major disadvantage of Chinese investment in Africa. Alves (2013) and Wegenast *et al.*, (2019) both conclude that Chinese investment in Africa neither increases job quantity nor improves job quality, due to importation of workers from home country and creation of low-skilled jobs for local workers. Sun *et al* (2017) contend that while Chinese enterprises have localized 89% of their workforce, the

vast majority of local employees remain concentrated in low-level positions. Consequently, this stratification restricts opportunities for advanced professional training, wage progression, and knowledge spillover to the host country workers. However, Oya and Schaefer (2023) argued that Chinese OFDI creates jobs, contributes to skills and training of local workers, and pays wages as much as other firms in the same sector. With this conflicting evidence, the employment effect of Chinese OFDI across sub-Saharan Africa remain debatable.

Hypothesis

Following the Keynesian employment theory that a positive relationship exists between investment and employment through positive demand effects (Keynes, 2018), and postulations in the literature that FDI can increase employment quantity directly by adding to net capital and indirectly through forward and backward linkages and economy-wide multiplier effects (UNCTAD, 1994), we hypothesize as follows:

H1. Chinese OFDI to West Africa may reduce youth unemployment.

Potential benefits from FDI are not realized automatically. Attracting FDI is only the first step, host countries must be able to induce the transfer of, and exploit the bundle of resources brought by FDI, such as knowledge, skills, technology and access to global markets (UNCTAD, 1999). Researchers have argued in line with the absorptive capacity (AC) theory that host countries must develop certain domestic capabilities in order to reap the gains from FDI, such as knowledge and technology spillovers (e.g., Marcin, 2008; Keller, 2010; Filippetti, *et al.*, 2017; Sultana & Turkina, 2020). AC refers to the ability of host countries to identify, mediate, assimilate and take advantage of the potential benefits of FDI (Girma, 2005). Empirical findings support the significant role of AC in acquiring the benefits of FDI. Moralles and Moreno (2020) use data of Brazilian firms to examine whether FDI productivity spillovers depend on local AC, they find that positive spillovers from FDI may be captured by firms with high AC. Sultana & Turkina (2020) test whether the AC of host countries matter in the relationship between FDI and technological advancement, they find that domestic AC plays a strong moderating role. Chen *et al.*, (2011) finds that Chinese industries with high AC were equipped to exploit the spillovers from FDI. Marcin (2008) reports that the size of spillovers to local firms depends on their AC. Girma (2005) shows that the gains from FDI increases with domestic AC until a threshold level is reached. The literature shows several elements that serve as important AC in interacting with FDI to enhance FDI's beneficial impact on host economies. These may include human capital, financial development, infrastructure quality, trade openness, institutional quality, FDI policy, innovation and knowledge intensity. Our interest is in human capital and institutional quality.

Human capital can not only boost creativity, labour efficiency and productivity of domestic enterprises through technological advancement, but can also enable domestic enterprises to learn from foreign-owned firms and to acquire the benefits from FDI. Borensztein *et al.*, (1998) investigates the effects of FDI on growth for a cross-section of host developing countries and finds that FDI promotes growth through the channels of capital accumulation and higher productivity growth, which are dependent on the stock of human capital. Moreover, Jude and Silaghi (2016) find that human capital plays a critical role in enhancing FDI impact on employment in the case of CEEC countries.

H2. The effect of Chinese OFDI on youth unemployment in West Africa depends on the host country's human capital.

Institutional quality also serves as critical AC that is needed to capture the benefits of FDI. To begin with, good institutions such as existence of rule of law, political stability, corruption control, property rights, enforcement of contracts, etc., encourages investment (Acemoglu *et al.*, 2005). It can lower transaction costs and create economic environment that promotes growth and attracts FDI (Asiedu, 2006). Furthermore, institutional quality can strengthen the ability of host countries to absorb the resources brought by FDI (Olofsdotter, 1998; Meyer & Sinani, 2009). Jude & Leveuge (2017) argue that institutional quality modulates capital accumulation and knowledge spillovers, which are the two main channels of FDI impact on economic growth. Adegboye and Okorie (2023) find that weak institutions hinder host countries from reaping the benefits of FDI while strong institutions enhance it. Cassimon *et al.*, (2022) report that quality institutions play strong mediating role in the relationship between foreign capital inflows (including FDI) and selected social variables in host countries. Thus, following the AC argument, we hypothesize as follows:

H3. The effect of Chinese OFDI on youth unemployment in West Africa depends on the host country's institutional quality.

3. MODEL AND METHODOLOGY

To model the impact of Chinese outward FDI on youth unemployment in sub-Saharan Africa, we adopt the theoretical framework used in Mkombe *et al.*, (2021). The model is derived from a labor demand function according to the Cobb-Douglas production function as shown below –

$$Y_{it} = A^{\psi} K_{it}^{\eta} L_{it}^{\beta} \quad (1)$$

Where Y is real output, K is the stock of capital, L is the quantity of labor (employment), *i* represents country and *t* is time, A is the stock of technology, η and β are the output elasticities (and output shares) of capital and labor, respectively. The coefficient ψ enables *K* and *L* to affect the efficiency of *A* in the production process.

Profit maximization model suggests selecting the optimal capital so that the cost of capital (C) equals the marginal revenue product of capital and the wage (W) equals the marginal revenue product of labor. Due to difficulty in estimating the capital stock at country level, the capital stock is removed from equation (1) following Jude and Silaghi (2016). Removing the capital stock from equation 1 leads to -

$$Y_{it} = A^\psi \left(\frac{\eta}{\beta} E_{it} \frac{W_{it}}{C_{it}} \right)^\eta L_{it}^\beta \quad (2)$$

E represents the employment level. Equation (2) is transformed to get the labor demand function by taking logarithms on the left and right sides of the equation and rearranging the terms as follows:

$$\ln L_{it} = \phi_0 + \phi_1 \ln Y_{it} + \phi_2 \ln \frac{W_i}{C_i} \quad (3)$$

$$\ln L_{it} = \zeta + \phi_1 \ln Y_{it} + \phi_2 \ln \frac{W_i}{C_i} + \phi_3 \ln FDI_{it} + \phi_4 T \quad (5)$$

Where $\zeta = -(\alpha \ln \alpha - \alpha \ln \beta)/(\alpha + \beta)$; $\phi_3 = \mu \phi_1$; $\phi_4 = \mu \phi_0$; $\mu = -\lambda/(\alpha + \beta)$.

Therefore, regarding unemployment as the opposite of employment, Equation (5) can indicate the relationship between inward FDI and unemployment if the right-hand side of Equation (5) is represented by the opposite signs.

To study the impact of China's OFDI on youth unemployment in West Africa, the study employed panel

$$YU_{it} = \beta_0 + \beta_1 FDI_{it} + \beta_2 GDP_{it} + \beta_3 INV_{it} + \beta_4 POP_{it} + \beta_5 HC_{it} + \beta_6 INFL_{it} + \beta_7 INFR_{it} + \beta_8 OPEN_{it} + \beta_9 AGRVA_{it} + \beta_{10} IQ_{it} + \beta_{11} GAP_{it} + \beta_{12} TNRR_{it} + \beta_{13} (AC \times FDI)_{it} + v_{it} \quad (6)$$

Where β_0 is the intercept, β_1 to β_{12} are the coefficients of $FDIC$, GDP , INV , POP , HC , $INFL$, $INFR$, $OPEN$, AGR , IQ , GAP , and $TNRR$, respectively. YU is youth unemployment, $FDIC$ is Chinese FDI, GDP is GDP growth, INV is domestic investment, POP is population growth rate, HC is human capital, $INFL$ is the rate of inflation, $INFR$ is infrastructure, $OPEN$ is trade openness, $AGRVA$ is agricultural value added, IQ is institutional quality, GAP is technology gap between China and host country, $TNRR$ is economic rents from natural resources, v_{it} ($\mu_{it} + \varepsilon_{it}$) is the error term that

$$YU_{it} = \beta_0 + \beta_1 FDI_{it} + \beta_2 GDP_{it} + \beta_3 INV_{it} + \beta_4 POP_{it} + \beta_5 HC_{it} + \beta_6 INFL_{it} + \beta_7 INFR_{it} + \beta_8 OPEN_{it} + \beta_9 AGRVA_{it} + \beta_{10} IQ_{it} + \beta_{11} GAP_{it} + \beta_{12} TNRR_{it} + \beta_{13} (HC \times FDI)_{it} + v_{it} \quad (7)$$

$$YU_{it} = \beta_0 + \beta_1 FDI_{it} + \beta_2 GDP_{it} + \beta_3 INV_{it} + \beta_4 POP_{it} + \beta_5 HC_{it} + \beta_6 INFL_{it} + \beta_7 INFR_{it} + \beta_8 OPEN_{it} + \beta_9 AGRVA_{it} + \beta_{10} IQ_{it} + \beta_{11} GAP_{it} + \beta_{12} TNRR_{it} + \beta_{13} (IQ \times FDI)_{it} + v_{it} \quad (8)$$

Where $(HC \times FDI)$ in equation (7) is the interaction between human capital and FDI, and $(IQ \times$

Where

$$\phi_0 = -(\lambda \ln A + \alpha + \ln \alpha - \alpha \ln \beta)/(\alpha + \beta),$$

$$\phi_1 = 1/(\alpha + \beta) \text{ and } \phi_2 = \alpha/(\alpha + \beta).$$

Inward foreign direct investment affects the technical efficiency parameter and stimulates sustained increases in the technical efficiency of production through technology diffusion (Borenzstein *et al.*, 1998; Jude & Silaghi, 2016). Thus, considering technological change stimulated by inward foreign direct investment, technical efficiency can be modelled as a function of foreign direct investment as follows:

$$A_{it} = e^{\phi_0 T_i} I F D I_{it}^{\phi_1} \quad (4)$$

Where $IFDI$ is the stock of inward foreign direct investment in country i at time t , T is the time trend and $\phi_0 \phi_1 > 0$. The relationship between labor (employment) and inward foreign direct investment is determined by taking the logarithm of A_{it} and substituting in the labor demand function in equation (3) as follows;

data estimation techniques, and followed Folawewo and Adeboje (2017), Jude and Silaghi (2016), and Mkombe *et al.*, (2021) in specifying the empirical model. We include several control variables to capture the different factors that influence unemployment rate in West Africa. The empirical model is specified as follows:

includes errors in the youth unemployment measure μ_{it} (the combined time series and cross section error component) + ε_{it} (the cross section or individual specific component), i is individual countries in West Africa and t is the year from 2003 to 2022. Furthermore, following the absorptive capacity (AC) argument, we include interaction variables on the right-hand side of the equation to test the moderating role of human capital and institutional quality in the effect of FDI on youth unemployment. This gives the following equations:

FDI) in equation (8) represent interaction between institutional quality and FDI.

4. Data and variables

4.1 Variables

Since youth unemployment, which occurs when a youth is without work but available for and seeking employment, is part of the overall unemployment in a country, we consider the factors influencing unemployment as factors affecting youth unemployment.

The FDI received from China is the main independent variable of interest. As discussed in previous sections, inward FDI is expected to generate new employment demand since it is assumed additional capital and superior intangible assets which can spillover to the domestic economy. This study therefore assumes that Chinese OFDI is negatively related to youth unemployment in West African countries.

Economic growth is another determinant of unemployment. According to Okun's law, an inverse relationship exists between unemployment and output growth. This is because in general, for production to increase, the number of workers must increase. Folawewo & Adebajo (2017) confirm that economic growth reduces unemployment rate in the case of West Africa. Therefore, this study expects a negative relationship between economic growth (proxied by GDP growth rate) and youth unemployment. Domestic investment is yet another variable that influences unemployment rate. Keynesian employment theory argues that increased investment increases employment through positive demand effects. New capital investments can generate new firms and production activities, which can, in turn, increase labor demand. Mkombe *et al.*, (2021), Oniore *et al.*, (2015) show that domestic investment has a reducing effect on unemployment. Thus, we assume that domestic investment has a negative effect on youth unemployment.

Inflation is another determinant of unemployment. Based on the "Phillips curve relationship" which suggests the existence of inverse relationship between wage growth and unemployment, macroeconomists have argued that inflation and unemployment are negatively related (Engemann, 2020; Ng *et al.*, 2018). Thus, this study also assumes a negative relationship between youth unemployment and inflation.

Another determinant of unemployment is population growth. Previous studies indicate a positive relationship between population and unemployment (Folawewo & Adebajo, 2017). Thus, this study expects a positive relationship between youth unemployment and population growth. Human capital is another factor that affects unemployment. Strong human capital and fast economic growth can lead to better employment opportunities. Human capital increases creativity and labor efficiency, hence economists associate human capital with high-skills, high-earnings, high economic

growth rate (Lucas, 2015; Acemoglu & Autor, 2012), and employment growth and stability (Cairo & Cajner, 2018). Mimi *et al.*, (2022) find that human capital reduces unemployment in host countries. This study therefore expects a negative relationship between unemployment and human capital. The study also considers technology gap, economic openness to international trade as independent variables. Since investors from developing countries are assumed to use technologies that are more appropriate for developing countries (Fu *et al.*, 2020), we hypothesize that technology gap with China reduces unemployment. Economic openness has been linked to economic expansion since the time of classical economics such as Adam Smith and David Ricardo. Economic openness can contribute to poverty reduction and stimulate the private sector to create jobs through the channels of market size expansion and increased productivity and innovation by introducing local firms to world-class competition, skills and technology (Sally, 2015). However, openness could also hamper development and lead to loss of jobs where the economy is not competitive enough. Therefore, this study assumes that economic openness can reduce or increase unemployment.

The study also includes several other factors that affect unemployment across sub-Saharan Africa, such as institutional quality, human capital, infrastructure, agricultural productivity and natural resources exploitation. In many African countries, there is inadequate infrastructure, such as poor transportation networks, electricity supply, internet facilities, etc., which can constrain economic activities and private investment, leading to fewer or no employment opportunities (Dunning, 2000). Institutional quality is another variable that affects economic performance, and hence employment. Efficient institutions can not only improve the investment climate and attract more FDI (Asiedu, 2006), but can also promote economic growth (Ross, 2019) and employment (Jude & Silaghi, 2016). Therefore, this study expects institutional quality to have a negative effect on youth unemployment.

Furthermore, over half of FDI conducted by developed country MNEs into Africa target natural resources or the extractive industry (UNCTAD, 2020). Based on the global factory theory, the MNEs export the extracted resources to other locations for processing or for use as raw materials. This type of FDI generates only few direct jobs due to its capital intensity and use of foreign expatriate workers but may generate indirect jobs through linkages and infrastructure construction (UNCTAD, 2007). Thus, natural resource endowed countries attract resource seeking FDI, which may help develop the extractive industry and may generate employment opportunities. This study therefore assumes that natural resource availability reduces unemployment. Most African countries still practice subsistence agriculture. Some emerging market investors tend to target the Agric sector which are often neglected by

developed country MNEs due to perceived risks. These emerging market investors, often backed by state financial support, take the risks, and bring some level of technology which helps increase productivity in the agriculture sector and may generate jobs directly and indirectly. This study therefore assumes that better agricultural productivity reduces unemployment.

Moreover, following the AC theory, the interaction of FDI with human capital and institutional quality can affect FDI's impact on employment. Apart from their standalone effect on employment, human capital and institutional quality play a crucial moderating role in FDI impact on economic growth which occur through capital accumulation and technology spillovers (Borensztein *et al.*, 1998; Jude & Levieuge, 2017). Therefore, this study expects FDI's interaction with human capital and institutional quality (the interactive variables) to have a negative effect on unemployment. Table-1 presents the variables proxy and definitions.

4.2 Data

The study selects as the sample for this analysis all countries of West Africa excluding Burkina Faso and Guinea Bissau, which are dropped due to limited data. Table-2 shows the list of countries in the study sample.

Data of Chinese OFDI to Africa is obtained from Johns Hopkins University SAIS China-Africa Research Initiative (CARI). CARI compiles and updates the data annually based on the Statistical Bulletin of China's Outward FDI published by China's MOFCOM every year. All other data are obtained from World Bank World Development Indicators (WDI) database. Data of "Institutional quality" is computed by authors using the six Worldwide Governance Indicators (WGI) estimates obtained from WDI database. The estimate for each WGI range from -2.5 to 2.5, with 2.5 indicating highest-quality institution. Key data descriptives are shown in Table-1.

Table 1: Variables and summary statistics

Variable	Definition	Expected effect	Observations	Mean	Std. dev.
Youth unemployment	Unemployment, youth total (% of total labor force ages 15-24) (modeled ILO estimate)		260	7.95	6.32
FDI China	Chinese outward FDI stock in sub-Saharan Africa	(-)	260	1.62	2.07
GDP growth	GDP growth (annual %)	(-)	260	4.35	4.60
Domestic invest	Gross fixed capital formation (% of GDP)	(-)	257	23.09	8.47
Population growth	Population growth (annual %)	(+/-)	260	2.63	0.69
Human capital	School enrollment, secondary (% gross)	(-)	152	45.04	19.63
Inflation	Inflation, CPI (annual %)	(+/-)	260	6.57	6.69
Infrastructure	Individuals using the Internet (% of population)	(-)	244	14.03	15.81
Openness	Trade (% of GDP)	(-/+)	257	64.22	30.36
Technology Gap China	The gap between the Chinese GDP per capita and host country GDP per capita divided by host country GDP per capita	(-)	260	6.73	4.66
Natural resources	Total natural resources rents (% of GDP)	(-)	247	10.22	7.32
Agriculture	Agriculture, forestry, and fishing, value added (% of GDP)	(-)	258	27.33	13.58
Institutional quality	Average estimate of the six WGI variables*	(-)	260	-0.57	0.48
		(-)	260	7.95	6.32
HC × FDI	Human capital variable times Chinese FDI variable	(-)	260	1.62	2.07
IQ × FDI	Institutional quality variable times Chinese FDI variable	(-)	260	4.35	4.60

Table-2: List of West African countries in the study

Benin	Gambia	Liberia	Nigeria	Togo
Cabo Verde	Ghana	Mali	Senegal	
Cote d'Ivoire	Guinea	Niger	Sierra Leone	

4.2.1 Panel unit root test

When conducting panel regression analysis, it is important to perform tests for unit roots (or (stationarity) in the panel datasets, to check that the dataset meets the regression assumptions and to prevent spurious results.

Two different unit root tests are performed, namely Levin-Lin-Chu (LLC) test, which assumes a common unit root process and requires strongly balanced data, and Philips Perron Fisher (PP-Fisher) test, which assumes individual unit root processes and can be applied to

unbalanced panels. Both tests have as the null hypothesis that all the panels contain a unit root. However, while LLC has the alternative hypothesis that panels are stationary, PP-Fisher has as the alternative hypothesis

that at least one panel is stationary. Table-3 presents the unit root test results. I(0) stands for stationarity at level or order zero and I(1) indicates stationarity at first difference or order one.

Table-3: Panel Unit Root tests

Variables	LLC test		PP-Fisher test	
	T-stat statistic	Order of Integration	Chi ² statistic	Order of Integration
Youth unemployment	-3.358	I(0)	21.945	I(1)
Chinese FDI	-2.240	I(1)	15.513	I(1)
GDP growth	-3.270	I(0)	20.964	I(0)
Domestic investment	*		2.218	I(0)
Population growth	-6.809	I(0)	1.684	I(0)
Human capital (HC)	*		2.646	I(0)
Inflation	-2.747	I(0)	10.071	I(0)
Infrastructure	*		3.926	I(1)
Openness	*		3.410	I(0)
Technology gap China	-4.523	I(0)	16.989	I(1)
Natural resources	-2.215	I(0)	2.407	I(0)
Agriculture	*		4.804	I(0)
Institutional Quality (IQ)	-3.645	I(0)	3.746	I(0)
HC × FDI	*		16.229	I(1)
IQ × FDI	-2.740	I(0)	30.143	I(0)

Note: all results are at 5% level of significance and * indicates the test statistic was not computed due to unbalanced data.

The unit root test results show that the data series have a mixed integration of I(0) and I(1). This means the data series does not meet the ordinary least square (OLS) assumption and pooled OLS regression cannot be applied. However, other panel estimators could be applied.

4.2.2 Multicollinearity test

We test the data series for multicollinearity. If independent variables are correlated, the regression may

give a biased estimation and the results will be unreliable. The correlation test (results available upon request) shows that youth unemployment data series has a high correlation with openness, population growth and agriculture. However, the result of the variance inflation factor (VIF) test in table-4 indicates there is no serious multicollinearity in the dataset as the mean VIF is 3.05 which is below the threshold of 10 (Hair *et al.*, 2014).

Table 4: The VIF test results for the variables

Variable	VIF	1/VIF
Population growth	6.84	0.146
Human capital	4.41	0.227
Technology-Gap China	4.32	0.231
Chinese FDI	2.99	0.335
Openness	2.84	0.353
Agriculture	2.77	0.361
Infrastructure	2.6	0.384
Institutional quality	2.5	0.399
Natural resources	2.5	0.399
Domestic Investment	2.07	0.483
Inflation	1.52	0.657
GDP growth	1.21	0.829
Mean VIF	3.05	

4.2.3 Heteroskedasticity and Autocorrelation tests

It is equally important to test the dataset for heteroskedasticity and autocorrelation. The presence of autocorrelation means that the error terms are correlated, which can lead to biased estimation. Heteroskedasticity shows the distribution of error terms, that is whether

error terms are normally distributed or not. We apply the Wooldridge serial correlation test which can identify first-order serial correlation in panel data (Wooldridge, 2010). Previous simulations show that Wooldridge test has good size and power properties in reasonably sized samples. The Wooldridge test has as a null hypothesis

that there is no autocorrelation. The null hypothesis is rejected if the p-value is significant at 5% level. We assess the dataset for heteroskedasticity using a process of Likelihood-ratio (LR) test as demonstrated by Wiggins and Poi (2023). The test has as a null hypothesis that the residual variance is constant (i.e., homoskedasticity) and the alternative hypothesis that residual variance is not constant (i.e., heteroskedasticity).

The null hypothesis is rejected if the corresponding p-value is significant at 5% level. The Wooldridge test for autocorrelation (Table-5) rejects the null hypothesis of no first order serial correlation with a p-value of 0.0000. Similarly, the LR test strongly rejects the null hypothesis homoscedasticity, indicating the existence of heteroskedasticity.

Table-5: Autocorrelation and Heteroskedasticity test results of the data

Autocorrelation: Wooldridge test	Heteroscedasticity: LR test
F (1, 13) = 138.69	Chi ² (12) = 124.99
Prob > F = 0.0000	Prob > Chi ² = 0.0000

4.3 Estimation technique

The tests performed on our dataset reveal the presence of autocorrelation, heteroskedasticity, and a mix of I(0) and I(1) stationarity. In this situation, it is recommended in literature to apply specific panel estimators, such as fixed-effect (FE) and random-effect (RE) estimators – with some correction commands, the feasible generalized least square (FGLS) estimator, the panel corrected standard errors (PCSE) model, or the generalized method of moments (GMM) (Hoechle, 2007; Mkombe *et al.*, 2021; Huang *et al.*, 2023).

Our dataset comprises 13 West African countries over 20 years period, meaning that the number of time periods are greater than the number of countries ($T > N$). In this dataset type, FE, RE and FGLS estimators could be applied. We apply the FGLS estimator, and FE model based on Hausman test result. We also apply system GMM estimator (Blundell & Bond, 1998) for robustness test. System GMM estimator is efficient, as it controls for potential endogeneity using from-within instruments. However, GMM requires $T < N$ datasets. Thus, to apply the estimator, we divide our dataset into two time periods of 10 years (i.e. 2003-2012 and 2013-2022), which is also reasonable for analyzing China's outward FDI, considering that 2003-late 2000s constituted the take-off period of China's outward FDI while the 2010s are described as the booming period (Wang & Gao, 2018). Moreover, Chinese MNEs had limited experience during the takeoff period compared to the later years. In addition, China's economic growth strategy in the take-off period was largely export driven, compared to later years when China is focusing on high-quality development. The different features of the two periods may influence how China's investments affect host countries.

5. RESULTS AND DISCUSSION

Table 6 present the results of the estimates of equations 1, 2 and 3 using the FE and FGLS-Parks estimators. The vitals of the regression estimates are good and the t-statistics are robust. The results of both estimators show that our explanatory variable of interest (Chinese FDI) is significant and the coefficient has the expected sign in all cases. However, because our dataset

has few observations ($n = 149$), the FE estimator may be less efficient (Clark & Lizner, 2015). Thus, we use the estimates of the FGLS-Parks model to interpret the main results. As mentioned earlier, the FGLS-Parks controls for panels autocorrelation, heteroscedasticity and mixed stationarity in the data series (Hoechle, 2007).

The results of the FGLS regression 1 in table 6 show that Chinese OFDI has a negative and significant effect on youth unemployment in West Africa ($\beta = -0.395$; $p < 0.05$). Specifically, a unit increase in China's OFDI stock as a ratio of GDP leads to a 0.395 percentage points decrease in youth unemployment. This effect improves as China's OFDI interacts with domestic absorptive capacity. As can be seen in regression 2, which considers Chinese OFDI interaction with human capital, the above coefficient of Chinese OFDI increases by 63% ($\beta = -0.645$; $p < 0.05$). Similarly, in regression 3, which includes China's OFDI interaction with domestic institutional quality, the initial coefficient increases by 133% ($\beta = -0.921$; $p < 0.05$). Thus, overall, the results show that Chinese OFDI has significant reducing effect on youth unemployment in the West Africa region. The results confirm H1 which states that Chinese OFDI to West African countries may reduce youth unemployment. The result is also consistent with findings of Lin and Wang (2015), Shen (2015), Boakye-Gyasi and Li (2015), Sinkala and Zhou (2014) and Fu *et al.*, (2020). The results could partly be explained by China's greenfield projects in labor-intensive activities such as construction and manufacturing, as well as their support for infrastructure development, which is an area where many sub-Saharan African countries face deficits Chinese investment in infrastructure such as transportation, electricity, industrial parks and housing does not only help bridge infrastructure gaps, but it also supports regional and domestic connectivity (Lin, 2012), which promotes job creation

With regards to the moderating effect of host country absorptive capacity, regression 2 of the FGLS estimation shows that Chinese OFDI interaction with human capital has a negative and statistically significant effect on youth unemployment ($\beta = -0.0284$; $p < 0.05$). This indicates the importance of local human capital in the relationship between Chinese OFDI and youth

unemployment in West Africa region. The result confirms H2 which states that the effect of Chinese OFDI on youth unemployment in West Africa depends on host countries' stock of human capital. Regression 3 also shows that Chinese OFDI interaction with institutional quality has a negative coefficient ($\beta = -0.647$; $p < 0.1$),

suggesting significant reducing effect on youth unemployment and the critical role it plays in enhancing Chinese OFDI impact on youth unemployment in the region. This confirms H3 which states that the effect of Chinese OFDI on youth unemployment in West Africa depends on host countries' institutional quality.

Table-6: Regression results for effect of China's outward FDI on youth unemployment in West African countries, 2003-2022

Independent Variables	Fixed-Effect estimates			FGLS-Parks regression estimates		
	(1)	(2)	(3)	(1)	(2)	(3)
China OFDI	-0.605*** (0.229)	-1.418*** (0.468)	-1.556*** (0.461)	-0.395*** (0.069)	-0.645** (0.255)	-0.921*** (0.314)
GDP growth	-0.0587 (0.053)	-0.0508 (0.052)	-0.0661 (0.052)	-0.0673*** (0.018)	-0.0369** (0.016)	-0.0591*** (0.018)
Domestic Investment	-0.0471 (0.035)	-0.0474 (0.035)	-0.0302 (0.035)	0.0116 (0.011)	-0.00849** (0.004)	0.0131 (0.011)
Population growth	-0.84 (1.124)	-0.756 (1.110)	-0.882 (1.101)	-0.0039 (0.278)	-1.150*** (0.342)	-0.131 (0.306)
Human capital	-0.0487 (0.034)	-0.0929** (0.040)	-0.0185 (0.035)	0.00654 (0.013)	0.135*** (0.017)	0.0161 (0.014)
Inflation	0.0304 (0.050)	0.0427 (0.049)	0.0513 (0.049)	0.0085 (0.014)	0.0474*** (0.006)	0.00612 (0.015)
Infrastructure	0.0492** (0.023)	0.0462** (0.022)	0.0541** (0.022)	0.109*** (0.010)	0.0811*** (0.008)	0.103*** (0.011)
Openness	0.0361* (0.021)	0.0358* (0.020)	0.0327 (0.020)	0.00546 (0.008)	0.00446 (0.004)	0.00567 (0.008)
Technology Gap	-0.0219 (0.144)	0.0904 (0.153)	-0.204 (0.161)	-0.409*** (0.061)	-0.0375 (0.057)	-0.399*** (0.061)
Natural resources	-0.169*** (0.044)	-0.171*** (0.043)	-0.173*** (0.043)	-0.0347 (0.020)	0.0173 (0.012)	-0.0335 (0.021)
Agriculture	0.0468 (0.066)	0.0445 (0.066)	0.0188 (0.066)	0.0141 (0.027)	-0.0107 (0.012)	0.0178 (0.026)
Institutional quality	-0.772 (1.417)	-0.669 (1.399)	-0.367 (1.399)	-1.727** (0.619)	0.174 (0.184)	-0.756 (0.712)
China OFDI × HC		0.0245** (0.012)			-0.0284*** (0.006)	
China OFDI × IQ			-1.405** (0.596)			-0.647* (0.356)
Constant	11.43*** (3.141)	12.36*** (3.135)	11.76*** (3.080)	6.870*** (1.203)	5.830*** (1.013)	7.688*** (1.321)
Observations	149	149	149	149	149	149
R-squared	0.394	0.416	0.424			
AR (1) test				0.812	0.758	0.8007
F-test Wald X2	2.51***	2.63***	2.72***	390.7***	1086***	306.46***

Note: Standard errors are in parenthesis. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

In the robustness check (table 7), the system GMM estimates for the 2003-2012 period shows the lag of Chinese OFDI has negative effect on youth unemployment in all cases, however, the coefficient is only significant in the case baseline model (regression 1). The coefficient is insignificant in the two cases where domestic absorptive capacity is included. This is explained by the fact that Chinese OFDI was relatively new and have not gained adequate experience in interacting with the domestic economy. The estimates for the 2013-2022 period, however, indicates that Chinese

OFDI lagged by 1 year has a negative and significant effect on youth unemployment in all cases. This confirms the main results of the FGLS estimates. In addition, the coefficient of Chinese OFDI in the latter regressions are higher than in regression 1, confirming the role of absorptive capacity in enhancing the effect of Chinese OFDI. Moreover, the two interaction variables have negative coefficients that are statistically significant ($\beta = -0.077$; $p < 0.05$ and $\beta = -4.077$; $p < 0.05$). This confirms our finding that the youth unemployment effect of Chinese OFDI is strongly dependent on host country

human capital and institutional quality. In other words, the two domestic absorptive capacity elements play a crucial role in the relationship between Chinese OFDI

and youth employment in the West Africa region. This result could reflect increased experience and improved employment practices by Chinese investors in the region.

Table 7: Arellano–Bover/Blundell–Bond System GMM Regression results for effect of China’s outward FDI on youth unemployment in West Africa

Independent Variables	2003-2012			2013-2022		
	(1)	(2)	(3)	(1)	(2)	(3)
Youth unemployment(t-1)	0.916*** (0.081)	0.942*** (0.094)	0.876*** (0.100)	0.265* (0.158)	0.342*** (0.092)	0.141 (0.099)
China OFDI (t-1)	-0.411*** (0.108)	-0.546 (0.584)	-1.222 (1.066)	-0.573* (0.313)	-1.999* (1.181)	-3.433*** (0.787)
GDP growth (t-1)	-0.0842 (0.048)	-0.0893 (0.049)	-0.0788 (0.046)	-0.133 (0.082)	-0.0729 (0.065)	-0.155*** (0.057)
Domestic Investment (t-1)	-0.114* (0.053)	-0.0971* (0.047)	-0.0738 (0.051)	-0.0754 (0.120)	-0.0473 (0.115)	0.000823 (0.075)
Population growth	-2.333 (1.660)	-1.252 (2.034)	-2.323 (1.348)	-19.59*** (7.166)	-12.42 (11.680)	-11.34** (5.367)
Human capital	-0.0488 (0.056)	-0.0675 (0.052)	-0.0624 (0.063)	-0.449** (0.175)	-0.234 (0.189)	-0.281** (0.126)
Inflation	0.047 (0.029)	0.036 (0.028)	0.0451 (0.028)	0.612*** (0.191)	0.511* (0.307)	0.363*** (0.125)
Infrastructure	-0.149 (0.080)	-0.230* (0.112)	-0.108 (0.096)	0.073 (0.055)	0.122*** (0.047)	0.103*** (0.036)
Openness	-0.0178 (0.011)	-0.0287* (0.011)	-0.0352** (0.013)	0.0108 (0.055)	-0.043 (0.095)	0.0103 (0.038)
Technology Gap	-0.395 (0.891)	-1.028 (0.851)	-0.981 (0.700)	-15.89** (7.636)	-17.10** (8.228)	-9.453*** (3.329)
Natural resources	0.021 (0.024)	0.00513 (0.021)	0.0257 (0.021)	-0.0565 (0.185)	0.0186 (0.245)	-0.262 (0.165)
Agriculture	-0.0903 (0.047)	-0.0625 (0.039)	-0.0379 (0.042)	-0.245 (0.167)	0.323 (0.233)	-0.305 (0.209)
Institutional quality	-0.379 (0.876)	0.0804 (1.307)	-0.644 (1.097)	-9.002*** (3.467)	-2.338 (2.636)	-8.740*** (3.301)
China OFDI × HC (t-1)		0.0517 (0.041)			-0.077*** (0.023)	
China OFDI × IQ (t-1)			-1.824 (1.308)			-4.970*** (1.043)
Constant	16.12** (5.236)	17.13** (5.474)	19.76** (6.316)	16.65 (16.120)	21.22 (23.430)	0.884 (10.170)
Observations	57	57	57	51	51	51
Countries	13	13	13	13	13	13
Instruments	11	11	11	11	11	11
AR2 p-value	0.643	0.822	0.883	0.576	0.746	0.271

Note: Standard errors are in parenthesis. *** p<0.01, ** p<0.05, * p<0.1.

Our results also reveal other variables that have significant impact on youth unemployment. The FGLS-Parks estimates in table 6 show that GDP growth has a negative and significant effect on youth unemployment in the West Africa region. For example, in regression 1, a unit increase in the rate of GDP growth reduces youth unemployment by 0.0673 percentage points. This is consistent with the findings of Mkombe *et al.*, (2022) and Folawewo and Adeboje (2017). Lagged GDP growth also reduces youth unemployment in 2003-2012 and 2013-2013 period, but rather insignificantly in most cases. This is perhaps due to the issue of jobless growth

in sub-Saharan Africa, where economic expansion is sometimes driven by commodity exports and population growth rather than structural change (ILO, 2020). Domestic investment shows mixed effects on youth unemployment depending on the regression equation and estimator. Population growth has a negative effect on youth unemployment and significantly in most cases. This contradicts prior theoretical expectation. One reason for this could be that the growth in population mainly affect young age group in which majority of the members are below the working age and not competing for employment. Indeed, West Africa is one of the

world's youngest regions (AfDB, 2015). Another reason could be that the growth in population creates new consumers which increases market demand, and thus investment and job opportunities. With regards to human capital, the coefficients are negative in most regressions except in the FGLS-Parks estimates. The authors could not explain these conflicting results, except the fact there is shortage of skilled-labor in most West African countries and there is a need for increased investment in education, healthcare and training of workers.

Inflation has a positive effect on youth unemployment, although insignificant in most cases. This result nullifies the Phillips-Curve hypothesis which suggests the existence of inverse relationship between inflation and unemployment. This can be partly explained by the high inflation experienced in the West Africa region during the study period. As wages adjust to inflation, businesses may be discouraged from expanding and creating new job positions, leading to slower employment growth. This suggests the need to pursue low to moderate inflation policy. With regards to infrastructure, the effect on youth unemployment is positive and significant in most cases. This could be due to inadequate infrastructure, such as electricity, communication and logistics facilities, which limits the role of infrastructure in boosting economic growth and generating jobs. Thus, there is need for more critical infrastructure investment in West Africa region to fill the huge infrastructure gap and promote employment, welfare and economic growth. With regards to Openness, the coefficients are mixed, but they are statistically insignificant overall.

Technology gap with China has a negative and significant effect on youth unemployment in West Africa region in most cases. We can also see that technology gap has large negative and significant coefficients in the 2013-2022 period in table 7, suggesting strong reducing effect on youth unemployment. This could be due to the suitability of transferred technology to the technology level of host countries, which makes it easier for the local workers to be recruited immediately by Chinese firms. Or it could be that Chinese firms are immediately training local employees to upgrade their skills to required levels. Furthermore, as mentioned earlier, perhaps Chinese enterprises absorbed majority of local workers in less-skilled positions. Natural resources have negative and insignificant coefficients in most cases, suggesting a weak reducing effect on youth unemployment overall. Although a proportion of the labor force are engaged extractive activities, these activities are mostly informal and low value-added activities and often leads to underemployment. The agriculture variable has insignificant effect on youth unemployment. This could be due to significant share of West Africa labor-force is still absorbed in mostly subsistence agriculture, thus even a relatively large contribution of agriculture to total GDP cannot generate significant number of jobs. Institutional quality has

significant reducing effect on youth unemployment in most of the cases, confirming the importance of efficient institutions in generating employment and boosting economic growth.

6. CONCLUSION

This study was conducted to estimate the effect of Chinese OFDI on youth unemployment in the West Africa region using panel fixed effect and FGLS-Parks estimators, as well as dynamic system GMM estimator, based on data obtained from WDI and CARI for 13 West African countries over the period 2003-2022. The study reveals that current and lagged Chinese OFDI have a negative and significant effect on the rate of youth unemployment in host countries of West Africa. The study also reveals that this effect is significantly dependent upon the human capital and institutional quality of the host countries. The finding is explained by the fact that large share of Chinese capital investment targets infrastructure development which complements domestic investment efforts and generates jobs in the construction industry. Chinese OFDI also targets labor-intensive manufacturing activities. Moreover, the investment in other sectors mainly enter through the greenfield mode, which has more job creation potential.

To boost the employment outcomes of FDI, West African countries should pursue a labor absorbing FDI policy that attracts more greenfield FDI from China and other source countries. The greenfield projects should be channeled to agriculture, manufacturing, infrastructure construction, and other sectors that have strong potential to generate more labor demand. More investment should be guided to agricultural infrastructure and agribusiness education (Adesugba & Mavrotas, 2016) so as to increase agricultural productivity, which is found to be strongly associated with employment growth in African economies (Yeboah & Jayne, 2018), since a significant share of youth members of the labor force is absorbed in the agriculture sector. Policy efforts may also focus on facilitating effective interaction between foreign and domestic enterprises to promote indirect job creation as the result of vertical linkages and positive horizontal learning and competition effects. In addition, governments of West Africa may strengthen their institutions further, invest in human capital, and increase the quantity and quality of infrastructure so as to attract and support private domestic and foreign investments, better absorb the potential benefits from FDI, stimulate economic activities, and create sustained employment growth. The public infrastructure investment should be guided to areas where the region is facing deficits, such as transportation, water and sanitation, schools and hospitals, roads, and energy. Policymakers should also implement pro-business policies and regulations in specific sectors (such as agriculture, tourism, and energy), reduce natural resource exploitation, and diversify the economies, to create employment

opportunities that can utilize the growing young labor-force.

[dataset] Johns Hopkins University SAIS China-Africa Research Initiative (2023). Chinese OFDI Stock in African Countries. <http://www.sais-cari.org/chinese-investment-in-africa>

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