

BRI and Infrastructure Development: Impact on the Economic Growth of Lower-income African Countries

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Abstract

Belt and Road Initiative (BRI) is a multi-billion-dollar investment and a ‘Going Out’ strategy of China. The major vision of BRI is to accelerate infrastructure investment, which, in turn, improves connectivity, enhances trade and foreign direct investment and spurs economic growth in the participating countries. This research seeks to examine the influence of the BRI on key economic indicators—specifically gross domestic product (GDP) growth, unemployment and foreign direct investment across 20 low-income African countries. Employing a robust panel data least squares dummy variable modelling approach, the study analyses the country-specific impact of BRI for data spanning the period from 2008 to 2022. The research outcomes indicate varying impacts of the BRI across different nations. In most countries, the BRI has had no substantial influence on GDP per capita, yet a detrimental effect is evident in Mozambique. The results show BRI has a negative effect on foreign direct investment in Benin, Congo, Tanzania and Rwanda, whereas it has a positive impact in Mozambique and Sierra Leone. Whereas variables like gross capital formation, labour force participation and regulatory indices consistently display substantial positive effects on economic growth, investment and employment. The research underscores the necessity for strong domestic policies that can optimise economic advantages and guarantee long-term growth.

JEL Codes: O11, O55, H54

Keywords

Belt and Road Initiative, lower-income countries, foreign direct investment, gross domestic product growth, unemployment

1. Introduction

In the last decade and a half, infrastructural development-led growth in Africa has gained significant attention from policymakers, researchers and economic experts for two major reasons. First, the

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investment in the infrastructure sector, mainly from China, has played a vital role in the economic growth of the continent (Kodongo & Ojah, 2016; Wang & Chedjou, 2018). Second, due to the rich natural resources, China led foreign direct investment (FDI) flows towards the continent exacerbated in the last decade with major investments in building transport corridors, such as railways, highways and airports (Ampaw et al., 2025; Ehizuelen, 2017; Otele & Guguyu, 2023). The majority of the studies concerning the growing influence of China in Africa are focused on the Chinese development initiatives during the early 2000s and, in particular, since the launch of the Belt and Road Initiative (BRI) in 2013 (Khalid et al., 2025; Mutiiria et al., 2020; Staden et al., 2018). Infrastructural development and structural development are one of the major needs of Africa as a continent to improve connectivity and enhance economic growth. For decades, African countries have faced diverse challenges, including rampant corruption, poor governance, unemployment, poor economic growth, and a lack of critical infrastructure, which is hindering their progress and development (Abdullahi & Sieng, 2023; Calderón & Servén, 2010; Lin, 2022). However, since the beginning of the BRI by China, the economic landscape of Africa began transforming due to the flow of a large amount of FDI from China targeting key sectors of the countries in different regions across the continent.

There are three major objectives of the China-led BRI in Africa: economic cooperation, regional connectivity and cultural exchange through investment in critical sectors across the continent. In this regard, the BRI-based investments are largely concentrated in various key economic zones and infrastructure development, including energy facilities, ports, railways and highways (Anami, 2024; EECN, 2023; Lisinge, 2020). Moreover, as a major strategic initiative, BRI operates around five major priorities of cooperation to achieve its key objectives. First, policy coordination, which involves close coordination with the stakeholder countries. Second, facility connectivity, which includes investment towards the development of transportation corridors (Komakech & Ombati, 2023). Third, unimpeded trade, which includes the development of free trade zones across the continent. Fourth, financial integration, which includes the financial flows towards Africa with support of Chinese-led investment banks, such as the Asian Infrastructure and Development Bank and BRICS-led New Development Bank (Wang, 2019). Last, people-to-people cooperation, which includes educational exchange, scientific cooperation, tourism and medical assistance to enhance cultural cooperation (Bega & Lin, 2023; Inusa et al., 2021; Wang & Chou, 2020).

Under the BRI, China is developing four major regional economic zones to boost regional economic connectivity and industrial productivity in Africa. The first economic zone is known as the East Africa Economic Zone, which includes Ethiopia, Kenya and Djibouti. The East African zone is a strategic and geoeconomic hub for the China-led BRI that aims at boosting connectivity in the Horn of Africa. The major BRI-led flagship projects in the East Africa zone include ‘Mombasa-Nairobi Standard Gauge Railway’ and ‘Lamu Port-South Sudan-Ethiopia-Transport’ corridor (Carmody & Murphy, 2022; Otele, 2020; Weng et al., 2021). Second, is the Southern African economic zone, which includes Zambia and South Africa, which are also a geostrategically important section of the BRI. Most of the BRI-led investments in the Southern Africa economic zone include mining, energy and manufacturing sectors. The third major economic zone is known as the North African Economic Zone, which includes Egypt. Egypt is strategically important for the BRI due to its location that connects Africa, Europe and Asia via the Suez Canal (Garcia et al., 2024). Similarly, the fourth major economic zone under the BRI includes the West African economic zone, which includes four major countries in West Africa, Nigeria, Ghana, Senegal and Côte d’Ivoire. Within this economic zone, China is actively developing industrial zones, transportation networks and port facilities with a strategic aim of securing access to the Atlantic Ocean (Carmody et al., 2021; Robinson, 2022). In general, Chinese efforts under the auspices of BRI are

designed to improve regional connectivity, boost trade opportunities and integrate developing regions into the global economic framework, while also advancing China's strategic and economic objectives.

The development of these four major economic zones in Africa under the BRI demonstrates the sheer geopolitical interests of China across the continent. According to the Nedopil Wang (2024), in the past 10 years, the cumulative investment and engagement under the BRI surpassed \$1 trillion, reaching up to \$1.053 trillion. These investments under the BRI can be divided into two major categories: construction projects, which amount to \$634 billion, and non-financial investments, which amount to \$419 billion (Nedopil, 2024, p. 1; Sehwat, 2024). Among BRI countries, African countries are the largest recipients of investments under the BRI. For instance, countries in Africa participating in the BRI experienced a 47% growth in Chinese construction contracts and a 114% rise in investments, which demonstrates the level of Chinese engagement with the continent. As a result, Africa has emerged as the top destination for Chinese engagement, receiving investments worth \$21.7 billion, surpassing the Middle East, which attracted \$15.8 billion (Nedopil, 2024, p. 3; Yu et al., 2019). This study aims to investigate the impact of BRI-led investment on economic growth in lower-income African countries.

There are two major reasons why this study focuses on the impact of BRI-led investment on the economic growth of lower-income African countries. First, the research aims to explore the economic development patterns across lower-income African countries as a result of FDI flows from China under the BRI. By analysing the BRI-led development patterns, the study aims to investigate the impact of BRI-led investments on economic growth, employment, trade and productivity in recipient nations. Second, this study seeks to investigate the motives behind Chinese investments in fragile, lower-income African nations, despite their economic and infrastructural limitations. By analysing the structural barriers such as limited access to capital, weak infrastructure and regional disparities, the study aims to investigate the underlying goals of China under the BRI in Africa, such as fostering economic alliances, securing resources, expanding markets and strengthening geopolitical presence. In this respect, this research aims to focus on key economic indicators—specifically gross domestic product (GDP) growth, unemployment and FDI across 20 low-income African countries. By employing a robust panel data least squares dummy variable modelling approach, the study analyses country-specific data spanning the period from 2008 to 2022.

II. Literature Review: Belt and Road Initiative and Economic Growth in Africa

Theoretical Review

China launched the BRI in 2013, intending to improve and enhance global connectivity, economic integration and inclusive development through extensive infrastructure investments. The major target geographies of the BRI include Asia, Latin America, Eastern Europe and Africa. However, in the past 10 years, Africa has become the largest recipient of Chinese investment under the BRI (Mutirira et al., 2020; Otele & Guguyu, 2023). One of the major reasons behind the growing engagement of Africa with China is its critical infrastructure deficits and opportunities for economic growth. According to Brautigam (2020) and Dollar (2019), the majority of the lower-income African countries joined the BRI to address their economic structural deficits and enhance their infrastructure through China's FDI flows. The authors also contend that the Chinese investment under the BRI is crucial for these countries to improve their transportation networks, logistic facilities and develop their energy sector (Brautigam, 2020; Dollar, 2019).

Since 2015, China, under the BRI, began investing in large-scale infrastructural projects across Africa, such as the Addis Ababa-Djibouti Railway, the Mombasa-Nairobi Standard Gauge Railway and

numerous port developments, including Port Lamu and Mombasa in Kenya and Port Sudan. The major reason behind the Chinese investments in these mega projects is to improve regional connectivity and to connect Africa with the global market (Carmody & Murphy, 2022; Liu & Ding, 2024; Otele, 2020). Various studies on BRI revealed that in the past 10 years, these projects have significantly contributed to the expansion of trade and attraction of FDI flows from China. For instance, Githaiga et al. (2019) in their study revealed that China's investments under the BRI in transportation, especially the construction of highways and railways, significantly increased the export capacities of resource-rich African nations in the past 10 decades (Githaiga et al., 2019).

Another study by Lin (2022) revealed that Chinese FDI flows towards Africa under BRI gave an opportunity to African countries, particularly low-income economies, to address substantial infrastructure challenges, including low electricity access, fragile road networks and lack of market connectivity. Through targeted investments in critical infrastructure like transportation, ports and energy systems, BRI seeks to reduce operational costs, improve economic competitiveness and accelerate the continent's industrial development (Lin, 2022). For many BRI researchers, the key objective of China's BRI, as revealed by experts such as Melecky et al. (2019) and Soyres et al. (2020), is to establish transportation and logistics networks to bridge mainland China with the global market via regional connectivity among BRI regions (Melecky et al., 2019; Soyres et al., 2020). Through targeted investments under the auspices of BRI, China is investing in African critical infrastructure, such as transportation, ports and energy systems, to reduce operational costs and improve economic competitiveness.

However, other studies contend that although Chinese investments under the auspices of BRI contributed to the development of key infrastructure, these large-scale projects gave birth to debt burdens. For instance, Bandiera et al. (2020) and Hurley et al. (2019) in their study revealed there are severe challenges associated with the growing engagement between China and African countries, such as the problem of debt sustainability, limited local labour participation and lack of transparency in financial agreements (Bandiera & Tsiropoulos, 2020; Hurley et al., 2019). In a similar type of study, Shukra et al. (2021) found that some of the BRI-based mega infrastructural projects suffer from inflated costs, over-reliance on Chinese expertise, minimal technology and knowledge transfer. These negative factors associated with the BRI in Africa raise serious concerns about cost-effectiveness but also reduce the potential for skill transfer to local workers, thereby hindering efforts to build sustainable capacity and expertise in the host nations (Shukra et al., 2021). However, despite various controversies in the information sphere, the importance and necessity of Chinese FDI flows for Africa can be ignored, especially considering the infrastructural boom through BRI-led investments in the past 10 years.

Empirical Review

The majority of empirical studies on the impacts of BRI-led investments in African countries revealed varying results when it comes to the impact of Chinese investments on GDP growth, unemployment, structural improvement, governance and poverty alleviation (Chin et al., 2021). Many studies found positive impacts of Chinese investment under the BRI at the macro-level, such as GDP growth and unemployment in host countries. While some empirical studies revealed the non-significant and negative impact of these investments on macro-economic indicators like GDP growth, poverty alleviation, and unemployment (Sattar et al., 2022; Zhao et al., 2022).

Komakech and Ombati (2023) in their empirical study using panel data analysis found that BRI has significantly contributed to the infrastructural development in Africa, particularly in lower-income African countries, Djibouti, Mozambique, Ethiopia, Kenya and Uganda. However, the author also contends that

although the BRI-led investment contributed to the economic growth in some of these countries, there are structural challenges such as corruption and increasing debts (Komakech & Ombati, 2023).

In their study, Sattar et al. (2022) revealed that FDI flows under the BRI do not contribute uniformly to socio-economic development, such as poverty reduction and human capital development. The study found that in the case of South Asian countries, BRI-led investment has a positive and significant impact on economic growth and poverty alleviation in South Asia and Central and Western Asia. However, in the case of Sub-Saharan African countries, FDI has no significant effect on GDP growth and poverty reduction (Sattar et al., 2022).

In their empirical study, Busse et al. (2016) and Elu and Price (2010) revealed that the Chinese FDI flows initiative aligns with the economic needs of host countries, particularly in Africa, which lack infrastructure and capital to build their industries. The study found that economic growth resulting from Chinese FDI is heavily influenced by the specific conditions within each host country. To conduct their empirical analysis, both authors have employed the generalised method of moments for their estimation by incorporating various variables such as FDI, trade, and aid from China. Their study revealed a nonlinear connection between China's FDI, trade, aid and real GDP per capita (GDPPC) in Africa (Busse et al., 2016; Elu & Price, 2010).

Another empirical study by researchers such as Doku et al. (2017), Donou-Adonsou and Lim (2018) and Khodeir (2016) revealed that China's outward FDI tends to deliver greater benefits to low-income and lower-middle-income nations in Sub-Saharan Africa compared to upper-middle-income countries (Doku et al., 2017; Donou-Adonsou & Lim, 2018; Khodeir, 2016). In recent years, a significant number of Chinese companies have established their franchises in low-income countries across Africa to implement various projects in these countries. The arrival of these companies has significantly contributed to the employment sector by facilitating skill enhancement and technology improvement, which supported economic growth in Sub-Saharan Africa to a certain degree (Habyarimana & Opoku, 2018; Lisimba, 2020). Another study by Sakouba and Chen (2023) revealed that Chinese investments under the auspices of BRI contributed to the structural transformation across Africa. The study found two-way Granger causality exists between BRI spending and financial development. The investment in infrastructure positively impacts regional financial development and economic growth (Sakouba & Chen, 2023).

Most studies (Busse et al., 2016; Hurley et al., 2019; Melecky et al., 2019; Shukra et al., 2021) on this subject were focused on the effects of BRI on African nations, yet there is a lack of detailed analysis regarding its influence on specific economic factors like GDP growth, unemployment and inflation. Moreover, the review of existing empirical studies reveals key gaps that this research intends to fill. Notably, prior studies have not focused on the specific relationship between BRI, FDI, GDP growth and unemployment in lower or lower-middle-income African countries. Moreover, the majority of the existing studies have concentrated on Europe, the broader African continent or large subregions like Sub-Saharan Africa. Thus, this research seeks to bridge this gap by focusing on how BRI investments impact these variables in lower-income African countries, offering a specific viewpoint on their economic outcomes.

Data and Methodology

The study employs the panel data least squares dummy variable (PLSDV) model to analyse the relationship between dependent and independent variables. The data utilised in this research span from 2008 to 2022 and were sourced from the World Bank database (WDI, WGI). The least squares dummy variable (LSDV) approach is recognised for its efficiency and robustness in conducting shock analysis, as it captures abrupt fluctuations by incorporating dummy variables into the model, thereby facilitating precise quantification of the shocks and their repercussions. Moreover, the LSDV model is particularly adept at isolating the effects of economic shocks. By incorporating a dummy variable for each of the 20 countries

examined, the model effectively delineates the impact of the BRI on each country and its respective dependent variables.

The econometric form of this is represented below.

$$y_{it} = \alpha_{it} + \sum_{i=1}^n \beta_i X_{it} + \sum_{i=1}^n \gamma_i DV_{it} + \varepsilon_{it} \quad (1)$$

where, y_{it} represents the dependent variables for country i at time period t , X_{it} represents independent variables, DV_{it} represents the dummy variables for individual countries, α_{it} represents the constant, and β_i , γ_i represents the parameters of independent variables and dummy variables, and ε_{it} represents the residuals, respectively.

III. Results and Discussion

Before applying the LSDV model, the stationarity of the variables is a prerequisite. We applied the Levin et al. (2002) panel unit root test and the augmented Dickey–Fuller (ADF)–Fisher unit root test to estimate the order of integration. Table 1 shows the Levin–Lin–Chu tests for panel unit roots. For simplicity and space restriction, we have only included the order of integration of each variable for the ADF–Fisher unit-root test. (The order of integration after the slash is associated with the ADF–Fisher unit-root test).

The results of the unit root tests are largely consistent and robust across both testing procedures. An exception arises for the Regulatory Index, for which the ADF–Fisher unit-root test indicates stationarity at the first difference. This finding justifies the application of the panel LSDV estimator, rendering it appropriate and consistent for the sample under consideration.

The BRI variable is defined as a binary measure, equal to one in any year a country joined the BRI and in subsequent years, and zero in all other years. This specification captures the discrete impact of BRI participation on macroeconomic outcomes following a country's accession to the initiative.

The empirical model, to isolate BRI participation, incorporates a standard set of macroeconomic control variables commonly used in investment, growth and labour market research. This encompasses gross capital formation, which serves as a proxy for domestic investment and infrastructure development; labour force participation, which reflects labour market size and availability; and the lagged dependent variable, which considers persistence and dynamic adjustment in the outcome variables. Appropriate additional controls are incorporated to capture country-specific macroeconomic conditions and to mitigate omitted variable bias. These controls collectively enable a more accurate identification

Table 1. Levin–Lin–Chu and Augmented Dickey–Fuller (ADF)–Fisher Panel Unit Root.

Variable	Statistics	p Value	Order of Integration
GDP growth	−11.6888	.0028***	I(0)/I(0)
Reg. index	−6.7275	.0036**	I(0)/I(1)
LFPR	−4.8377	.0003***	I(0)/I(0)
Unemployment	−5.9125	.0193**	I(0)/I(0)
Net FDI	−9.3647	.0000***	I(0)/I(0)
GCF	−7.1837	.0026**	I(0)/I(0)

Notes: * $p < .05$, ** $p < .01$, *** $p < .001$. FDI: Foreign direct investment; GDP: Gross domestic product ; LFPR: Labor force participation rate; GCF: Gross capital fromation.

of the partial effect of BRI participation on GDPPC, FDI and unemployment across the sample of lower-income African countries.

Tables 1–4 show the results of the estimation of this study.

Table 2. Estimations.

Country/Variable Dependent Variable: GDPPC	Lag GDPPC	FDI	GCF	Unemployment	Reg. Index	DV _{BRI}
Overall	.1015899* (1.71)	0.000171 (0.00)	.147*** (3.05)	0.193 (1.53)	−0.542 (−0.75)	—
Benin	—	—	—	—	—	1.105 (0.53)
Burundi	—	—	—	—	—	−0.334 (−0.16)
Central African Republic	—	—	—	—	—	−3.897 (−1.20)
Chad	—	—	—	—	—	−2.599 (−1.25)
Comoros	—	—	—	—	—	−0.824 (−0.48)
Congo, Dem. Rep.	—	—	—	—	—	1.025 (0.32)
Gambia	—	—	—	—	—	−0.487 (−0.24)
Guinea	—	—	—	—	—	−0.454 (−0.22)
Guinea-Bissau	—	—	—	—	—	1.295 (0.41)
Madagascar	—	—	—	—	—	−1.057 (−0.46)
Mali	—	—	—	—	—	−1.391 (−0.62)
Mozambique	—	—	—	—	—	−4.576** (−2.07)
Niger	—	—	—	—	—	0.417 (0.20)
Rwanda	—	—	—	—	—	0.613 (0.26)
Senegal	—	—	—	—	—	−1.971 (−0.90)
Sierra Leone	—	—	—	—	—	0.247 (0.12)

(Table 2 continued)

(Table 2 continued)

Country/Variable Dependent Variable: GDPPC	Lag GDPPC	FDI	GCF	Unemployment	Reg. Index	DV _{BRI}
Tanzania	—	—	—	—	—	-2.155 (-0.97)
Togo	—	—	—	—	—	1.119 (0.54)
Uganda	—	—	—	—	—	-0.0925 (-0.05)
Zimbabwe	—	—	—	—	—	-2.223 (-1.03)
_cons	-1.566 (-0.57)	—	—	—	—	—
N	300	300	300	300	300	300

Notes: t-statistics in parentheses. * $p < .1$, ** $p < .05$, *** $p < .01$. FDI: Foreign direct investment; GDPPC: Gross domestic product per capita; GCF: Gross capital formation.

Table 3. Estimations.

Country/Variable Dependent Variable: FDI	GDPPC	GCF	LFPR	Unemployment	Reg. Index	DV _{BRI}
Overall	0.00741 (0.13)	.426*** (11.18)	.0692* (2.34)	0.175 (1.48)	-0.936 (-1.39)	—
Benin	—	—	—	—	—	-4.397** (-2.25)
Burundi	—	—	—	—	—	-0.0527 (-0.03)
Central African Republic	—	—	—	—	—	-6.156** (-2.02)
Chad	—	—	—	—	—	2.587 (1.33)
Comoros	—	—	—	—	—	0.771 (0.47)
Congo, Dem. Rep.	—	—	—	—	—	-5.618* (-1.86)
Gambia	—	—	—	—	—	2.353 (1.23)
Guinea	—	—	—	—	—	-2.889 (-1.49)
Guinea-Bissau	—	—	—	—	—	-2.080 (-0.70)
Madagascar	—	—	—	—	—	-1.278 (-0.59)

(Table 3 continued)

(Table 3 continued)

Country/Variable Dependent Variable: FDI	GDPPC	GCF	LFPR	Unemployment	Reg. Index	DV _{BRI}
Mali	—	—	—	—	—	0.714 (0.34)
Mozambique	—	—	—	—	—	7.342** (3.58)
Niger	—	—	—	—	—	-2.708 (-1.40)
Rwanda	—	—	—	—	—	-3.638* (-1.67)
Senegal	—	—	—	—	—	-1.716 (-0.83)
Sierra Leone	—	—	—	—	—	6.808** (3.49)
Tanzania	—	—	—	—	—	-10.70*** (-5.35)
Togo	—	—	—	—	—	-2.891 (-1.49)
Uganda	—	—	—	—	—	-0.995 (-0.52)
Zimbabwe	—	—	—	—	—	-1.081 (-0.53)
_cons	-11.19*** (-4.47)	—	—	—	—	—
N	300	300	300	300	300	300

Notes: t-statistics in parentheses. * $p < .1$, ** $p < .05$, *** $p < .01$. FDI: Foreign direct investment; GDPPC: Gross domestic product per capita; GCF: Gross capital formation; LFPR: Labor force participation rate.

Table 4. Estimations.

Country/Variable Dependent Variable: Unemployment	GDPPC	FDI	GCF	LFPR	Reg. Index	DV _{BRI}
Overall	0.0457 (1.59)	0.0452 (1.48)	-0.0607** (-2.64)	-0.0870** (-6.12)	-1.144*** (-3.39)	—
Benin	—	—	—	—	—	-2.809*** (-2.85)
Burundi	—	—	—	—	—	-1.886* (-1.89)
Central African Republic	—	—	—	—	—	4.070*** (2.65)
Chad	—	—	—	—	—	-2.947*** (-3.02)

(Table 4 continued)

(Table 4 continued)

Country/Variable Dependent Variable: Unemployment	GDPPC	FDI	GCF	LFPR	Reg. Index	DV _{BRI}
Comoros	—	—	—	—	—	−0.385 (−0.47)
Congo, Dem. Rep.	—	—	—	—	—	2.047 (1.33)
Gambia	—	—	—	—	—	0.938 (0.97)
Guinea	—	—	—	—	—	0.625 (0.63)
Guinea-Bissau	—	—	—	—	—	−0.925 (−0.61)
Madagascar	—	—	—	—	—	0.781 (0.71)
Mali	—	—	—	—	—	−1.254 (−1.17)
Mozambique	—	—	—	—	—	1.327 (1.25)
Niger	—	—	—	—	—	−2.415** (−2.48)
Rwanda	—	—	—	—	—	7.692*** (7.61)
Senegal	—	—	—	—	—	−1.960* (−1.88)
Sierra Leone	—	—	—	—	—	−2.175** (−2.17)
Tanzania	—	—	—	—	—	0.984 (0.92)
Togo	—	—	—	—	—	−2.491** (−2.55)
Uganda	—	—	—	—	—	−0.550 (−0.57)
Zimbabwe	—	—	—	—	—	5.002*** (5.09)
_cons	11.79*** (10.67)	—	—	—	—	—
N	300	300	300	300	300	300

Notes: t-statistics in parentheses. * $p < .1$, ** $p < .05$, *** $p < .01$. FDI: Foreign direct investment; GDPPC: Gross domestic product per capita; GCF: Gross capital formation; LFPR: Labor force participation rate.

H_0 : Panels contain unit roots.

H_a : Panels are stationary.

Tables 2–4 show the estimation of the PLSDV for the dependent variables GDPPC, FDI and unemployment (Unemp) for 20 lower-income African countries.

The empirical results of the BRI's influence on GDPPC indicates that BRI participation has no statistically significant impact on GDPPC in the majority of lower-income African countries within the sample. In the sole exception of Mozambique, a negative and statistically significant BRI coefficient is found, suggesting a potential negative impact on the country's GDPPC in that particular scenario. Lack of statistically significant coefficients for the BRI variable in the remaining countries indicates that BRI participation has not led to measurable GDPPC growth over the studied timeframe.

In contrast, a number of control variables show economically and statistically significant impacts. Research indicates that gross capital formation has a positive and statistically significant effect on per capita GDP, highlighting the importance of domestic investment in promoting the economic growth. The lagged value of GDPPC shows a strong and positive correlation, suggesting that income levels remain stable and supporting the existence of dynamic growth patterns. Together, these findings indicate that traditional growth factors make a substantial contribution to GDPPC performance in the 20 lower-income African countries examined, but the BRI has not yet produced noticeable growth advantages within this group.

The effects of BRI on FDI vary across the sample of lower-income African countries. Specifically, the BRI variable is linked to a negative and statistically significant impact on FDI inflows in Benin, the Central African Republic, Congo, Tanzania and Rwanda, implying that BRI involvement in these countries may correlate with a reduction in FDI during the studied period. In contrast, Mozambique and Sierra Leone show a strongly positive and statistically significant correlation between BRI participation and FDI, suggesting that the initiative may have promoted greater foreign investment in these particular instances.

For the remaining countries in the sample, the estimated coefficients for BRI are statistically insignificant, suggesting that involvement in the initiative has not resulted in a measurable impact on FDI inflows. In addition to the BRI variable, various control variables consistently and significantly affect FDI. Investment capacity and infrastructure have a positive and statistically significant impact on attracting foreign capital, as evidenced by the significance of gross capital formation. The labour force participation rate is positively linked to FDI, demonstrating how the size and availability of the labour market influence foreign investors' decisions to locate in 20 lower-income African countries studied.

Substantial cross-country variation in unemployment is evident across lower-income African countries studied. The BRI variable is linked to a statistically significant and negative coefficient in Benin, Burundi, Chad, Niger, Senegal, Sierra Leone and Togo, suggesting that participation in BRI has led to a decrease in unemployment in these countries.

In contrast, the BRI coefficient is significantly positive in the Central African Republic, Rwanda, and Zimbabwe, implying a correlation between the initiative's engagement and rising unemployment in these labour markets. The estimated BRI effects for the remaining countries in the sample are statistically insignificant, indicating no measurable impact on unemployment during this period.

Other variables, including gross capital formation, labour force participation, and the regularity index, exhibit highly significant and negative effects on unemployment in the 20 lower-income African countries. Putting better regulation and economic activity as the major factors in overcoming unemployment.

IV. Conclusion

This research assesses the impact of macroeconomic factors, encompassing the BRI, on GDPPC, FDI, and unemployment across 20 lower-income African nations during the period of 2008–2022, employing the PLSDV method. The results indicate divergent effects for the BRI, with its overall impact differing substantially across countries and various indicators. Research reveals that the BRI has no statistically significant impact on most countries in the data set, implying minimal contributions to their GDP growth rates. Mozambique is an outlier, as the BRI has a statistically significant and negative effect on its GDPPC. Gross capital formation and the previous year's GDPPC consistently have a significant and positive impact on GDP growth, underscoring their crucial function in fuelling economic growth in these nations.

The evaluation of FDI shows a range of consequences resulting from the BRI. Benin, the Central African Republic, Congo, Tanzania and Rwanda are experiencing a notably detrimental effect from the BRI on FDI inflows, whereas Mozambique and Sierra Leone display a highly favourable relationship. BRI has a negligible effect on FDI in other nations. Furthermore, factors such as gross capital formation and labour force participation are found to substantially enhance FDI, highlighting their considerable influence in promoting investment inflows. The effects of the BRI on unemployment differ significantly from one country to another. In countries such as Benin, Burundi, Chad, Niger, Senegal, Sierra Leone and Togo, the BRI makes a substantial contribution to lowering unemployment rates. In contrast, unemployment has risen in the Central African Republic, Rwanda and Zimbabwe. Several key macroeconomic indicators, including gross capital formation, labour force participation and regulatory measures, are vital in reducing unemployment by boosting economic activity and promoting stability. The findings highlight the significance of strong domestic policies, particularly those focused on capital investment, workforce integration and regulatory changes, as crucial elements for achieving lasting economic growth in lower-income African countries.

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