

Assessing the Impact of China's Economic Engagement in Africa

Lalmi SOUMIA¹
Courage MLAMBO²

Abstract

This paper investigates the impact of China's economic activities on the economic growth of selected African countries. Since the early 2000s, China has significantly increased its economic and political interactions with nations across the African continent, positioning itself as Africa's primary trading partner, a substantial investor, and a major contributor to infrastructure development. The study employs a quantitative research design using panel data spanning from 2003 to 2021 across ten African countries. A Common Correlated Effects (CCE) Mean Group Estimator and Pooled Mean Group (PMG) estimator were utilized for the analysis. The findings reveal that Chinese loans and Chinese foreign direct investment do not have a statistically significant effect on economic growth in the selected countries. However, Chinese imports to Africa exhibit a negative and significant effect on growth, while Africa's exports to China show a positive but insignificant relationship. The presence of Chinese workers in Africa is positively and significantly associated with economic growth, as is natural resource revenue. Government expenditure, contrary to expectations, shows a negative and significant relationship with growth. The study recommends that African countries enhance their absorptive capacity for external financial inflows, prioritize value addition to exports destined for China, and improve the efficiency of government spending.

Keywords: China-Africa; Economic Growth; Exploitation, Africa; China's Economic Engagement.

JEL classification: F14; F21; F43; O11; O55.

DOI: 10.24818/RMCI.2026.3.704

1. Introduction

Since the early 2000s, China has significantly increased its economic and political interactions with nations across the African continent. The heightened level of engagement has positioned China as Africa's primary trading partner, a substantial investor in the region, and a significant contributor to major infrastructure development projects across the continent (Oqubay and Lin, 2019;

¹ Lalmi Soumia, Institution Name tahri mohmed bechar university, e-mail: lalmisoumia1996@gmail.com

² Courage Mlambo, Institution name Mangosuthu University of Technology, e-mail: mlamboct@gmail.com

Sheely, 2022; IMF, 2023; Narang, 2024; Nyabiage, 2024). Jayaram et al. (2017) and Cheung (2024) note that China has catapulted from being a relatively small investor in the continent to becoming Africa's largest economic partner. China has also been heavily involved in financing and constructing infrastructure projects across the African continent to enhance transportation networks, trade routes, and economic integration through the Belt and Road Initiative (BRI), launched by China in 2013. Chinese development finance is one of the major reasons why the African continent has been able to reduce its massive annual US\$100 billion infrastructure deficit (Debates, 2022). For Africa, these economic activities represent significant opportunities for advancement, particularly given the region's underdeveloped status, infrastructure deficiencies, and historically limited investor interest. This comes at a crucial time for developing nations facing an ever-rising infrastructure-financing gap (Carmody, 2020).

China has become Africa's largest trading partner, reaching \$282 billion in 2022 (Pinto, 2022; South African Institute of International Affairs, 2023). China has been a pivotal lender in Africa, extending loans exceeding US\$170 billion to 49 African countries and regional institutions between 2000 and 2022 (de Kluiver, 2023). African countries have taken out Chinese loans to fund growing development needs. Rather than impede economic growth, borrowing to fund infrastructure promotes economic growth (Scarfe et al., 2023). Many African countries, with limited internal revenues, cannot afford these network components. Infrastructure investments depend on foreign finance, and this is where China has been effective. Chinese involvement provides a rapid path to digital progress for African nations. Africa has also benefited enormously from the skills, increased investment, and rapidly expanding export ability built off the back of China's initial commodities and infrastructure investment (Standard Bank, 2023). All these economic structures serve as symbolic showcases of China's capabilities, positioning the country as a facilitator of modernisation and progress (Narang, 2024). Through Chinese investments, African countries have diversified their economies and exports, with greater access to new sources of income generation and economic growth and improved overall prosperity. This implies that China's economic engagements in Africa could yield favourable results and should thus be welcomed. Africa requires further economic expansion to alleviate poverty and address underdevelopment, which have long been persistent challenges for African nations. Mitigating these issues would mark a substantial milestone in Africa's progress.

China's influence on African economies comes with challenges (Shinn, 2019; Debates, 2022; Nyere et al., 2024). For instance, the scale and scope of China's economic engagements with Africa have been observed to be disproportionately advantageous to China. The loans extended by China to Africa have been characterised as potentially trapping recipients in debt. Critics argue that China employs these loans as a means to exert political leverage over African nations (Jones et al., 2022; Condon, 2023; Tao, 2023; Zhou, 2024). A lack of transparency also affects infrastructure projects funded by Chinese loans. Many do

not go through public tender processes, raising the risk of corruption, especially in nations with weak governance structures (de Kluiver, 2023). Critics say China uses its own labour and material, rather than hiring local contractors and service providers. They also accuse China of delivering sub-standard work and repeated delays on projects (McGregor, 2020). China, included, tend to exert asymmetrical and unbalanced pressure when negotiating deals with African states (Malobisky, 2024; Nyere et al., 2024). The relationship is dominated by commodities and significant trade deficits by African countries (Pinto, 2022; Gopaldas, 2024).

Beijing's pursuit of influence in Africa goes beyond economic interests. Criticisms of Chinese investments in Africa include debt-trapping, economic dependence, and prioritisation of Chinese interests over local needs. China's investments in infrastructure are coupled with efforts to secure political support and access to resources (Yuan, 2024). This may suggest that the benefits of China's economic activities may be unsustainable. Moreover, in some countries such as Zimbabwe, Chinese investors work with the ruling elites to clinch business deals. The preceding conversation indicates a lack of consensus regarding the economic advantages to Africa from its interactions with China. Consequently, there is a necessity for empirical research to assess the economic impact of China's economic engagements on Africa.

This forms the goal of this study: to assess the impact of China's economic engagement in Africa. The research aims to utilize econometric analysis to investigate the effects of China's economic involvement in Africa. Its objective is to gain insights and comprehension regarding the extent to which African nations derive benefits from their economic ties with China. The remainder of this paper is organised as follows: Section 2 reviews the relevant literature and develops the theoretical framework; Section 3 presents the research hypotheses; Section 4 describes the methodology; Section 5 reports and discusses the empirical results; and Section 6 concludes with policy recommendations and study limitations.

2. Literature Review and Theoretical Framework

2.1 China–Africa Trade and Economic Growth

The relationship between international trade and economic growth has long been a central topic in development economics, with the export-led growth hypothesis positing that trade openness, particularly through exports, serves as a catalyst for economic expansion (Kalaitzi and Chamberlain, 2020). In the context of China–Africa relations, this relationship has attracted considerable scholarly attention given the rapid expansion of bilateral trade volumes over the past two decades. The literature presents a complex and sometimes contradictory picture regarding the growth effects of China–Africa trade, reflecting differences in methodology, country coverage, and time periods examined.

Obobisa et al. (2021) explored the causal link between China–Africa trade, China's outward foreign direct investment (OFDI), and the economic growth of 24

Sub-Saharan African countries from 1999 to 2018. The aggregated panel was classified into upper-middle-income, low-middle-income, and low-income Sub-Saharan African countries. Using the feasible generalised least squares (FGLS) estimator, the study found that China–Africa trade negatively contributes to economic growth among all panels in the long run, while China’s OFDI improves growth in low-middle and low-income African countries but has a significant negative effect in upper-middle-income African countries. This finding is significant because it suggests that the growth effects of Chinese economic engagement are heterogeneous across different income levels, a nuance that is often overlooked in aggregate analyses.

Several studies have examined the sectoral and distributional effects of China–Africa trade. Stein and Uddhammar (2021) provide a comprehensive analysis of China’s role in Africa through trade, investment, and loans, noting that while infrastructure development has been substantial, concerns about debt sustainability and economic dependency persist. Ngoma (2023) specifically investigated the impact of Chinese imports on industrialisation in Ethiopia, finding that rising exposure to Chinese imports leads to slower sales and employment growth for domestic firms. Torreggiani and Andreoni (2023) reached similar conclusions in the context of South Africa, demonstrating that Chinese import penetration negatively affects the growth dynamics of manufacturing firms, particularly those that have not undertaken significant investments in capability development. These findings challenge the notion that trade with China unambiguously benefits African economies and highlight the importance of domestic absorptive capacity.

On the positive side, Arteaga et al. (2020) examined the relationship between exports to China and economic growth in Latin America and found that exports to China enhanced economic growth in South American countries, suggesting that commodity-exporting developing regions may benefit from Chinese demand. Hagemejer and Mućk (2019) found that exports significantly improved economic growth in Central and Eastern European countries from 1995 to 2014, providing broader evidence for the export-led growth hypothesis. Chen et al. (2024) concurred and stated that China’s robust economic growth and substantial demand for raw materials have propelled African goods exports, witnessing a more than fourfold increase in nominal US dollar terms between 2000 and 2022. These studies collectively suggest that the growth effects of China–Africa trade are conditional on the direction of trade flows, the composition of exports, and the domestic capacity of African economies to leverage trade opportunities.

2.2 Chinese FDI and Economic Growth in Africa

Foreign direct investment is widely regarded as a key driver of economic growth in developing countries, primarily through capital accumulation, technology transfer, employment creation, and productivity spillovers (Doku et al.,

2017). China's FDI in Africa has grown substantially since the early 2000s, raising important questions about its growth effects relative to FDI from traditional Western sources. The theoretical expectation is that FDI should contribute positively to economic growth, but the empirical evidence from the China–Africa context presents a mixed picture.

Doku et al. (2017) found that a 1% increase in China's FDI stock in Africa significantly increases Africa's GDP growth by 0.607%. Similarly, Debongo et al. (2022) showed that China's foreign direct investment had a significant positive impact on Africa's inclusive development. Notably, Debongo et al. (2022) found that the interaction of Chinese FDI with institutional quality has a significant positive effect on GDP per capita growth, indicating a conditional effect that depends on the institutional environment of host countries. Miao et al. (2020) further demonstrated that the conditional effect of China–Africa trade and domestic absorptive capacity on economic growth was positive and statistically significant, reinforcing the importance of domestic conditions in determining the growth impact of Chinese economic engagement.

However, other studies have found less favourable results. The negative relationship between Chinese FDI and growth in upper-middle-income African countries found by Obobisa et al. (2021) suggests that FDI effects may diminish as countries reach higher income levels, possibly due to crowding-out effects or the orientation of Chinese FDI toward extractive industries that offer limited linkages to the broader economy. Busse et al. (2014) examined the impact of trade, FDI, and aid from China on African economies and found that the effects vary considerably depending on the sector and the institutional context. These findings underscore the need for more nuanced empirical analysis that accounts for cross-country heterogeneity and institutional moderators.

2.3 Chinese Loans and Debt Sustainability

The question of whether Chinese loans to Africa constitute a “debt trap” or a legitimate development financing mechanism has generated intense debate in both academic and policy circles. Proponents argue that Chinese loans fill a critical gap left by traditional Western donors and multilateral institutions, enabling African countries to finance much-needed infrastructure projects (Chanaka, 2022; Department of International Development Cooperation, 2024). Opponents contend that the loans are structured in ways that trap recipient countries in unsustainable debt, giving China disproportionate political and economic leverage (Condon, 2023; Mutai et al., 2024).

Were (2018) examined the debt-trap narrative and found that while Chinese loans do contribute to Africa's debt burden, the debt-trap characterisation may be overstated for most countries. Ngundu (2022) found that Africa's growth responds positively to Chinese loans but only in the short run, with the effects phasing out in the long run. The Department of International Development Cooperation (2024) revealed that China's sovereign financing provided to Africa is

overall effective, though the distribution and allocation of loans may contain anomalies that prevent desired outcomes from being achieved. De Kluiver (2023) highlighted the challenges of hidden debt from Chinese state-owned banks, which complicates debt estimation and poses serious challenges for financial management and accountability. The IMF (2023) positioned these concerns within the broader context of Sub-Saharan Africa's economic relations with China, noting that while Chinese financing has supported infrastructure development, debt sustainability risks require careful monitoring, particularly for countries with elevated debt-to-GDP ratios.

2.4 Infrastructure Development and Chinese Workers

China's involvement in African infrastructure development has been one of the most visible aspects of the bilateral economic relationship. The Belt and Road Initiative has channelled significant resources toward transportation networks, energy projects, and digital infrastructure across the continent (Narang, 2024). While these investments are generally welcomed for addressing Africa's infrastructure deficit, the use of Chinese labour on these projects has been a contentious issue.

Hillman and Tippet (2021) and Ghiselli and Morgan (2022) note that the presence of large numbers of Chinese workers on these projects is one of the most controversial aspects of China's economic engagement with Africa. Chinese multinational corporations (MNCs) in Africa are often criticised for hiring Chinese expatriates at the expense of native workers, raising the possibility that Chinese MNCs fail to contribute to local employment or the skill improvement of native workers (Wegenast et al., 2019; Yang, 2022). However, Kernen and Lam (2014) found that Chinese state-owned enterprises in Ghana have gradually increased their local workforce recruitment over time, suggesting a potential evolution in labour practices. The economic rationale for using Chinese workers centres on productivity arguments and the shortage of specialised skills in certain African labour markets, though the long-term implications for skills transfer and local employment remain debated.

2.5 Theoretical Framework

This study draws on three complementary theoretical perspectives to frame the analysis of China's economic engagement in Africa. First, the FDI Spillover Theory provides the primary lens for understanding how Chinese foreign direct investment may affect economic growth in African countries. According to this theory, FDI generates positive externalities for host economies through technology transfer, managerial skill diffusion, competition effects, and backward and forward linkages with domestic firms (Borensztein et al., 1998). However, the magnitude and direction of these spillovers depend on the absorptive capacity of the host country, including its human capital endowment, institutional quality, and the level

of development of its financial markets (Miao et al., 2020). This theoretical perspective leads to the expectation that Chinese FDI should positively affect African economic growth, but with heterogeneity across countries based on their absorptive capacity.

Second, the Dependency Theory, originally articulated by Prebisch (1950) and Frank (1966) and later applied to China–Africa relations by scholars such as Botha (2006) and Chan (2018), provides a critical counterpoint. This theory posits that economic relations between developed and developing countries tend to reproduce and reinforce structural inequalities, with the developed country extracting resources and markets while the developing country remains in a subordinate position. From this perspective, China’s economic engagement with Africa may reproduce neo-colonial patterns of resource extraction, trade imbalances, and debt dependency. The trade deficit that most African countries run with China, the concentration of exports in primary commodities, and the use of Chinese labour and materials in infrastructure projects are all consistent with dependency theory’s predictions.

Third, the Modernisation Theory provides a more optimistic framework, suggesting that external economic engagement, including trade, investment, and infrastructure development, can serve as an engine for economic transformation in developing countries (Rostow, 1960). From this perspective, China’s investments in African infrastructure, its demand for African commodities, and its provision of development finance represent opportunities for African countries to modernise their economies, diversify their production structures, and integrate into global value chains. The theoretical tension between dependency and modernisation perspectives reflects the broader debate about China’s role in Africa and underscores the need for rigorous empirical analysis to determine which dynamics predominate in practice.

By integrating these three theoretical perspectives, this study provides a balanced analytical framework that acknowledges both the potential benefits and risks of China’s economic engagement in Africa. The empirical analysis is designed to test competing predictions derived from these theories, particularly regarding the effects of Chinese loans, FDI, trade, and labour flows on African economic growth.

3. Research Hypotheses

Based on the literature review and theoretical framework presented above, the following hypotheses are proposed for empirical testing:

H1: Chinese loans to African governments have a positive and significant effect on economic growth in the selected African countries.

H2: Chinese foreign direct investment (FDI) has a positive and significant effect on economic growth in the selected African countries.

H3: China’s exports to Africa (African imports from China) have a negative effect on economic growth in the selected African countries.

H4: African exports to China have a positive and significant effect on economic growth in the selected African countries.

H5: The number of Chinese workers in Africa has a positive and significant effect on economic growth in the selected African countries.

H6: Natural resource revenue has a positive and significant effect on economic growth in the selected African countries.

H7: Government expenditure has a positive and significant effect on economic growth in the selected African countries.

4. Methodology

The study used secondary quantitative sources. Data were sourced from the World Bank, the Boston University Global Development Policy Center, and the China–Africa Research Initiative at the Johns Hopkins University. The analysis uses data from 10 countries in Africa over a period of 19 years (2003–2021), resulting in a total of 190 observations. The choice of countries was determined by issues of data availability and also by the volume of economic transactions between China and the selected African countries. The countries included in the analysis are Angola, Ethiopia, Zambia, Kenya, Egypt, Nigeria, Cameroon, South Africa, the Republic of the Congo (RoC), and Ghana.

This study adopts and modifies the model by Obobisa et al. (2021), who explored the causal link between China–Africa trade, China’s outward foreign direct investment (OFDI), and the economic growth of 24 Sub-Saharan African countries from 1999 to 2018. The modified model is specified as follows:

$$GDPg = f(CLA, CFDI, CEA, CIA, CWA, NR, GE)$$

where GDPg is the annual growth rate of Gross Domestic Product for African countries, CLA is Chinese loans to African governments, CFDI is Chinese Foreign Direct Investment flows, CEA is China’s exports to Africa (i.e., African imports from China), CIA is African exports to China, CWA is the number of Chinese workers in Africa, NR is total natural resource revenue, and GE is general government final consumption expenditure. A detailed description of the variables and their sources is presented in Table 1.

Summary of variable descriptions

Table 1

Variable	Description and Unit of Measurement	Source
GDPg	Annual growth rate of GDP at market prices based on constant local currency (constant 2010 US dollars)	World Bank
CLA	Chinese loans to African governments, amounts borrowed (US\$ Mn)	Boston University GDP Center, 2023
CFDI	Chinese FDI flows to African countries (US\$ Mn)	China–Africa Research Initiative

Variable	Description and Unit of Measurement	Source
CEA	China's exports to Africa / African imports from China (US\$ Mn)	China–Africa Research Initiative
CIA	African exports to China (US\$ Mn)	China–Africa Research Initiative
CWA	Number of Chinese workers in Africa by end of year	China–Africa Research Initiative
NR	Total natural resource revenue (sum of oil, gas, coal, minerals, and forest revenues)	World Bank
GE	General government final consumption expenditure (current US\$)	World Bank

• **Estimation techniques:** The study adopted a panel cointegration analysis and cross-sectional dependence analysis. the analysis followed the following sequential steps (i) cross sectional dependence and unit root testing; (ii) cointegration testing; and (iii) estimation of the long-run relationships.

• **Unit root testing and cross-sectional dependence:** Before conducting unit root tests, the study had to check the Cross-sectional Dependence. This was done using the Pesaran CSD Test. After the Pesaran Test was performed, unit root tests followed next. This was important since in order to estimate an ARDL model it needs to be ensured that the variables in the regression are either integrated of order zero I(0) or at most integrated at order one I(1). For this aim, Levin, Lin & Chi (LLC) and Im, Pesaran and Shin (IPS) unit root tests are used in the paper.

• **Cointegration testing:** After confirming the order of integration, the second stage of the analysis tests for evidence of long-run cointegration among the variables by conducting the Pedroni (1999, 2004) and Kao (1999) panel cointegration tests. However, the study had also to factor in the issue of cross-sectional dependence. Hence the use of the Westerlund (2007) cointegration test. The test not only allows the heterogeneity of the short-run parameters but can also manage cross section dependence (Szabo, 2014).

• **Long run estimation**

• **Panel ARDL:** Based on Pesaran et al. (1999), the dynamic heterogeneous panel regression can be incorporated into the error correction model using the autoregressive distributed lag ARDL (p,q)17 technique and stated as follows (Loayza and Ranciere, 2006):

$$\Delta(y_i)_t = \sum_{j=1}^{p-1} \gamma_j^i \Delta(y_i)_{t-j} + \sum_{j=0}^{q-1} \sigma_j^i \Delta(X_i)_{t-j} + \varphi^i [(y_i)_{t-j} - \{\beta_0^i + \beta_1^i (X_i)_{t-j}\}] + \varepsilon_{it}$$

where y is the GDP growth rate, X is a set of independent variables including the financial development indicator, and γ and σ represent the short-run coefficients of lagged dependent and independent variables respectively, β are the

long-run coefficients, and ϕ is the coefficient of speed of adjustment to the long run- equilibrium. The subscripts i and t represent country and time, respectively. The term in the square brackets of equation (1) contains the long-run growth regression, which includes the long-run coefficients of X vectors.

The autoregressive distributed lag (ARDL) model offers three possibilities to estimate non-stationary; (i) the pooled mean group (PMG) estimators, (ii) the mean group (MG), and the dynamic fixed effects (DFE). All three estimators consider the long-run equilibrium and the heterogeneity of the dynamic adjustment process (Demetriades and Law, 2006). The MG estimator is obtained by estimating N independent regressions and then averaging the (unweighted) coefficients, whilst the DFE requires pooling the data and assuming that the slope coefficients and error variances are identical (Frimpong, 2012). The PMG estimator constrains the long-run coefficients to be identical across groups. This is particularly useful when there are reasons to expect that the long-run equilibrium relationship between the variables is similar across countries (Bhattacharya et al. 2018).

- **Common Correlated Effects (CCE) Mean Group estimator:** The Pesaran (2006) common correlated effects (CCE) mean group estimator accounts for cross-sectional dependence (or common correlation) by incorporating unobserved common factors in the estimation process. The CCE approach estimates coefficients for each cross-section and averages them across the panel using appropriate weights. The robustness of the CCE regression results may be verified by estimating models (1-3) using the pooled mean group (PMG) estimator by Pesaran and Smith (1995) and Pesaran et al. (1999).

$$y_{it} = u_i + \lambda_i y_{it-1} + \beta_{0,i} x_{it} + \beta_{1,i} x_{it-1} + \sum_{l=0}^{p-1} \gamma'_{i,l} \bar{Y}_{t-p} + e_{it}$$

where, where y_{it} is the dependent variable and x_{it} an observed independent variable that includes m unobserved common factors. $\bar{Y}_t$ are the cross-sectional averages of the dependent and independent variables. $\gamma_{i,l}$ are the estimated coefficients of the cross-sectional averages and are generally treated as nuisance parameters. This estimator is known as the common-correlated effects mean-group (CCE-MG) estimator or CCE pooled estimator. The Common Correlated Effects (CCE) approach corrects cross-sectional dependence of the error terms due to unobserved common factors (Bokosi, 2022). Neglecting such dependencies could lead to biased estimates and to spurious inference ((Bhattacharya et al 2018; Gedin, 2020; Asteriou et al. 2021).

5. Results

5.1 Correlation analysis

The study first checked for multi collinearity amongst the variable. In order to do this, a correlation analysis was performed on the independent variables and results are shown in Table 2.

Correlation matrix between model variables

Table 2

	GDPg	CLA	CFDI	CEA	CIA	GAR	CWA	NR	GNE
GDPg	1.0000								
CLA	-0.0310	1.0000							
CFDI	-0.0843	0.0176	1.0000						
CEA	-0.1789*	-0.0100	0.1249*	1.0000					
CIA	-0.1990*	0.2954*	0.0555	0.1090	1.0000				
CWA	0.0845	0.3880*	-0.0280	-0.0838	0.7373*	0.6372*	1.0000		
NR	0.0909	0.0857	-0.0737	-0.3489*	0.3719*	0.0554	0.4482*	1.0000	
GE	0.0425	-0.0512	-0.0100	0.0755	-0.4550*	-0.0108	-0.342*	-0.595*	1.0000

Source: Prepared by researchers based on the outputs of STATA version 18.

Results showed that no multicollinearity problem was identified. This can be seen from the coefficient value range (0.010-0.7373) in the table. the values are lower than the benchmark of 0.80 (Irfan, 2014) and it can thus be said that there was no multicollinearity in the model.

5.2 Cross dependency and Stationarity Tests

The analysis had to perform the cross-dependence test before performing the unit root tests. The Pesaran Test was used to test for cross section dependence. Results are shown in Table 3.

Pesaran CSD Test

Table 3

Variable	t-bar	Z[t-bar]	p-value
CLA	-2.834	-3.389	0.000
GDP	-2.716	-3.026	0.001
GE	-1.369	1.110	0.866
CIA	-2.398	-2.050	0.020

Source: Prepared by researchers based on the outputs of STATA version 18.

Results from the Pesaran CSD test showed that the dependent variable, GDP, showed elements of cross-sectional dependence. Furthermore, other variables such as CLA and CIA also showed elements of cross-sectional dependence. Only GNE did not show cross sectional dependence. This shows that there was a need to cater for cross sectional dependence in the model. After performing the cross-dependency test, the next step was to do unit root testing. Unit root tests were performed using the LLC and the IPS tests. Results are shown in Table 4 and 5.

Results of unit root tests at the level and after taking the first difference

Table 4

Variables	level				1st Diff			
	LLC		IPS		LLC		IPS	
	stat	prob	stat	prob	stat	prob	stat	prob
GDPg	-0.8264	0.2043	-3.9363	0.0000	-4.5821	0.0000	-	-
CLA	-3.6173	0.0001	-4.6779	0.0000	-	-	-	-
CFDI	-2.7787	0.0027	-4.6167	0.0000	-	-	-	-
CEA	-0.3243	0.3729	1.8426	0.9673	-5.2878	0.0000	-4.8437	0.0000
CIA	-0.0095	0.4962	2.4392	0.9926	-6.0485	0.0000	-5.9729	0.0000
CWA	-0.6351	0.2627	0.8467	0.8014	-2.9927	0.0014	-5.8500	0.0000
NR	-1.3427	0.0897	-1.7636	0.0389	-5.2395	0.0000	-	-
GE	-0.4407	0.3297	-1.5027	0.0665	-13.876	0.0000	-7.3085	0.0000

Source: Prepared by researchers based on the outputs of STATA version 18.

Results show that, on the LLC test, CLA and CFDI were found to be stationary at levels. The rest of the variables had to be differenced once in order for them to become stationary. With the IPS test, GDP, CLA, CFDI and NR were stationary at levels. CEA, CIA, CWA and GNE had to be differenced once in order for them to be stationary.

Results of CIPS unit root test

Table 5

Variable	CIPS stat	10%	5%	1%
GDP	-3.301	-2.21	-2.34	-2.6
CLA	-3.913	-2.21	-2.34	-2.6
CFDI	-2.856	-2.21	-2.34	-2.6
CEA	-0.293	-2.21	-2.34	-2.6
CIA	-1.542	-2.21	-2.34	-2.6
CWA	-1.835	-2.21	-2.34	-2.6
NR	-2.158	-2.21	-2.34	-2.6
GE	-1.925	-2.21	-2.34	-2.6

Source: Prepared by researchers based on the outputs of STATA version 18.

From the result, the CIPS statistical values of GDP, CLA and CFDI (-3.301, -3.913 and -2.856 respectively). These values are comparatively less than the critical value (CV) at 10%, 5% and 1% (-2.21, -2.34 and -2.6) respectively. This shows that there was unit root in these variables. They became stationary after first differencing. The rest of the variables were stationary at levels. Their CIPS statistical values were higher than the critical values. All the unit root tests performed in the study showed that some variables were not stationary at levels. This shows that there was some unit root in some variables.

5.3 Cointegration Tests

The cointegration tests were performed using the Pedroni Test and the Westurland Test. Results are shown in Tables 5 and 6.

Results of Pedroni cointegration test

Table 6

Test Statistics	Statistic	Prob
Modified Phillips-Perron		0.0019
Phillips-Perron t		0.0029
Augmented Dickey-Fuller t		0.0482

Source: Prepared by researchers based on the outputs of STATA version 18.

All the test statistics reject the null hypothesis of no cointegration in favor of the alternative hypothesis that the variables are cointegrated in all panels with a panel-specific cointegrating vector. The Pedroni test was also complemented by the Westerlund Test.

Results of Westerlund ECM panel cointegration test.

Table 7

	T-stat		<i>p-value</i>
Variance ratio	All panels	1.0814	0.1398
Variance ratio	At least some panels	1.8808	0.0300

Source: Prepared by researchers based on the outputs of STATA version 18.

Results show that the first VR statistic does not the null hypothesis of no cointegration. This implies all panels are not cointegrated. However, the second VR test statistic rejects the null hypothesis of no cointegration in favor of the alternative that at least some panels are cointegrated. This shows that there are some panels that are cointegrated.

5.4 Primary Findings

The study used two estimation techniques to analyse its data; PMG and CCEMG. However, the presence of cross-sectional dependence required implementing a suitable regression method. This study then uses the CCEMG estimator because the variables are cross-sectionally correlated. As a result, the CCEMG emerged as the primary estimation method in this study. The findings obtained from the CCEMG were subsequently presented, while those from the PMG were utilized to validate the results.

PMG and CCEMG results

Table 8

PMG		CCEMG	
CLA	0.0665 (0.0623)	CLA	0.1823 (0.1280)
CFDI	0.2235 (0.3014)	CFDI	0.0524 (0.0619)
CEA	0.1647 (0.1311)	CEA	0.1403 (0.2571)
CIA	-0.2088*** (0.0032)	CIA	-0.4240** (0.1651)
GAR	0.3675*** (0.0323)	GAR	0.16011*** (0.0267)
CWA	0.0773*** (0.0067)	CWA	0.3124*** (0.0444)
NR	0.3789** (0.173)	NR	0.2334*** (0.0464)
GE	0.1561*** (0.0151)	GNE	0.0523** (0.0312)

Source: Prepared by researchers based on the outputs of STATA version 18.

5.5 Discussion of Results

5.5.1 Chinese Loans (CLA)

The CCE-MG results indicate that the coefficient for Chinese Loans (CLA) is positive (0.1823) but statistically insignificant. This finding does not support H1 and suggests that Chinese loans do not have a statistically significant effect on economic growth in the selected countries. Chinese loans are typically viewed as physical capital input that directly adds to Africa's physical capital accumulation. A study by Ngundu (2022) found that Africa's growth responds positively to Chinese loans but only in the short run, with the effects phasing out in the long run. The Department of International Development Cooperation (2024) revealed that China's sovereign financing provided to Africa is overall effective. However, it should be noted that the distribution and allocation of Chinese loans may have anomalies that could prevent the desired outcomes from being achieved. For instance, lending contracts often stipulate that Chinese state-owned enterprises are primary contractors for the projects, and this can suppress the development of local industries (de Kluiver, 2023). The rise in hidden debt from Chinese state-owned banks complicates the estimation of debt levels, posing a serious challenge for financial management and accountability (Were, 2018; de Kluiver, 2023; IMF, 2023). This could explain why the study found no significant relationship between Chinese loans and economic growth. Moreover, numerous loans have been allocated to projects that are still in development, and the full benefits of these projects may materialise at a later date. As a result, it may be early to accurately

quantify the economic effect of Chinese loans in Africa (Chan, 2018; Calabrese, 2021).

5.5.2 Chinese FDI (CFDI)

The CCE-MG results indicate that the coefficient for Chinese Foreign Direct Investment (CFDI) is positive (0.0524) but statistically insignificant. This finding does not support H2 and is surprising because FDI is generally expected to contribute positively to economic growth. Doku et al. (2017) found that a 1% increase in China's FDI stock in Africa significantly increases Africa's GDP growth by 0.607%. Debongo et al. (2022) also showed that China's foreign direct investment had a significant positive impact on Africa's inclusive development. However, the interaction of Chinese FDI with the institutional quality variable has a significant positive effect on GDP per capita growth, indicating a conditional effect (Debongo et al., 2022). Miao et al. (2020) also showed that the conditional effect of China–Africa trade and domestic absorptive capacity on economic growth was positive and statistically significant. The insignificant result in this study may reflect the relatively small and diverse sample of countries, or it may indicate that the positive effects of Chinese FDI are contingent on institutional and absorptive capacity conditions that vary across the sample.

5.5.3 China's Exports to Africa (CEA)

The coefficient for China's exports to Africa (CEA) is positive (0.1403 in the CCE-MG model) but statistically insignificant. This finding does not support H3, which predicted a negative effect. The insignificance of this variable suggests that African imports from China do not have a measurable impact on economic growth in the selected countries, neither positive nor negative. Ngoma (2023) points out that despite the well-established negative effect observed in advanced economies, the theoretical relationship between Chinese imports and economic outcomes in any given country is ambiguous. This ambiguity could explain the insignificant finding. It is also possible that the aggregate nature of the trade variable masks differential effects across sectors, with some sectors benefiting from access to cheaper Chinese inputs while others suffer from competitive pressures.

5.5.4 African Exports to China (CIA)

The coefficient for African exports to China (CIA) is negative and statistically significant in both the PMG model (-0.2088 , $p < 0.01$) and the CCE-MG model (-0.4240 , $p < 0.05$). This finding contradicts H4 and economic theory, which expects exports to boost economic growth. An increase in exports should also increase the inflow of foreign exchange and permit the expansion of imports of services and capital goods, which are important in increasing productivity and

economic growth (Kalaitzi and Chamberlain, 2020). Hagemejer and Mućk (2019) found that exports significantly improved economic growth in Central and Eastern Europe. The majority of Africa's exports to China are comprised of mineral fuels, lubricants, and related materials, as well as iron ore, metals, and other commodities (Eleanor, 2017; Subban, 2022). The negative coefficient may reflect the Dutch disease effect, whereby heavy reliance on commodity exports to China crowds out manufacturing and other tradable sectors. It may also indicate that the terms of trade have moved unfavourably for African commodity exporters, or that the concentration of exports in primary commodities limits the growth-enhancing effects of trade. Chen et al. (2024) noted that while African goods exports to China increased more than fourfold between 2000 and 2022, the composition remained heavily skewed toward unprocessed commodities.

5.5.5 Chinese Workers in Africa (CWA)

The coefficient for Chinese Workers in Africa (CWA) is positive and statistically significant at the 1% level in both the PMG model (0.0773, $p < 0.01$) and the CCE-MG model (0.3124, $p < 0.01$). This finding supports H5 and indicates that when the number of Chinese workers in Africa increases, economic growth in the selected African states also increases. The presence of Chinese workers in Africa has sparked significant controversy, with criticisms that China imports its own workforce into African countries (Hillman and Tippet, 2021; Ghiselli and Morgan, 2022). However, the majority of Chinese workers brought into Africa are skilled personnel who work in specialised fields such as construction. Many African countries do not have sufficient skilled workers in these sectors, and the availability of skilled Chinese workers could be ensuring productivity and efficiency in infrastructure projects. This positive relationship is consistent with the argument that the contribution of Chinese workers to project completion and infrastructure quality may ultimately support economic growth, even though it raises concerns about local employment displacement in the short term.

5.5.6 Natural Resource Revenue (NR)

The coefficient for natural resource revenue (NR) is positive and statistically significant at the 1% level in the CCE-MG model (0.2334, $p < 0.01$) and at the 5% level in the PMG model (0.3789, $p < 0.05$). This finding supports H6 and is consistent with the economic literature. Many African states are resource-rich and rely on natural resource revenue for growth, with the mining sector contributing a significant portion to GDP. The OECD (2008) noted that natural resources can generate and sustain growth, thereby reducing poverty. Redmond and Nasir (2020) and Majeed et al. (2021) empirically showed that natural resource abundance has a significant positive impact on economic growth. The result indicates that the countries under investigation are utilising their resource revenue efficiently, hence a positive contribution to growth. This finding is encouraging

given the ongoing debate about the resource curse in African economies (Dinga et al., 2024).

5.5.7 Government Expenditure (GE)

The coefficient for Government Expenditure (GE) is negative and statistically significant in the CCE-MG model (-0.0523 , $p < 0.05$). However, the PMG model shows a positive and significant coefficient (0.1561 , $p < 0.01$). This discrepancy between the two estimators warrants careful interpretation. The CCE-MG estimator, which accounts for cross-sectional dependence and is therefore the preferred estimator for this study, suggests that government expenditure is associated with lower economic growth. This finding does not support H7. The negative relationship may reflect the composition of government spending in the selected African countries, where a large proportion of expenditure is directed toward recurrent spending (e.g., public sector wages) rather than productive capital investment. Onifade et al. (2020) showed that recurrent government expenditures were found to have a significantly negative impact on economic growth in Nigeria. Buthelezi (2023) also showed that government expenditure reduces economic growth in South Africa. Government spending can positively or negatively impact economic growth depending on whether it promotes or hinders the efficiency and productivity of the economy (Okunlola et al., 2024). The finding suggests that the quality and composition of government spending, rather than its volume, is the critical determinant of its growth impact.

6. Conclusion

This study investigated the impact of China's economic activities on the economic growth of ten African countries using panel data spanning from 2003 to 2021. The CCE-MG estimator, which accounts for cross-sectional dependence, was employed as the primary estimation technique, with the PMG estimator used for robustness comparison. The analysis yielded several important findings that contribute to the ongoing debate about the nature and consequences of China's economic engagement in Africa.

First, the study found that Chinese loans and Chinese FDI do not have statistically significant effects on economic growth in the selected countries. This finding challenges the narrative that Chinese financial flows are either a powerful driver of African growth or a harmful debt trap. Rather, the evidence suggests that the growth effects of Chinese finance are contingent on how these resources are absorbed and utilised by recipient countries. The insignificant results may also reflect the long gestation periods of infrastructure projects funded by Chinese loans, whose full economic benefits may not yet be captured within the study period.

Second, the study found that China's exports to Africa (African imports from China) have an insignificant effect on growth, while African exports to China

are negatively associated with growth. The negative coefficient for African exports is particularly noteworthy, as it contradicts the standard export-led growth hypothesis. This finding may reflect the commodity-dependent nature of African exports to China and the potential Dutch disease effects associated with concentrated resource exports.

Third, the presence of Chinese workers in Africa emerged as a positive and significant driver of economic growth. While this finding is controversial from a labour market perspective, it likely reflects the productivity and efficiency gains associated with skilled Chinese workers in infrastructure construction and other specialised sectors where African labour markets face skill shortages.

Fourth, natural resource revenue is positively and significantly associated with growth, suggesting that the selected countries are, at least in the current period, managing their resource wealth in a manner that supports rather than hinders economic development. Government expenditure, however, shows a negative association with growth under the preferred CCE-MG estimator, pointing to potential inefficiencies in the composition and allocation of public spending.

Based on these findings, the study makes the following policy recommendations. African countries should reassess the loans and foreign direct investment they receive from China by focusing on enhancing the absorptive capacity of these external finances. Strengthening institutional quality, improving governance frameworks, and developing local complementary industries are essential to maximise the growth benefits of Chinese economic engagement. African governments should prioritise improving and increasing the value of exports to China through beneficiation and industrialisation to enhance growth prospects. Additionally, the positive association between Chinese workers and growth suggests that skilled foreign labour can play a complementary role in infrastructure development, but African governments should simultaneously invest in domestic skills development to ensure long-term sustainability and local employment benefits. Finally, the negative relationship between government expenditure and growth highlights the need for African governments to improve the efficiency, targeting, and composition of public spending toward growth-enhancing investments.

7. Limitations and Future Research

This study has several limitations that should be acknowledged. First, the sample of only ten countries, selected primarily based on data availability, limits the generalisability of the findings to the broader African continent. Future studies should seek to expand the country coverage as more comprehensive data becomes available. Second, the study period ends in 2021 and does not capture the potential effects of post-pandemic shifts in China–Africa economic relations, including the scaling back of Chinese lending and the evolving dynamics of the Belt and Road Initiative. Third, the use of aggregate-level data masks important within-country heterogeneity, including sectoral differences and regional variations that may

influence the growth effects of Chinese engagement. Fourth, the study does not directly account for institutional quality as a moderating variable, despite theoretical and empirical evidence suggesting that institutions play a crucial role in determining the growth effects of FDI and trade. Future research should incorporate institutional quality indicators and examine their interactive effects with Chinese economic engagement variables. Fifth, the positive finding regarding Chinese workers should be interpreted with caution, as the study is unable to distinguish between the direct productivity effects of Chinese workers and the indirect effects of the infrastructure projects they are associated with. Disentangling these effects would require more granular project-level data. Finally, the unexpected negative coefficient for African exports to China warrants further investigation using alternative model specifications, different country groupings, and more detailed trade composition data.

References

1. Arteaga, J.C., Cardozo, M.L. & Diniz, M.J.T., 2020. Exports to China and economic growth in Latin America, unequal effects within the region. *International Economics*, 164, pp. 1-17.
2. Asteriou, D., Pilbeam, K. & Pratiwi, C.E., 2021. Public debt and economic growth: panel data evidence for Asian countries. *Journal of Economics and Finance*, 45, pp. 1-25. <https://doi.org/10.1007/s12197-020-09515-7>
3. Bar-Nahum, Z., Finkelshtain, I., Ihle, R. & Rubin, O.D., 2020. *Effects of violent political conflict on the supply, demand and fragmentation of fresh food markets*. *Food Security*, 12(3), pp. 503-515.
4. Bhattacharya, R., Mann, K. & Nkusu, M., 2018. Estimating the demand for reserve assets across diverse groups of countries. *IMF Working Paper* No. WP/18/38.
5. Bokosi, F.K., 2022. The effects of industrialisation on economic growth: panel data evidence for SADC countries. *African Journal of Economic Review*, 10(3), pp. 1-22.
6. Borensztein, E., De Gregorio, J. & Lee, J.W., 1998. How does foreign direct investment affect economic growth? *Journal of International Economics*, 45(1), pp. 115-135.
7. Botha, I., 2006. China in Africa: friend or foe? China's contemporary political and economic relations with Africa. Stellenbosch University. <https://scholar.sun.ac.za/items/ecf44aa3-8d89-4e04-b6f6-c22a0c78f5a5>
8. Busse, M., Erdogan, C. & Mühlen, H., 2014. China's impact on Africa – the role of trade, *FDI and aid*. *Kiel Working Paper* No. 2064. <https://www.econstor.eu/bitstream/10419/183560/1/wp-206.pdf>
9. Buthelezi, E.M., 2023. Impact of government expenditure on economic growth in different states in South Africa. *Cogent Economics & Finance*, 11(1). <https://doi.org/10.1080/23322039.2023.2209959>
10. Calabrese, L., 2021. China–Africa economic relations: the BRI, the AfCFTA, and the rest of the world. Istituto Affari Internazionali. <https://www.ispionline.it/en/publication/china-africa-economic-relations-bri-afcfta-and-rest-world-31179>
11. Chan, M.E.M.W.Y., 2018. *China in Africa: a form of neo-colonialism?* E-International Relations. <https://www.e-ir.info/2018/12/02/china-in-africa-a-form-of-neo-colonialism/>

12. Chanaka, T.T., 2022. China–Africa cooperation: a model for South–South cooperation. In: Wang, H. and Miao, L., eds. *China and the world in a changing context*. Singapore: *Springer*, pp. 47–65.
13. Cheung, S., 2024. As *China's economy slows, Africa stands at a critical juncture*. South China Morning Post. <https://www.scmp.com/comment/opinion/article/3248568/chinas-economy-slows-africa-stands-critical-juncture>
14. Chen, W., Fornino, M. & Rawlings, H., 2024. Navigating the evolving landscape between China and Africa's economic engagements. *IMF Working Paper*. <https://doi.org/10.5089/9798400267840.001>
15. Carmody, P., 2020. *The new scramble for Africa*. 2nd ed. Cambridge: Polity Press.
16. Condon, B., 2023. *China's loans pushing world's poorest countries to brink of collapse*. Associated Press. <https://apnews.com/article/china-debt-banking-loans-financial-developing-countries-collapse>
17. Dalyop, G.T., 2019. Political instability and economic growth in Africa. *International Journal of Economic Policy Studies*, 13(1), pp. 217–257.
18. De Kluiver, J., 2023. *Navigating the complex terrain of China–Africa debt relations*. Institute for Security Studies. <https://issafrica.org/iss-today/navigating-the-complex-terrain-of-china-africa-debt-relations>
19. Debates, R., 2022. *China's political influence activities in Sub-Saharan Africa*. Observer Research Foundation. <https://www.orfonline.org/expert-speak/chinas-political-influence-activities-in-sub-saharan-africa>
20. Debongo, D.Y.S., Wu, H.Q., Chang, H.R. & Kassa, D.L., 2022. The impact of China's foreign direct investment on Africa's inclusive development. *Social Sciences & Humanities Open*, 6(1), p.100276. <https://doi.org/10.1016/j.ssaho.2022.100276>
21. Demetriades, P. & Law, S.H., 2006. Finance, institutions and economic growth. *Cambridge Working Papers in Economics* No. 0630.
22. Department of International Development Cooperation, 2024. A study on the effectiveness of China's sovereign financing in Africa. FinDev Lab. https://findevlab.org/news_and_event/a-study-on-the-effectiveness-of-chinas-sovereign-financing-in-africa/
23. Dinga, G.D., Mama, N. & Achuo, E.D., 2024. *Resource abundance: blessing or curse?* Comparative analyses of point and diffuse resources. *Heliyon*, 10(3), p.e25078.
24. Doku, I., Akuma, J. and Owusu, J., 2017. Effect of Chinese foreign direct investment on economic growth in Africa. *Journal of African Business*, 18(3), pp. 263–277.
25. Eleanor, E., 2017. *China in Africa*. Council on Foreign Relations. <https://www.cfr.org/backgrounder/china-africa>
26. Epo, B.N. & Nochi Faha, D.R., 2020. Natural resources, institutional quality, and economic growth: an African tale. *The European Journal of Development Research*, 32, pp. 99–128. <https://doi.org/10.1057/s41287-019-00222-6>
27. Frimpong, B., 2012. Population health and economic growth: panel cointegration analysis in Sub-Saharan Africa. Lund University. <https://lup.lub.lu.se/luur/download?func=downloadFile&recordId=2831648>
28. Gedin, J., 2020. *Can economic freedom promote growth via physical capital accumulation?* Lund University.
29. Ghiselli, A. & Morgan, P., 2022. Building legitimacy? The role of Chinese contract workers in foreign regimes' political strategies. *Review of International Political Economy*, 30(5), pp. 1824–1850. <https://doi.org/10.1080/09692290.2022.2127833>

30. Gopaldas, R., 2024. *Is a new chapter in China–Africa relations on the horizon?* Nanyang Technological University. <https://www.ntu.edu.sg/cas/news-events/news/details/is-a-new-chapter-in-china-africa-relations-on-the-horizon>
31. Hagemeyer, J. & Mućk, J., 2019. Export-led growth and its determinants: evidence from Central and Eastern European countries. *The World Economy*, 42, pp. 1994-2025.
32. Hillman, J. & Tippet, A., 2021. *Who built that? Labor and the Belt and Road Initiative*. Council on Foreign Relations. <https://www.cfr.org/blog/who-built-labor-and-belt-and-road-initiative>
33. IMF, 2023. *At a crossroads: Sub-Saharan Africa's economic relations with China*. Regional Economic Outlook: Sub-Saharan Africa. Washington, DC: International Monetary Fund.
34. Kalaitzi, A.S. & Chamberlain, T.W., 2020. Exports and economic growth: some evidence from the GCC. *International Advances in Economic Research*, 26, pp. 203-205.
35. Jayaram, K., Kassiri, O. & Sun, I.Y., 2017. *The closest look yet at Chinese economic engagement in Africa*. McKinsey & Company. <https://www.mckinsey.com/featured-insights/middle-east-and-africa/the-closest-look-yet-at-chinese-economic-engagement-in-africa>
36. Kernen, A. & Lam, K.N., 2014. Workforce localization among Chinese state-owned enterprises (SOEs) in Ghana. *Journal of Contemporary China*, 23(90), pp. 1053-1072.
37. Landry, D., 2024. *More problems more money? Does China lend more to African countries with higher credit risk levels?* Global Studies Quarterly, 4(2), ksae017. <https://doi.org/10.1093/isagsq/ksae017>
38. Laniran, T.J. & Adeleke, D., 2023. Does natural resource hinder, taxation capacity and accountability? A case of selected oil abundant developing countries. *Journal of Social and Economic Development*. <https://doi.org/10.1007/s40847-023-00266-9>
39. Leshoro, T.L., 2020. Impacts of productive and recurrent public expenditure on economic growth in South Africa: an analysis using the autoregressive distributed lag – error correction model. *Journal of Economic and Financial Sciences*, 13(1), a563.
40. Majeed, A., Wang, L., Zhang, X. & Kirikkaleli, D., 2021. *Modeling the dynamic links among natural resources, economic globalization, disaggregated energy consumption, and environmental quality*. Resources Policy, 73, p.102241.
41. Malobisky, J., 2024. *A roadmap for strategically countering China's development influence in Africa*. Newlines Institute. <https://newlinesinstitute.org/state-resilience-fragility/a-roadmap-for-strategically-countering-chinas-development-influence-in-africa/>
42. Miao, M., Lang, Q., Gebre, B.D., Jiang, Y. & Zhang, X., 2020. The impacts of Chinese FDI and China–Africa trade on economic growth of African countries: the role of institutional quality. *Economies*, 8(3), p. 53. <https://doi.org/10.3390/economies8030053>
43. McGregor, A., 2020. *China's growing reach in Africa: are we seeing a fair trade?* The Africa Report. <https://www.wathi.org/chinas-growing-reach-in-africa-are-we-seeing-a-fair-trade/>
44. Narang, H., 2024. *Infrastructure diplomacy: the key to China's influence in Africa*. East Asia Forum. <https://eastasiaforum.org/2024/02/07/infrastructure-diplomacy-the-key-to-chinas-influence-in-africa/>
45. Ngoma, M.M., 2023. *Chinese imports and industrialisation in Africa: evidence from Ethiopia*. CEPR. https://steg.cepr.org/sites/default/files/202301/STEG%20AC23%20Ngoma%20ChineseImportsAndIndustrializationInAfrica_0.pdf

46. Ngundu, M., 2022. How economic growth in Africa responds to Chinese loans: evidence from new CARI's loan dataset. In: *Osabuohien, E. et al., eds. COVID-19 in the African continent*. Leeds: Emerald Publishing, pp.183–199.
47. Nyabiage, J., 2024. China–Africa trade hit US\$282 billion in 2023 but Africa's trade deficit widens. *South China Morning Post*. <https://www.scmp.com/news/china/diplomacy/article/3250552/china-africa-trade-hit-282-billion-2023-africas-trade-deficit-widens>
48. Nyere, C., Adogo, H. & Chitanga, G., 2024. *Africa–China relations under scrutiny: building a community with a shared future*. *The African*. <https://theafrican.co.za/featured/africa-china-relations-under-scrutiny-building-a-community-with-a-shared-future>
49. Obobisa, E.S., Chen, H., Ayamba, E.C. & Nyarko Mensah, C., 2021. *The causal relationship between China–Africa trade, China OFDI, and economic growth of African countries*. *SAGE Open*, 11(4). <https://doi.org/10.1177/21582440211064899>
50. OECD, 2008. *Natural resources and pro-poor growth: the economics and politics*. Paris: OECD Publishing.
51. Ofosu, G. & Sarpong, D., 2022. China in Africa: on the competing perspectives of the value of Sino-African business relationships. *Journal of Economic Issues*, 56(1), pp. 137-157.
52. Okunlola, O.C., Sani, I.U., Ayetigbo, O.A. et al., 2024. Effect of government expenditure on real economic growth in ECOWAS: assessing the moderating role of corruption and conflict. *Humanities and Social Sciences Communications*, 11, p. 768.
53. Onifade, S.T., Çevik, S., Erdoğan, S. et al., 2020. An empirical retrospect of the impacts of government expenditures on economic growth: new evidence from the Nigerian economy. *Economic Structures*, 9, p. 6.
54. Oqubay, A. & Lin, J.Y., eds., 2019. *China–Africa and an economic transformation*. Oxford: Oxford University Press. <https://doi.org/10.1093/oso/9780198830504.003.0001>
55. Pinto, T., 2022. *How China–African trade may evolve*. GIS Reports. <https://www.gisreportsonline.com/r/china-africa-trade/>
56. Redmond, T. & Nasir, M.A., 2020. *Role of natural resource abundance, international trade and financial development in the economic development of selected countries*. *Resources Policy*, 66, p.101591.
57. Scarfe, J., Un, C., Mukanganga, R. & Lwere, T., 2023. *Infographic: are China's loans to Africa back to pre-Covid-19 levels?* Development Reimagined. <https://developmentreimagined.com/chinas-loans-to-africa/>
58. Shahbaz, M., Destek, M.A., Okumus, I. & Sinha, A., 2019. *An empirical note on comparison between resource abundance and resource dependence in resource abundant countries*. *Resources Policy*, 60, pp. 47-55.
59. Sheely, T., 2022. *10 things to know about the U.S.–China rivalry in Africa*. United States Institute of Peace. <https://www.usip.org/publications/2022/12/10-things-know-about-us-china-rivalry-africa>
60. Shinn, D., 2019. *China's economic impact on Africa*. Oxford Research Encyclopedia. <https://doi.org/10.1093/acrefore/9780190228637.013.831>
61. South African Institute of International Affairs, 2023. *The future of Africa–China trade and how to get there*. <https://saiia.org.za/event/the-future-of-africa-china-trade-and-how-to-get-there/>

62. Standard Bank, 2023. *Africa and China driving and redefining 21st century growth together*. <https://www.standardbank.com/sbg/standard-bank-group/news-and-insights/whats-happening/news/africa-and-china-driving-and-redefining-21st-century-growth-together>
63. Stein, P. & Uddhammar, E., 2021. China in Africa: the role of trade, investments, and loans amidst shifting geopolitical ambitions. *Observer Research Foundation*. <https://www.orfonline.org/research/china-in-africa>
64. Subban, V., 2022. *Africa: China's trade ties with the continent continue to strengthen*. Global Compliance News. <https://www.globalcompliancencnews.com/2022/06/14/africa-chinas-trade-ties-with-the-continent-continue-to-strengthen/>
65. Tao, A., 2023. *Beyond the narrative of China's debt trap diplomacy*. E-International Relations. <https://www.e-ir.info/2023/08/02/beyond-the-narrative-of-chinas-debt-trap-diplomacy/>
66. Torreggiani, S. & Andreoni, A., 2023. *Rising to the challenge or perish? Chinese import penetration and its impact on growth dynamics of manufacturing firms in South Africa*. Structural Change and Economic Dynamics, 67, pp. 133-149. <https://doi.org/10.1016/j.strueco.2022.12.010>
67. Usman, Z. & Xiaoyang, T., 2024. *How is China's economic transition affecting its relations with Africa?* Carnegie Endowment for International Peace. <https://carnegieendowment.org/research/2024/05/how-is-chinas-economic-transition-affecting-its-relations-with-africa>
68. Wegenast, T., Krauser, M., Strüver, G. & Giesen, J., 2019. *At Africa's expense?* Disaggregating the employment effects of Chinese mining operations in sub-Saharan Africa.
69. Were, M., 2018. *Debt trap? Chinese loans and Africa's development options*. South African Institute of International Affairs, Policy Insights No. 66.
70. Yang, Y., 2022. *Bring your own workers: Chinese OFDI, Chinese overseas workers, and collective labor rights in Africa*. Columbia University Academic Commons.
71. Yuan, D., 2024. *China in Africa: building roads and political capital*. Deutsche Welle. <https://www.dw.com/en/china-in-africa-building-roads-and-political-capital/a-68030063>
72. Zhou, C., 2024. *Sri Lanka's China 'debt trap' fears grow as Beijing keeps investing*. Nikkei Asia. <https://asia.nikkei.com/Spotlight/Asia-Insight/Sri-Lanka-s-China-debt-trap-fears-grow-as-Beijing-keeps-investing>
73. Zhou, G., Zhu, J. & Luo, S., 2022. The impact of fintech innovation on green growth in China: mediating effect of green finance. *Ecological Economics Times*, 193, p.107308.