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Evaluating China's Belt and Road Railway Projects in Nigeria: Infrastructure Gains and Strategic Risks

Adedeji Daniel Gbadebo

Department of Accounting Science, Walter Sisulu University, Mthatha, South Africa
E-mail: agbadebo@wsu.ac.za

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ABSTRACT

China's Belt and Road Initiative (BRI) has had a substantial impact on Nigeria's infrastructure development, notably railway projects. This report evaluates the risks and advantages of BRI-funded railway projects, with a focus on the economic, social, and environmental implications. Utilizing a structured survey of 300 respondents from the Federal Capital Territory and Keffi in Nasarawa State, and analyzed using chi-square statistical methods, the research evaluates both the perceived benefits and associated risks of BRI-funded railway projects. While BRI railway investments improve transportation infrastructure, economic activity, and regional connections, questions remain about debt sustainability, reliance on Chinese technology and labor, and governance transparency. Statistical finings shows that the claimed advantages of BRI railway projects have no statistically meaningful influence on Nigeria's infrastructure development. Furthermore, the related dangers, such as increased national debt and economic reliance, are not much greater than the advantages. The study highlights critical policy implications, including the need for renegotiated BRI terms to enhance local enterprise participation, rigorous cost-benefit assessments before loan engagements, and strengthened governance frameworks to ensure transparency and accountability. It also underscores the importance of long-term maintenance strategies and robust environmental impact assessments to preserve infrastructure functionality and mitigate adverse outcomes. Furthermore, long-term maintenance plans and environmental impact assessments should be addressed in order to maintain infrastructure efficiency and reduce negative consequences. These insights contribute to ongoing discourse on infrastructure governance and development financing in emerging economies, underscoring the necessity of context-sensitive policy approaches that balance international cooperation with domestic capacity-building and institutional integrity.

Introduction

The Belt and Road Initiative (BRI), which was formed in 2013, aims to connect East Asia and Europe through economic efforts. The initiative has expanded into Africa, Oceania, and Latin America, boosting China's economic and political might (Gürcan, 2022). However, some observers regard it as an extension of China's growing might, whilst the United States is apprehensive about China-led economic growth (McBride, 2023). The BRI has faced criticism for its lack of transparency, environmental impact, and debt-trap diplomacy in some partner countries. Despite these concerns, China continues to push forward with the initiative, seeking to establish itself as a global economic leader through infrastructure development and trade partnerships.

China's Belt and Road Initiative (BRI) has had an influence on Africa, with investments in 52 out of 54 countries and plans to join the 53rd market in Sao Tome and Principe. More than 90% of the 54 nations have signed Memoranda of Understanding (MoUs), with half in West Africa and the other half in East, North, and Southern Africa (Venkateswaran, 2020). As a result, China's posture toward Africa has strengthened, and the country's political and economic influence in the region has expanded.

Nigeria, popularly known as the "giant of Africa," is unquestionably the most important country on the continent, with the largest population. Despite its abundance of natural resources and vast terrain, Nigeria, like the rest of Africa, remains undeveloped, with 63% of its population living in poverty (Alhassan, 2024). The country faces challenges such as corruption, political instability, and inadequate infrastructure that hinder its progress towards economic development. However, Nigeria has shown resilience and potential for growth, with a burgeoning tech industry and a young, entrepreneurial population driving innovation and change.

Nigeria and China, two major players in their respective fields, have developed close bilateral ties over time. This relationship is built on mutual economic interests and diplomatic cooperation, with both countries benefiting from trade agreements and cultural exchanges. Nigeria routinely looks to China for infrastructural development projects, while China views Nigeria as a vital partner in increasing its influence in Africa. China's engagement in African crises stretches back to the 1950s. During this time, African republics began to free themselves from colonialism (Gana et al., 2024). China's involvement in African affairs has evolved over the years, with a focus on infrastructure development, resource extraction, and diplomatic partnerships. This has led to both positive and negative impacts on African countries, shaping the dynamics of China-Africa relations in the 21st century.

Any country must prioritize development since it is crucial for improving inhabitants' living circumstances and eliminating poverty. Development is critical in Nigeria's circumstance because it may assist in eliminating severe poverty and promoting social and economic stability. With over 200 million people, Nigeria's growth is critical for producing employment and maintaining long-term well-being.

Nigeria is one of the African countries that has received the greatest Chinese investment. By 2021, total investment had exceeded $20 billion USD, largely in the construction of free-trade and export-processing zones, oil extraction, home appliances and vehicle assembly, agricultural production, and so on (Jianchun, 2023). This investment has the potential to significantly boost Nigeria's economy and create much-needed infrastructure. However, there are concerns about the long-term implications of such heavy Chinese investment on Nigeria's sovereignty and economic independence.

China has historically shown respect for Nigeria and other African states, recognizing them as equals without asserting supremacy. As a result, Nigeria has emerged as China's biggest contractor market, second largest trade partner, and a major investment destination in Africa. Nigeria and China signed the Belt and Road Initiative cooperation pact in 2018. This partnership led to the successful completion of major projects, including the Lekki Deep Sea Port, Zungeru Hydroelectric Project, Lagos-Ibadan Train Route, Abuja-Kaduna Rail Line, Abuja-Keffi-Lafia-Makurdi Road Dualization, and various airport terminals. Nigeria is committed to boosting Belt and Road cooperation with China and expanding its connections with China (Jianchun, 2023).

Statement of the Problem

China's Belt and Road Initiative (BRI), which began in 2013, has emerged as a revolutionary global infrastructure program, providing chances for developing countries such as Nigeria to solve major infrastructure shortfalls through foreign investment. Nigeria, Africa's largest economy, confronts substantial infrastructure issues, notably in its railway industry, which is undeveloped while having the potential to improve regional connectivity, commerce, and economic growth.

The BRI has ushered in substantial railway investments in Nigeria, notably the Abuja-Kaduna and Lagos-Ibadan rail projects, which aim to upgrade transportation networks, stimulate industry, and further integrate Nigeria into global supply chains. While these advances offer significant infrastructural benefits, they also raise serious concerns about strategic threats. These include debt sustainability, sovereignty encroachment, unequal distribution of benefits, and concerns about the transparency and conditions of Chinese-funded projects. Critics such as Gana et al. (2024) fear that Nigeria's reliance on Chinese loans, which are frequently collateralized with natural resources, might exacerbate the country's financial fragility, as witnessed in other BRI partners.

Despite the growing body of research on the BRI in Africa, existing literature frequently focuses on macroeconomic implications, geopolitical dynamics, or China's strategic interests, rather than providing a detailed, Nigeria-specific analysis that assesses both the infrastructural benefits and strategic risks of BRI railway projects. Few studies have conducted a balanced, critical review that considers infrastructure outcomes, debt implications, environmental and social repercussions, and long-term viability of such partnerships in Nigeria.

This paper fills that vacuum by concentrating explicitly on BRI-related railway projects in Nigeria, critically assessing how these investments affect infrastructure development while also exposing the country to strategic vulnerabilities. By doing so, the study contributes to a more nuanced view of Nigeria's involvement in the BRI and provides policy-relevant insights into whether such collaborations accord with Nigeria's long-term development goals or foster reliance in a developing global order.

Objectives of the Study

- To evaluate the impact of China's Belt and Road Initiative (BRI) railway investments on Nigeria's infrastructural development.
- To assess the risks and challenges associated with BRI-funded railway projects in Nigeria.

Hypothesis

- H_0: China's BRI railway investments have no significant impact on Nigeria's infrastructural development.
- H_1: China's BRI railway investments have a significant impact on Nigeria's infrastructural development.
- H_0: The risks associated with BRI-funded railway projects do not significantly outweigh their benefits for Nigeria's economic and infrastructural growth.
- H_1: The risks associated with BRI-funded railway projects significantly outweigh their benefits for Nigeria's economic and infrastructural growth.

Literature Review

Overview of Chinese Investments in Nigeria

From 2003 to 2018, China's annual foreign direct investment in Africa increased considerably, rising from $74.8 million to $5.4 billion. China became Africa's fourth-largest investor when flows returned to $2.7 billion in 2019 and $4.2 billion in 2020, despite the COVID-19 epidemic (Fu, 2021). This surge in investment has been driven by China's Belt and Road Initiative, which aims to enhance infrastructure connectivity between China and Africa.

Chinese investments in Africa as a whole, particularly in Nigeria, have increased considerably in recent years, surpassing those of the United States. They cover a variety of industries, including infrastructure, telecommunications, manufacturing, and energy (Alhassan, 2024). These investments have not only boosted Nigeria's economy but have also created work possibilities for the local population. China's BRI has also enhanced the two countries' economic ties, paving the way for more investment projects in Nigeria.

Chinese infrastructure development in Nigeria should not be overlooked; as part of the BRI, China has consistently partnered with the Nigerian government to expand ports, construct new transportation systems, and upgrade existing

infrastructure. China is investing in infrastructure in 35 African nations, with a special focus on Angola, Nigeria, and Sudan. Nigeria's infrastructure restoration activities have been heavily dependent on China, notably the China Civil Engineering Construction Corporation (CCECC) (Amusan, 2022). China is sponsoring Nigeria's Abuja Rail Mass Transit System as well as the Lagos-Kano line refurbishment (Yuan & Jianxin, 2009). Nigeria's present ports and rail initiatives, such as the Lekki Deep Sea Port and the Lagos Rail Mass Transit Blue Line, are projected to boost economic growth and Sino-African cooperation. The developments, which include West Africa's largest deep-sea port, are expected to provide $360 billion in economic benefits and 170,000 jobs (Deol, 2023). China's infrastructure development has grown to encompass airport terminals, railroads, and ports. Murtala Muhammed International Airport (MMIA), Nnamdi Azikiwe International Airport in Abuja, Aminu Kano International Airport, Akanu Ibiam International Airport in Enugu, and Port Harcourt International Airport are among the airport terminals funded by the Chinese Exim Bank facility to the Nigerian government (Okeke-Korieocha, 2022).

Chinese firms played a critical role in realizing Nigeria's digital economic potential and invested extensively in telecoms. These Chinese enterprises have spent more than $16 billion in permanent assets and infrastructure around the country (Alajemba, 2018). Huawei, a well-known Chinese brand, has led attempts to increase its market share in Nigeria's telecommunications business. They have formed collaborations with local firms to deliver cutting-edge technology and infrastructure solutions, ultimately helping to expand Nigeria's digital economy. Huawei has made significant investments in Nigeria, totaling $76 million, since 1999. The Nigerian government has also entrusted Huawei with the construction of smart cities and e-government software, emphasizing the company's role in driving technological advancements in the country. Huawei and Globacom have also collaborated to build the Glo2 submarine cable network (Hungerland & Chan, 2021). These developments highlight the importance of strong telecommunications infrastructure in stimulating economic growth and fostering international partnerships.

China has obtained a sizeable portion of Nigeria's railway and port building contracts since 2013 and has given the country several infrastructure loans through its state-owned banks. The effects of Chinese investments in Nigeria have been studied by some (Emmanuel & Ruth, 2022). They looked at the history of ties between Nigeria and China and how they have changed dramatically, from little to no interaction to China becoming Nigeria's biggest commercial partner and a significant player in the infrastructure industry. Others in similar studies contend that China's growing interest has influenced the development and evolution of Nigeria-China ties (Ian, 2021). This suggests that Nigeria-China ties have been significantly shaped by China's strategic economic objectives, as well as its ambition to acquire resources and increase its worldwide influence. Africa's biggest oil producer is Nigeria, and China, the world's biggest energy user, wants to ensure a steady and varied supply of oil to support its explosive economic expansion. Nigeria offers an appealing market because of its sizable population, abundant

natural resources, and developing market, and China has aggressively sought investment possibilities overseas to promote its economic development (Quadri, 2020). Since many developing countries saw the BRI as a chance to increase infrastructure spending and draw in foreign investment, it has been a major factor in Beijing's efforts in Africa.

Theoretical Framework

This study adopts dependency theory as the theoretical framework of analysis.

Scholars Raúl Prebisch, André Gunder Frank, and Fernando Henrique Cardoso pioneered dependency theory, which provides a vital framework for understanding the strategic implications of China's Belt and Road Initiative (BRI) railway projects in Nigeria. Dependency theory, which emerged as a critique of modernization theory in the 1950s and 1960s, contends that the global economic system is designed to benefit established "core" countries at the expense of "peripheral" developing states (Frank, 1967; Prebisch, 1950). It contends that underdevelopment is not a stage on the route to development but rather a state deliberately sustained by uneven economic relations.

Applying this theory to Nigeria's relationship with China, particularly through railway infrastructure projects such as the Lagos-Ibadan and Abuja-Kaduna lines, highlights deeper issues about economic sovereignty and long-term reliance. While these projects contribute to infrastructure development, they frequently include financing terms that bind Nigeria to Chinese lenders, contractors, and suppliers, strengthening external dependency rather than creating indigenous capabilities (Brautigam, 2020). According to dependency theorists like Cardoso and Faletto (1979), such partnerships demonstrate a new type of "associated dependent development," in which elites in peripheral nations work with outside powers to enable structurally limited and externally directed growth.

The importance of dependency theory stems from its ability to reveal the structural dynamics and power imbalances implicit in international development projects such as the BRI. It allows us to objectively analyze if Nigeria's infrastructure achievements come at the expense of strategic autonomy, debt sustainability, and technological self-reliance. This concept highlights the possible hazards of replicating historical patterns of economic dominance under a different geopolitical guise by positioning China not just as a development partner, but also as an emergent core power within a new global dependence system.

Research Methods

This study used a quantitative research approach to assess the infrastructural benefits and strategic risks connected with China's Belt and Road Railway projects in Nigeria. An online survey was distributed to residents and stakeholders in the Federal Capital Territory (Abuja) and Keffi, Nasarawa State. These areas were chosen because they are close to significant railway routes under the Belt and Road Initiative and are relevant to the study's goals.

Sampling Technique

A total of 300 respondents were chosen using a stratified random sampling procedure. To guarantee a balanced and diverse representation of opinions, the population was initially stratified based on important demographic variables such as occupation (e.g., transportation workers, governmental servants, company owners, civil society members), age, and gender. Respondents were picked at random from each stratum in order to reduce sampling bias and increase generalizability within the designated regions.

Survey Design, Validity and Reliability

The questionnaire was organized and created using literature on infrastructure development, foreign direct investment, and the strategic risks of international collaborations. It included both closed-ended and Likert scale questions. To verify content validity, the draft questionnaire was examined by two academic specialists in development studies and international affairs. A pilot test was carried out with 30 respondents from a neighboring village (not included in the final sample), and input was used to improve the instrument.

Cronbach's alpha was calculated for the Likert-scale items to test internal consistency, and it came back at 0.82, suggesting a good degree of reliability.

Results and Discussion

Data Analysis Techniques

The results from the questionnaire were coded and analyzed using descriptive and inferential statistics. The chi-square (χ^2) test of independence was used to analyze the associations between categorical variables. For example, the study looked at whether views of infrastructure advantages (such as enhanced mobility and job development) differed considerably across occupational categories and educational levels. Similarly, the test was used to see if demographic groups differed in their understanding of strategic risks (for example, debt worries and loss of national control).

The chi-square test is useful for studying relationships between categorical variables since it determines if observed variations in answers are statistically significant or random. Hypothesis testing was conducted at a significance level of 0.05.

Data Presentation and Analysis

Table 1. Demographic Characteristics of Respondents

Demographic Variable	Categories	Frequency (f)	Percentage (%)
Gender	Male	180	60.0%
	Female	120	40.0%
Age Group	18 – 25 years	90	30.0%

Demographic Variable	Categories	Frequency (f)	Percentage (%)
	26 – 35 years	120	40.0%
	36 – 45 years	60	20.0%
	46 years and above	30	10.0%
Occupation	Government Official	60	20.0%
	Private Sector Employee	75	25.0%
	Academic/Researcher	45	15.0%
	Student	75	25.0%
	Business Owner	45	15.0%
Level of Education	Primary	30	10.0%
	Secondary	90	30.0%
	Tertiary	180	60.0%
Total		**300**	**100.0%**

Source: Survey (2025)

The gender distribution of the respondents shows that males (60%) outnumber females (40%). This suggests that the study sample has a higher representation of men, which could reflect broader societal trends or specific characteristics of the target population. However, the 40% female representation ensures that diverse gender perspectives are included in the analysis, contributing to a balanced understanding of the subject matter. In terms of age distribution, the largest proportion of respondents (40%) falls within the 26–35 years age bracket, followed by 30% in the 18–25 years category. Those aged 36–45 years account for 20%, while only 10% of respondents are 46 years and above. This indicates that the majority of respondents are young adults, an active and engaged demographic that is likely to have strong opinions on contemporary issues. The relatively lower representation of older age groups may suggest limited participation from individuals who are either retired or less involved in the focus of the study. The occupational distribution reveals that students and private sector employees constitute the highest proportion of respondents, each making up 25% of the sample. Government officials account for 20%, while academic researchers and business owners each represent 15%. This occupational diversity ensures that insights from various professional backgrounds are incorporated into the study. The strong presence of students and private sector employees may indicate a high level of awareness and engagement with the research topic, whereas the participation of government officials and academics adds an element of expertise and policy-related perspectives.

Regarding educational attainment, a significant 60% of respondents have tertiary education, while 30% have completed secondary education, and only 10% have primary education. The predominance of tertiary-educated individuals suggests that the sample consists mainly of highly literate respondents, which may

influence the nature of responses by ensuring a more analytical and informed approach to the issues under investigation. The presence of respondents with secondary and primary education, though relatively lower, provides a broader representation across different educational backgrounds.

Table 2. Impact of BRI Railway Investments on Nigeria's Infrastructural Development

Statement	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Total
Improved transport infrastructure	120 (40%)	90 (30%)	45 (15%)	30 (10%)	15 (5%)	300 (100%)
Enhanced economic activities	110 (36.7%)	95 (31.7%)	50 (16.7%)	25 (8.3%)	20 (6.7%)	300 (100%)
Contributed to urbanization & regional connectivity	125 (41.7%)	85 (28.3%)	40 (13.3%)	30 (10%)	20 (6.7%)	300 (100%)
Improved ease of transportation	130 (43.3%)	80 (26.7%)	40 (13.3%)	30 (10%)	20 (6.7%)	300 (100%)
Infrastructure meets global standards	90 (30%)	85 (28.3%)	60 (20%)	40 (13.3%)	25 (8.3%)	300 (100%)

Source: Survey (2025)

The responses indicate that a significant proportion of the participants (70%) believe that the BRI railway projects have improved Nigeria's transport infrastructure. Specifically, 40% of respondents strongly agree, while 30% agree. This suggests that the railway investments have positively influenced Nigeria's transportation sector by enhancing mobility, reducing travel times, and improving logistics efficiency. However, 15% of respondents remain neutral, possibly due to limited personal experience with the railway system, while 15% disagree, which may reflect dissatisfaction with specific aspects such as service frequency, accessibility, or affordability. Economic benefits associated with the BRI railway projects are also widely acknowledged, as 68.4% of respondents agree that these investments have facilitated trade, job creation, and tourism. This aligns with economic theories that suggest infrastructural development contributes to economic expansion by enabling more efficient movement of goods and services. However, 16.7% of respondents remain neutral, indicating that while economic benefits may exist, they may not be evenly distributed. Furthermore, 15% disagree, possibly reflecting concerns about debt sustainability, project execution challenges, or limited economic integration in certain areas.

Regarding urbanization and regional connectivity, 70% of respondents agree that the BRI-funded railways have contributed to these aspects. The expansion of rail networks often leads to the emergence of new business districts and improved interconnectivity between rural and urban centers. This development can stimulate investment and attract new industries, further accelerating economic growth.

However, 13.3% of respondents are neutral, which could indicate a lack of direct experience with these benefits, while 16.7% disagree, possibly due to concerns over unfulfilled promises, regional disparities in development, or inadequate last-mile connectivity. The responses on the ease of transportation show that 70% of participants believe that the railway projects have significantly improved passenger and freight movement. This highlights the effectiveness of rail transport in reducing road congestion, lowering transportation costs, and providing a safer alternative to road travel. Nonetheless, 13.3% of respondents remain neutral, suggesting that while rail transport has improved, other challenges such as ticketing systems, schedules, and accessibility may still exist. Similarly, 16.7% of respondents disagree, possibly reflecting dissatisfaction with service reliability, frequency, or affordability.

The perception of the quality and maintenance of BRI-funded railway infrastructure presents a more mixed response. While 58.3% of respondents believe the infrastructure meets global standards, a substantial 20% remain neutral, and 21.6% express disagreement. This suggests that while the projects have introduced modern rail systems, concerns persist regarding long-term maintenance, operational efficiency, and service quality. Infrastructure projects of this scale require continuous investment in maintenance and technology upgrades to remain competitive and sustainable. The mixed perception may also stem from delays in project execution, inconsistent service delivery, or wear and tear on facilities.

Table 3. Risks and Challenges Associated with BRI-Funded Railway Projects in Nigeria

Statement	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Total
Increase in national debt	135 (45%)	80 (26.7%)	40 (13.3%)	30 (10%)	15 (5%)	300 (100%)
Long-term economic risks due to Chinese loans	125 (41.7%)	90 (30%)	45 (15%)	25 (8.3%)	15 (5%)	300 (100%)
Dependency on Chinese technology & labor	140 (46.7%)	85 (28.3%)	35 (11.7%)	25 (8.3%)	15 (5%)	300 (100%)
Transparency & accountability issues	120 (40%)	80 (26.7%)	50 (16.7%)	30 (10%)	20 (6.7%)	300 (100%)
Environmental concerns	100 (33.3%)	85 (28.3%)	55 (18.3%)	35 (11.7%)	25 (8.3%)	300 (100%)
Displacement & land acquisition controversies	115 (38.3%)	90 (30%)	45 (15%)	30 (10%)	20 (6.7%)	300 (100%)
High maintenance & operational costs	130 (43.3%)	85 (28.3%)	40 (13.3%)	25 (8.3%)	20 (6.7%)	300 (100%)

Renegotiation of BRI agreements	145 (48.3%)	80 (26.7%)	35 (11.7%)	25 (8.3%)	15 (5%)	300 (100%)

Source: Survey (2025)

The findings indicate that a majority of respondents (71.7%) believe that BRI-funded railway projects have significantly contributed to Nigeria's rising national debt. This concern stems from Nigeria's reliance on external loans for infrastructure projects, which, if not well-managed, could lead to economic instability. Meanwhile, 13.3% of respondents are neutral, suggesting they either lack knowledge of Nigeria's debt profile or do not perceive it as a major risk. On the other hand, 15% disagree, possibly viewing the projects as necessary investments for long-term economic development. Similarly, 71.7% of respondents agree that reliance on Chinese loans poses long-term economic risks for Nigeria. This supports broader concerns regarding debt sustainability and potential economic dependence on China. Given that loan agreements often involve strict repayment terms, failure to meet obligations could lead to further borrowing or economic constraints. The 15% neutrality rate suggests some respondents are uncertain about the long-term implications, while 13.3% disagree, potentially seeing the infrastructure gains as outweighing the risks.

A notable concern among respondents (75%) is Nigeria's growing dependency on Chinese technology and labor. This aligns with reports that many BRI projects involve significant foreign involvement, limiting opportunities for domestic workforce development. The 11.7% neutrality rate may suggest that some individuals recognize both positive and negative aspects of foreign involvement, while 13.3% disagree, possibly believing that knowledge transfer and local employment opportunities are sufficient. Issues of transparency and accountability in BRI railway project implementation are also significant, with 66.7% of respondents agreeing that these projects face governance challenges. Infrastructure projects of this magnitude require strong oversight, yet concerns over opaque contract agreements, procurement processes, and project execution persist. Meanwhile, 16.7% of respondents are neutral, possibly due to a lack of detailed information, and 16.7% disagree, potentially trusting the regulatory frameworks in place.

Regarding environmental impact, 61.6% of respondents express concerns about the ecological consequences of BRI railway construction. Infrastructure development often involves deforestation, habitat disruption, and pollution, which can negatively affect communities. However, 18.3% remain neutral, possibly due to limited awareness of specific environmental issues, while 20% disagree, potentially perceiving economic benefits as outweighing environmental drawbacks. The displacement of communities due to land acquisition for railway construction is another major concern, with 68.3% of respondents acknowledging controversies surrounding this issue. Land disputes can arise when compensation is inadequate or relocation plans are poorly executed. However, 15% remain neutral, likely due to a lack of personal experience, while 16.7% disagree, possibly believing that land acquisition was conducted fairly.

Another major concern is the high cost of maintaining and operating the BRI railway infrastructure, with 71.6% of respondents agreeing that this poses sustainability challenges. Railway projects require continuous funding for repairs, modernization, and operational efficiency. If revenues generated do not cover maintenance costs, the financial burden could fall on the government, increasing fiscal pressure. Meanwhile, 13.3% of respondents remain neutral, and 15% disagree, possibly viewing long-term economic benefits as justification for high maintenance costs. Finally, a significant majority (75%) support renegotiating the terms of BRI railway agreements to mitigate economic risks. This suggests widespread recognition of the need for more favorable loan conditions, local content integration, and greater transparency in agreements. The 11.7% neutrality rate indicates that some respondents are unsure about the feasibility of renegotiation, while 13.3% disagree, potentially believing that current agreements are reasonable and beneficial.

Hypothesis Testing

The chi-square test is a statistical method used to determine whether there is a significant association between categorical variables. In this study, the chi-square test is employed to examine whether China's Belt and Road Initiative (BRI) railway investments have significantly impacted Nigeria's infrastructural development and whether the risks associated with these projects significantly outweigh their benefits.

Hypothesis for Impact on Infrastructure

- **H_0:** China's BRI railway investments have no significant impact on Nigeria's infrastructural development.
- **H_1:** China's BRI railway investments have a significant impact on Nigeria's infrastructural development.

Hypothesis for Risks vs. Benefits

- **H_0:** The risks associated with BRI-funded railway projects do not significantly outweigh their benefits for Nigeria's economic and infrastructural growth.
- **H_1:** The risks associated with BRI-funded railway projects significantly outweigh their benefits for Nigeria's economic and infrastructural growth.
- **Observed Frequencies (O)**
- The observed frequencies for each response category were extract from **Table 2** (Impact of BRI Railway Investments) and **Table 3** (Risks and Challenges of BRI Railway).

Table 4. Impact on Infrastructure (Table 2)

Statement	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Total
Improved transport infrastructure	120	90	45	30	15	300

Statement	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Total
Enhanced economic activities	110	95	50	25	20	300
Urbanization & regional connectivity	125	85	40	30	20	300
Ease of transportation	130	80	40	30	20	300
Infrastructure meets global standards	90	85	60	40	25	300

Table 5. Risks vs. Benefits (Table 3)

Statement	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Total
Increase in national debt	135	80	40	30	15	300
Long-term economic risks	125	90	45	25	15	300
Dependency on Chinese technology & labor	140	85	35	25	15	300
Transparency & accountability issues	120	80	50	30	20	300
Environmental concerns	100	85	55	35	25	300
Displacement & land acquisition	115	90	45	30	20	300
High maintenance & operational costs	130	85	40	25	20	300
Renegotiation of BRI agreements	145	80	35	25	15	300

Table 6. Chi-Square Test Results and Hypotheses Evaluation

Hypothesis	χ^2 Value	Degrees of Freedom (df)	p-value	Decision
Impact on Infrastructure	22.52	16	0.127	Fail to Reject H_0
Risks vs. Benefits	30.06	28	0.360	Fail to Reject H_0

Interpretation of Chi-Square Results

The chi-square test is useful for assessing categorical survey data, but the statistical findings must be interpreted with caution. Both hypotheses have p-values (0.127 and 0.360) that are above the standard significance threshold of 0.05, suggesting that there is insufficient evidence to reject the null hypotheses. However, failure to reject the null hypothesis does not suggest the lack of an effect or correlation; rather, it indicates that the data from this sample is insufficient to demonstrate a statistically significant relationship.

Consider possible design constraints, such as a lack of control variables (e.g., geography, educational background) and limited statistical power from uniform or low response variability. Measurement biases include overrepresentation of educated respondents and social desirability bias in self-reporting.

Implications of Non-Significant Findings

Descriptive statistics indicate that respondents see benefits from BRI railway investments in transportation infrastructure, economic activity, and urban linkages. However, the non-significant chi-square result ($p = 0.127$) indicates that the observed agreement may not differ much from what may happen by chance, especially given the distribution across five Likert categories. Instead of a true lack of infrastructure influence, this might be due to perceptual heterogeneity or inadequate association strength.

While there is clear worry about hazards such as national debt and reliance on Chinese labor, the chi-square test ($p = 0.360$) indicates that these worries are not consistently high enough among respondents to infer a statistically significant trend. Rather than concluding that dangers exceed benefits, the data do not give compelling evidence to the contrary.

Unlike previous research, which showed either very positive narratives of infrastructure change (Onuoha, 2022) or critical perspectives of economic reliance (Okafor & Yusuf, 2021), the findings of this study reveal a more fragmented perception. The lack of a substantial connection might be attributed to responder uncertainty, mixed public opinion, or insufficient public knowledge of the long-term repercussions of BRI projects.

Conclusion

China's Belt and Road Initiative (BRI) has had a considerable impact on Nigeria's railway infrastructure, with noteworthy projects including the Lagos-Ibadan and Abuja-Kaduna train lines improving transportation connections and increasing local economic activity. However, the statistical analysis in this study shows that these benefits are not yet statistically significant at the national level in terms of larger infrastructure development measures. This shows that, while visible

improvements exist, they have not yet resulted in demonstrable systemic advances across Nigeria's infrastructure.

Furthermore, the report raises strategic concerns about increased debt exposure, reliance on Chinese technology and labor, limited local capacity participation, and opaque governance processes. These concerns, although not outweighing the potential advantages, pose significant risks to the long-term viability and independence of Nigeria's infrastructure development.

A more cautiously hopeful and deliberate strategy is thus required—one that leverages the advantages of BRI membership while actively reducing its associated hazards. Nigeria's experience illustrates the wider issues that African governments engaging in BRI face, particularly in terms of sovereignty, sustainability, and long-term regional integration.

Recommendations

Based on the findings, the following suggestions were made:

- The Nigerian government should revise BRI rules to encourage increased participation from indigenous businesses and skilled workers. Enhanced technology transfer regulations would lessen reliance on Chinese knowledge while promoting domestic capacity development.
- All new BRI-related financing should go through a thorough cost-benefit and risk assessment. Loan arrangements must be consistent with Nigeria's long-term development goal and not exacerbate public debt risks.
- A strong legal and institutional framework is required to improve accountability. Public disclosure of project data, such as contracts and execution milestones, can help to prevent corruption and ensure that initiatives benefit the public.
- With significant maintenance expenses associated with BRI railway infrastructure, Nigeria should create specific finance channels and invest in local technical training programs to ensure long-term operation and sustainability.
- Future BRI projects must be preceded by detailed environmental and social impact evaluations. Community discussions should be prioritized in order to reduce displacement risks and guarantee that local communities benefit directly from infrastructure investments.

References

Alajemba, N. (2018). China invests over $16 billion in Nigeria’s telecoms sector. ITEdgeNews. Retrieved August 17, 2023, from https://www.itedgenews.africa/china-invests-16-billion-nigerias-telecoms-sector/

Alden, C., & Alves, A. C. (2017). China and Africa's development: The legacy of engagement. Zed Books.

Alhassan, L. (2024). Assessing the socioeconomic impact of Chinese investments in Nigeria under the Belt & Road Initiative. BRIQ Belt and Road Initiative Quarterly, 5(2), 192–209.

Amusan, T. (2022). What Nigeria can teach us about China's Belt and Road. The Diplomat. Retrieved October 20, 2023, from https://thediplomat.com/2022/11/what-nigeria-can-teach-us-about-chinas-belt-and-road/

Brautigam, D. (2020). The Dragon's Gift: The Real Story of China in Africa. Oxford University Press.

Cardoso, F. H., & Faletto, E. (1979). Dependency and Development in Latin America. University of California Press.

Carmody, P., Taylor, I., & Zajontz, T. (2022). China's spatial fix and 'debt diplomacy' in Africa: Constraining Belt or Road to economic transformation? Canadian Journal of African Studies, 56(1), 1–21.

Chin, G. T., & Gallagher, K. P. (2019). Coordinated credit spaces: The global footprint of China's development banks. Review of International Political Economy, 26(2), 193–219. https://doi.org/10.1080/09692290.2018.1511383

Deol. (2023). China delivers major infrastructure projects in Nigeria. ACE Times. Retrieved February 27, 2023, from https://www.zawya.com/en/projects/bri/china-delivers-major-infrastructure-projects-in-nigeria-elj6dv3l/

Dokua Sasu, D. (2023). Oil industry in Nigeria. Statista. Retrieved October 20, 2023, from https://www.statista.com/topics/6914/oil-industry-in-nigeria/#topicOverview

Eze, M. O. (2021). Infrastructure financing and Chinese foreign policy: The Belt and Road Initiative in Africa. African Studies Quarterly, 20(1), 45–66.

Ezeani, E. O., & Ngoka, R. O. (2022). Nigeria-China relations and infrastructural development in Nigeria. University of Nigeria Journal of Political Economy, 12(2), 246–275.

Frank, A. G. (1967). Capitalism and Underdevelopment in Latin America. New York: Monthly Review Press.

Fu, Y. (2021). The quiet China-Africa revolution: Chinese investment. The Diplomat. Retrieved October 31, 2023, from https://thediplomat.com/2021/11/the-quiet-china-africa-revolution-chinese-investment/

Gana, M. I., Bashir, A. A., Zurkallaini, A. M., Abubakar, S. D., & Fauziyya, M. R. (2024). Nigeria-China bilateral relations: Trade, investment, and political influence. Kashere Journal of Politics and International Relations, 2(2), 39–48.

Grimm, S., & Hackenesch, C. (2020). China in Africa: Interests, actors and evolving engagement. SAIS Review of International Affairs, 40(2), 55–69. https://doi.org/10.1353/sais.2020.0025

Gürcan, E. C. (2022a). Deciphering the Chinese economic miracle: Lessons for the developing world. Belt & Road Initiative Quarterly, 3(2), 46–75.

Hungerland, N., & Chan, K. (2021). Assessing China's Digital Silk Road: Huawei's engagement in Nigeria. LSE Ideas Digital IR.

Jianchun, C. (2023, January 20). China-Nigeria cooperation in the new era. Ministry of Foreign Affairs of the People's Republic of China. Retrieved October 13,

2023, from https://www.fmprc.gov.cn/mfa_eng/wjb_663304/zwjg_665342/zwbd_665378/202301/t20230120_11012882.html

Kazeem, Y. (2020). Nigeria is getting more of its infrastructure from China—but at what cost? Quartz Africa. https://qz.com/africa/1848486

Leke, A., & Barton, D. (2016). Africa's infrastructure paradox. McKinsey & Company. https://www.mckinsey.com

McBride, J. (2023). China's massive Belt and Road Initiative. Council on Foreign Relations. Retrieved November 2, 2023, from https://www.cfr.org/backgrounder/chinas-massive-belt-and-road-initiative

Mitchell, C. (2023). Feature: China replaces African loans with energy investments amid faltering economy. S&P Global Commodity Insights. Retrieved November 10, 2023, from https://www.spglobal.com/commodityinsights/en/market-insights/latest-news/oil/101223-feature-china-replaces-african-loans-with-energy-investments-amid-faltering-economy

Ogbonnaya, U. M. (2018). China's Belt and Road Initiative and Africa's development: The Nigerian case. Journal of Asian and African Studies, 53(5), 683–697. https://doi.org/10.1177/0021909618777627

Okafor, E. E., & Yusuf, A. (2021). Debt, dependency, and development: Evaluating Nigeria-China economic cooperation under the Belt and Road Initiative. African Journal of Economic Policy, 28(2), 113–130.

Okeke-Korieocha, I. (2022). Why China funded Nigeria's new airport terminals – Ambassador. BusinessDay NG. Retrieved October 22, 2023, from https://businessday.ng/aviation/article/why-china-funded-nigerias-new-airport-terminals-ambassador/

Onuoha, F. C. (2022). Chinese investments and infrastructure development in Nigeria: Opportunities and threats. African Security Review, 31(1), 1–15. https://doi.org/10.1080/10246029.2022.2014157

Prebisch, R. (1950). The Economic Development of Latin America and Its Principal Problems. United Nations, Economic Commission for Latin America.

Quadri, R. A. L. (2020). One Belt One Road: Should Nigeria sieve the Chinese benevolence, or accept it as a free lunch? AHBV Akdeniz Havzası ve Afrika Medeniyetleri Dergisi, 2(1), 43–77.

World Bank. (2020). Belt and Road economics: Opportunities and risks of transport corridors. https://www.worldbank.org/en/topic/regional-integration/publication/belt-and-road-economics-opportunities-and-risks-of-transport-corridors