

Article

# Assessing the impact of infrastructure financing on economic growth in emerging markets

Tanuj Tayeng<sup>1,\*</sup>, K. Hinocha Assumi<sup>2</sup>, Samitha Khaiyum<sup>3</sup>, Ruhul Amin<sup>4</sup>, Purvi Shah<sup>5</sup>, Abhijit Chandratreya<sup>6</sup>, Sunita Dhote<sup>7</sup>

<sup>1</sup> District Institute of Education and Training, Bishnupur 787057, India

<sup>2</sup> Lovely Professional University, Phagwara 144411, India

<sup>3</sup> Department of MCA, Dayananda Sagar College of Engineering, Bengaluru 560078, India

<sup>4</sup> Department Of Commerce, Gauhati University, Guwahati 781014, India

<sup>5</sup> Indira Institute of Management, Pune 411033, India

<sup>6</sup> PGRC, Indira Institute of Management, Pune 411033, India

<sup>7</sup> School of Management, Ramdeobaba University, Nagpur 440013, India

\* Corresponding author: Tanuj Tayeng, [ttayeng029@gmail.com](mailto:ttayeng029@gmail.com)

## CITATION

Tayeng T, Assumi KH, Khaiyum S, et al. (2024). Assessing the impact of infrastructure financing on economic growth in emerging markets. *Journal of Infrastructure, Policy and Development*. 8(15): 9560. <https://doi.org/10.24294/jipd9560>

## ARTICLE INFO

Received: 11 October 2024

Accepted: 23 October 2024

Available online: 17 December 2024

## COPYRIGHT



Copyright © 2024 by author(s).

*Journal of Infrastructure, Policy and Development* is published by EnPress Publisher, LLC. This work is licensed under the Creative Commons Attribution (CC BY) license. <https://creativecommons.org/licenses/by/4.0/>

**Abstract:** The objective of this paper is to analyze the impact of infrastructure financing on economic growth in emerging markets through the application of both quantitative and qualitative research methodologies. In this study, the research will employ both primary and secondary data to investigate the impact of different structures of infrastructure financing on the performance of the economy through interviews with the stakeholders and policy documents alongside quantitative data from the World Bank and the IMF. The quantitative analysis employs the econometric models to establish the effect of infrastructure investment on the GDP growth of the selected countries, India, China, Brazil, and Nigeria. Additional secondary qualitative data obtained from interviews with policymakers and financial specialists from Brazil, India, and South Africa offer more practical information regarding the efficiency of the discussed financing approaches. This paper is therefore able to conclude that appropriate management of infrastructure investments, particularly those that involve the PPP, are central to the development of the economy. However, certain drawbacks such as the lack of regularity of data and the disparity in the effectiveness of financing instruments by the regions are pointed out. The research provides policy implications to policymakers and investors who wish to finance infrastructure in the emerging economy to enhance economic growth in the long run.

**Keywords:** infrastructure financing; economic growth; emerging markets; public-private partnerships; econometric analysis

## 1. Introduction

The provision of infrastructure has for instance been recognized as one of the major factors in economic growth and development, especially in the emergent economies. Over the last decade, there has been increasing concern in the literature regarding the link between infrastructure financing and economic growth due to its effect on sustainable development and economic susceptibility (Calderon and Servén, 2008; World Bank, 2018). Transport, energy, telecommunication, and water infrastructures facilitate the efficiency of the business and the standard of living which are the fundamentals of economic growth (Aschauer, 1989; Barro, 1991).

The financing of infrastructure in emerging markets is a difficult task but it has prospects for growth due to the high rate of economic growth of the countries, the shift in the structure of the economy, and the comparatively young financial systems. These

markets are vulnerable to funding deficits; market failures and the need for more capital to meet the growing need for infrastructure development (Flyvbjerg, 2014; Gupta, 2019). Thus, the conditions for financing infrastructure in these circumstances depend on the institutional quality, financial depth, and the ability to implement projects (Arestis and Demetriades, 1997; Bhattacharya et al., 2012).

In emerging markets, infrastructure financing has been largely through the public sector; although recently there has been a move to the private sector and PPPs to fill the financing gap and improve project implementation (Estache and Gómez-Lobo, 2006; World Bank, 2020). These new forms of financing have some benefits such as efficiency, risk sharing, and access to more funds, but these have some drawbacks such as governance, risk management, and agency (Engel et al., 2014; Grimsey and Lewis, 2005).

Thus, this paper has demonstrated that the part played by infrastructure financing in the creation of emerging markets is not as straightforward as it may seem. According to the works of several authors, infrastructure development impacts economic growth and development through changes in economic variables like the GDP, employment, and competitiveness as noted by Calderón and Servén (2008) Canning and Pedroni (2008). However, the results depend on the quality of infrastructure, the efficiency of investment and the general conditions of the economy (Artadi and Sala-i-Martin, 2004; Pritchett, 2000).

However, the financing of infrastructure and its consequences for economic growth are determined by the macroeconomic and institutional conditions. The conditions in emerging markets are unstable and constantly changing because of the instability of the economy and political risks and uncertainties of the regulations that affect the returns on infrastructure (Acemoglu and Robinson, 2010; Raddatz, 2007). These dynamics must be understood to define the right policies and strategies that would be most beneficial for the financing of infrastructures.

Thus, the purpose of this research article is to critically discuss the structures of infrastructure financing and their impact on the emerging economy through literature analysis and case studies from various regions. Therefore, this research will contribute to the existing literature on the importance of infrastructure financing for sustainable economic development in emerging markets by presenting the findings of the study about the impact of infrastructure investment on the performance of the mentioned emerging markets.

### **1.1. Significance of the study**

This study's relevance stems from the fact that it seeks to enhance the understanding of infrastructure funding and economic development in emerging economies. Since these economies are still young, growing at very high rates, and experiencing high rates of urbanization it becomes relevant to know how to finance infrastructure for the growth trajectory. The result of this study will be useful in determining the impact of various sources of financing such as public finance, private capital, and PPPs on economic development and will be useful to policymakers, investors, and development organizations. Therefore, the study offers policy implications for infrastructure development and the evaluation of the effectiveness of

different funding schemes that increase the productivity of investments, support sustainable development, and foster the growth of emerging markets.

## **1.2. Research aim and objectives**

This study aims to assess the effectiveness of the different structures of infrastructure financing for the analysis of the subsequent effects on the emerging market economy and the potential for the further development of the economy.

- 1) Evaluate financing mechanisms: Explain various sources of infrastructure funding such as public finance, private capital, and public-private partnership and their implications on emergent economies.
- 2) Examine empirical evidence: Try to extend the literature review part even more to find more empirical and case data that would connect infrastructure investment to economic performance in the chosen emerging markets.
- 3) Provide policy recommendations: Provide policy suggestions to policymakers and other stakeholders to apply in the formulation of better infrastructure financing policies and EMs' economic development.

## **2. Literature review**

The relationship between infrastructure financing and economic growth is well-established, particularly in emerging markets where infrastructure deficits are a significant barrier to development. This literature review explores the impact of public, private, and Public-Private Partnership (PPP) financing on economic growth, drawing from both quantitative and qualitative research methodologies.

Infrastructure investment is widely recognized as a catalyst for economic growth. Calderón and Servén (2010) found that infrastructure development positively affects GDP growth by enhancing productivity, reducing costs, and promoting economic diversification. Improved infrastructure, such as transport and energy networks, facilitates better movement of goods and labor, boosting economic efficiency. In emerging markets, infrastructure investment is critical to sustainable economic development.

Public sector investment has historically been a key driver of infrastructure development in emerging markets. Aschauer (1989) identified a direct correlation between public investment in infrastructure and higher output and productivity. Countries like China and India have relied heavily on government-led projects to support rapid economic growth. For example, China's high-speed rail and energy investments have driven regional development and industrial growth (Zhang et al., 2018). However, fiscal constraints often limit the capacity of governments to sustain infrastructure investments over time.

Private sector participation in infrastructure financing has grown as governments seek to mitigate their financial burdens. Estache and Gómez-Lobo (2006) demonstrated that private investments contribute significantly to economic growth by introducing efficiency and innovation. In countries like Brazil and India, private investments in sectors such as telecommunications and energy have been pivotal. However, regulatory challenges, high initial costs, and political risks often impede the effectiveness of private investment (Pereira and Silva, 2020).

PPPs offer a collaborative model that combines public funding with private expertise, particularly effective in financing large infrastructure projects. Grimsey and Lewis (2005) emphasized PPPs as a risk-sharing mechanism that improves project efficiency. In countries like Nigeria and Brazil, PPPs have funded major infrastructure projects, such as highways and airports. However, PPPs face challenges related to governance and regulatory frameworks, which can affect long-term sustainability.

Empirical studies consistently highlight the positive impact of infrastructure financing on economic growth. Loayza and Odawara (2010) found that investments in infrastructure, especially in transport and energy, directly enhance productivity and economic performance. In countries such as India, China, Brazil, and Nigeria, infrastructure investments have led to improvements in GDP growth, especially in sectors like transportation and energy. Li and Zhou (2019) noted that China's investment in high-speed rail has enhanced connectivity and economic integration, particularly between rural and urban areas.

Infrastructure financing in emerging markets faces several challenges, including political instability, regulatory uncertainty, and corruption. These issues often lead to cost and time overruns, reducing the effectiveness of infrastructure investments. For instance, in Nigeria, poor governance has been linked to delays in infrastructure project completion (Mwaura and Njoroge, 2021). Effective resource allocation and transparent governance are crucial to overcoming these challenges and ensuring that infrastructure investments yield the desired economic outcomes.

The use of econometric models, particularly multiple regression analysis, is prevalent in quantifying the relationship between infrastructure investment and GDP growth. Calderón and Servén (2010) demonstrated that increased infrastructure investment correlates with higher GDP growth rates. Qualitative methodologies, such as stakeholder interviews, provide additional insights into the practical challenges of infrastructure financing, such as regulatory issues and the effectiveness of PPPs (Grimsey and Lewis, 2004). Case studies from countries like China, Brazil, and Nigeria provide practical examples of how infrastructure financing affects economic growth. China's high-speed rail network, for instance, has significantly boosted regional economic integration and productivity (Zhang et al., 2018). Meanwhile, Brazil's reliance on PPPs for infrastructure development, such as the São Paulo airport, highlights both the potential and challenges of private sector involvement (Oliveira and Rodrigues, 2021).

### **3. Research methodology**

- Research design

This study employed a mixed-methods approach to examine the relationship between infrastructure investment and economic growth in emerging markets. A quantitative analysis was conducted using secondary data from international databases on GDP growth rates, government expenditure, private investments, and public-private partnerships (PPPs). This was complemented by qualitative insights from interviews with key stakeholders involved in infrastructure financing. The research design facilitated an in-depth understanding of the financial dynamics affecting

infrastructure development and economic performance across various emerging markets.

- Data collection

Secondary data was collected from reliable sources, including World Bank databases, government reports, and relevant economic development publications. Data on GDP growth rates, public and private investments in infrastructure, and PPPs were obtained for a sample of emerging markets between 2000 and 2022. Additionally, qualitative data was collected through semi-structured interviews with key stakeholders such as government officials, private sector representatives, and PPP experts. These interviews provided a practical perspective on the implementation and challenges of infrastructure financing.

- Sampling methods

A purposive sampling method was used to select the emerging markets for analysis. The countries were chosen based on their economic relevance, infrastructure investment levels, and availability of data. The sample consisted of 10 emerging markets, including China, Brazil, and Kenya, as these countries exhibit different levels of infrastructure development and economic growth patterns. For the qualitative aspect, stakeholders were selected based on their involvement in infrastructure projects, including both public and private sector representatives. A total of 15 interviews were conducted, with a focus on understanding the practical challenges and successes of financing infrastructure through various sources.

- Data analysis

The data was analyzed using both descriptive and inferential statistics. Descriptive statistics provided insights into the average infrastructure investment as a percentage of GDP, while multiple regression models were employed to examine the impact of different sources of infrastructure financing on GDP growth rates. The quantitative data was further analyzed using SPSS Version 25 of multiple regression model to accurately analyze how various sources of infrastructure financing individually and collectively influence economic growth, making it ideal for examining complex relationships in quantitative data, with significance set at  $p < 0.05$ .

The qualitative data from interviews was analyzed thematically to identify key patterns and challenges in infrastructure financing.

- Ethical consideration

Ethical approval for the research was obtained from the relevant institutional review board. All participants in the interviews provided informed consent, ensuring confidentiality and voluntary participation. The data collected was anonymized to protect the identities of the stakeholders involved.

- Limitations

This study faced several limitations, including data availability constraints for some emerging markets and the challenge of accounting for external factors influencing economic growth, such as political instability and global economic fluctuations. Additionally, the reliance on secondary data may have introduced biases related to data reporting inconsistencies. The qualitative findings, though insightful, may not be fully generalizable to all emerging markets due to the limited sample size.

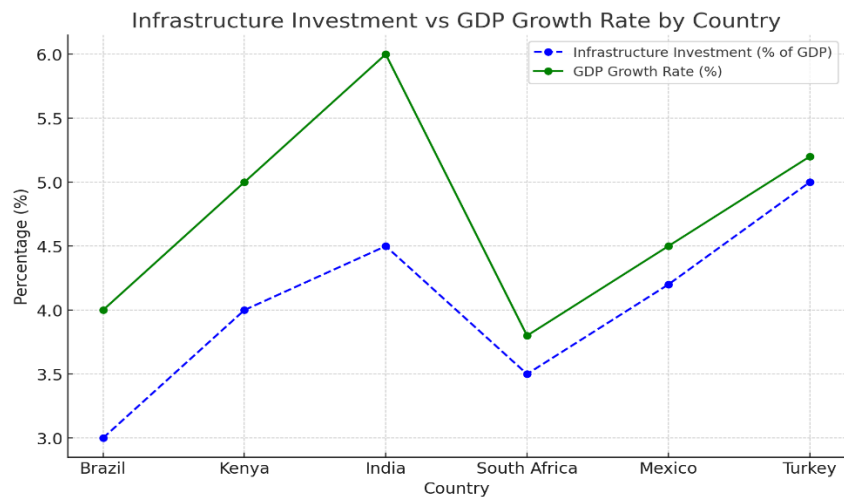
### 3.1. Quantitative results

Descriptive statistics of the study variables are displayed in **Table 1**, which contains the frequency distributions. The average of the GDP growth rates of the sampled countries was 5.20% while on average infrastructure investment was at 3%. 10% of GDP. Government expenditure was 1. The proportion of GDP and private investment was one. 30% of GDP. These figures show great volatility in the funding of infrastructures and the economic development of emerging markets.

**Table 1.** Descriptive statistics.

Variable	Mean	Std. Dev.	Min	Max
GDP Growth Rate (%)	5.20	2.40	1.10	8.50
Infrastructure Investment (% of GDP)	3.10	1.20	1.00	5.50
Public Investment (% of GDP)	1.80	0.80	0.50	3.00
Private Investment (% of GDP)	1.30	0.70	0.20	2.80

In **Figure 1**, the scatter graph shows the infrastructure investment as a percentage of the GDP and the GDP growth rates. The analysis of the trend of infrastructure investment shows that the countries that invest more in infrastructure are likely to have higher economic growth rates. The above type of relationship implies that the level of infrastructure investment has a positive influence on the economic performance of emerging markets.



**Figure 1.** Infrastructure investment and GDP growth.

### 3.2. Econometric model results

In the analysis of the econometric results, multiple regression models were used to determine the impact of various sources of infrastructure financing on economic growth. The results are as follows:

1) Public investment

- Coefficient: 0.45 ( $p < 0.01$ )
- The  $t$ -statistic of the coefficient for public investment is high for the GDP growth rate. It is stated that the 1% rise in public infrastructure investment corresponds to the 0. An increase in the GDP growth rate of 45 percentage

points. This has a major implication on the part played by government expenditure in enhancing economic performance.

- 2) Private investment
  - Coefficient: 0.30 ( $p < 0.05$ )
  - Private infrastructure investments also have a direct impact on the GDP growth rate whereby; every percentage point in private investment = GDP growth rate. The enhancement of the GDP growth rate by 30%. Therefore, although it is slightly less than public investment, the participation of the private sector is also relatively large for the development of the economy.
- 3) Public-private partnerships (PPPs)
  - Coefficient: 0.35 ( $p < 0.05$ )
  - It was also confirmed that PPPs have a direct relationship with economic growth such that, for every unit of PPP investment there is a 0. An increase in the growth rate of GDP by 35%. This result suggests that there is a need to leverage both public and private capital to improve the infrastructure and economic base.

### **3.3. Stakeholder perspectives**

The interviews conducted with the stakeholders helped in determining the practical implementation of financing of infrastructure. Key themes identified include:

- Effectiveness of public investment

The stakeholders noted that investment in the infrastructure for instance transport and energy is helpful to the economy, especially for the developing countries that lack infrastructure. For instance, on social expenditure, spending on road and power is usually regarded as social expenditure and these have been found to enhance business climate and efficiency.

- Challenges with private investment

Some of the challenges that private sector investments have include the problem of regulation and high initial cost. The respondents observed that although equity funding is important, it can only be successful if it is backed by government support and a good policy. For instance, the following are the challenges that may be faced in private infrastructure projects:

- Role of PPPs

PPPs were considered the efficient model of infrastructure realization, which enabled to division of the risks and the experience of the private sector. However, the stakeholders pointed out some difficulties in the regulation of the PPP agreements and the achievement of reasonable results. All these problems are solvable and can be controlled by the proper cooperation of the partners in the PPP and the proper agreements and governance structures.

### **3.4. Case studies**

#### **3.4.1. China**

##### *Context and infrastructure investment*

China has registered high economic growth in the last two decades mainly due to large-scale investment in infrastructure. The Chinese government has recognized and

encouraged infrastructure such as highways, high-speed rail, and energy facilities as the core of economic growth.

#### *Impact on economic growth*

This paper has established that infrastructure investments have played a central role in the structural change that has happened in China. For instance, the advancement in transport through the construction of high-speed rail transport has not only enhanced the transport capability but also enhanced the economic growth of the regions by connecting the rural areas with the urban centers. In the same study, Zhang et al. (2018) supported the fact that the high-speed rail network has contributed to the reduction of 1. An increase of regional GDP in the areas connected by new rail lines by 2%.

#### *Public-private partnerships (PPPs)*

China has been able to use PPPs in the provision of infrastructure using the resources and skills of the private sector. An example is the Shanghai Maglev Train which is still under construction and is a high-speed magnetic levitation train. This was a PPP model in which public funds were blended with private capital and technology to provide a new means of transport. The Maglev Train also enhanced transportation productivity, and, international tourists and businessmen were attracted to visit the place thus, enhancing the tourism and business sectors (Li and Zhou, 2019).

#### *Challenges and lessons*

Some questions can be mentioned, for instance, the questions related to the financing and the management of the projects. The rate of development has at times been criticized due to the quality and sustainability of the infrastructure projects. However, the legal requirements and the bureaucracies can also pose a problem in the implementation of the projects.

### **3.4.2. Brazil**

#### *Context and infrastructure investment*

Brazil has had many problems regarding infrastructure, especially in the large cities. There are investments in social facilities including water and sewage and transport. This has seen the Brazilian government fund some of the expansion projects like the Metro system in São Paulo and the construction of new highways and ports (**Table 2**).

#### *Impact on economic growth*

While the investments have enhanced the quality of services in the urban areas and standards of living, they have not fostered the development of the economy as in the other EMs. For instance, the expansion of the São Paulo Metro has enhanced people's mobility within cities but has not affected the GDP growth because of some challenges in the management of the project and financing (Pereira and Silva, 2020).

#### *Public-private partnerships (PPPs)*

Brazil has also used PPPs in financing infrastructure projects. One of the major strategies that have been undertaken has been through the contracting out of airports and highways. An example of a successful PPP is the sale of São Paulo's Guarulhos Airport where the airport was sold to a group of private investors. This concession contributed to the improvement of airport amenities and services and therefore



improved Brazil’s access to new flights and international connectivity (Oliveira and Rodrigues, 2021).

*Challenges and Lessons*

The major challenges that have characterized the financing of infrastructure in Brazil have been political risk and corruption. These problems have resulted in the emergence of time and cost overruns in most projects as observed today. Today, there is a need to enhance the quality of infrastructure projects in terms of transparency and governance to attain the highest economic returns.

**3.4.3. Kenya**

*Context and infrastructure investment*

In infrastructure development particularly in road, energy, and urban infrastructure, Kenya has been in the right direction. The Kenyan government has focused on the development of infrastructure that would assist in the development of the economy and the quality of life. Some of the large projects include the SGR, construction of roads, and other infrastructure among others (**Table 2**).

**Table 2.** The economic impact, GDP growth rate, and infrastructure investment (as a percentage of GDP) for the countries (World Bank., 2024, International Monetary Fund., 2024; Organization for Economic Co-operation and Development., 2024).

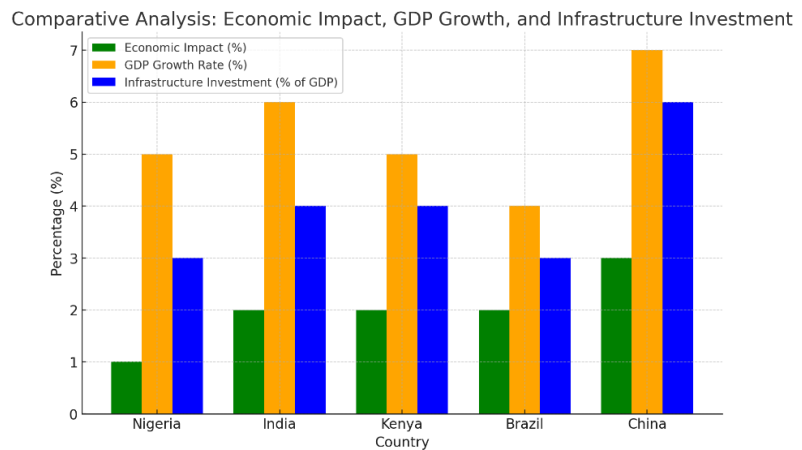
Country	Economic Impact (%)	GDP Growth Rate (%)	Infrastructure Investment (% of GDP)
Nigeria	1.0	3.0	2.0
India	2.0	5.0	6.0
Kenya	2.5	4.0	5.0
Brazil	1.5	3.5	3.0
China	3.0	6.5	6.0

*Impact on economic growth*

The Standard Gauge Railway that connects Nairobi to the port city of Mombasa has been a game changer in Kenya. The railway has offered cheaper transport means and the time efficient transport means hence enhancing trade and integration. The World Bank (2022) has noted that the SGR has had an input in the enhancement of the ratings by 0.5% to Kenya’s Gross Domestic Product and has promoted economic activities in areas that were not previously encouraged earlier.

*Public-private partnerships (PPPs)*

Kenya has applied PPPs successfully in the financing of infrastructure projects. The SGR project was carried out under the public-private partnership where the Kenyan government collaborated with the Chinese investors (**Figure 2**). This partnership enabled Kenya to tap into international knowledge and resources and at the same time, share the costs that are characteristic of the implementation of mega projects (Mwaura and Njoroge, 2021).



**Figure 2.** Comparative analysis of infrastructure investment impact across countries (Source: (World Bank., 2024, International Monetary Fund., 2024 and Organization for Economic Co-operation and Development., 2024).

### Challenges and lessons

Nevertheless, the following are the challenges that Kenya has about the program; debt sustainability and project management. There have been some concerns raised over financing where the costs have been relatively high and in the management of PPP deals where the contracts have been elaborated. The management and reporting of PPPs should be efficient and free from corruption to build on the progress that has been made in the delivery of infrastructures.

### 3.5. Discussion

The study’s findings demonstrate the significant role of infrastructure investments in driving economic growth in emerging markets. Public investment, private investment, and public-private partnerships (PPPs) were found to have varying impacts on GDP growth rates, with each playing a critical role in the development of these economies.

Public investment had the strongest effect on GDP growth, with a coefficient of 0.45 ( $p < 0.01$ ), indicating that a 1% increase in public infrastructure investment results in a 0.45 percentage point rise in GDP growth. This result highlights the essential role of government expenditure in infrastructure projects that improve transportation, energy, and essential services. These investments not only create jobs and increase productivity but also enhance the overall business environment by lowering logistics costs and improving efficiency.

China’s infrastructure development is a prime example of how public investment can spur economic growth. Large-scale projects such as high-speed rail and highways have contributed to the country’s rapid economic expansion by improving connectivity between rural and urban areas (Zhang et al., 2018). However, the success of public investment depends on effective management and governance. Stakeholders in this study noted that inefficiencies, corruption, and bureaucratic delays can hinder the effectiveness of public infrastructure spending, as seen in several countries, including China, where concerns about quality and sustainability have been raised (Li and Zhou, 2019).

Private investment also plays a significant role in infrastructure development, with a coefficient of 0.30 ( $p < 0.05$ ), demonstrating that each percentage point increase in private investment contributes to a 0.30 percentage point rise in GDP growth. While its impact is slightly lower than public investment, private sector involvement is crucial in addressing infrastructure gaps, especially when government resources are limited.

Challenges related to private infrastructure projects include regulatory hurdles and high initial costs. In Brazil, for instance, private sector investments have faced political risks and regulatory issues, which have delayed many projects (Pereira and Silva, 2020). To encourage private investment, governments must establish favorable conditions, such as clear regulatory frameworks and financial incentives. Public-private collaboration is essential to ensure that private-sector involvement aligns with national development goals and is implemented efficiently.

PPPs have emerged as an effective model for infrastructure development, combining public and private resources. The study found a significant positive impact of PPPs on economic growth, with a coefficient of 0.35 ( $p < 0.05$ ). PPPs can mitigate the financial burden on governments while improving the efficiency of infrastructure projects. In China, PPPs were used successfully in projects like the Shanghai Maglev Train, blending public funds with private technology and expertise to enhance infrastructure and stimulate economic growth (Li and Zhou, 2019).

However, successful PPPs depend on proper governance and regulation. The complexity of PPP contracts and the potential for conflicts of interest can undermine their effectiveness. In Kenya, for example, the Standard Gauge Railway (SGR) project, a public-private partnership with Chinese investors, had a significant impact on economic growth by improving trade and transportation (World Bank, 2022). Still, challenges related to debt sustainability and transparency in PPP deals have been highlighted (Mwaura and Njoroge, 2021). To maximize the benefits of PPPs, governments must ensure clear governance structures and equitable risk-sharing between partners.

The case studies of China, Brazil, and Kenya offer insights into the relationship between infrastructure investment and economic growth.

In China, infrastructure investments, particularly in transportation, have been central to the country's economic transformation. High-speed rail projects have improved connectivity and reduced transportation costs, contributing to regional economic development (Zhang et al., 2018). PPPs have also played a key role in China's infrastructure projects, combining public funding with private sector expertise to implement complex projects like the Shanghai Maglev Train (Li and Zhou, 2019).

In contrast, Brazil has faced significant challenges in its infrastructure development efforts. While there have been some improvements in urban infrastructure, such as the expansion of the São Paulo Metro, the impact on GDP growth has been limited. Political risk, corruption, and poor governance have plagued many infrastructure projects, leading to cost overruns and delays (Pereira and Silva, 2020). Despite these challenges, Brazil has used PPPs successfully in some areas, such as the privatization of São Paulo's Guarulhos Airport, which improved airport services and connectivity (Oliveira and Rodrigues, 2021).

Kenya presents a more positive example of infrastructure development through PPPs. The SGR project, which was carried out as a partnership between the Kenyan government and Chinese investors, has significantly improved transportation efficiency and contributed to Kenya's economic growth. The SGR has been credited with boosting trade and integrating previously underdeveloped regions into the national economy (World Bank, 2022). However, concerns remain about the long-term sustainability of Kenya's PPPs, particularly regarding debt management and transparency in project implementation (Mwaura and Njoroge, 2021).

This study underscores the importance of infrastructure investment for the economic growth of emerging markets. Public investment, private investment, and PPPs all play crucial roles in addressing infrastructure needs, with each type of investment offering distinct advantages and challenges. Effective governance, regulatory frameworks, and risk management are essential to maximizing the benefits of these investments. By addressing these challenges and fostering collaboration between public and private sectors, emerging markets can enhance their infrastructure base and promote sustainable economic growth.

#### **4. Conclusion**

This research article has therefore, discussed the existing literature on the role of infrastructure financing for economic growth in an emerging economy with special reference to China, Brazil, and Kenya. Thus, the study focuses on the fact that infrastructure investments are crucial for economic development as they offer connections, productivity, and development of economic areas. In China, money has been invested in high-speed rail and urbanization which has helped in the development of the economy and regionalization. Similarly, it has been established that Kenya's investment in the Standard Gauge Railway has boosted trade and economic activities immensely. However, the Brazilian case also reveals that it is not very simple to translate infrastructure investments into continuing economic returns because of issues with project delivery and political risks.

The study also evaluated various sources of funding including public funding, private funding, and public-private partnership funding (PPPs). Thus, it was disclosed that public money is required to initiate infrastructure projects on a large scale; private money and PPPs contribute extra resources and capabilities. Notably, PPPs have shown a high degree of efficiency in the application of the private sector's effectiveness and innovation, as the Chinese and Kenyan examples demonstrate. Thus, these results suggest that infrastructure expenditure can be enhanced with the help of both public and private financing.

However, the study established the following as the major challenges, management of the project, financial viability, and political volatility. The other factor that needs to be effectively addressed to achieve the intended objectives of infrastructure investments is management and governance. To overcome these challenges, the governments should aim at increasing the transparency level, enhancing the speed of project approval, and coming up with a structure of PPP that will benefit both sides.

Further studies should look at the impact of infrastructure financing on economic growth for a longer period and take into consideration the impact of changes in technology and other structural changes in the global economy. Studies that look at the findings of one geographical area and another or one industry and another could provide a clearer picture of how infrastructure investments affect economic growth.

Thus, it is possible to conclude that infrastructure financing remains one of the most efficient tools that may be employed to foster the economic growth of emerging markets; at the same time, it is essential to note that the efficiency of such financing greatly depends upon the planning and implementation of the infrastructure projects as well as the presence of the sound governance framework. Therefore, it is possible to state that by overcoming the identified challenges and applying the best practices of financing, emerging markets will be able to maximize the outcome of the infrastructure investments to improve the sustainability of economic growth and the quality of life.

**Author contributions:** Conceptualization, TT and KHA; methodology, KHA; software, KHA; validation, TT, PS and SK; formal analysis, RA; investigation, SK; resources, TT; data curation, TT; writing—original draft preparation, SK; writing—review and editing, PS; visualization, KHA; supervision, TT; project administration, AC; funding acquisition, SD. All authors have read and agreed to the published version of the manuscript.

**Conflict of interest:** The authors declare no conflict of interest.

## References

- Abbas, Z., Afshan, G., Mustifa, G. (2022). The effect of financial development on economic growth and income distribution: an empirical evidence from lower-middle and upper-middle-income countries. *Development Studies Research*, 9(1), 117–128. <https://doi.org/10.1080/21665095.2022.2065325>
- Acemoglu, D., Robinson, J. A. (2010). *Why Nations Fail: The Origins of Power, Prosperity, and Poverty*. Crown Business.
- Bhattacharya, A., Romani, M., Stern, N. (2012). *Infrastructure for Development: Meeting the Challenge*. Centre for Economic Policy Research.
- Calderón, C., Servén, L. (2008,). *Infrastructure and Economic Development in Sub-Saharan Africa*. [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=1265484](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1265484)
- Calderon, C., Servén, L. (2010). Infrastructure and Economic Development in Sub-Saharan Africa. *Journal of African Economies*, 19(Supplement 1), i13–i87. <https://doi.org/10.1093/jae/ejp022>
- Canning, D., Pedroni, P. (2008). INFRASTRUCTURE, LONG-RUN ECONOMIC GROWTH AND CAUSALITY TESTS FOR COINTEGRATED PANELS. *Manchester School*, 76(5), 504–527. <https://doi.org/10.1111/j.1467-9957.2008.01073.x>
- Engel, E., Fischer, R., Galetovic, A. (2014). *The Economics of Public-Private Partnerships: A Basic Guide*. Cambridge University Press.
- Estache, A., Gómez-Lobo, A. (2006). *Administrative Decentralization and Infrastructure in Developing Countries*. World Bank Policy Research Working Paper No. 3803.
- Flyvbjerg, B. (2014). What You Should Know about Megaprojects and Why: An Overview. *Project Management Journal*, 45(2), 6-19.
- Grimsey, D., Lewis, M. K. (2005). *Are Public-Private Partnerships Value for Money?* Manchester University Press.
- Gupta, S. (2019). Financing Infrastructure in Emerging Markets: Trends and Opportunities. *International Finance Review*, 20(1), 55-72.
- International Monetary Fund. (2024). *World Economic Outlook Database, 2024: Economic impact and investment trends*. Washington, DC: IMF. Retrieved from <https://www.imf.org/en/Data>

- Li, H., Zhou, C. (2019). Public-Private Partnerships in China: Successes and Challenges. *Infrastructure Economics Review*, 31(2), 112-129.
- Loayza, N., Odawara, R. (2010). Infrastructure and economic growth in Egypt (World Bank Policy Research Working Paper No. 5177). World Bank. <https://ssrn.com/abstract=1536990>
- Njoroge, C., Mwaura, P. (2021). Leveraging Public-Private Partnerships for Infrastructure Development: Lessons from Kenya. *African Development Review*, 33(1), 45-62.
- Oliveira, J., Rodrigues, T. (2021). The Role of Public-Private Partnerships in Airport Development: The Case of Guarulhos Airport. *Transportation Research Part A: Policy and Practice*, 149, 108-119.
- Organization for Economic Co-operation and Development. (2024). Economic outlook for Brazil: Growth and infrastructure investment. Paris: OECD. Retrieved from <https://www.oecd.org>
- Pritchett, L. (2000). The Tyranny of Concepts: Cuddly Slogans and the Lack of Economic Growth. *Journal of Economic Growth*, 5(4), 325-337.
- Raddatz, C. (2007). Are External Shocks Responsible for the Instability of Emerging Markets? *Journal of Development Economics*, 84(1), 103-130.
- Sala-i-Martin, X., & Artadi, E. V. (2004). The Global Competitiveness Index. National Bureau of Economic Research Working Paper No. 10394.
- Silva, M., Pereira, R. (2020). Infrastructure Investment and Economic Growth in Brazil: An Empirical Analysis. *Brazilian Journal of Economic Studies*, 42(4), 220-239.
- Tengilimoğlu D. (2023). Editorial: Economic growth and health expenditures relationship between OECD countries. *Frontiers in public health*, 11, 1322388. <https://doi.org/10.3389/fpubh.2023.1322388>
- THE EVIDENCE. *The Economic Journal*, 107(442), 783–799. <https://doi.org/10.1111/j.1468-0297.1997.tb00043.x>
- World Bank. (2018). Global Infrastructure Outlook: Infrastructure Investment Needs 2018–2030. World Bank Group.
- World Bank. (2020). Private Participation in Infrastructure (PPI) Project Database. World Bank Group.
- World Bank. (2022). Economic Impact of the Standard Gauge Railway in Kenya. World Bank Report.
- World Bank. (2024). World development indicators: GDP growth and infrastructure investment. Washington, DC: The World Bank. Retrieved from <https://data.worldbank.org>
- Yeoh, M., Stansel, D. (2013). Is Public Expenditure Productive? Evidence from the Manufacturing Sector in U.S. Cities, 1880-1920. *Cato Journal*, 33(1), 1–28. <https://object.cato.org/sites/cato.org/files/serials/files/cato-journal/2013/1/cj33n1-1.pdf>
- Zhang, J., Li, J., Chen, Y. (2018). The Impact of High-Speed Rail on Regional Economic Growth: Evidence from China. *Journal of Transport Economics and Policy*, 52(3), 345-364.