



Public infrastructural development and economic performance in Africa: a new evidence from panel data analysis

Davidmac O. Ekeocha¹ · Jonathan E. Ogbuabor¹ · Anthony Orji¹ 

Received: 2 October 2020 / Accepted: 14 May 2021

© The Author(s), under exclusive licence to Springer Science+Business Media, LLC, part of Springer Nature 2021

Abstract

This study examined the effects of both aggregate and disaggregated infrastructural development indices (such as transport, electricity, ICT, and water and sanitation infrastructure indices) on economic performance in Africa. The study used the dynamic system GMM framework and found that both aggregate and disaggregated infrastructural development indices impact positively on GDP per capita growth in Africa. These impacts were shown to be significant in all cases, except for the transportation infrastructure index. The results overwhelmingly confirmed the prevalence of the symmetric hypothesis in the infrastructure–growth relationship in Africa. The study also found some evidence in support of the significant roles of capital, labour and initial GDP per capita in Africa’s economic performance, while the role of trade remained negative and muted. The study concluded that through effective public administration, African leaders and policymakers can promote economic performance on the continent by evolving policies that favour increased infrastructural development, human capital development and capital accumulation.

Keywords Infrastructure · Economic performance · System GMM · Africa

JEL Classification H54 · F43 · C23 · N17

✉ Anthony Orji
anthony.orji@unn.edu.ng

Davidmac O. Ekeocha
olisa.ekeocha@unn.edu.ng

Jonathan E. Ogbuabor
jonathan.ogbuabor@unn.edu.ng

¹ Department of Economics, University of Nigeria, Nsukka, Nigeria

1 Introduction

Economic research on infrastructural development has witnessed increased interest from scholars in recent times, and some have expressed support for the symmetric impact of infrastructure on economic growth (Levoli et al. 2019; Nugraha et al. 2020). Consequently, policymakers and governments in various economies, especially in Africa, have recognized that there is need for them to evolve and implement policies that will increase investments in basic infrastructures as a means of enhancing economic performance on a sustainable basis. Unfortunately, Africa's share of developed infrastructures has remained dismal compared to other regions of the world. For instance, just as in other African countries, most schools in Kenya have very low investments in information and communication technology (ICT) infrastructure, and this has been attributed to high costs in the procurement protocols (Bariu 2020).

One main feature of the extant literature is that most studies have hardly focussed on the disaggregated indices of infrastructural development, such as transportation and ICT infrastructure indices. Some of the existing studies (such as Hussain et al. 2019, which studied Asian countries; Bottasso et al. 2018, which studied Brazil; and Baita 2020, which studied Economic Community of West African States, ECOWAS; Pereira and Pereira 2020, which studied Portugal) centred on the role that aggregate infrastructure plays in delivering improved trade. Pereira and Pereira (2020) specifically found a positive and significant impact of infrastructure development on both traded and non-traded industries. Nazneen et al. (2019) found symmetry between China–Pakistan Economic Corridor (CPEC) infrastructural development and perceived tourism cost. The study demonstrated that people are more likely to support tourism even in prevailing higher costs. Castelnovo et al. (2018) examined the economic impact of the procurement events of the Large Hadron Collider (i.e. largest scale research infrastructure) using balance-sheet data of supply companies. The study found significant symmetry between procurement and company research and development, knowledge creation and economic performance. Clearly, the extant literature has hardly classified infrastructures as hard infrastructures (like transport and telecommunications) and soft infrastructures (like financial infrastructures and border-transport efficiency) so that the impacts of these disaggregated forms of infrastructure can be highlighted.

Some aspects of the extant literature have also focussed on the role of infrastructure in advancing growth. Some of such studies have found evidence in support of symmetric effect of infrastructure on growth (Sama and Afuge 2016 studied in Cameroon; Amos and Jidda 2018 studied Nigeria; Samir and Mefteh 2020 studied a panel of 63 countries). Studies that investigated South Asia and Indonesia have also established symmetric infrastructure–growth relationship as well as mutual causal feedbacks (Sahoo and Dash 2012; Khan et al. 2020; Kurniesih 2020). Wang et al. (2020b) also found that improved efficiency of urban infrastructures in Chinese cities lead to improved economic growth, while Heshmati and Rashidghalam (2020) found significant positive correlations between urban infrastructure and urbanization in China. Lin and Chen (2020) used a panel tobit model to show that land transport