The Effect of China’s Infrastructure Assistance on Africa's Economic Transformation

Eva Zhirong Fan *

The Chinese University of Hong Kong, P.O. Box 1200, Shatin, New Territories, Hong Kong SAR

* Corresponding Author Email: evangliner827@gmail.com

Abstract. China’s growing investment is transforming the African economy. China's infrastructure aid to Africa is constantly growing and diversifying. Quality and well-developed infrastructure is crucial for expanding African economy, strengthening competitiveness, and improving African's quality of life. This article examines the impact and bottleneck restrictions of population, resources, and industrial policy on Africa's economic transition. The following section analyzes the impact of Chinese infrastructure aid on the economic transformation of Africa, including human capital, industrial clusters, and industrial upgrading. Based on panel data from 2003 to 2022, a quantitative research method analyses China-Africa investment and African economic transformation, comparing to Japan in order to better comprehend the mechanism. In conclusion, an effort is made to elucidate the rationale behind Chinese infrastructure aid and economic change in Africa, together with policy recommendations for future investment and development.

Keywords: African economy; Economic transformations; Political economy of development; Infrastructure; Industrialization.

1. Introduction

Infrastructure aid is Africa's primary source of China’s investment. The proposed research topic is the influence of Chinese infrastructure aid on Africa's economic transformation by combining a case study of a current South African highway project with an empirical study of Chinese infrastructure assistance with African countries to clarify the impact mechanism and fill a previous research gap.

2. Outline

2.1 Research Framework

The first section summarizes research. This paper focuses on infrastructure aid, FDI (foreign direct investment), and economic transformation. First, theories related to the relationship between FDI and economic transformation are compiled based on development and industrial economics. Then, a categorical appraisal of studies on Chinese infrastructure aid in Africa is presented. Figure 1 shows the picture of research framework.

The fourth section outlines the experiences and methods from which firms can learn, using China Construction East South Africa (CCESA)'s Makro II highway project in Port Elizabeth as a case study. The fifth section set up an individual random effects model showing a significant relationship between China-Africa infrastructure aid and economic change in Africa comparing to Japan. In the medium-term, China-Africa commerce will hurt Africa's industrial renaissance. In the long-term, China's investment in Africa will catalyze Africa's economic transformation.

In the last section, which summarizes the thesis and gives possible recommendations, the primary conclusion and perspective are offered.
2.2 Research Discipline

2.2.1. Foreign Direct Investment (FDI)

FDI is a foreign entity's controlling stake in a company in another country. This investment has direct control, unlike overseas portfolios. FDI includes intangible and infrastructure investment.

2.2.2. Political Economy of Development

The field studies the impact of economic theories on socialism, communism, and public policy. It examines how political decisions, institutions, and government forms affect economic decisions.

2.2.3. Economic Transformation

Economic transformation involves shifting labor and other resources from low- to high-productivity sectors and increasing within-sector productivity growth. Economic transformation focuses on high-productivity activities across all sectors (i.e., agriculture, infrastructure and services). Economic transformation is affected by FDI.

2.2.4. Distinction between Aid and Direct Investment in Infrastructure

There are both indirect and direct effects of aid for infrastructure on FDI (Donaubauer et al., 2016b). The indirect effect of aid for infrastructure promotes FDI inflows through its impact on the host country’s endowment of economic infrastructure.

Aid for infrastructure also directly impacts FDI inflows, unlike other types of aid. Taking the estimation results at face value, a 10% increase in aid for infrastructure leads to an increase in FDI inflows.

2.3 Case Study-Port Elizabeth Makro II project

This thesis analyzes China Construction East South Africa's (CCEESA) Port Elizabeth Makro II project in South Africa, an example of Chinese infrastructure assistance in Africa. The nine-month project includes a mall road and related auxiliary work. The project will transport 3 million passengers and 9 million tons of freight, boosting South Africa's agricultural, mining, infrastructure, and commercial sectors.
2.4 Expected outcome

2.4.1. China’s infrastructure promotes economic transformation in Africa

China has assisted recipient nations in constructing a vast amount of economic infrastructure, which can generate significant economic growth. Transport infrastructure can directly reduce time spent on the road and boost non-agricultural employment. Convenient electricity and communication infrastructure can expand the marketing frontiers of products by linking farmers to markets, and ultimately promote economic transformation.

2.4.2. Policy recommendations for infrastructure assistance

2.4.2.1. Creating an effective infrastructure aid program.

Before providing aid, it's crucial to analyze the recipient nation's infrastructure to prevent aid misdirection, increase productivity and economic development, and prevent the economy from becoming overly dependent on foreign aid. Taking into account the results of the panel data model, China should tailor its aid policies to specific African nations and import advanced technology, as opposed to simply donating money to the continent, in order to mitigate the short-term negative impact of China's infrastructure aid on Africa's economic transformation.

2.4.2.2. Increasing infrastructure investment in low-income regions.

Africa are the primary recipients of official development assistance (ODA), economic superpowers such as the United States, China, and the European Union should assist them in poverty eradication and economies transformation.

2.4.2.3. Improving the system for evaluating foreign aid.

This research paper demonstrates that the more corrupt a government is, the less effective it is. Donor nations, such as China, should investigate the level of government control in recipient nations prior to implementing aid, so as to avoid ineffective aid funds.

2.4.3. Rationale and New for Undertaking the Research

There is a paucity of literature on the use of theoretical and empirical methods to study the impact of infrastructure aid on economic transformation in Africa, and the author believes that relevant research should be conducted to serve as a reference for other scholars looking into similar issues.

3. Intellectual Context

Here is the existing theoretical debates and empirical context for the proposed research.

3.1 Background of the Topic

3.1.1. China's infrastructure aid to Africa is broadly dispersed

China has been Africa's largest infrastructure financier for 20 years. According to data from Deloitte 2021, China's infrastructure assistance to Africa is dispersed across numerous sectors, including power and energy, transportation, real estate and mining. Figure 2 shows the amount of African investment aid from China from 2001 to 2011.
3.1.2. Africa have prioritized infrastructure development through foreign investment since independence

The share of manufacturing in sub-Saharan Africa's GDP decreased from 10% in 1995 to 9% in 2015, with Ghana and Zambia falling as low as 7%. In recent years, the diversity and maturity of manufacturing in African countries have declined, and de-industrialization has emerged as a major issue for African economies (Brooks, 2016). The majority of African nations have thus adopted the model of attracting foreign investment through the construction of infrastructure.

3.1.3. Africa's extensive markets and current programs

The growth of the urban population, particularly the expansion of the middle class, has increased the purchasing power of the urban population, and consumer spending in Africa is projected to increase from $680 billion in 2008 to $2.2 trillion in 2020, providing Chinese government-related investor with a vast market opportunity (Sautman, 2020). There are currently a few programs promoting infrastructure aid in Africa, including the Africa Infrastructure Knowledge Program (AICD) and the Program for Infrastructure Development in Africa (PIDA).

3.1.4. Risk and Corporate Social Responsibility

Africa is at risk of civil unrest, government corruption and epidemics (Holslag 2009). Companies representing Chinese government to provide infrastructure assistance should also take corporate social responsibility.

3.2 Literature Review

3.2.1. Research on Positive effects of infrastructure aid

Asteriou Dimitrios (2009) uses a 27-year time series dataset of five South Asian economies to analyze the cross-country panel data and concludes that aid can boost the output efficiency of the recipient's economy over time. Using a panel analysis of Ugandan countries from 1992 to 2000, Deininger and Okidi (2003) demonstrate that infrastructure-related inflows, which can break through the boundaries of sluggish development in recipient countries, are crucial to achieving economic transformation.

3.2.2. Research on Negative effects of infrastructure aid

Girijasankar Mallik (2008) examine the effects of aid on the economic growth of countries in the African region that are especially reliant on foreign investment and aid. William Easterly (2013) founds that an overabundance of infrastructure aid would have a negative impact on a recipient nation's internal resource allocation, resulting in a more passive, bureaucratic, and poorly governed government.

3.2.3. Research on Factors Influencing Africa's infrastructure aid

The political climate in Africa is one contributing element. Craig Burnside (2000) find that the poor political environment prevents recipient country from making long-term decisions. The amount of infrastructure aid is another element. Collier (2006) finds that the ideal value of aid to GDP has upper and lower bounds. Once this threshold is exceeded, the positive effects of aid on economic promotion are reduced.

4. Main Research Questions

Globalization connects African countries. The continuous demand for China infrastructure aid and the profound changes in industrial policy have led to rapid changes in the African economy. How does China's infrastructure aid work? How will it affect economy? Until now these issues have remained relatively vague and unclear. To answer these questions, it is necessary to combine the African economy’s background with the institutional reforms.
5. Methodology

5.1 Research Methods and Model

The thesis mainly adopts comparative research method, historical analysis, empirical analysis method and qualitative research methods (i.e., in-depth interviews and text analysis).

Using historical and empirical analysis, the thesis collects data from 2003 to 2022 in 15 African countries and examines the bottleneck restrictions of population, resources, and industrial policy on Africa's economic transition.

Using empirical analysis for data from World Bank about twenty African countries from 2003 to 2022, the thesis here set up four indexes: Economic Transformation Indicator (InEco), Infrastructure Indicators (Infr), Trade Indicator (Tra), and Investment Indicator (Inv). The panel data regression model analyzing the relationship between economic transformation and infrastructure is developed and tested empirically through Software Stata.

\[
InEco_{it} = X_{it}\beta + u_{it} u_{it} = \alpha_{i} + \epsilon_{it}
\]

where \(InEco_{it}=(InEcoi1,InEcoi2,...,InEcoi13)\), \(X_{it}=(Tra,Inv,Inf)\), i.e. \(X_{it}\) is a column vector containing three explanatory variables.

5.2 Test of the Panel Data model

To avoid spurious regression, the study report employs the Levin-Lin-Chu Test and Fisher-type Test (ADF unit-root test). To prevent time lag, the research thesis uses the Hausman test (Table 1).

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5.3 Result of the model

The research thesis shows that at the 10% confidence level, the model is valid and that there is a significant correlation between China-Africa infrastructure investment and African economic transformation. China's infrastructure aid may halt the change of the economy in the medium term, but not in the long run.

6. Ethical Issues

The study seeks ethical approval from the university's committee of ethics and adhere to its criteria.

7. About the author

The author holds a bachelor's degree in economics from Central China Normal University and a master's degree from The Chinese University of Hong Kong. In addition, the author was a full-time research assistant at the university, supported by National Social Sciences Foundation of China. The author has published the research "The Relationship between the Exchange Rate and the Sino-U.S. Trade Surplus: An Empirical Study from 2006 to 2015".

8. Dissemination

The research thesis would be published in national journals and presented at national conferences.
9. Summaries and conclusions

China’s infrastructure aid is critical to accelerating Africa's economic transformation and may halt the African economic transformation in the medium term, but not in the long term. There are some policy recommendations: In light of the panel data model's findings, China should adopt a targeted aid strategy for specific African nations and import cutting-edge technology rather than simply donating money to the continent. This would help to counteract any short-term drawbacks and enhance the long-term impact of China's infrastructure aid on the continent's economic transformation.

References


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