



Impact of infrastructure expenses in strategic sectors for Brazilian poverty

Emerson Marinho^{a,*}, Guaracyane Campelo^b, João França^a, Jair Araujo^c

^a Post-Graduate Course in Economy, University Federal of Ceara—(CAEN/UFC), University Avenue 2700, 2nd Floor, Benfica, Fortaleza, Ceará 60020-181, Brazil

^b University Federal of Ceara—(UFC/Sobral), Department of Economics and Finance, Coronel Stanislaus Fleet s/n, Centro, Sobral-Ce, Block I, Campus Sobral, Mucambinho, Fortaleza, Ceará 62010-560, Brazil

^c University Federal of Ceara, Agricultural Science Center, AC Campus do Pici, Av Mister Hull, Pici, Fortaleza, Ceará 60440-970, Brazil

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Abstract

This paper analyzes the impact of infrastructure investments in the reduction of poverty in Brazil, controlled through other determinants such as economic growth, income inequality, average schooling years, unemployment rate and state budgets from 1995 to 2011. A model for a dynamic panel data, estimated by the generalized method of moments (GMM) in two steps as developed by Arellano–Bond (1991) and Blundell–Bond (1998) found among other conclusions, a significant inverse relation between public investment in infrastructure and poverty. The Granger causality test for panel data proposed by Hurlin and Venet (2001, 2004) and Hurlin (2004, 2005) reinforced results validation.

JEL classifications: H54; I30

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1. Introduction

Historically speaking, all expenses in Brazilian infrastructure have always been the responsibility of the public sector. In the nineties, however, partnerships between the public and private sectors enabled the beginning of significant participation of national and international private companies through privatizations in the telecommunications sector and part of the energy business, road and railroad concessionaries, etc. However, despite these changes, the State continues to be the main responsible agent for the supply of infrastructure.

Seeking to discuss the role of infrastructure in poverty reduction, it must be said that more access to infrastructure services also affects the materialization of the so-called “Millennium Development Goals” (MDG) Brazil is involved in. The contribution of infrastructure to the Millennium Development Goals (MDG) is reflected in the increase in productivity and wellbeing among poor people, thus improving their access to local markets and other regions, optimizing

* Corresponding author.

E-mail addresses: emarinho@ufc.br, emerson.marinho@pq.cnpq.br (E. Marinho), guaracyane@ufc.br (G. Campelo), joamario@caen.ufc.br (J. França), jaraujoce@gmail.com (J. Araujo).

the coverage and the quality of services offered through the improvement of education, health, transportation services, energy, information technology and basic sanitation.

The infrastructure supply is a vital component of the incentive to national economic growth, both for its potential to generate employment and for its influence in all economy sectors. In this sense, it improves economic activity and helps reduce persistent poverty. Additionally, wide access to infrastructure contributes to reduce inequality (Silvia and Triches, 2014; Bertussi and Ellery, 2012; Mussolini and Teles, 2010; Calderon and Serven, 2004; Ferreira and Malliagros, 1998).

Adequate infrastructure is a necessary condition for economic development. Therefore, any growth strategy planned to help the poor must necessarily include the promotion of investment in infrastructure in order to allow wider population access to the positive externalities created by such investments (Hirschman, 1958; Datt and Ravallion, 2002).

An adequate infrastructure is a necessary condition for economic development. Therefore, any growth strategy that involves helping the poor must necessarily contemplate the promotion of infrastructure investments, seeking to allow this population segment a better access to the positive externalities generated by adequate infrastructure.

According to the *Inter-American Development Bank (IDB, 2000)* it is possible to define infrastructure as a set of engineering structures and facilities that are the necessary basis for the development of productive activities such as services, policies, social and personal activities. The regions that directly benefit from infrastructure services achieve positive externalities, attracting industries and human capital, thus increasing productivity and stimulating economic growth.

Among international works that empirically tested the role of infrastructure in the fight against poverty, we should mention those of *Jacoby (2000)*, *Runsinarith (2008)*, *Roy (2009)*, *Ogun (2010)*, *Seetanah et al. (2009)*, *Escobal and Ponce (2001)* and *Aparicio et al. (2011)* among others.

In the local environment, economics literature on the impact of direct public investments in infrastructure for poverty reduction purposes is mainly covered by the works of *Cruz et al. (2010)* and indirectly, by the *Kageyama and Hoffmann study (2006)*.

With this perspective, considering the temporal effect of poverty and using state-provided data, this article analyzes if the results of infrastructure investment policies have affected the dynamics of poverty in Brazil from 1995 to 2011. For this purpose, we applied a dynamic panel data model that uses the Generalized Method of Moments (GMM) developed by *Arellano and Bond (1991)*, *Arellano and Boyer (1995)* and *Blundell and Bond (1998)*. Additionally, the Granger Causality Test was applied for *Hurlin and Venet panel data (2001, 2004)* and *Hurlin (2004, 2005)* which validated results by revealing that infrastructure is an efficient tool to fight poverty. This test points at both the existence of this tool and the causality link between poverty and infrastructure.

The GMM methodology enables to solve the problem of endogeneity in econometric models, as well as to detect the effects of possible omitted variables and measurement errors. In this model, we intend to verify the correlation between poverty and infrastructure, which is measured through the State's public expenses per capita in strategic areas of the economy (energy and mineral resources, transportation, communications, health and sanitation). This relation is controlled by other poverty determinants, such as the gross domestic product (GDP) per capita, average schooling years, income inequality, unemployment rate and the State budgets.

The most common way to measure poverty, because of its simplicity, is the setting of a poverty line, in other words, an income level below which people are classified as poor. The poverty line used is made available by the IPEA (*Institute of Applied Economics Research*) and its value is equal to half minimum monthly salary according to prices of September 2009. The calculation of this line follows the *Corseuil and Foguel method (2002)*. The indicator used to measure absolute poverty was the proportion of poor people.

The poverty line applied in this article was made available by the Institute of Studies on Labor and Society—IETS, for several Brazilian states. This line doubles the indigence line and it is defined as the financial value necessary for an individual to purchase minimum calorie consumption food. The indicator used to measure absolute poverty was the proportion of poor individuals.

Among other important findings, the main one was that public investment in public infrastructure provoked a significant impact on poverty reduction. As for the other determinants, such as the increase in years of schooling, State budgets and the reduction of unemployment, they also contributed to decrease poverty incidence. The same happened with regards to the State GDP per capita, however this impact has been lower than that of income inequality. This fact may be due to the high income concentration found in Brazil, which in a certain way amortizes the effects of economic growth.

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