Economic development and growth in Colombia: An empirical analysis with super-efficiency DEA and panel data models

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ARTICLE INFO

ABSTRACT

In this paper, we analyse economic development and growth through traditional measures (gross domestic product and human development index) and Data Envelopment Analysis (DEA) in Colombian departments over the period 1993–2007. We use a DEA model to measure and rank economic development and growth from different approaches such as poverty, equality and security. The results show considerable variation in efficiency scores across departments. A second-stage panel data analysis with fixed effects reveals that higher levels of economic activity, quality life, employment and security are associated with a higher efficiency score based on the standards of living, poverty, equality and security. All findings of this analysis should demonstrate that economic development and growth could be achieved most effectively through a decrease in poverty, an increase in equality, a reduction in violence, and improved security. This indicates the need to generate effective policies that guarantee the achievement of these elements in the interest of all members of society.

1. Introduction

In recent years, scholars have come to recognise that weak or ineffective states generate insecurity, conflict, violence, political instability, human rights violations, poverty and corruption; this is reflected by a decrease in the economic growth and development of regions or countries with poor governance and management [28,50]. Therefore, improvements in the effective presence of the state through good governance and management are key strategies to foster economic growth and development as well as population welfare and to decrease the potential for conflicts and violence.

Fragile states are usually found in developing countries. Therefore, and with the aim of achieving the Millennium Development Goals (MDGs), it is important to improve governance and management to obtain stability, decrease poverty and increase economic development and growth. There is a general agreement that improvements in economic development and growth are more effective where there are good policies and strong institutions; likewise, the strategies to reduce poverty require a high degree of state effectiveness to create adequate management through the application of high quality strategies, programs and instruments [14].

The academic literature refers to economic growth when dealing with proportional changes in gross domestic product (GDP) or a sustained increase in per capita or per worker product, most often accompanied by an increase in population and usually by sweeping structural changes [2,6,40]. On the other hand, development analyses living standards and the literature include features that are not necessarily appropriate monetary indicators. Thus, the concepts of economic development and growth are currently oriented toward creating a suitable environment where individuals can strive to enhance welfare, make use of available technology and acquire new knowledge in a secure environment [15].

Economic growth and development have a strongly relation. Economic growth supplies the resource to drive a rise on development and enhancements in the human development guarantee economic growth by the increment in the quality of labour force. Economic development is the improvement in the standard of living of population with sustained growth from a simple, low-income economy to an advanced, high-income economy (See Fig. 1). When the quality of life betters this generate development, which include process and policies that raise the economic, political and social wellbeing of the nation's society. The purpose of development policies is to accumulate several productive factors to begin a sufficient economic growth that causes improvements on standard of living, reduction of inequalities, and increases welfare of population [34,65–69]. Fig. 1 also shows some preliminary baseline patterns of the relationship between Economic development (in particular,
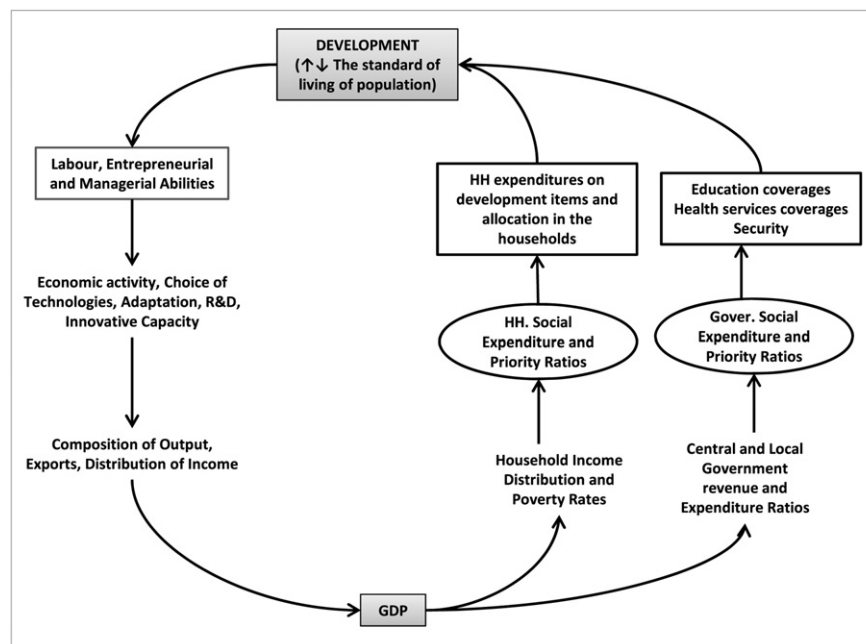
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Fig. 1. Economic growth and development. Source: Based on Refs. [34,66].

Standard of living, poverty, equality, security and human development) and Economic Growth. The relations reported in this figure are not causal, but provide evidence of interesting relations for the analysis in Sections following.

The most widely used indices for ranking countries according to economic development and growth are GDP or, more frequently, GDP per capita, and the human development index (HDI).[1] GDP is used mainly as an economic indicator to measure and compare the welfare, standard of living or economic wellbeing of different countries or regions, whereas the HDI is an annual publication of the United Nations Development Program (UNDP) that analyses global human development in the Human Development Report. In addition to country rankings, poverty, literacy, education, and life expectancy are all used to determine countries' level of development.

In the current scholarly literature, it is widely accepted that traditional measures of economic development and growth such as GDP or per capita incomes and HDI can provide only an incomplete picture of how well countries or regions are doing because these indexes exclude other important socioeconomic variables [33,39,44,77]. In the case of GDP, the relationship between economic growth and social welfare is not straightforward. This index is limited because it does not incorporate various aspects that determine individual and environmental wellbeing, such as the value of non-market goods and services (e.g., ecosystem services, unpaid labour, and leisure) or distributional issues and because it focuses on current economic activities or flows, rather than on the developments in natural, economic and social capital, which are important from a long-term perspective [9].

However, HDI also does not indicate other important variables, including environmental degradation, security or inequalities within countries and between sexes, and depends on data that are not always available, particularly in low-income countries (e.g., on life

expectancy, literacy and education). This index could be redundant as a development indicator: if there is a major and positive correlation between HDI and any of its components, it offers few additional insights into inter-country development levels [5,47].

Studies to measure and rank economic development and growth across countries have used varied approaches. For example, Peniwati and Hsiao (1987) [56] suggested a composite index that included GNP per capita, physical quality of life, percentage of national income received by the poorest 40%, population density in agricultural areas, political rights and civil liberties, number of telephones per capita and number of drug-related offenses. They found that GNP and equality rankings had the widest variations, whereas rankings in terms of the index of physical quality of life and the index for measuring net social progress showed the narrowest variations. Bassanini and Scarpetta [7] analysed the driving forces behind economic growth in OECD countries using panel data and found that differences in investments rates, human capital, R&D, trade exposure, financial structures, macroeconomic conditions and policy settings seem to play an important role in determining observed GDP per capita patterns across countries. Changes in these factors can be rapidly translated into changes in living standards [8].

Analysing HDI, Nagar and Basu (2001) [52] adopted the latent variable approach to analyse 174 countries, and they confirmed that with the addition of other socioeconomic, the alternate HDI rankings differ significantly from the official UNDP ranking. Dowrick et al. (2003) [25] suggested an index to incorporate GDP, consumption and life expectancy, demonstrating that the HDI implicitly values life expectancy over its opportunity cost and that estimates of the effect of human capital investment on economic growth may understate the welfare benefits if they measure growth solely in terms of GDP and ignore important indicators such as life expectancy. Grimm et al. [33] suggested a methodology to introduce inequality in the three dimensions of HDI, which allows a comparison of the degree in human development of the poor with the level of the non-poor within and across countries. They found that inequality in income is generally higher than inequality in education and life expectancy and that the HDI rankings differ more in moderately developed countries, whereas in very rich and very poor countries, the differences are lower.

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[1] HDI was developed in 1990 by Mahbub ul Haq [70], and has been assessed and published since 1993 by United Nations Development [71]. The objective of the Human Development Report is to "capture better complexity of human life" by providing a quantitative approach to combining various socioeconomic indicators into a measure of human development [72].