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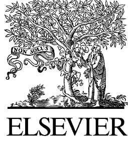

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Capturing the effects of changing capital-intensity on long-term growth in developing countries☆

Fred Campano[a], Alberto Costantiello[b], Dominick Salvatore[a,*]

[a] *Department of Economics, Fordham University, Brox, NY 10458, United States*
[b] *LUM, Casamassima, 73125 Bari, Italy*

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1. Introduction

As the year 2015 winds down, one finds this encouraging note on the United Nations website in regards to the Millennium Development Goals (MDG) for the least developed countries (LDCs).

> The *Millennium Development Goals* have been a great success in many ways. Plans are now being made within the UN system to ensure that *sustainable development goals* can be set (and met) as well. The General Assembly's *Open Working Group on Sustainable Development Goals* is now formulating a set of SDGs, which will be integrated into the *UN's post-2015 development agenda*.

The main goal of raising the incomes of all people in developing countries up to the poverty threshold of about $1 a day was essentially accomplished. The target of $1 a day has been around since the 1970s, however, since the dollar continually changes in value, from time to time a more precise definition of what dollar would be the basis of the goal. That is, the base year of the dollar and its relationship to other currencies had to be taken into account. International dollars (more widely known as purchasing power parity dollars or PPPs) seem to be the logical

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* Corresponding author. Tel.: +1 718 817 4048; fax: +1 914 337 3355.
E-mail address: Salvatore@fordham.edu (D. Salvatore).

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choice. Nevertheless, it appears that the $1 a day goal has been met, although we cannot say for sure because the national accounts for 2015 are not yet finalized, but there are some caveats which remain. While the LDCs collectively did very well in terms of growth rate of GDP, there was a range of performance among the countries. Some were able to achieve higher returns on investment than others and many of the countries went through one or more cycles of foreign debt crisis. This has become a central area of concern to the international community. Since 1996, the International Monetary Fund and the World Bank (2016) have been collaborating and developing strategies to help heavily indebted poor countries (HIPCs) avoid future crisis. This has been coined "debt sustainability" and now guide lines for *Sustainable Development Goals* are being made within the UN system to ensure that the post 2015 development will be as debt crisis free as possible.

In this paper, we project the future outcome for some 33 of the 48 LDCs under scenarios which close the discrepancies in the use of investment in generating GDP growth. The outcomes will be in terms of closing the differences between countries in the efficiency of investment to promote growth and reaching the post 2015 poverty threshold guidelines. Because we are simulating the efficiency of gross capital formation in producing growth of GDP, the changes that result do not imply additional increases of investment, and thereby contributing to sustainable development objectives by relieving some of the pressure to borrow.

2. Capital intensity and growth

A rather counter-intuitive notion is that as a country becomes more developed and consequently more capital-intensive, it becomes less efficient in converting investment into growth. This is best illustrated by comparing the incremental capital output ratio (ICOR) for different groups of countries. In Table 1 we show the quartile values of the ICOR for 28 developed countries, 24 Latin American and Caribbean countries, 20 Asian countries and the LDCs.

In the above table we show the Latin American and Caribbean group higher on the development scale than the Asian Group. Some may argue that when seen from a capacity to produce manufactures that is not true. We are basing our ranking on average level of per capita GDP, but we also recognize that some members of each of these two groups belong in the Least Developed (i.e. Haiti and Afghanistan) and some members should be considered Developed (i.e. Republic of Korea and Bermuda). But nevertheless, there is a rise in the ICOR which is broadly correlated with per capita income. One also notices in this table that the inter-quartile spread is less in Asia than in all other groups. This is an indication that investment efficiency is relatively uniform in Asia.

Table 1
Incremental capital-output ratios by quartile and level of development (average 1995–2013).

Level of development	Q_1	Median	Q_3
Developed	10.36	14.72	17.49
Latin America and Caribbean	4.05	5.36	9.04
Asia	3.99	4.29	5.375
Least developed	2.93	4.27	6.63

Source: Based on computations of the national accounts data supplied by the United Nations Statistical Division.
The regression equation $Y_{t+1} = a + b\sum I_t$ was used to compute ICOR = 1/*b*.

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