Cross-Country Income Differences Revisited: Accounting for the Role of Intangible Capital

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Paper Abstract: Living standards, as captured by average income per person, vary drastically across countries. According to the estimates of the World Bank, the ratio of 90th to 10th percentile in the world income distribution is at a factor of 28 in 2012. What can explain such enormous differences in income per capita across countries?

Based on the Solow growth model, economists have been seeking to provide answers around two proximate determinants: differences in factors of production and in efficiency. This analytical framework is formally known as the development accounting analysis. The main idea of this analysis is that by using cross-country data on output and inputs at one single point in time, development accounting quantifies how much of the cross-country variation in income can be explained by the observed differences in the factors employed in production and how much is left to be explained by the differences in efficiency as measured by total factor productivity (TFP)? The latter is backed out as a residual, which is everything that cannot be accounted for by the observables. The current consensus is that TFP plays a predominant role in accounting for differences in per capita income, and the observed differences in factor inputs merely explain a very small share (e.g. Easterly and Levine, 2001; Caselli, 2005; Mutreja, 2014).

This paper aims to extend the existing works on international income differences by accounting for an important factor of production that has been wrongly ignored so far, namely intangible capital. An emerging research agenda on intangible investment has shown that investment in intangible assets, such as brand equity, scientific research and development (R&D), and organizational structures, has become increasingly the more important forms of investment in the modern economy and these investments have escaped the statistical net until very recently. Thanks to the pioneering measurement work of intangible investment by Corrado, Hulten and Sichel (2005), evidence is growing stronger that there is a gradual shift in investment composition towards intangible assets. In some high-income countries, such as the US, intangible investment as a share of GDP had already exceeded the share of traditional investment in tangible assets (e.g. machinery and equipment) by the early 1990s, and has kept on rising over time. It seems that the traditional emphasis on physical capital as the only capital input is missing out on an increasingly important part of investments in advanced economies. Hence, inputs can potentially explain more of cross-country income differences than is generally known so far and can more accurately explain the productivity trends.

Based on various data sources, this paper develops a new intangible investment database that is consistent and internationally comparable for a sample of 60 economies and over the period of 1995-2011. Under the development accounting framework, this paper shows that the fraction of cross-country income variation explained by the observed differences in factor inputs increases significantly after taking intangible capital into account. In the baseline specification, the explanatory power of the observed inputs is about 43 percent; while this rate is much lower (25%)
if intangible capital were wrongly ignored in the analysis. This evidence suggests that intangible capital plays a very important role in explaining cross-country variation in income and significantly diminish the role of TFP. Depending on the assumptions regarding the income share of factor inputs, the observed differences in intangible capital can account for up to 18% of the cross-country income variation.