An Attempt to Measure the Differences in Productivity of Nations: A Stochastic Frontier Approach

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Abstract
It is broadly accepted that differences in efficiency and productivity growth are important contributions to the enormous differences in the wealth of nations. Technical inefficiency is estimated for a panel of 40 countries, 34 of which are OECD-members and the remaining 6 are emergent economies, for the period of 2001-2011, using a stochastic frontier model. Environmental variables are found to have an important role in explaining differences in technical inefficiency across countries. In particular, a high contribution of the agricultural sector and natural resources rents to the economy, trade barriers, a bad business environment, a high number of patents, a high level of government debt and the financial crisis contribute negatively to technical efficiency. On the other hand, a good health status and good institutions help countries to be located closer to the frontier. Total factor productivity (TFP) growth is computed and decomposed using a primal frontier approach. The relative importance of the TFP change and total factor accumulation to economic growth is also analyzed. The results show that differences in factor accumulation between OECD and emergent economies are important to explain differences in the growth rates of GDP per worker. Over 2001-2011, the general improvement in technical efficiency of countries is outweighed by technological regress.

Keywords: Technical efficiency, environmental variables, total factor productivity growth, stochastic frontier analysis.