

Paper submitted to session 4B on Intergenerational Disadvantage

**Title of paper:
Estimating an Educational Production Function
for Five Countries of Latin America on the basis of the PISA data.**

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Paper outline¹

This paper takes a new look at the concept of education production function, on the basis of the results of the 2006 OECD PISA (Programme for International Student Assessment) survey for five Latin American countries: Brazil, Chile, Colombia, Mexico and Uruguay. It adopts an efficiency analysis perspective, an approach which in itself is not new, but, rather than selecting as inputs a few variables among the many that are available in this survey, it attempts to include the maximum amount of available information. Such an approach is made possible because in a first stage the huge amount of relevant information available on the production of education is aggregated via the use of Correspondence Analysis (CA). Before estimating the degree of efficiency of education production, an important distinction has to be made between what should be considered as discretionary inputs and which are really the only ones that should be taken into account when measuring the efficiency of educational production, and factors which are likely to have an impact on the efficiency of transforming these inputs into outputs. To measure efficiency we use the stochastic production frontier approach. However rather than focusing on educational production by educational institutions we analyze efficiency at the individual (student) level. Once such individual efficiency measures are obtained, we analyze via an OLS regression the determinants of this efficiency. In the final stage of the analysis, using the so-called Shapley decomposition, we attempt to determine the exact impact on efficiency of each of the non discretionary variables that are considered as determinants of efficiency.

In the first stage of the analysis, on the basis of country-specific regressions, we concluded that the location of the school and the self-rated ability of the student had the greatest impact on the efficiency with which a student is able to transform the discretionary inputs at his/her disposal into test scores. The human capital of the parents, the degree of autonomy of the school and the type of school funding appeared also to play an important role. Note that there were important differences between the countries in the relative importance of the different determinants.

In the second stage of the analysis, a unique regression was estimated for all the countries. We then concluded that between countries differences explained 41% of the

¹ A preliminary complete version of the paper is available upon request.

R-square. The other important variables were respectively the location of the school, the self-rated ability of the student, the characteristics of the school and finally the gender of the student.

Given the importance of the location of the school as well as of its characteristics which together explain approximately a third of the R-square, we can quite safely conclude that there is room for policy implications. By improving the quality of schools in rural areas and small cities as well as by taking a closer look at the relative importance of factors such as the degree of autonomy of the school, the type of school funding, the degree of transparency of the information available on the school and the degree of its homogeneity, public authorities can certainly have an impact on the efficiency with which students transform discretionary inputs into test cores.