
Chapter 2

Relationship between skills and economic growth

This chapter introduces the research on the connection between economic growth and the skills of a population, and briefly discusses some of the difficulties and uncertainties encountered in making this connection.



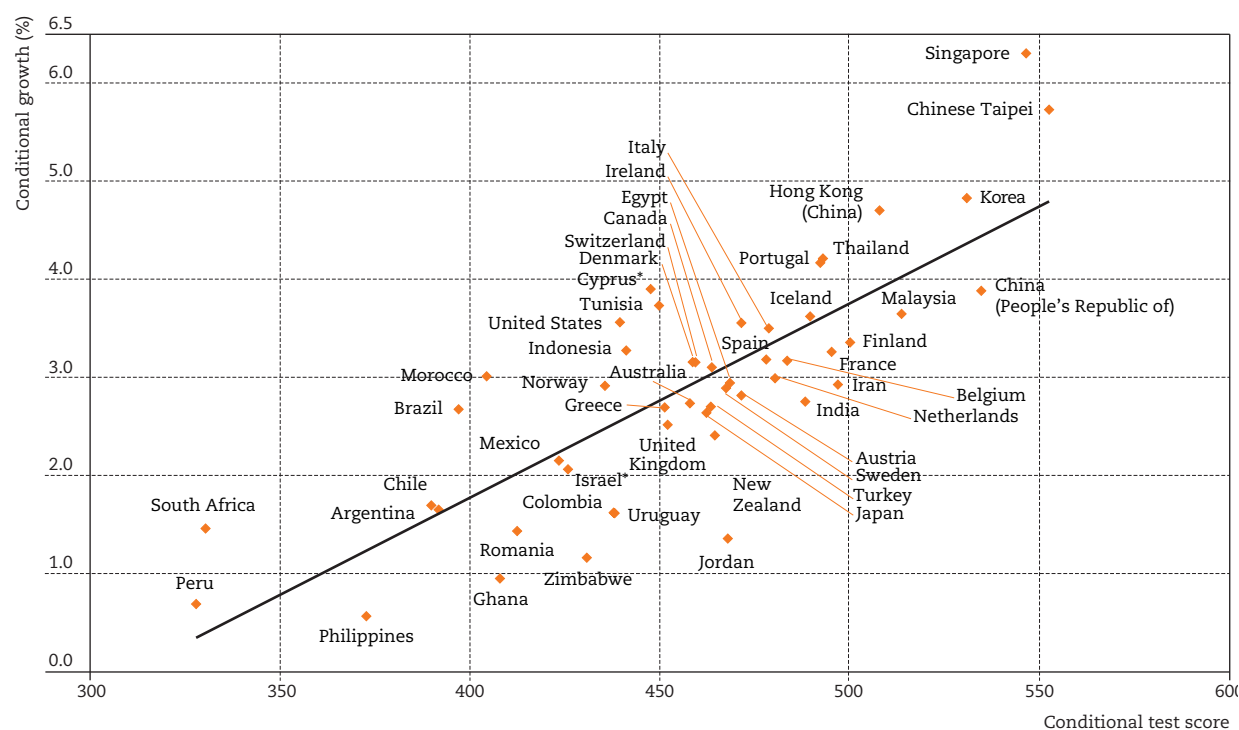
The process of economic growth has interested economists for much of the past century, but until recent decades, most studies remained as theory with little empirical work. Over the past 25 years, economists have linked the analysis much more closely to empirical observations and, in the process, rediscovered the importance of growth. The analysis, mirroring much of the recent empirical work, concentrates on the measurement of human capital and its role in describing why some countries have grown faster than others.

The existing empirical analysis of growth is now extensive, but this work has not always been convincing or successful. Extracting the fundamental factors underlying growth differences has proven difficult. This report builds on prior analysis by the authors that resolves the most important uncertainties in understanding long-run growth (Hanushek and Woessmann, 2015). That analysis shows that growth

is directly and significantly related to the skills of the population. The key is measuring skills properly. In that work, as below, skills are measured by the aggregate test scores on international mathematics and science tests. The conclusion is that a population's knowledge capital, or collective cognitive skills, is by far the most important determinant of a country's economic growth.

Perhaps the easiest way to see the relationship is to plot the marginal impact of knowledge capital on long-run growth. Figure 2.1 depicts the fundamental association graphically, plotting annual growth in real per capita GDP between 1960 and 2000 against average test scores, after allowing for differences in initial per capita GDP and initial average years of schooling. Countries align closely along the regression line that depicts the positive association between cognitive skills and economic growth.¹

FIGURE 2.1 KNOWLEDGE CAPITAL AND ECONOMIC GROWTH RATES ACROSS COUNTRIES



* See notes at the end of this chapter.

Notes: Added-variable plot of a regression of the average annual rate of growth (in %) of real per capita GDP from 1960 to 2000 on average test scores on international student achievement tests, average years of schooling in 1960, and initial level of real per capita GDP in 1960 (mean of unconditional variables added to each axis).

Source: Hanushek and Woessmann (2015).

This basic relationship underlies the discussion of a development goal defined in terms of skills, and of the economic implications of meeting such a goal. The plausibility of using these estimates as the basis of projections into the future must also be considered. Virtually all past economic analyses of the long-run growth of countries have highlighted a role for human capital, but the validity and reliability of the empirical analysis have been open to question (Pritchett, 2006). There have been concerns about the instability of estimates, which has been seen as evidence of mis-specified relationships that likely omit the influence of other factors. There has also been

concern about reverse causality – i.e. the possibility that growth causes expansion of schooling rather than the opposite. As summarised in Annex A and laid out in detail in Hanushek and Woessmann (2015), these prior concerns can be satisfactorily answered once skills are correctly measured, and the basic growth relationships can support a detailed analysis of the economic implications of improving a nation's knowledge capital.

While the complete analysis of these statistical and modeling issues can be complicated, a summary is provided in Annex A, with appropriate references to more detailed analysis.

NOTES

1. The statistical model underlying Figure 2.1 is displayed in Annex Table A1 (column 3).

REFERENCES

- Hanushek, E.A., and L. Woessmann (2015), *The Knowledge Capital of Nations: Education and the Economics of Growth*, The MIT Press, Cambridge, MA.
- Pritchett, L. (2006), “Does learning to add up add up? The returns to schooling in aggregate data”, in E.A. Hanushek and F. Welch (eds.), *Handbook of the Economics of Education*, North Holland, Amsterdam, pp. 635-695.

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Note by Turkey

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