Title: The value of smarter teachers: International evidence on teacher cognitive skills and student performance

Authors
Marc Piopiunik, Simon Wiederhold (Ifo Institute, Germany) & Eric A. Hanushek (Stanford University, USA)

Abstract
Numerous international assessment tests have shown that the cognitive skills of students differ greatly across developed countries. These differences are consequential because the cognitive skills of the population have been shown to be an important driver of a country’s long-run economic growth. International differences in teacher quality are commonly hypothesized to be a key determinant of these student performance gaps, but lack of consistent quality measures has precluded testing this. The PIAAC data for the first time allow to measure teacher cognitive skills consistently across countries.

We first show that teacher cognitive skills differ widely internationally. To investigate the impact of teacher cognitive skills, we pursue two different strategies. First, we estimate OLS models with extensive sets of control variables, including student and family background, school inputs, institutional features of school systems, and countries’ level of economic development. Controlling for parent cognitive skills allows accounting for the persistence of skills across generations. Second, we exploit student and teacher performance across two subjects in a fixed-effects model. This controls for non-subject-specific differences across countries and student-specific characteristics that similarly affect math and reading.
performance. The results indicate a robust impact of teacher cognitive skills on student performance. In the OLS models, a one standard deviation (SD) increase in teacher cognitive skills is associated with about 0.1 SD higher student performance in both math and reading. The fixed-effects estimates are slightly smaller (0.07 SD).

We also provide evidence about the determinants of international differences in teacher cognitive skills. Existing studies have documented a strong decline in teacher cognitive skills in the U.S. during the past decades, which has been explained with improving alternative labor market opportunities for women. We generalize this evidence to a much broader set of countries, exploiting within-country changes across birth cohorts in the proportion of females working in high-skilled occupations. We find that a higher share of women working in high-skilled occupations other than teaching is significantly related to a lower cognitive skill level of teachers, particularly of female teachers. Differences in women's opportunities to enter high-skilled occupations therefore partly explain differences in teacher cognitive skills across countries.

Title: Skill gain and loss in North American labour markets: Skill supply is not enough

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Abstract
Economic policy in Canada has focused on increasing the supply of skill at the expense of increasing the demand for key cognitive skills or the efficiency of the markets that put them to productive use. Our analysis documents rapid increases in the occupational demand for literacy skill and profiles changes in skill supply since 1994. Despite massive investments in post-secondary education the supply of literacy skill is actually falling. Our report uses synthetic cohort analysis to isolate and explain massive adult skill loss. The evidence suggests that skill loss can be traced to the fact that the majority of jobs impose very low levels of cognitive skill demand. This finding suggests that public policy must begin paying attention to increasing the economic demand for skill and to improving the efficiency of the markets that match this demand to workers skills. Simply investing in the creation of new skills is not enough.

Title: The impact of skill supply and demand on participating in job-related training in Europe

Author
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Abstract
Updating and upgrading skills of the population is increasingly important on the agenda of European countries. However significant inequalities remain in access to training opportunities and participation in non-formal education. The research has concentrated strongly on the supply of skills, i.e. individuals’ education and skill levels, but the demand side has been relatively neglected. In this paper I will analyse countries with different skill formation strategies, taking into account both labour supply and demand characteristics, influence on participation in non-formal job-related education. I use data from the Programme for the International Assessment of Adult Competencies and country statistics from the OECD and Eurostat to describe the skill formation strategies of different countries. The purpose of the study is to create a better understanding of the interplay between skill
demand and supply in countries with different skill formation strategies in order to provide valuable information on the transferability of policy measures within the European Union.

Title: Having the right mix: The role of skill bundles for comparative advantage and industry performance in global value chains

Authors
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Abstract
The international trade literature provides important insights on how countries' skill endowments affect their comparative advantage and specialization in international trade. However, empirical studies have mainly used the Heckscher-Ohlin-type framework to estimate the effects of countries' skill endowments on their comparative advantage. Thereby, workers are assumed to possess only one type of skill (mostly measured by educational attainment) and only countries' relative endowment with workers of different skill levels matters for countries' specialization in international trade. In contrast, Ohnsorge and Trefler (2007) argue that it is the bundling of various skills at the worker level (skill bundles) and their joint distribution within countries that matter for countries' specialization patterns. This study tests the theoretical model of Ohnsorge and Trefler (2007) using the assessed cognitive skills from the OECD Survey of Adult Skills (PIAAC) and the OECD Trade in Value Added (TiVA) database. Results indicate that the trade effect explained by the skill bundle distribution is much larger than the traditional Heckscher-Ohlin effect of relative skill endowments.