

# Workers' Skills Are Crucial for Success on Modern Labor Markets

**Simon Wiederhold** [Ifo Institute Munich – wiederhold@ifo.de]

**Ludger Woessmann** [University of Munich and Ifo Institute – woessmann@ifo.de]

Evidence from the new Programme for the International Assessment of Adult Competencies (PIAAC) suggests that skills are highly valued in modern economies. On average, going up one (out of five) PIAAC proficiency levels is associated with an 18 percent wage increase. But the labor-market returns to skills differ widely across European countries, from 12 to 24 percent.

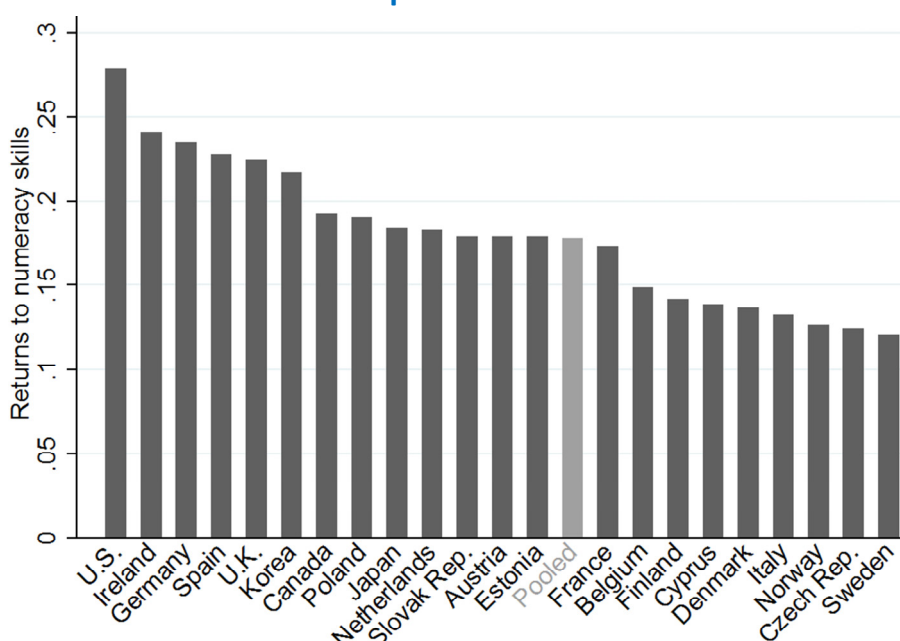
It has long been reckoned that the skills of the population are a key ingredient in knowledge-based economies, which is why the European Union emphasizes the development of a skilled workforce. PIAAC, the new OECD study of adult skills, for the first time allows us to quantify how different modern economies value skills.

PIAAC was designed to measure key information processing skills that individuals need to advance in their jobs and participate in society. Drawing representative samples of adults in each country, the survey assessed skills in numeracy, literacy, and problem solving in technology-rich environments.

These new data allow us to measure how labor markets reward skills in 18 European and 4 additional countries. We estimate the returns to skills as the increase in hourly wages when skills increase by one out of five proficiency levels in PIAAC. Our analysis focuses on workers aged 35-54 who are full-time employed, because prime-age earnings best approximate lifetime earnings.

Higher cognitive skills are systematically related to higher wages in all 22 countries (see Figure). The effect size of the returns is economically important: On average, an increase in numeracy skills by one out of five proficiency levels in PIAAC is associated with an increase in wages by 18 percent across countries.

**Returns to skills in 18 European and 4 additional countries**



The graph depicts the percentage by which hourly wages increase on average with each standard deviation in numeracy skills, which is roughly one out of five proficiency levels in PIAAC. Estimates refer to prime-age full-time employees and control for gender and work experience. Source: see reference overleaf.

## WHAT ACCOUNTS FOR THE SUBSTANTIAL DIFFERENCES ACROSS COUNTRIES?

But perhaps the most striking finding from the international analysis is the substantial variation in returns to skills across countries. Estimated returns to skills in the countries with the highest returns (the United States, Ireland, and Germany) are roughly twice as large as in the countries with the lowest returns (Sweden, the Czech Republic, and Norway). Eight countries, including all Nordic countries, have returns between 12 and 15 percent, whereas six countries are above 21 percent with the largest return being 28 percent in the United States.

Having established the pattern of returns to skills across countries, the cross-country dimension of the analysis allows us to provide stylized facts about what accounts for differences in returns to skills across countries. Intriguingly, returns to skills are systematically lower in countries with higher union density, stricter employment protection legislation, and larger public sectors. By contrast, product-market regulations and the existence of a minimum wage are not systematically related to differences in skill returns across countries. Skill returns also do not vary systematically with the level or distribution of skills in a country.

## ONLY SMALL DIFFERENCES ACROSS SUBGROUPS

Differences in returns to skills across subsets of workers also show interesting patterns. On average, women and men have identical returns. By contrast, observed skills make somewhat more difference for natives than for immigrants, for full-time than for part-time workers, for private-sector than for public-sector workers, and for workers with high rather than low socioeconomic background. However, any of these differences are limited, and returns are substantial even in the subgroups with lower returns. Still, there are important country differences in these patterns.

The skill-earnings associations prove immensely robust in a variety of further dimensions. For example, they hardly change when accounting for earnings

differences across migration status, parental education, or industries. The same is true when using monthly rather than hourly earnings, adding bonus payments, or including the self-employed.

Perhaps surprisingly, though, returns to literacy and particularly numeracy are quite consistently higher than returns to problem solving, a construct developed to measure skill demands in technologically-based economies.

The age pattern of returns indicates that the prime-age workers considered here have skill returns that are on average 4 percentage points greater than for labor-market entrants aged 25-34. By contrast, returns for workers aged 55-65 are close to the ones of prime-age workers. This age pattern underscores the problem of previous studies that relied just on the experiences of younger workers in evaluating the economic role of skill differences. Only the participating transition economies in Eastern Europe do not show this age pattern, probably reflecting the loss of human capital to older workers when their economies changed after the fall of the Iron Curtain.

Beyond wages, higher skills are also systematically related to a higher likelihood of being employed in the first place.

## THE IMPORTANCE OF SKILL DEVELOPMENT

Much of the international discussion of educational policy is centered on school quality and student achievement. To understand the full economic implications of these discussions, it is necessary to go beyond labor-market analyses of the mere length of school attainment and directly investigate the role of acquired skills.

Overall, the results show that modern knowledge-based economies highly reward skills. This puts the focus on policies for skill development at all levels – from the education provided before and in school to lifelong learning opportunities on and off the job – and on policies that ensure that skills are effectively retained and used. The new results emphasize that such policies are crucially important to secure the prosperity of European citizens in the future.

For more details see: Eric A. Hanushek, Guido Schwerdt, Simon Wiederhold, Ludger Woessmann, *Returns to Skills around the World: Evidence from PIAAC*. OECD Education Working Paper 101, Dec. 2013.