Symposium III

Symposium: The economics of skills

Chair
Ludger Wößmann (Ifo Institute and University of Munich, Germany)

Room: Joseph Haydn

Abstract
PIAAC provides the unique opportunity to study both the consequences and the determinants of economically relevant skills. This session will combine two papers from both streams of analysis to shed new light on the economics of skills. On the one hand, two studies analyze how skills are demanded in permanent and temporary jobs and how ICT skills affect workers' earnings on the labor market. On the other hand, two studies analyze how school systems affect adult skills as measured in PIAAC – one focusing on the effects of central school exams, the other on the quality of compulsory schooling as measured in PISA. Together, the four studies help to deepen our understanding of economic consequences and determinants of adult skills.

Presentations

- **Title:** Permanent jobs, employment protection and job content.
  **Author:** Lawrence M. Kahn *(Cornell University, USA)*

- **Title:** Returns to ICT skills.
  **Authors:** Simon Wiederhold, Oliver Falk & Alexandra Heimisch *(University Eichstaett-Ingolstadt and Ifo Institute Munich, Germany)*

- **Title:** Central school exams and adult skills: Evidence from PIAAC.
  **Authors:** Guido Schwerdt, Lisa Leschnig & Katarina Zigova *(University of Konstanz, Germany)*

- **Title:** Lasting effects of quality of schooling revealed by combining PIAAC and PISA at country level.
  **Author:** Jan-Eric Gustafsson *(University of Gothenburg, Sweden)*

**Title: Permanent jobs, employment protection and job content.**

**Author**
Lawrence M. Kahn *(Cornell University, USA)*

**Abstract**
"Using Programme for the International Assessment of Adult Competencies (PIAAC) data for 21 countries, I study the impact of employment protection laws (EPL) on job content. Economic theories predict that stricter protection increases workers' willingness to make firm-specific investments. These theories also predict that stricter protection leads firms to raise their hiring and promotion standards for permanent jobs. Both of these mechanisms predict higher levels of job content in permanent than in temporary jobs; further, it is predicted that stricter EPL increases the gap in job content between permanent and temporary jobs due both to workers' investments and firm hiring standards. I found support for both sets of predictions. First, in almost all cases, workers' self-reported..."
use of influence, reading, writing, planning, numeracy and ICT skills, and their task discretion, were higher in permanent than in temporary jobs. Second, stricter EPL raised the gap in job content for influence, reading, writing and planning skills used in permanent jobs vs. temporary jobs, controlling for industry, occupation and human capital. This finding suggests that workers are making firm-specific (or perhaps occupation- or industry- specific) investments that raise their productivity levels and thus warrant higher level job content. These effects became larger when I did not control for industry, occupation, government employment, and human capital variables including schooling, actual labor market experience, cognitive test scores and nativity status. The larger effects of EPL without these controls provide some indirect support for the idea that EPL leads firms to raise their hiring standards.”

Title: Returns to ICT skills.

Authors
Simon Wiederhold, Oliver Falk & Alexandra Heimisch (University Eichstaett-Ingolstadt and Ifo Institute Munich, Germany)

Abstract
How important is mastering information and communication technology (ICT) in modern labor markets? We answer this question with unique data on ICT skills tested in 19 countries. Our two instrumental-variable models exploit technologically induced variation in broadband Internet availability that gives rise to variation in ICT skills across countries and German municipalities. We find that a one-standard-deviation increase in ICT skills raises earnings by about 25 percent. Exogenous broadband availability cannot explain numeracy or literacy skills, suggesting that estimated returns are unaffected by general ability. One mechanism driving positive returns is selection into occupations with high abstract task content.

Title: Central school exams and adult skills: Evidence from PIAAC.

Authors
Guido Schwerdt, Lisa Leschnig & Katarina Zigova (University of Konstanz, Germany)

Abstract
“Centralized exit exams are often hypothesized to favorably affect incentive structures in schools. While previous research indeed provides evidence on positive effects of centralized exams on test scores of students, critics warn that this finding may simply reflect differences in students’ test-taking ability, rather than actual differences in knowledge and skills. If that were so, central exams would not genuinely improve human capital that affects productive skills of adults. Indeed, the existing evidence on the relationship between central exams and labor market outcomes is at best mixed.

We provide first direct evidence on the relationship between the type of exit examination at the end of secondary school and skills of adults based on PIAAC. The PIAAC data allows a comprehensive analysis of the relationship between central exams and cognitive skills as well as labor market outcomes. We supplement the PIAAC data with specifically collected data on the type of exit examinations for 31 participating countries in PIAAC over the last 50 years. This allows us to study the potential impact of central exams on adult skills by exploiting the cross-country and within-country variation in exam types over time.

Our findings suggest a substantial positive effect of central exit exams on adult skills. Conditional on covariates, individuals in education systems with centralized exams at the end of high school are associated with more than 20 percent of a standard deviation higher skills
during adulthood. Taking unobserved country variation into account, graduates in central exam regimes still significantly outperform graduates of schools using local exams by more than 6 percent of a standard deviation. Our results are robust to a large set of alternative specifications and robustness checks. In particular, by exploiting variation in exam types across German federal states, we document that central exam effects of a similar magnitude exist within a single country. In sum, our findings support the hypothesis that centralized exit exams have long term productivity-enhancing effects.

**Title:** Lasting effects of quality of schooling revealed by combining PIAAC and PISA at country level.

**Author**
Jan-Eric Gustafsson *(University of Gothenburg, Sweden)*

**Abstract**
"Differences in level of performance on cognitive tasks between different age cohorts may be due to age effects, such as maturation or decay. However, they may also be due to cohort-effects, implying that persons belonging to a certain age-group have experienced common influences conducive to performance, such as better nutrition, less environmental pollution, improved mass media, more education, or better education. The main aim of the study was to investigate to what extent quality of compulsory schooling is reflected in performance differences between age-cohorts.

Data for 20 countries participating both in the five rounds of the PISA survey between 2000 and 2012 and in the cross-sectional PIAAC survey of adult skills conducted in 2012 were analyzed. The idea was that trends in levels of achievement at age 15 can be estimated with the PISA survey and that these trends may be reflected in the PIAAC data as differences in level of performance between younger and older age groups.

For each country the PISA data was used to estimate linear achievement trends for literacy and numeracy across the five PISA rounds to indicate change in quality of schooling. For the PIAAC data mean differences were computed between a younger (16 – 19 years) and an older (25 – 29 years) age group. The regression coefficients indicating country-level change in PISA performance were then related to the PIAAC performance differences between age groups with scatter plots and regression analysis. Results showed that age-group performance differences were strongly and significantly related to the PISA achievement trends \( r = .70 \). Furthermore, the relations held up when controls were introduced for level of education attained (beta = .55) and for general social and cultural development of the country (beta = .48).

It is concluded that quality of schooling has lasting impact on adult literacy and numeracy performance levels, and it is also observed that the results provide a validation both of the PISA and the PIAAC studies."