2. Measuring and analysing skills mismatch in the labour market

CEF Online Learning Campus

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ECFIN B2 – Economics of structural reforms and investment
Context

• Skills mismatch « hot topic » after the 2009 crisis
  • Shift to the right in Beveridge curve
  • Skills shortages (e.g. IT-sector) and labour shortages
  • « Overqualification »

➢ Need to bring clarity to the debate, notably for country-level analysis for the European Semester

➢ Cross-country comparable data allows benchmarking performance

Source: EC draft Joint Employment Report 2021
Definition: Weighted relative dispersion of employment rates across skills groups (low-, medium-, high-skilled) (based on ESTAT LFS data)
Skills shortages in the industry sector

Definition: Proportion of employers indicating that labour is a major factor limiting their production. Source: EU-BCS data
On-the-job mismatch: underqualification

**Definition**: Proportion of employment that works in jobs requiring higher qualifications than they have. Based on ILO (2007) methodology and ESTAT LFS data.
On-the-job mismatch: overqualification

**Definition:** Proportion of employment that works in jobs requiring lower qualifications than they have. Based on ILO (2007) methodology and ESTAT LFS data.
Are mismatches increasing over time in EU27?

Macro-economic mismatch is declining

Skills shortages are increasing

... but influenced by the cycle
Impact of Covid on employment (persons)

- High-qualified generally better shielded against the pandemic
  - More likely to be able to telework
  - Less likely to work in contact-intensive jobs
- Those who were already more vulnerable before the crisis have suffered more in economic as well as in health terms
DOES RISING SKILLS MISMATCH HAMPER PRODUCTIVITY GROWTH?
Empirical approach

• **Reduced form model**: labour productivity is a function of human capital $H$, skills mismatch $S$ and cyclical factors (output gap) $X$:

$$LP_{i,t} = c_i + \beta H_{i,t} + \gamma S_{Hi,t} + \delta X_{i,t} + \epsilon_{i,t}$$

• **Estimation**: panel fixed effects and random effects exploiting within-country variation and cross-country variation

• **Possible channels**: human capital and skills mismatch can affect LP through
  • TFP (through enhancing innovation and absorbing knowledge)
  • capital intensity (complementarities with human capital)
Impact of education on productivity

- Generally, positive impact of education on productivity
- However, this impact on productivity is stronger if high-qualified workers work in high-skilled jobs
  - Importance of quality assurance and economic policies

Skills mismatch and productivity: a complex relationship

<table>
<thead>
<tr>
<th>Skills mismatch indicator</th>
<th>Expected relationship</th>
<th>Empirical relationship</th>
</tr>
</thead>
<tbody>
<tr>
<td>Macro-economic skills mismatch</td>
<td>(+) as high macro-economic skills mismatch is associated with low employment rates of lower qualified individuals and labour productivity is expected to be higher if employment is biased towards the higher-qualified</td>
<td>(-) for the full sample, possibly due to strong correlation with economic growth (+) for the EU-15</td>
</tr>
<tr>
<td>Skills shortages</td>
<td>(-)</td>
<td>(+) possibly due to strong correlation with economic growth</td>
</tr>
<tr>
<td>Overqualification</td>
<td>(+) within a given job category, (-) within a given qualification</td>
<td>(+) within a given job category, (-) within a given qualification</td>
</tr>
<tr>
<td>Underqualification</td>
<td>(-) within a given job category, (+) within a given qualification</td>
<td>(-) within a given job category, (+) within a given qualification</td>
</tr>
</tbody>
</table>

Source: Vandeplas, A. and A. Thum-Thysen (2019) “Skills mismatch and productivity in the EU”, DG ECFIN Discussion Paper No. 100. Table summarizes results based on a regression of productivity on measures of skills mismatch, controlling for skill levels and country-specific effects and the output gap.
WHICH SKILLS DO WE NEED FOR THE FUTURE?
Skills transition for a digital economy

From skills of the past…
manual, routine-based skills

… to skills of the future

Digital skills
ICT and STEM
Foundational skills
Non-cognitive skills
Empirical analysis of PIAAC data

- **Foundation skills**: literacy, numeracy, problem-solving
- **Digital skills**: basic versus complex digital skills
- **Aggregate cognitive skills indicator**
- **Non-cognitive skills**:
  - Self-organization, interaction and communication, managing and supervision, readiness to learn and creativity, trust in persons, conscientiousness
  - Aggregate non-cognitive skills indicator
- **Physical skills**
• NL, EE best performers in **cognitive** skills

• DK, FI, SE best performers in **non-cognitive (soft)** skills

• SI, LT most frequent users of **physical** skills

• No significant correlation between cognitive skills and other types of skills **at the country level.**
Variation in skills by sector (EU-average)

- **Finance & Insurance, ICT**: highest cognitive and non-cognitive skills, lowest physical skills
- **Agriculture, construction**: most frequent use physical skills
  - Cognitive & non-cognitive skills positively correlated, negatively to physical skills

**Sectors**: A: Agriculture; B-E: Industry; F: Construction; G-I: Trade, food & accommodation; J: ICT; K: Finance and Insurance; L: Real estate; M_N: Professional and business services; O-Q: Public sector; R-U: Arts, entertainment etc.
Non-cognitive skills matter for productivity

<table>
<thead>
<tr>
<th>Skill</th>
<th>Correlation with productivity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical skills</td>
<td>(-)***</td>
</tr>
<tr>
<td>Numeracy</td>
<td>(+)***</td>
</tr>
<tr>
<td>Literacy</td>
<td>(+)***</td>
</tr>
<tr>
<td>Problem-solving</td>
<td>(+)***</td>
</tr>
<tr>
<td>ICT skills – complex</td>
<td>(+)***</td>
</tr>
<tr>
<td>ICT skills – simple</td>
<td>(+)***</td>
</tr>
<tr>
<td>Cognitive skills - aggregate</td>
<td>(+)***</td>
</tr>
<tr>
<td>Readiness to learn and creative thinking</td>
<td>(+)***</td>
</tr>
<tr>
<td>Conscientiousness</td>
<td>(+)***</td>
</tr>
<tr>
<td>Trust in persons</td>
<td>(+)***</td>
</tr>
<tr>
<td>Interaction and communication</td>
<td>(+)***</td>
</tr>
<tr>
<td>Managing and supervision</td>
<td>(+)***</td>
</tr>
<tr>
<td>Self-organisation</td>
<td>0</td>
</tr>
<tr>
<td>Non-cognitive skills - aggregate</td>
<td>(+)***</td>
</tr>
</tbody>
</table>

CONCLUSION AND POLICY IMPLICATIONS
Conclusions and policy implications

• Human capital investment is key in technology adoption, productivity and growth ***not only quantity of spending matters, but also efficiency of spending to target quantity, quality and inclusion***

• Lower skills mismatch is associated with good economic performance ***boost skills supply*** (e.g. invest in upskilling and reskilling) and ***demand*** (e.g. promote job creation in skills-intensive sectors)

• Building “skills for the digital economy” to foster productivity requires a multi-pronged approach ***boost digital and cognitive skills, but also non-cognitive skills such as self-organisation or teamwork*** (for instance through curricula design)
Policy levers

What can national governments do?

- Reforms of education, training & skills systems (incl. adult learning) and broader economic policies (business environment, public administration, R&D…).

What can the EU do?

- In the EU:
  - Broad policy guidance through initiatives such as the European Education Area, European Skills Agenda, Digital Education Action Plan, …
  - Country-specific policy guidance through the European Semester.
  - Support for reforms and investment through NextGenerationEU (Recovery and Resilience Facility & Technical Support Instrument) and other instruments in 2021-27 MFF: ESF+, Erasmus+, ERDF, EGF, Just Transition Fund, REACT-EU, Brexit Adjustment reserve, …

- In accession countries:
  - Instrument for pre-accession assistance, Technical Assistance and Information Exchange instrument (TAIEX).
References


• Follow-up work:
Thank you

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Macro-economic skills mismatch

- **Downward trend** in Northern-Macedonia
- **Upward trend** in Turkey
- **Serbia**: decline until 2016, and stabilization since then
- **Montenegro**: decline until 2018, pick up since then
Skills shortages
Country-level variation in skills levels, industry sector (NACE B-E)

- Industry sector more knowledge intensive in NL, DK, SK than in CY, EL and FR.
- Physical skills more important in LT, SI, PL than in FI, BE, FR.
- Result of industrial specialisation & organization of production processes (influenced by economic conditions & policies)