



2. Measuring and analysing skills mismatch in the labour market

CEF Online Learning Campus

Anneleen Vandeplas
ECFIN B2 – Economics of structural reforms and investment

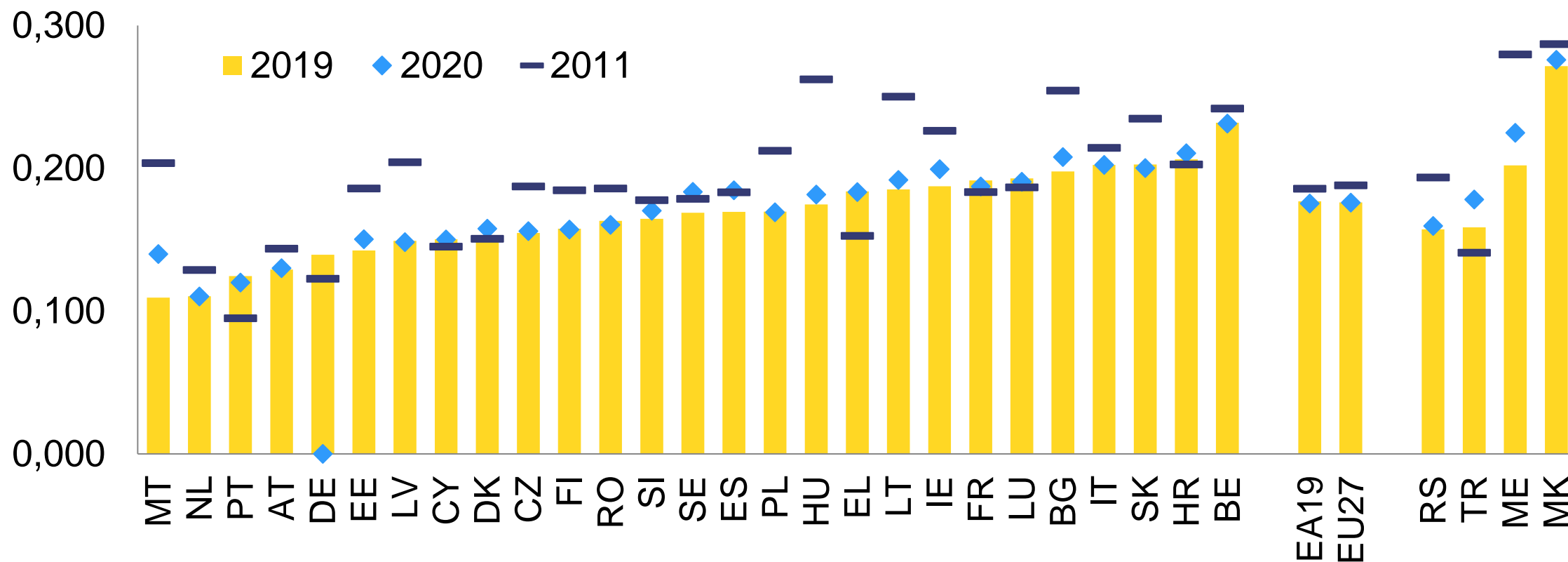
Context

- 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



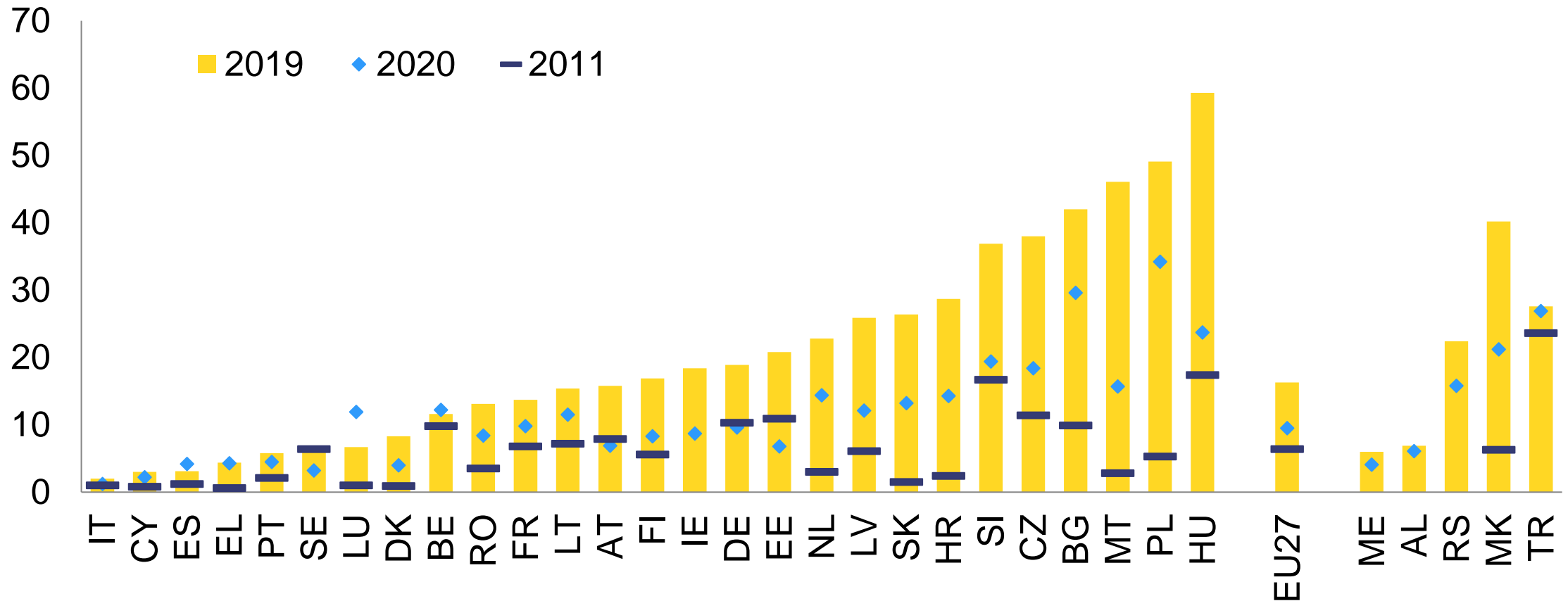
Source: EC draft Joint
Employment Report 2021

Macro-economic skills mismatch



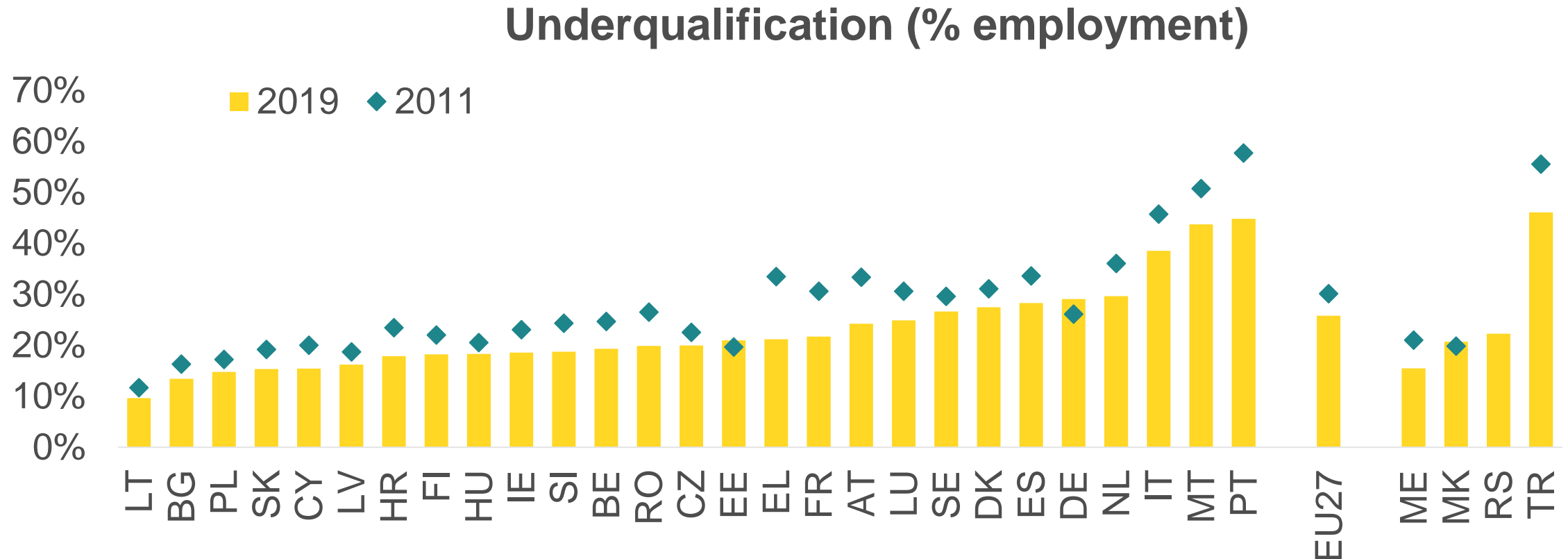
Definition: Weighted relative dispersion of employment rates across skills groups (low-, medium-, high-skilled) (based on ESTAT LFS data)

Skills shortages in the industry sector



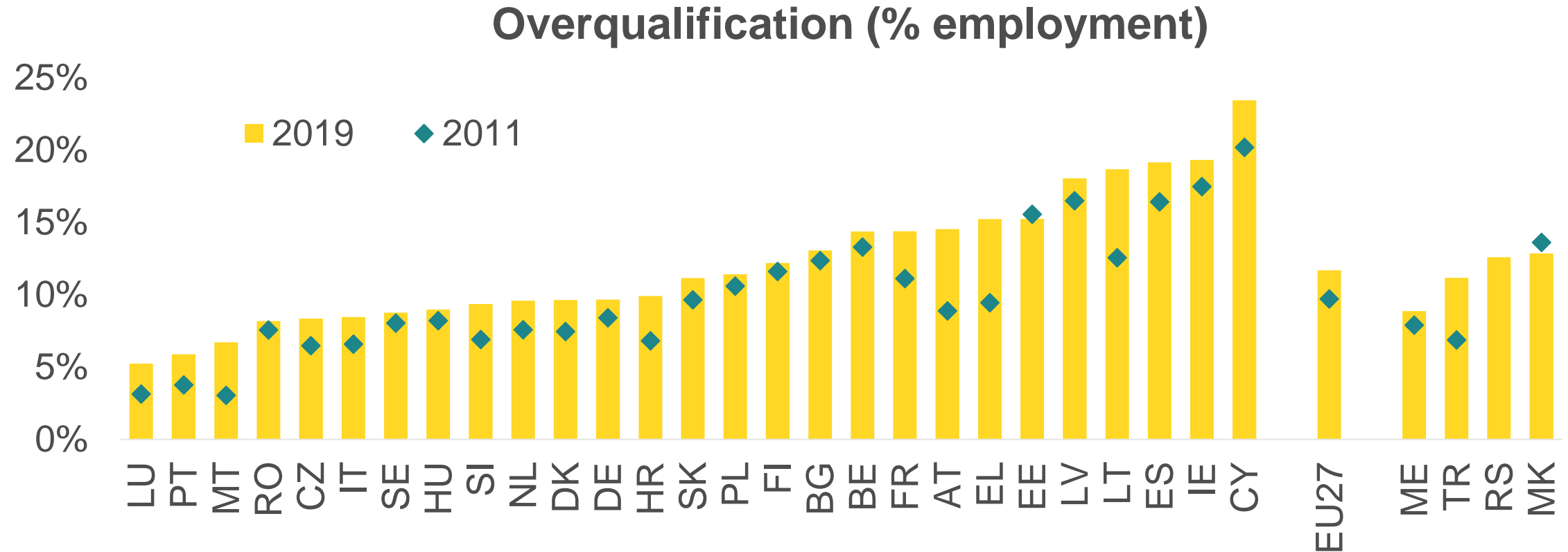
Definition: Proportion of employers indicating that labour is a major factor limiting their production. Source: EU-BCS data

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

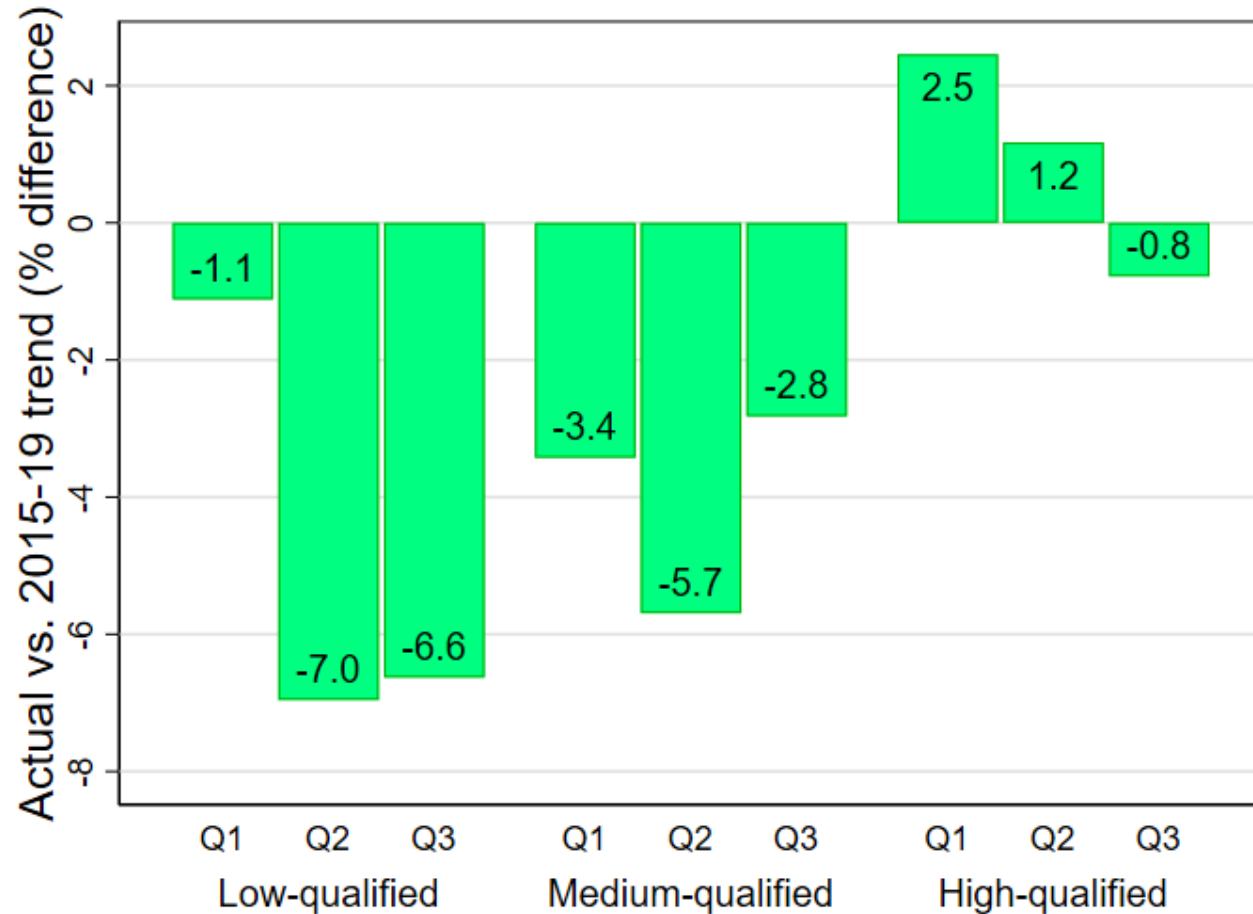


Skills shortages are increasing



... but influenced by the cycle

Impact of Covid on skills mismatch



Covid impact 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

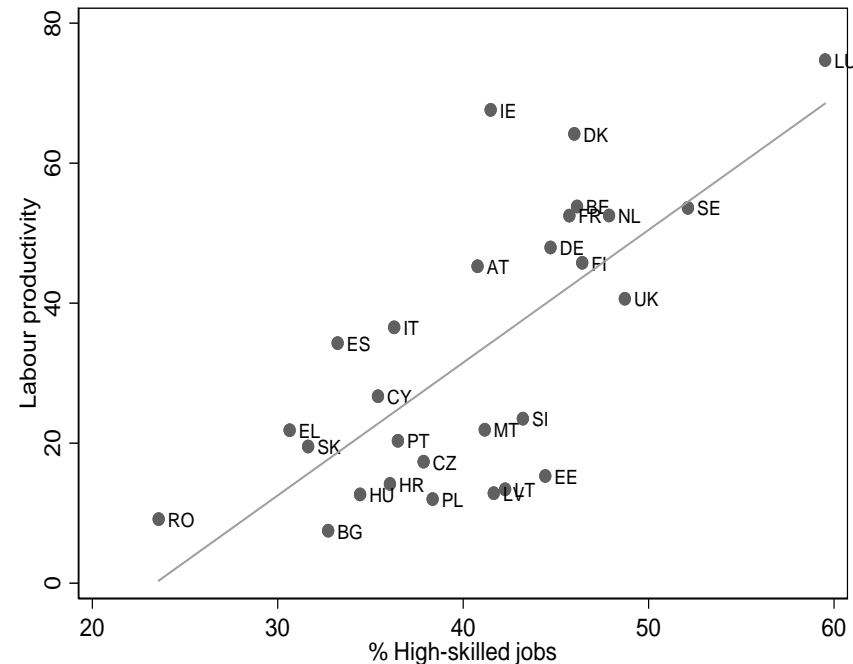
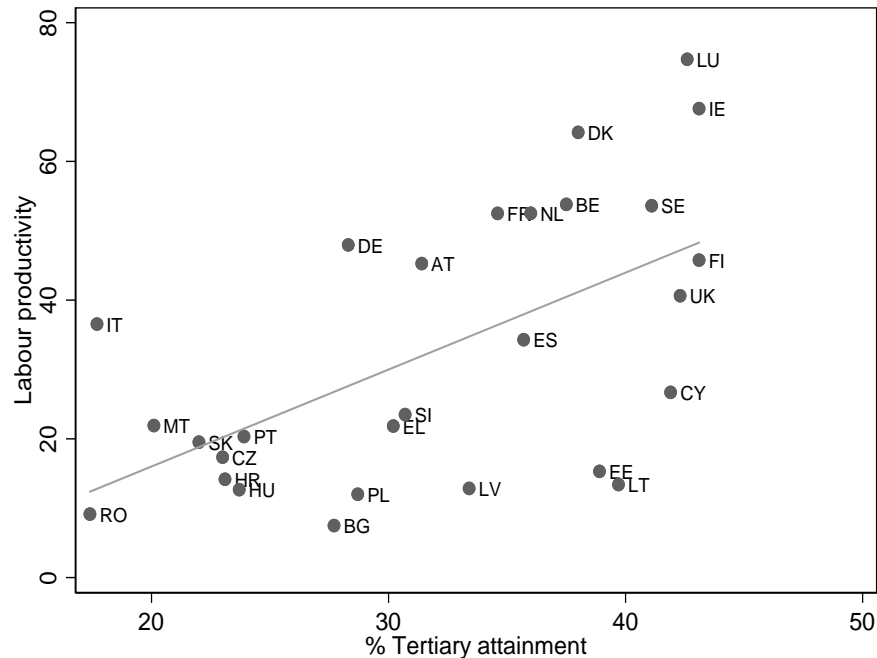
- **Reduced form model:** labour productivity is a function of human capital H , skills mismatch S and cyclical factors (output gap) X :

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

- **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

Skills mismatch indicator	Expected relationship	Empirical relationship
Macro-economic skills mismatch	(+) 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	(-) for the full sample, possibly due to strong correlation with economic growth (+) for the EU-15
Skills shortages	(-)	(+) possibly due to strong correlation with economic growth
Overqualification	(+) within a given job category, (-) within a given qualification	(+) within a given job category, (-) within a given qualification
Underqualification	(-) within a given job category, (+) within a given qualification	(-) within a given job category, (+) within a given qualification

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

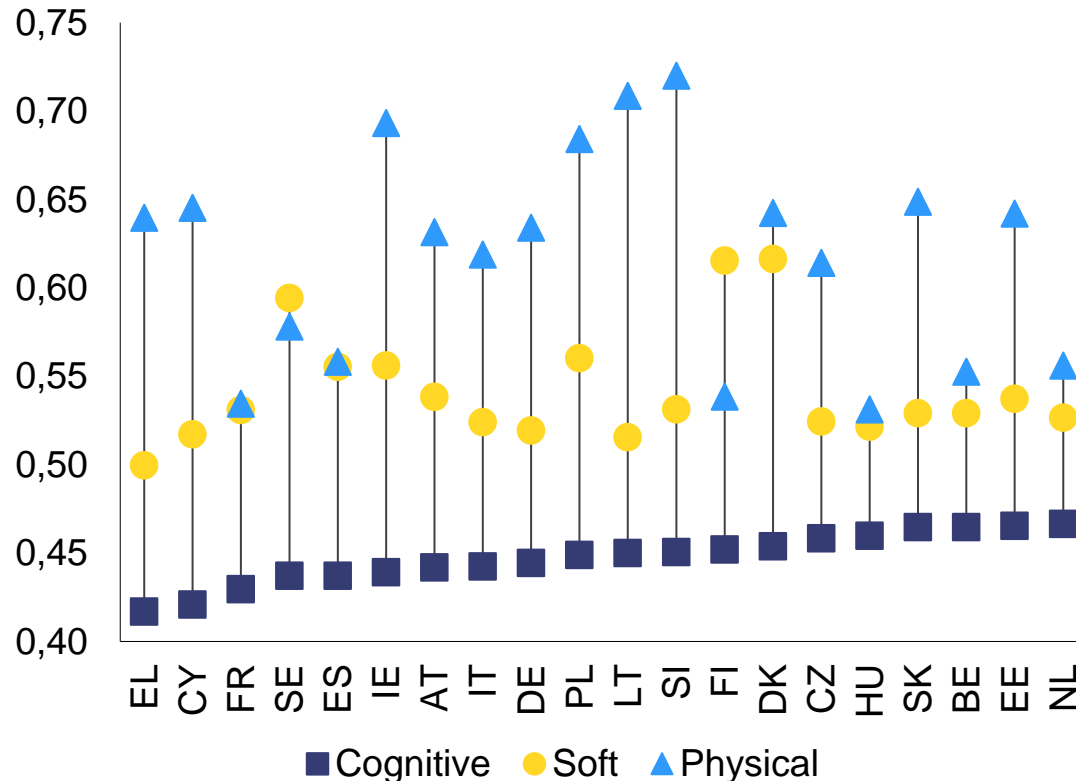
Foundational
skills

Non-
cognitive
skills

Empirical analysis of PIAAC data

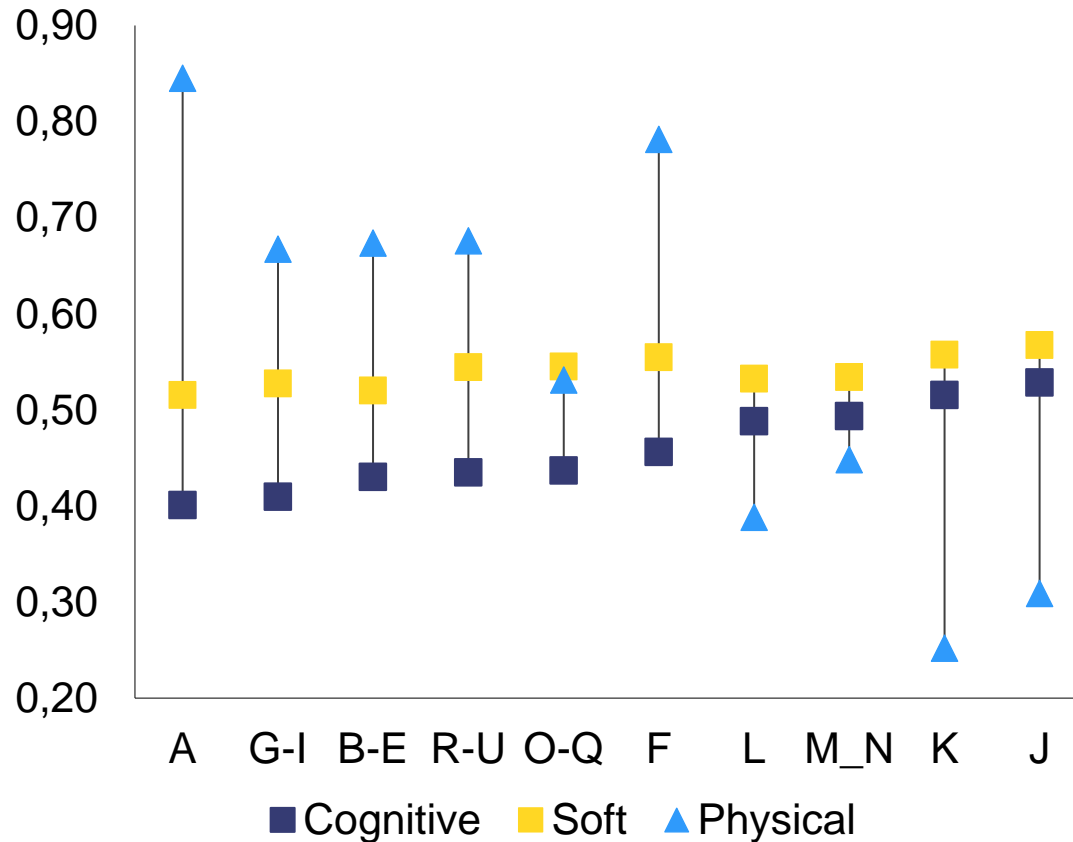
- **Foundation skills:** literacy, numeracy, problem-solving
- **Digital skills:** basic versus complex digital skills
- **Aggregate cognitive skills indicator**
- **Non-cognitive skills:**
 - Self-organization, interaction and communication, managing and supervision, readiness to learn and creativity,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

Variation in skills by country



- 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

Skill	Correlation with productivity
Physical skills	(-) ^{***}
Numeracy	(+) ^{***}
Literacy	(+) ^{***}
Problem-solving	(+) ^{***}
ICT skills – complex	(+) ^{***}
ICT skills – simple	(+) ^{***}
Cognitive skills - aggregate	(+) ^{***}
Readiness to learn and creative thinking	(+) ^{***}
Conscientiousness	(+) ^{***}
Trust in persons	(+) ^{***}
Interaction and communication	(+) ^{***}
Managing and supervision	(+) ^{***}
Self-organisation	0
Non-cognitive skills - aggregate	(+) ^{***}

Source: Own calculations based on PIAAC and EUKLEMS data in Morandini, Thum-Thysen and Vandeplas (2020), “Facing the digital transformation: are digital skills enough?”, DG ECFIN Economic Policy Brief.

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:**

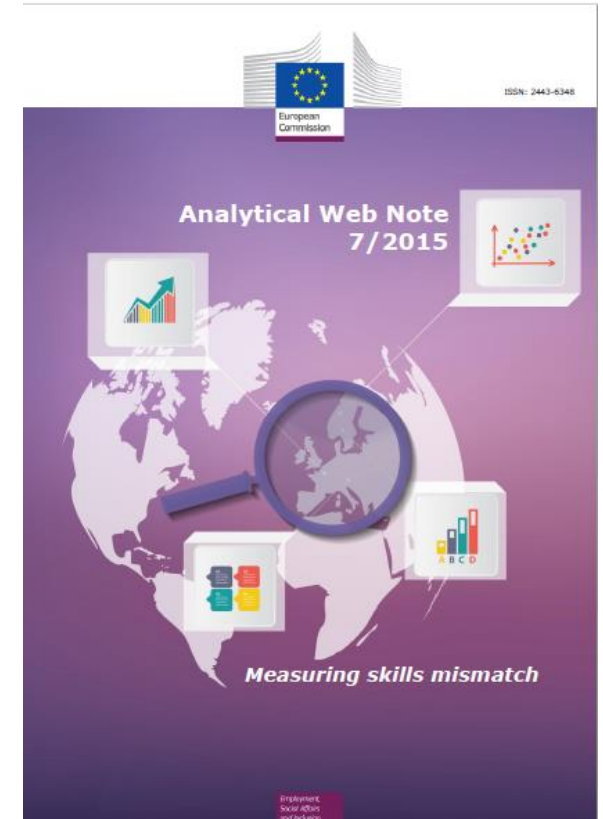
- Broad policy guidance through initiatives such as the European Education Area, European Skills Agenda, Digital Education Action Plan, ...
- Country-specific policy guidance through the European Semester.
- Support for reforms and investment through NextGenerationEU (Recovery and Resilience Facility & 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

- Kiss, A., & Vandeplas, A. (2015). Measuring skills mismatch. DG EMPL Analytical webnote 7/2015,
- **Drawing on earlier Commission work:** Arpaia, A., Kiss, A., & Turrini, A. (2014). Is unemployment structural or cyclical? Main features of job matching in the EU after the crisis. IZA Policy Paper No. 91.
- **Follow-up work:**
 - Vandeplas, A., & Thum-Thysen, A. (2019). Skills Mismatch & Productivity in the EU. European Economy Discussion Paper 100
 - Morandini, M. C., Thum-Thysen, A., & Vandeplas, A. (2020). Facing the Digital Transformation: Are Digital Skills Enough? European Economy Economic Brief 054



Thank you



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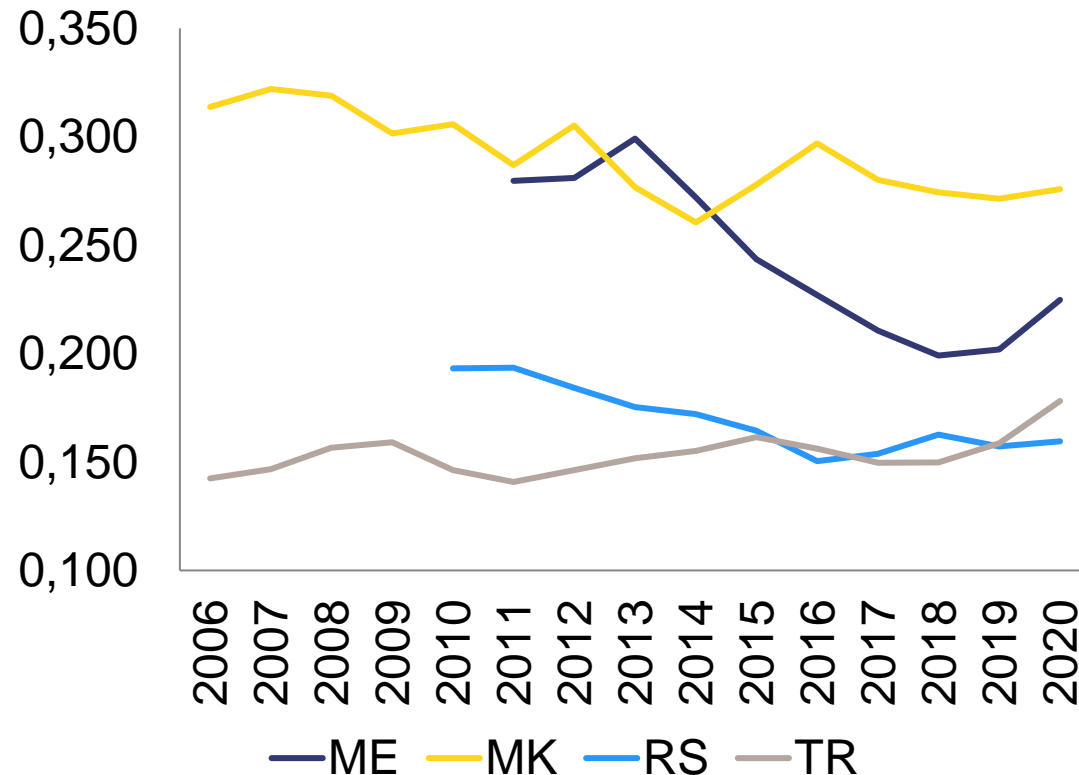
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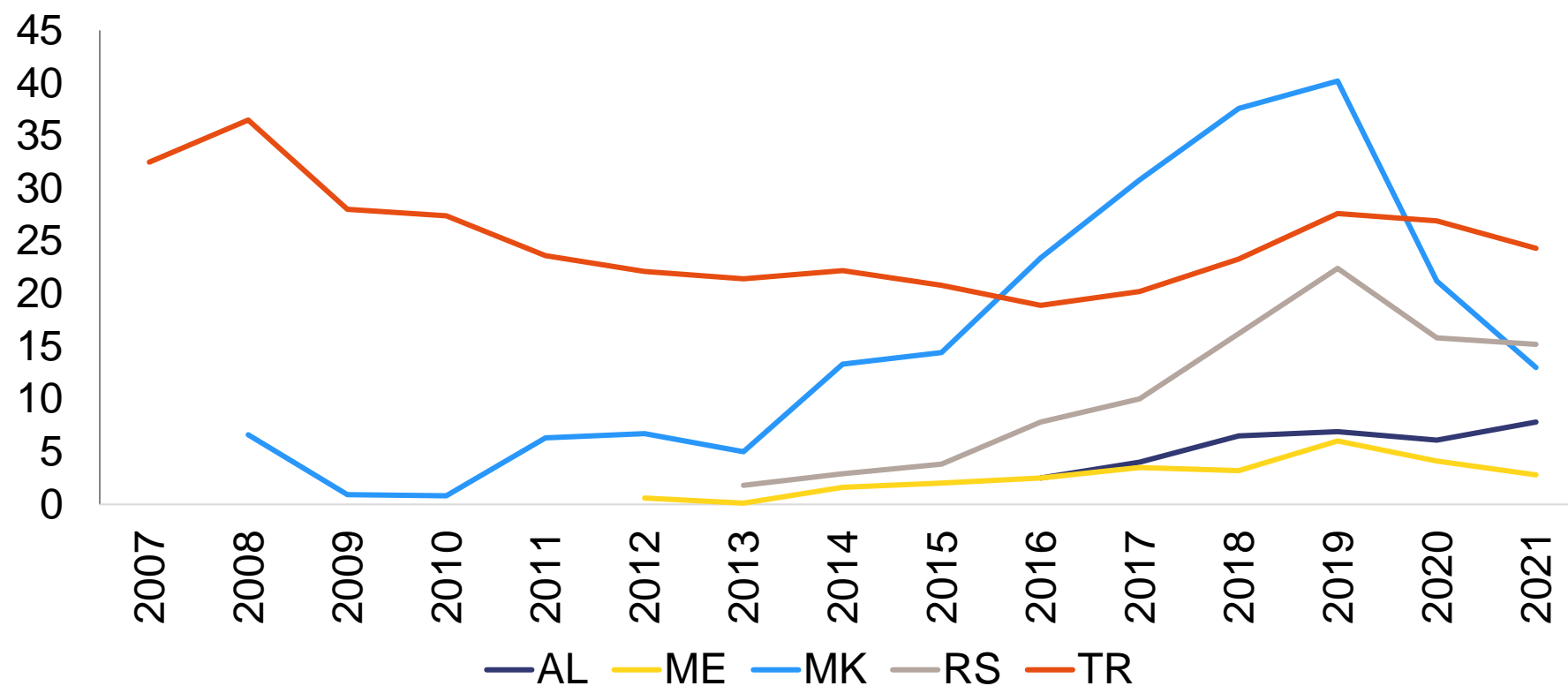
Extra slides

Macro-economic skills mismatch

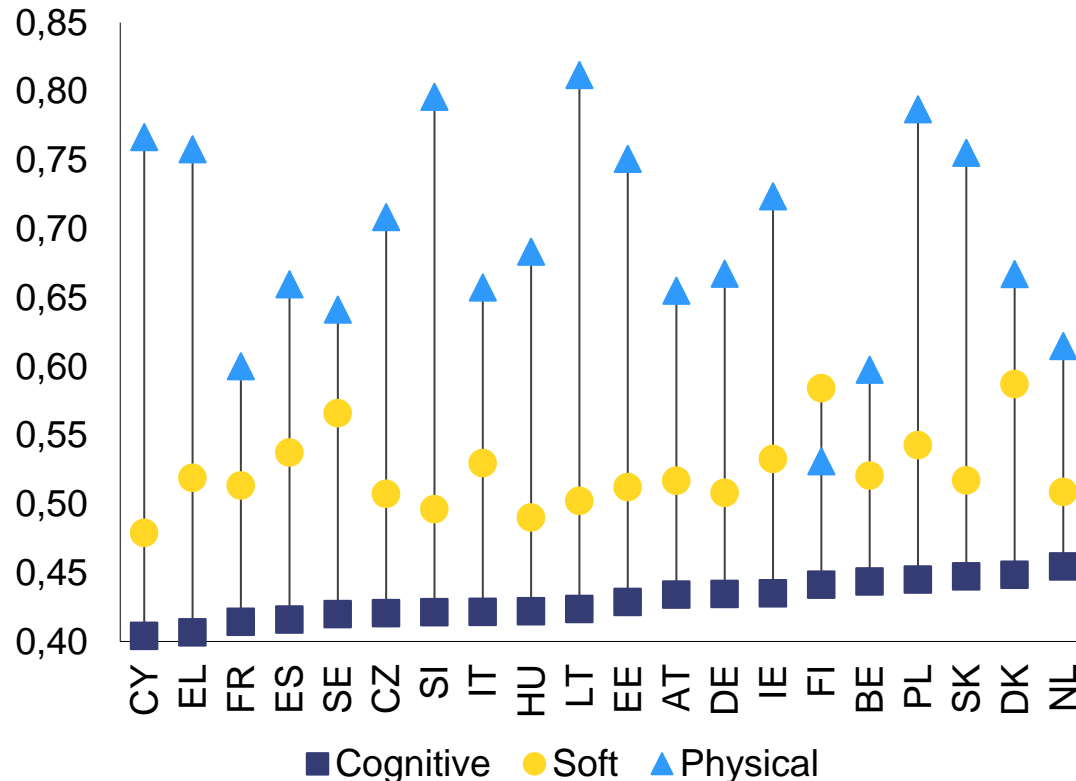


- **Downward trend** in Northern-Macedonia
- **Upward trend** in Turkey
- **Serbia:** decline until 2016, and stabilization since then
- **Montenegro:** decline until 2018, pick up since then

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)