Automation, digitalisation and algorithmic decision-making
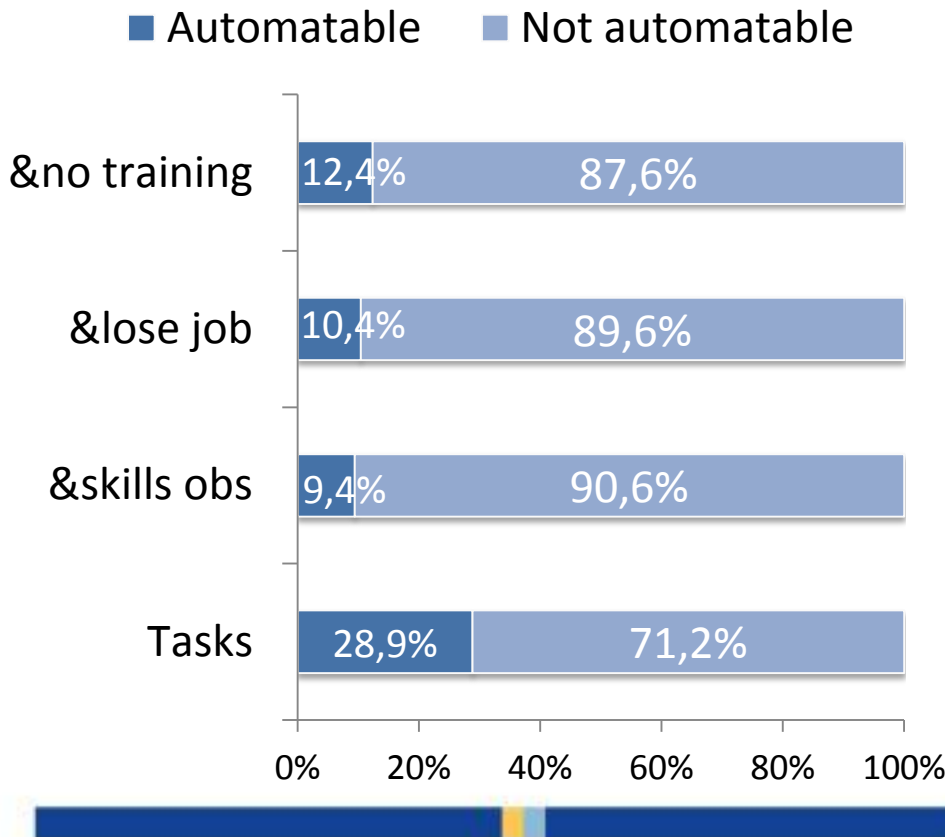
Konstantinos POULIAKAS
Department for Skills and Labour Market, CEDEFOP

'European group on ethics in science and technologies'
Open roundtable on the future of work
Brussels, 05 Feb 2018

Risk of automation for the most vulnerable…

* Automatable jobs defined as cluster of jobs involving higher frequency of routine tasks and low importance of communication - team working – problem solving - planning skills

■ Automatable ■ Not automatable
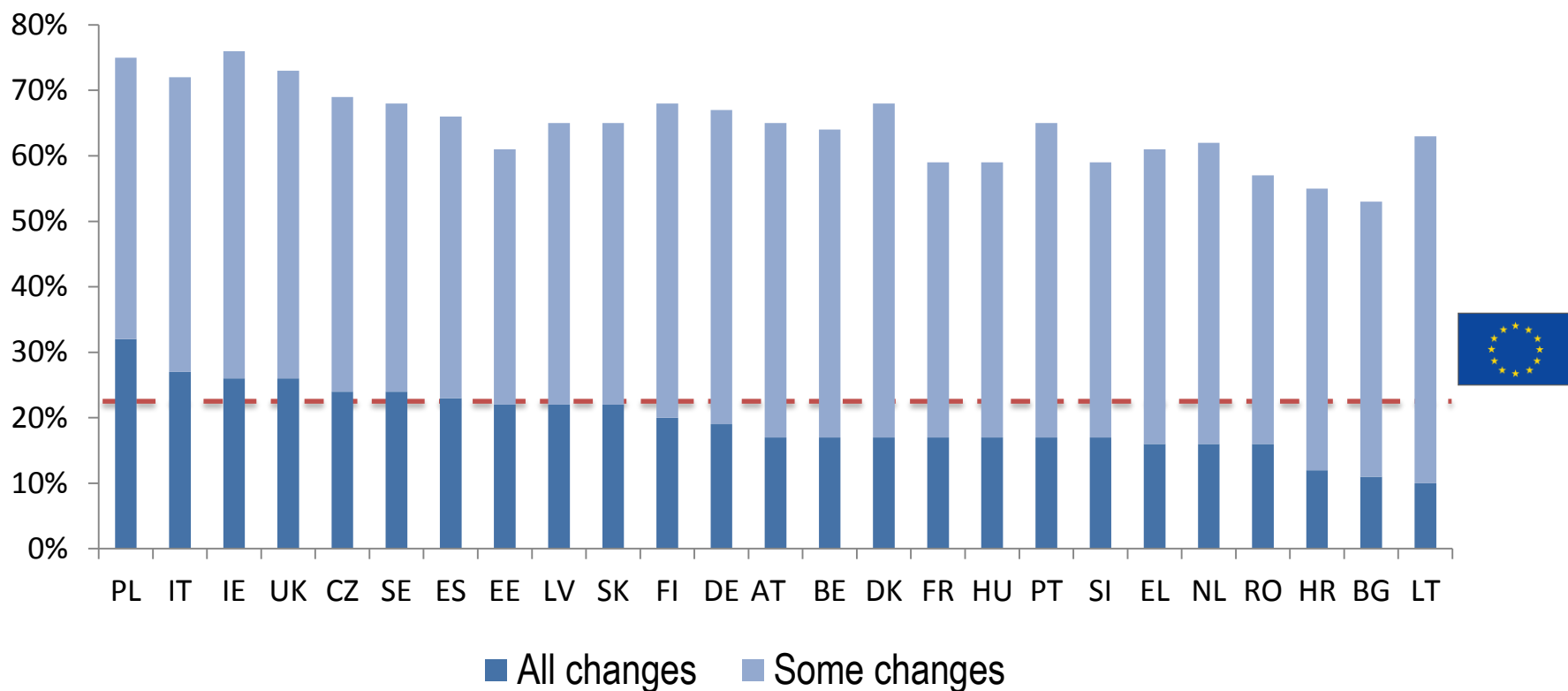
Category	Automatable	Not automatable
&no training	12,4%	87,6%
&lose job	10,4%	89,6%
&skills obs	9,4%	90,6%
Tasks	28,9%	71,2%

(x-axis: 0% 20% 40% 60% 80% 100%)

Odds of being in automatable job

- Male
- Age: >55
- Ed: High
- Ed: Medium
- Previously unemployed
- Private sector
- Workplace many
- Small firm size
- No formal contract
- Part-time
- No training

(x-axis: 0 0,5 1 1,5 2)

More supportive CVET needed

% adult workers who experienced changes (e.g. in technologies used) in workplace and were supported by training activities paid for by the employer

Legend: ■ All changes ■ Some changes

Share of automatable jobs (tasks & no training) within 2-digit occupations

Cleaner or Helper	48%
Agricultural, Forestry, Fishery Labourer	45%
Street and other Sales or Services Worker	36%
Labourer in Mining, Construction, Manufacturing	29%
Food Preparation Assistant	22%
Driver or Mobile Plant Operator	22%
Plant or machine operator	21%
Assembler	21%
General or Keyboard Clerk	18%
Personal service worker	18%
Protective service worker	16%
Sales worker	15%
Average	**12%**

Personal care worker	10%
Customer services clerk	9%
Science and engineering professional	6%
ICT professional	6%
Teaching technician	6%
Health technician	3%
Teaching professional	3%
Administrative or Commercial Manager	3%
Chief Executive, Senior Official or Legislator	2%
Production or Specialised Services Manager	2%
Health Professional	1%

Source: Cedefop European skills and jobs survey (ESJS)

Implications for education and training

The challenge

The promise

> Fast-deep LMI
> Skills matching
> Reskilling

> 'Individualisation'
> Massive, online, open
> Non-credentialism
> New learning platforms

> Biases
> Inequality

> Homo adaptus
> Quality assurance
> EQF responsiveness
> Governance
> 'Personalisation' (learning & career guidance)
> Humans-in-command

Robots in education and training

- Real-time feedback
- Self-directed learning
- Experiential

- Improvement in problem solving, logical thinking, scientific inquiry
- Social skills?

 But
- Critical role of teachers
- Facilitation
- Evaluation

Human discretion!

For more information
Konstantinos.Pouliakas@cedefop.europa.eu
www.cedefop.europa.eu