



Technequality

Understanding the relation between technological innovations and social inequality



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement no. 822330

Technequality Policy week
February 4, 2022

Prof. Dr. Didier Fouarge (ROA, Maastricht University)
Dr Cornelia-Madalina Suta (Cambridge Econometrics)

 Maastricht University
School of Business and Economics

 ROA

Outline

- **Labour market forecasting scenarios for automation risks**
 - Model of automation
 - Scenario assumptions
 - Results
 - Policy recommendations
 - Example of simulation results

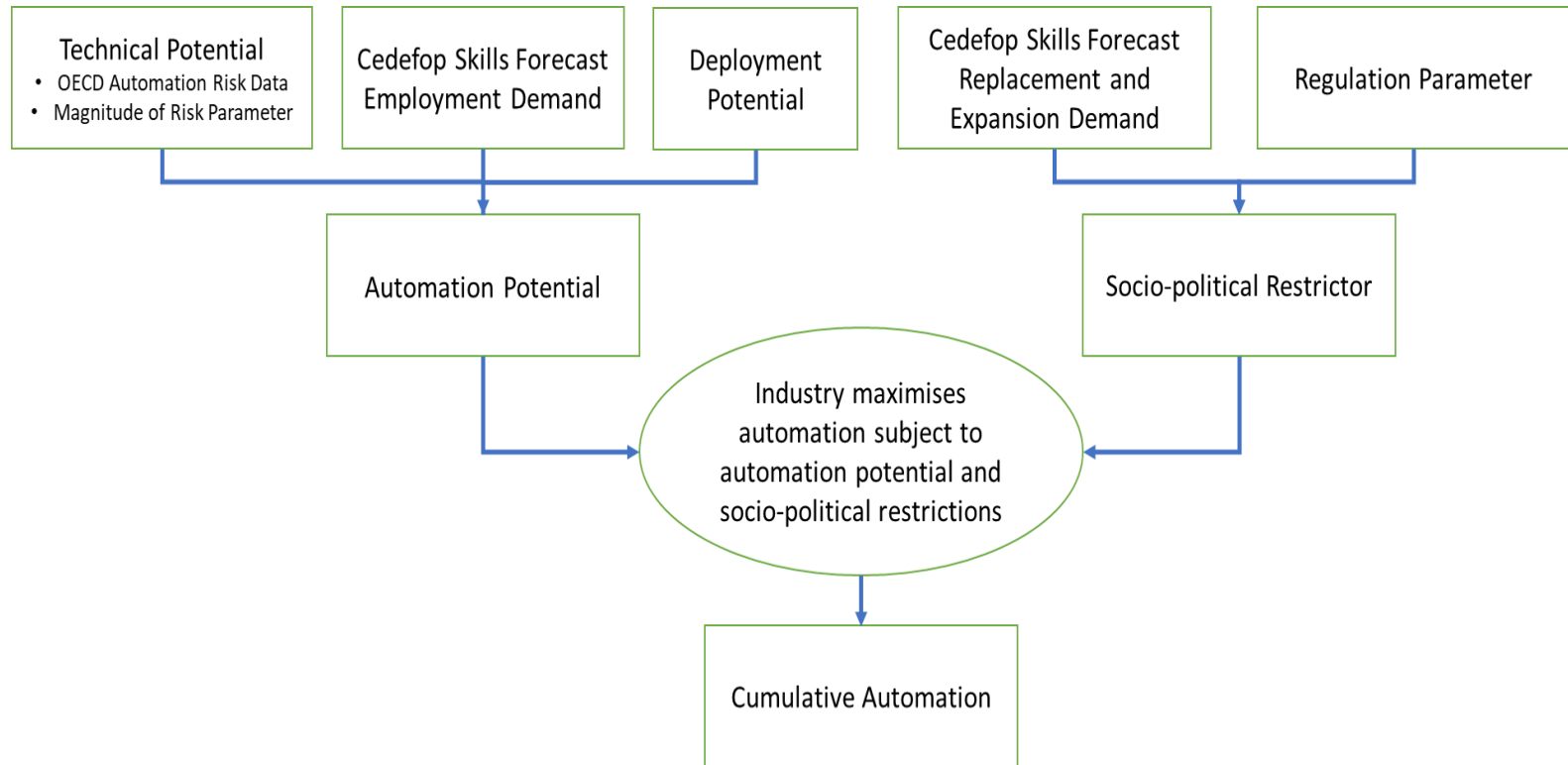


This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement no. 822330



Labour market forecasting scenarios for automation risks

Model of automation



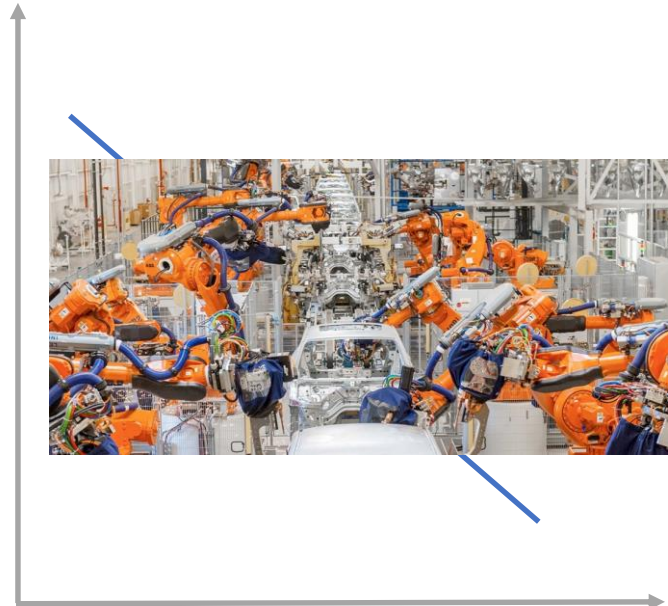
Human tasks & Machine tasks

Technology can **complement** human tasks



Non-routine analytical/creative tasks
Interactive tasks

Technology can **substitute** human tasks



Routine cognitive
Routine manual tasks

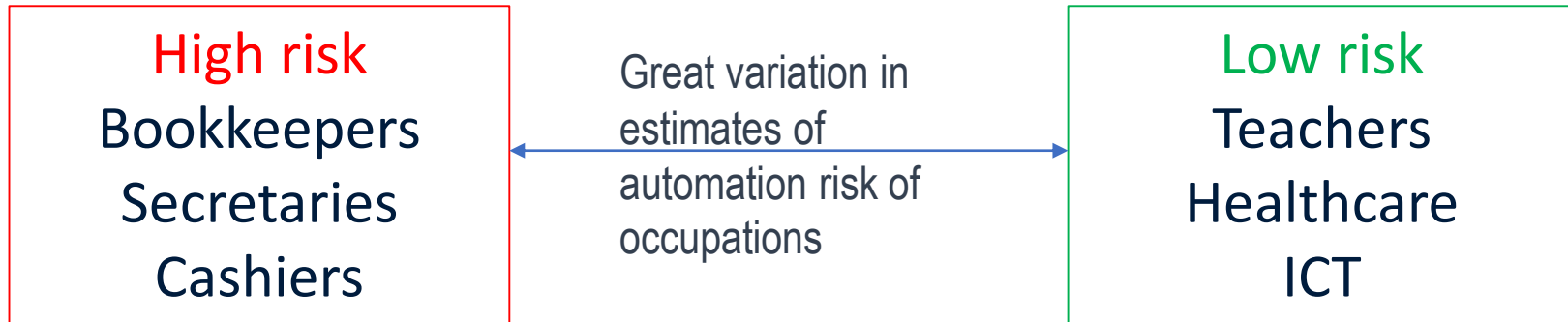


Changes the demand for
human tasks & skills

What jobs/tasks are likely to be automated?

'if-then' tasks easily automated

analytical & interactive tasks not easily automated



Automation will:

- Create jobs → Not quantified by us
- Destroy jobs → Our scenario analysis
- Change tasks/skills → Our survey on tasks within occupations



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement no. 822330



1. **Qualitative** scenarios for the impact of intelligent automation on work

- Thought experiment based on literature
- 8 qualitative scenarios for impact of technology based on 3 key variables:
 - 1-speed of innovation,
 - 2-speed of adoption,
 - 3-impact on tasks.

<https://technequality-project.eu/files/d12fdscenariostudiesv20pdf>



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement no. 822330



2. **Quantitative** labour market forecasting scenario's for automation risks

- Econometric estimations
- 18 scenarios for number of jobs in 2030 based on 3 key variables:
 - 1-automation risk,
 - 2-speed of adaptation,
 - 3-barriers to adoption.
- We build on:
 - Cedefop Skills Forecast 2018
 - OECD automation risk data (Quintini & team)
- We do not account for job creation

<https://technequality-project.eu/files/d14fdmethodologyscenariodesignv20pdf>



Labour market forecasting scenarios for automation risks

18 scenarios for number of jobs in 2030 based on 3 key variables – see table.

+3 scenarios for low/med/high automation risk, and 1-speed of adoption depends on relative wages, 2-employment protection legislation = regional barrier to adoption

| Parameter | Description | Assumptions |
|--|---|----------------------------|
| Automation risk (Technical potential) | OECD automation risk by occupation (three categories: high (>70%), significant (50-70%), and low (<50%)). | Low: lower bound in range |
| | | Middle: mid-point of range |
| | | High: upper bound in range |
| Speed of adoption of automating technologies | The year in which full technical potential could be realised. | 2035 |
| | | 2055 |
| | | 2075 |
| Economic and socio-political barriers | Restriction on automation. | No employment protection |
| | | Employment protection. |



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement no. 822330



Main scenario results

(% difference from Cedefop Skills forecast 2018 by 2030 in EU-28):

<https://www.camecon.com/tools/labour-market-forecasting/>

| | No employment protection | | | Employment protection | | |
|--------|--------------------------|------|------|-----------------------|------|------|
| | 2035 | 2055 | 2075 | 2035 | 2055 | 2075 |
| High | -44% | -20% | -13% | -37% | -19% | -12% |
| Middle | -31% | -14% | -9% | -28% | -13% | -9% |
| Low | -18% | -8% | -5% | -17% | -8% | -5% |

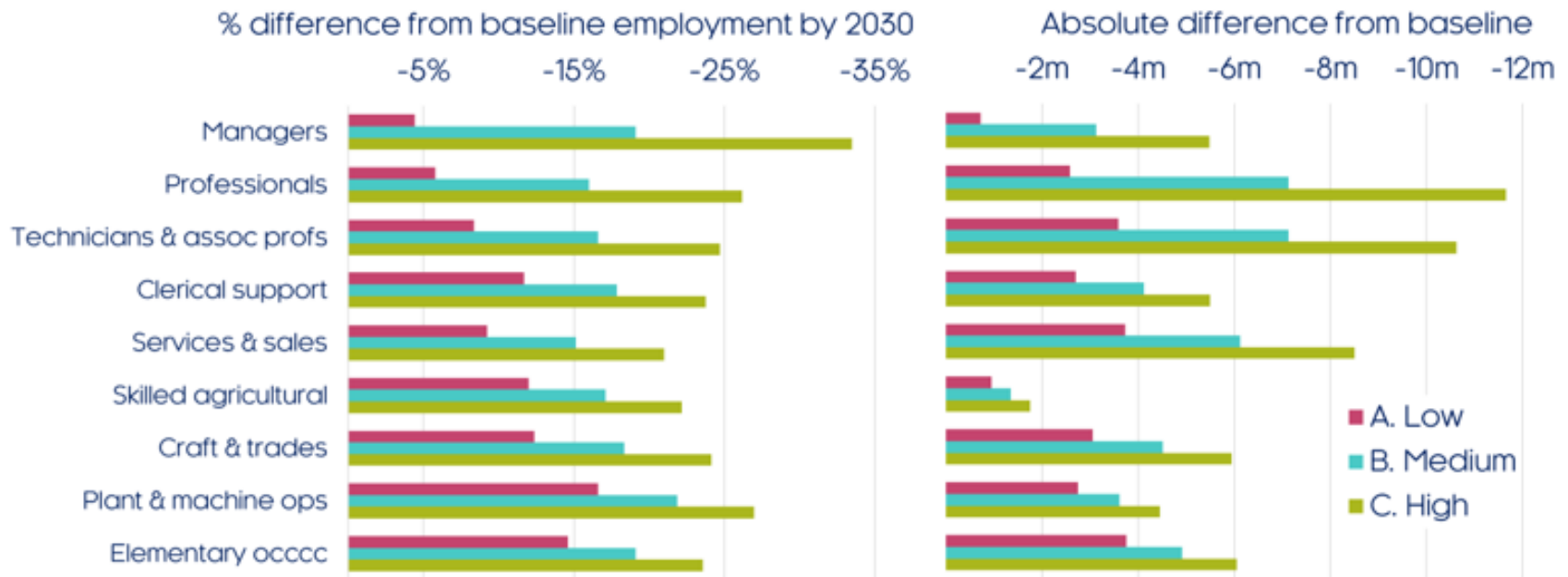


This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement no. 822330



12.5 million to 106.6 million jobs lost by 2030

Scenario results (% difference from baseline by 2030 in EU-28 employment by ISCO-08 occupation)



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement no. 822330



Explore the data yourself using the interactive [web app](#)

Select a country and industry to explore

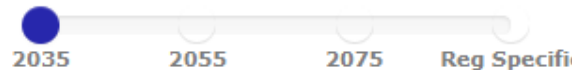
Country **EU_28** Industry **All industries**

Select the scenario assumptions' combination*

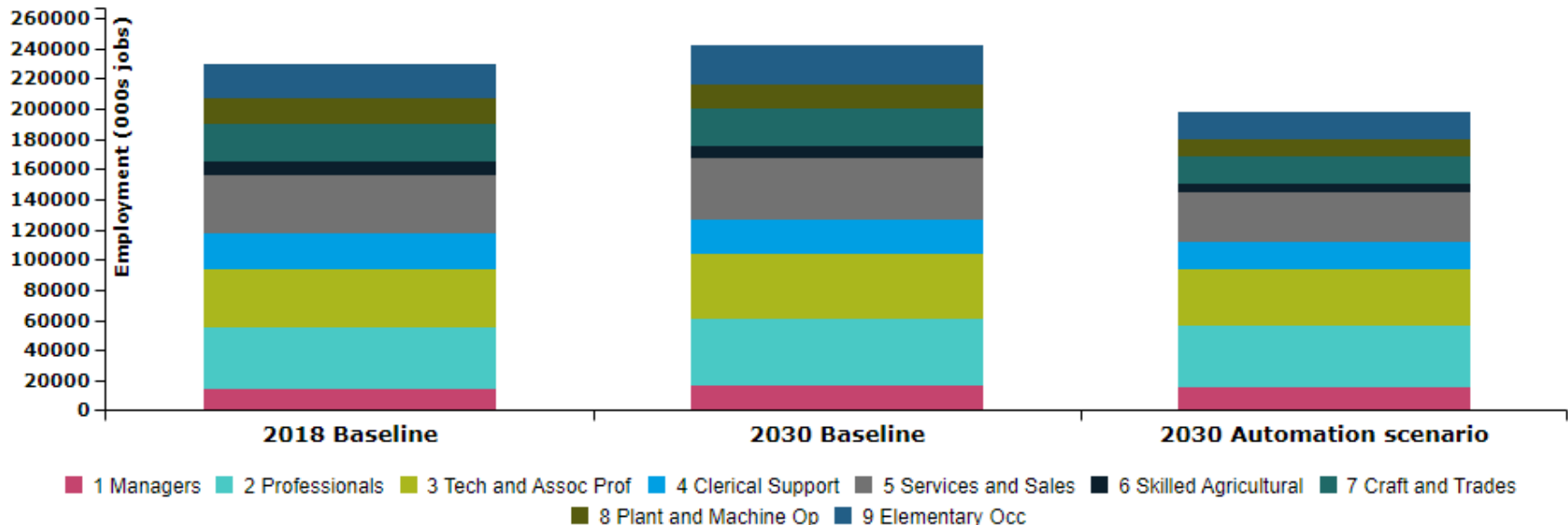
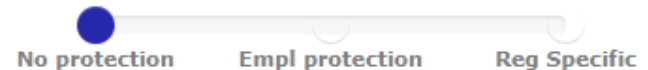
Automation risk



Full adoption by**



Barriers on automation**



Labour market forecasting scenarios for automation risks

Recommendations for policy responses

- Flexibility and adaptability of policy responses
- Preparedness
- Moderated transitions, i.e. slow the pace of a rapid transition
- Target solutions
- Alertness to unintended consequences

<https://technequality-project.eu/files/d71fd-policybrief1v20pdf>



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement no. 822330

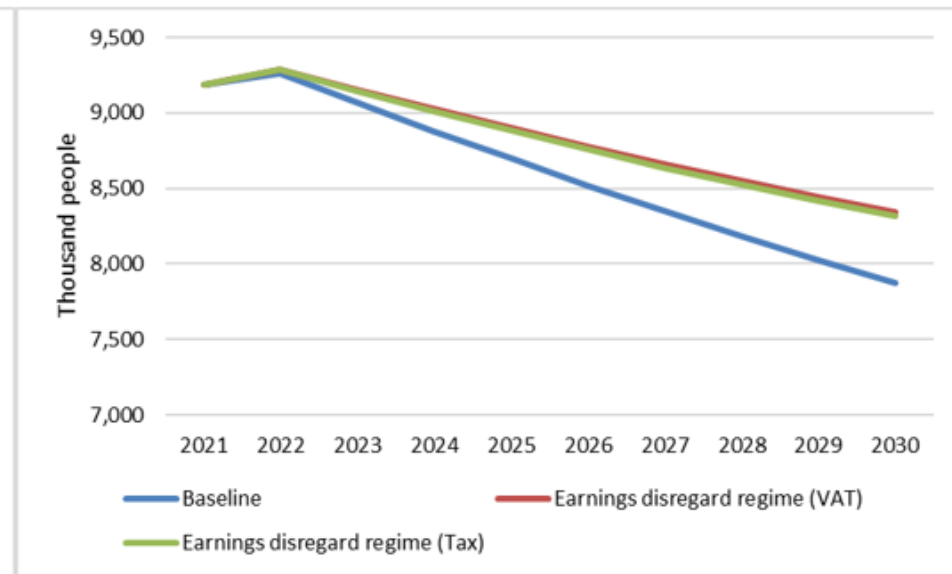
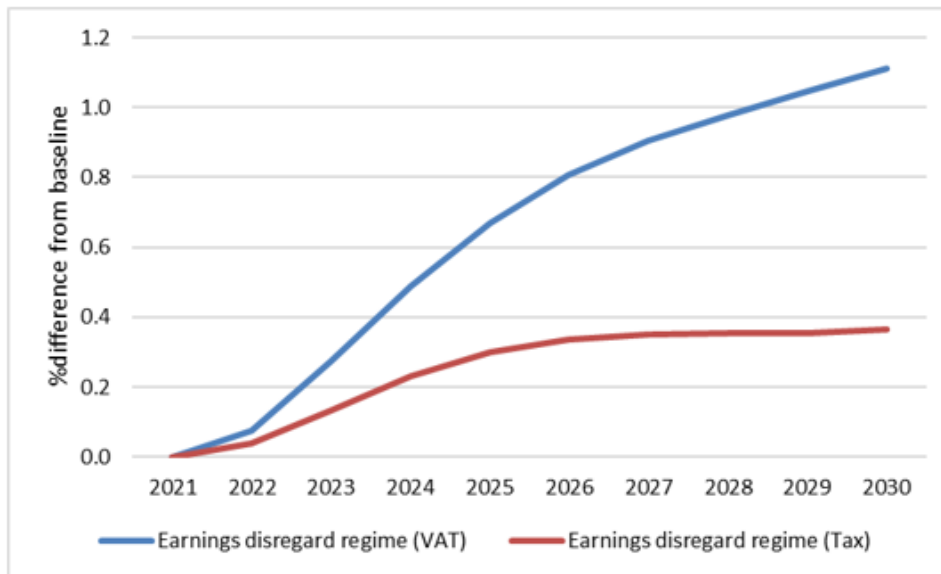


Example of targeted solution

| Scenario | Scenario assumptions |
|---------------------------|---|
| Baseline | 16% of jobs in the Netherlands to be displaced by automation over 2021-30. |
| Earnings disregard regime | <p>Among the 16% displaced by automation, 14% of them manage to re-enter into full-time or part-time employment.</p> <p>The rest will enter into social assistance in which people get a work bonus when they start to work or work more hours.</p> <p>In each year, 15% of people on social assistance may keep 50% of the earnings from part-time work up to the maximum of 203 euros per month. When they find full-time work, they exit Social Assistance and keep 100% of their earnings.</p> <p>Financing the social assistance:</p> <ol style="list-style-type: none">1. VAT increase; or2. Income tax increase |

Example of targeted solution

NL GDP and employment – scenario results



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement no. 822330



Conclusion

- Automation will:
 - Destroy jobs
 - Create jobs
 - Change tasks/ skills
- Impact on jobs. We offer to policy makers:
 - Qualitative narrative to consider effects
 - Quantitative estimation by country, sector, occupation
 - Online tool to visualise 21 potential scenario's



For more information

Policy brief on scenario studies of impact of technological changes on jobs: <https://technequality-project.eu/projects/policy-briefs>

Combines findings from:

1. **Qualitative** scenarios for the impact of intelligent automation on work
2. **Quantitative** labour market forecasting scenario's for automation risks



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement no. 822330



Technequality

Understanding the relation between technological innovations and social inequality



Madalina Suta
Cambridge Econometrics
cs@camecon.com



Didier Fouarge
Maastricht University
d.fouarge@maastrichtuniversity.nl



This project has received funding
from the European Union's Horizon
2020 research and innovation
programme under grant agreement
no. 822330

