#OECDAI

LABOUR-SAVING AND LABOUR-AUGMENTING TECHNOLOGIES

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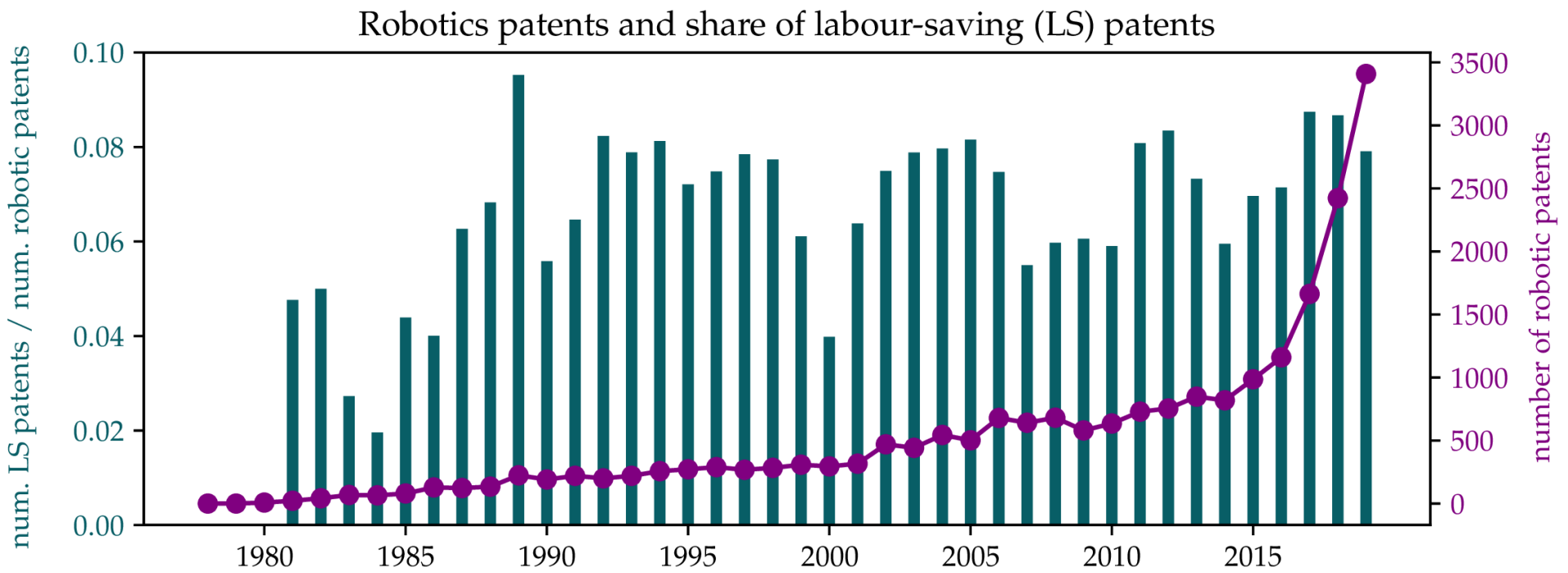
Working with or against the machine "in a time of brilliant technologies" (Brynjolfsson)

- the impact of new (digital) technologies and automation upon employment stands at the core of recent policy debate
- policymakers committed to ensure an *orderly transition* to the new industrial paradigm (e.g. avoiding mass unemployment) need to know *in advance*:
  - which *occupational* categories are likely to be substituted in the future
  - which *skills* are required by remaining (and possibly new) professions
- assess the possibility for humans and machines to work *side by side*, and for new technologies to be labour-, welfare-, and wellbeing-enhancing (e.g. Bessen)
- to do so, a *leading* (not *lagging*) indicator of automation innovation is required
- leveraging on semantic analysis, we identify labour-saving innovations among European robotics patents between 1978 and 2019

An increasing number of labour-saving innovations hitting markets

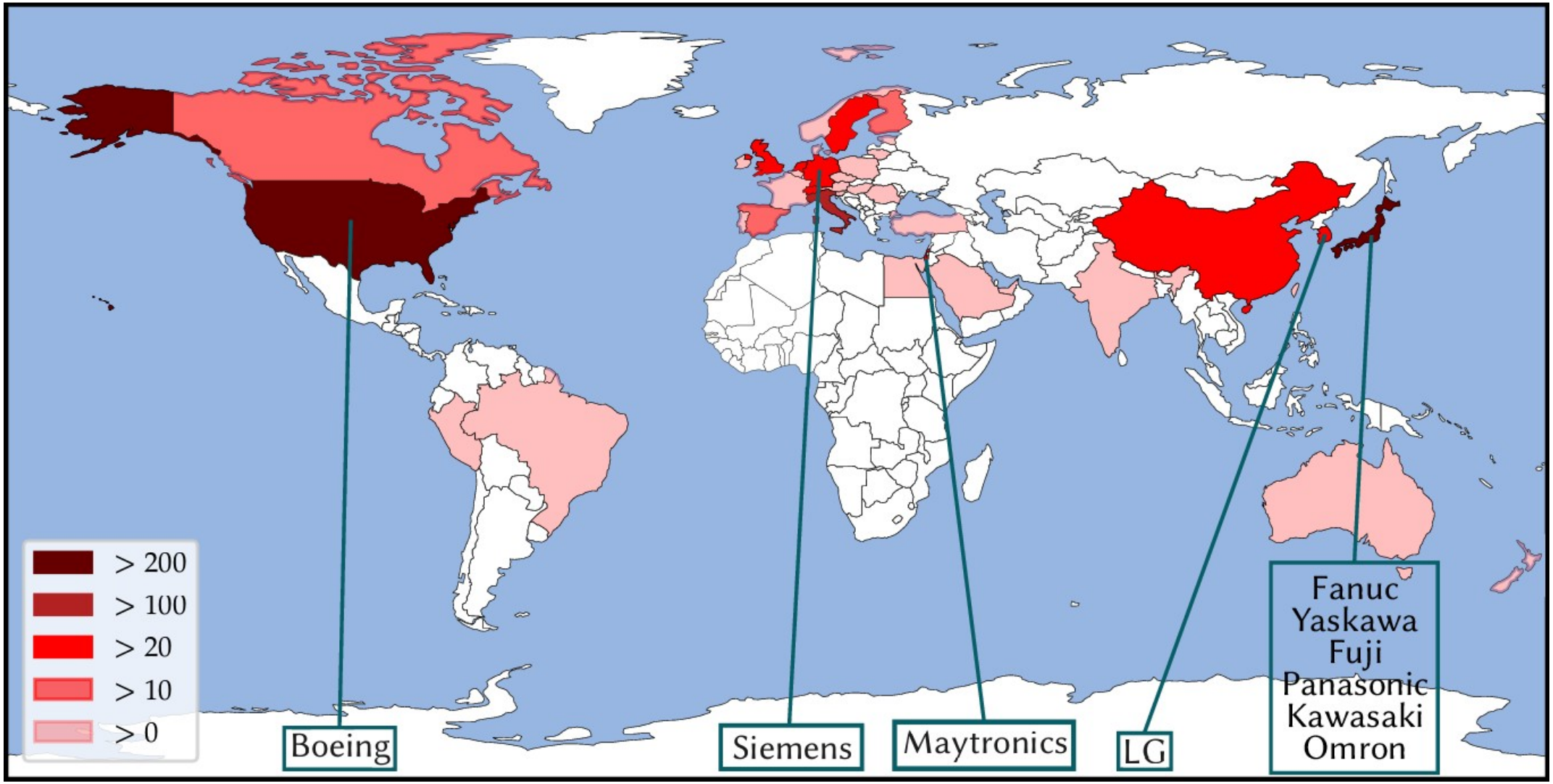


Source: Staccioli and Squicciarini (2021, forthcoming). Based on EPO patent applications between 1978-2019.

"Robots satisfy the demand for saving labour and rationalisation of work in view of the current rise in labour cost" (EP0068026A1, 1983)

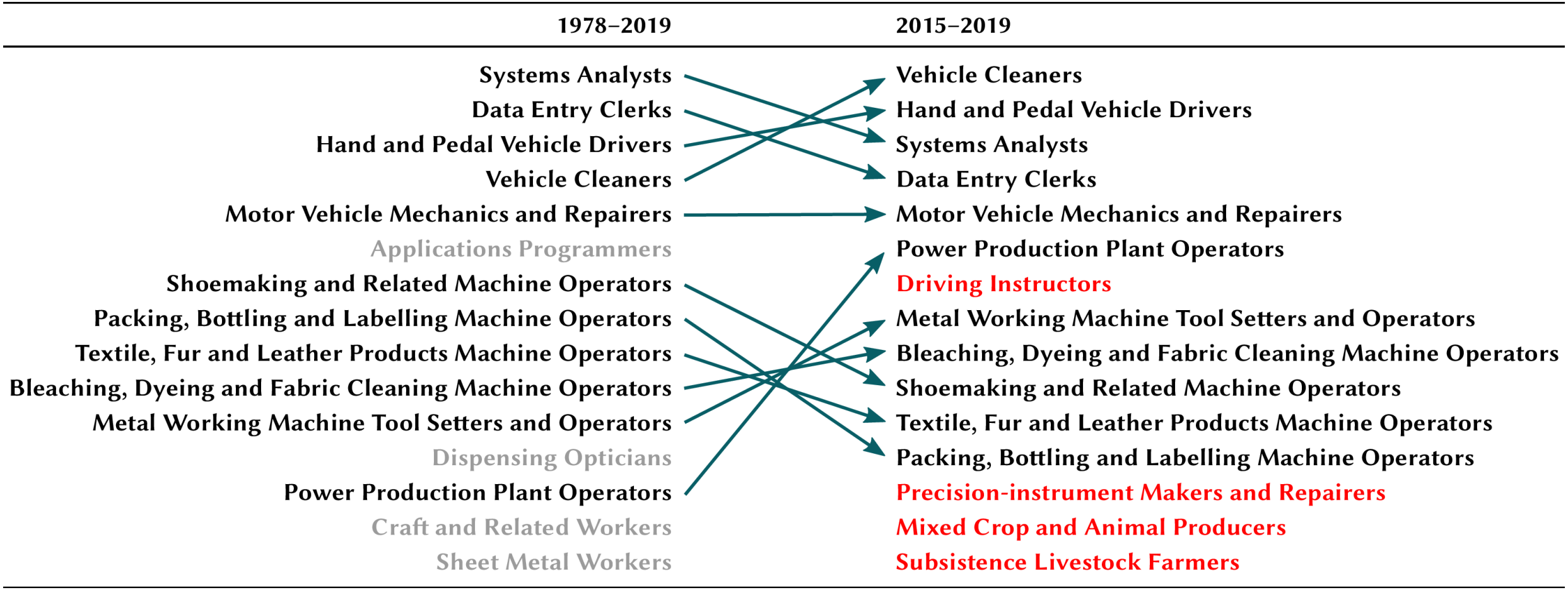
"Automated machining stations can be used to manufacture large quantities of pieces quickly and completely without human intervention" (EP2475501B1, 2009)

Where are LS patents developed and who leads the race?



Source: Staccioli and Squicciarini (2021, forthcoming). Based on EPO patent applications between 1978-2019.

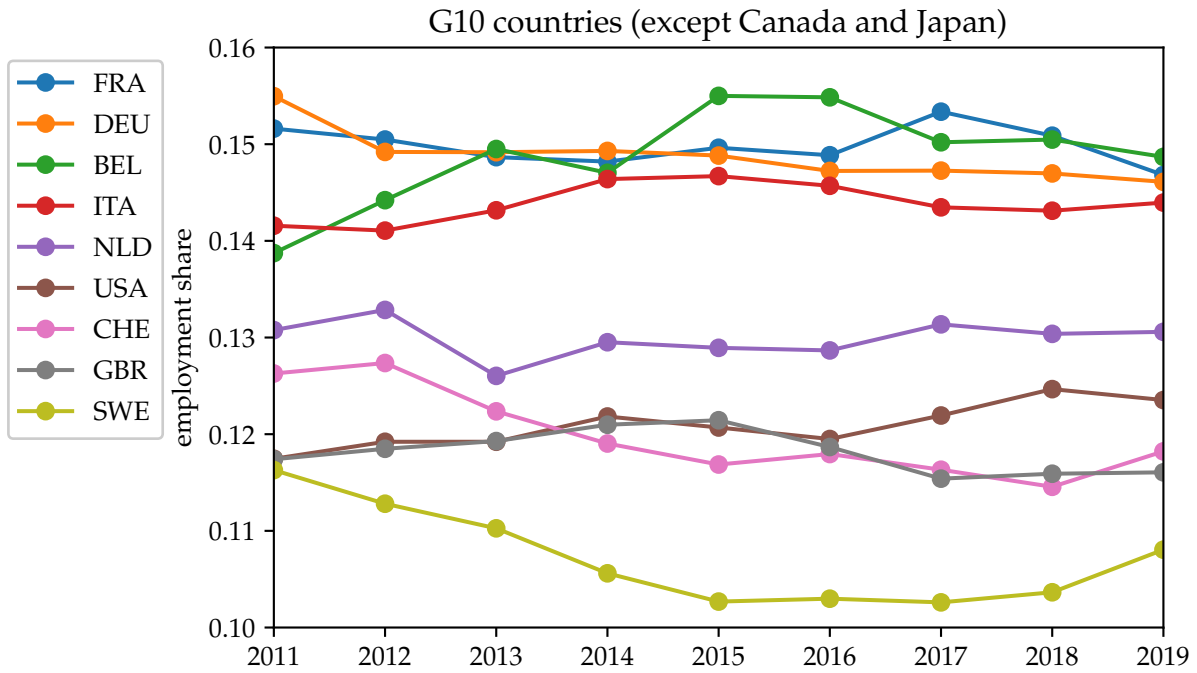
Which occupations are more exposed to labour-saving innovations?

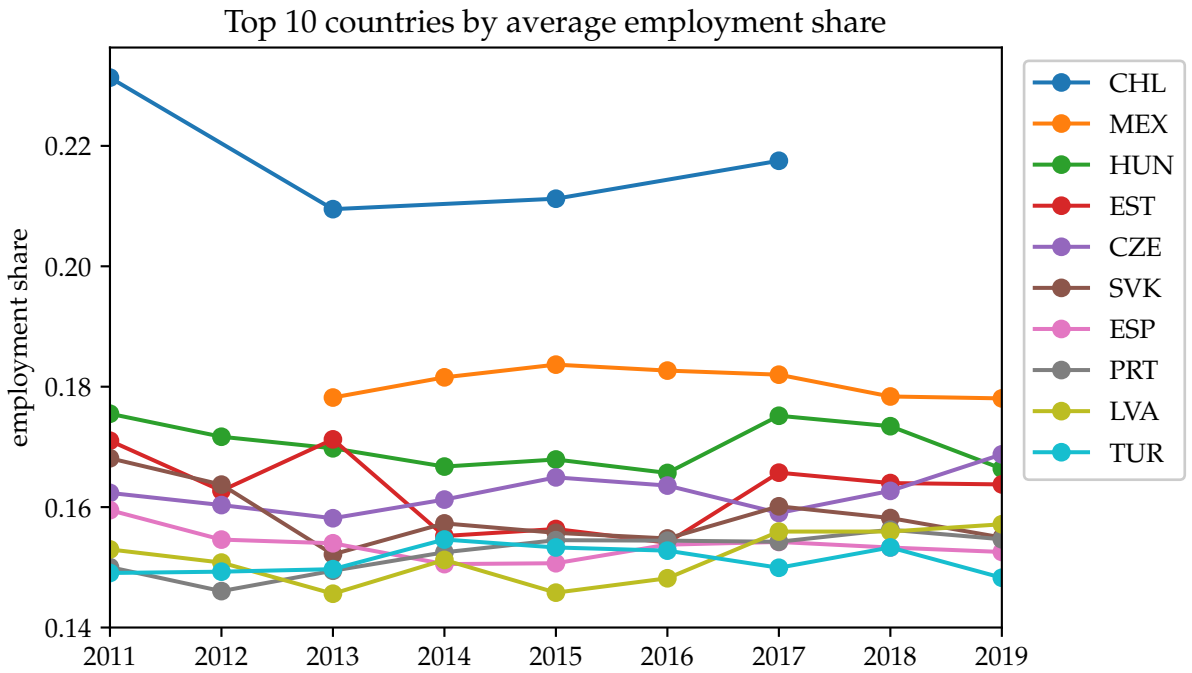


Source: Staccioli and Squicciarini (2021, forthcoming). Based on EPO patent applications between 1978-2019 and ISCO08 4-digit occupational titles.

Are machine really substituting workers? The (employment) world looks flat, after all...

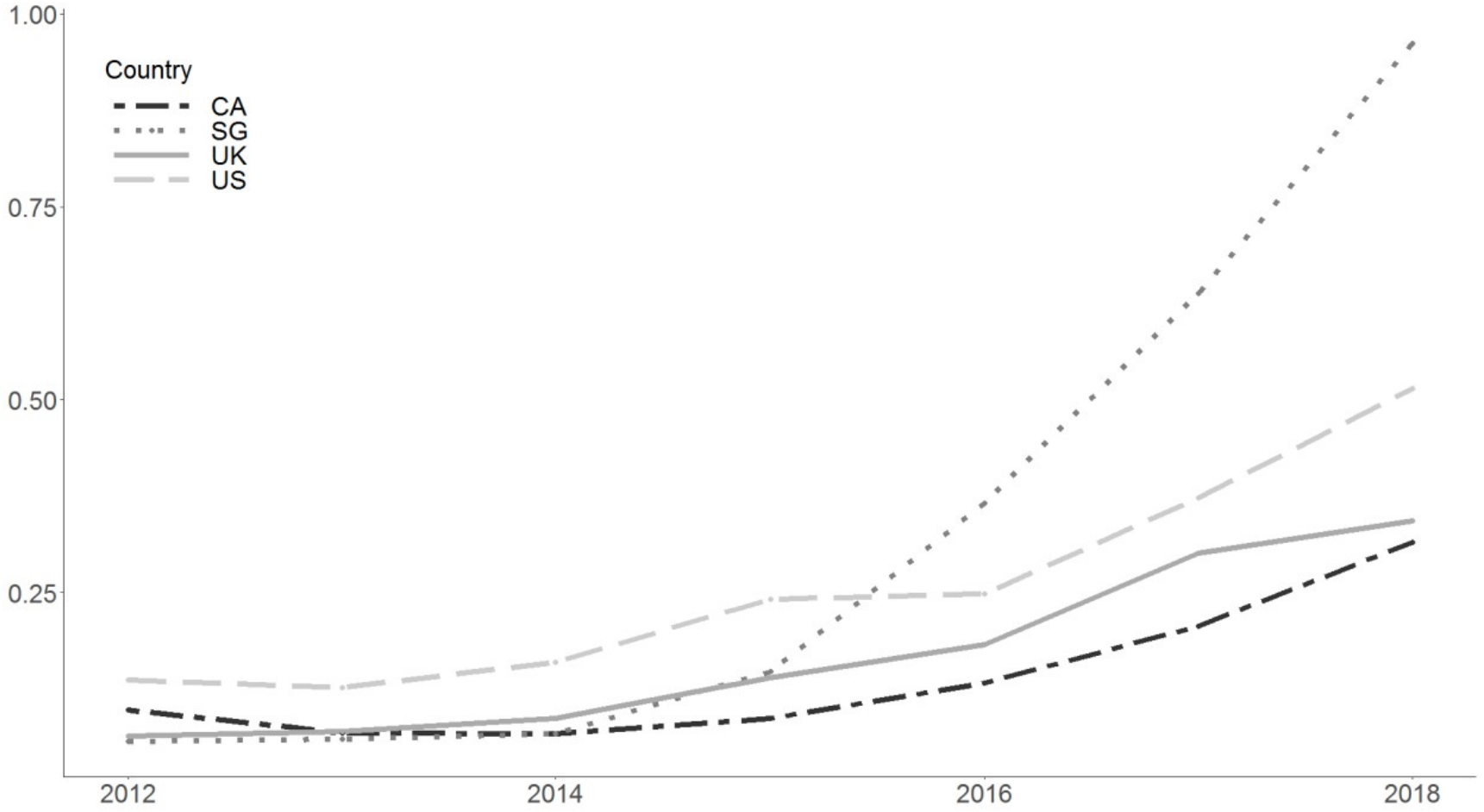
Aggregate employment share of top 10 exposed occupations





Source: Staccioli and Squicciarini (2021, forthcoming). Based on EPO patent applications between 1978-2019, ISCO08 2-digit occupational titles, and the ILO employment database.

… new (digital) technologies create demand for new types of workers



Source: Squicciarini and Nachtigall (2020). Based on Burning Glass Technologies data.

Where do we go from here? Some questions in need of an answer

- while the number of labour-saving technological innovations has increased over time, employment levels of workers in most exposed occupations remain stable
- new technologies, such as AI, are creating demand for a variety of workers, in different occupational categories

- how to best identify workers for which demand is created by new technologies?
- what does it take to work side-by-side with machines?
- who risks to be left behind?
- what can policy do to maximise the benefits of new technological paradigms for economies *and* societies?
- how to avoid widening or creating new divides?