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The challenges and opportunities in the digitalisation of production

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Introduction

- Digitalisation is a general purpose technology, changing how we live and work.
- The digitalisation of production, epitomised by Industrie 4.0 and first promoted in Germany, is:
 - “... the comprehensive transformation of the whole sphere of industrial production through the merging of digital technology and the internet with conventional industry” (Davies, 2015)
- No agreed definition of Industrie 4.0 and not yet widespread, though moved out of manufacturing into services and adopted as a policy aspiration by many governments.
- Interest in part because said to be at the forefront of a new 4th Industrial Revolution (WEF, 2017).

Opportunities and challenges: a polarised debate?

- The optimists see opportunities:
 - New organisational forms with increased flexibility, reduced production time and enhanced productivity and growth.
 - Integration across the whole value chain including suppliers, distributors, contractors and customers - from conception to production to consumption.
 - And system capable of learning and adapting: clever robots do not just work continuously doing as they were told (programmed) as they did in the past, there is now machine learning so can adapt to be more efficient at these tasks.
- The pessimists see challenges:
 - Clever robots can undertake both physical (manual) tasks and, increasingly, cognitive (mental) tasks, in doing so they can substitute human labour.
 - Lead to massive job losses with increased social exclusion and reduced job quality for remaining workers, both occupational health and polarisation.
 - Compounds existing concerns about the (limited) distribution of value (wealth) from production.

Current responses

- Polarised debate has translated into polarised policy responses:

1. Mainstream policy:

- Safety nets for workers between jobs are to be created and transitions for workers to new jobs are to be enabled. These jobs should be good jobs. Underlying principle is that workers, welfare and regions need to accept and adjust to the changes that are coming.

2. Radical politics:

- No point of safety nets and transitions and tinkering. Instead embrace the full potential of the new digital technology to eradicate (demeaning and exploitative) work and let the clever robots to do it. Advocate the end of all paid work and see a new welfare society replacing capitalist society.

Going beyond ...

- Need to ensure the opportunities are realised and the challenges mitigated by building on better data and understanding.
- History shows us that:
 - Choices exist – technology is not determinant.
 - Jobs likely to be lost, created and changed.
- Whilst challenges for workers are obvious, opportunities are less clear.
 - E.g. How increased efficiency and productivity for firms translates into mutual gains for workers needs to be made evident.
- Requires:
 - Understanding business models and how value is created, captured and then distributed;
 - Government to have a role market shaping (mission-led) not just dealing with market failure;
 - Role for social partners negotiating and delivering on the mission.
 - Industrie 5.0?