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**THE SOCIAL IMPLICATIONS OF THE FOURTH INDUSTRIAL REVOLUTION
IN THE ASIA-PACIFIC REGION**

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Kostas Mavromaras

Future of Employment and Skills Research Centre

adelaide.edu.au

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Outline

Technological change

Focus on technology, work and jobs

Social consequences of technological change

The broader Asia-Pacific region

Technological change

A historic perspective

- “We have been here before”
- Speed, depth and uncertainty

Where do we see change?

- Wealth creation
- Trade and globalisation
- Work and jobs
- Ethical considerations

Focus on technology, work and jobs

Types of technology and work

Net outcome: the battle between productivity and displacement effects

What are the really “bad” technologies

Impact on employment and jobs (consequences and remedies)

Ethics

Types of technology and work: Enabling versus Replacing technologies: definitions

Enabling technologies help humans work:

E.g. CAD software, enables an architect to draw faster and more accurately. Humans remain at the centre of the scene. While some displacement is possible, higher productivity overpowers those negatives.

Replacing technologies do away with humans:

The main change is that humans are displaced by machines and the savings are enough to pay for the automation. As the US rustbelt folklore has it: “all you need nowadays for manufacturing is one worker and one dog, the dog to keep humans away from the machines and the worker to feed the dog!”

Types of technology and work: Enabling versus Replacing technologies: impact

Enabling technologies...

improve productivity. The driving force behind much of the wealth creation we are experiencing in today's world. Can benefit both employers and workers. As the cost/price of a good/service reduces, demand for the good/service rises. The overall impact will depend on the elasticity of demand...

Replacing technologies...

Above all destroy jobs. They create negative outcomes for some (esp. the displaced workers and their communities) and a broad range of positive outcomes for others (esp. the employers/producers). They typically reduce wages, labour demand, overall employment.

Net outcomes: do technologies reduce employment and/or wages?

Technologies result in:

- **a displacement effect** as more workers are chasing fewer jobs, which puts wages under downward pressure.
- **a productivity effect** as we produce more for less and we are richer, which makes overall demand for goods/services increase (total factor productivity increases) and applies an upward pressure on wages.

Displacement effect = first order effect (employment has reduced so wages have also reduced – work is valued less) + second order effect (robots are cheaper, hence the goods produced are cheaper and demand increases)

If (displacement effect) > (productivity effect) then wages will reduce. Otherwise wages and/or employment will rise

What determines the net outcome of technologies?

A battle between displacement and productivity effects

Weak productivity rises are trouble, strong ones bring net positive effects

Historic and more recent net outcomes

Historically, net effects have been positive (supporting world economic development and increasing world employment)

Worryingly, **more recent evidence** shows stagnant wages, with unbundled production processes shifting work overseas, leaving behind them waves of local social and political problems, with global repercussions.

Are we sailing into uncharted waters?

What do really “bad” technologies do?

They **destroy old jobs** but do not generate new **good** jobs

- they only bring modest productivity gains, but can still “justify” the displacement to the production process owner
- they “take out” complete jobs by being able to fully replace the human, as the displacement is more drastic.

They **leave displaced workers with no skills** that can be transferred to another type of production, as they cannot be fully re-trained (difficult for some demographics).

The extent of the problem is an empirical matter and will differ by technology/workforce/sector/country and more...

Measuring displacement

How many jobs will be lost? Hard to measure and harder to predict

The degree to which job losses will also result in employment losses is the subject of a current debate among economists. If we decompose jobs into their constituent tasks, we find in many cases that some tasks can be automated and some cannot.

The argument then goes, whilst the jobs lost that occupied required X hours in total, if the tasks within these jobs that cannot be automated needed, say $X/3$ hours in total, then one third of the total hours will be repackaged into different (new) jobs and employment losses will reflect this (i.e. only two thirds of the total hours will be lost).

Measuring displacement

How many new jobs will new technologies create? This is very hard to predict, we are entering the crystal ball world!

Improved productivity increases product demand in the sector, and may also result in increases in jobs in new and complementary sectors. Thus, up to a point, productivity increases will ameliorate the negative displacement effects of automation. But how many and how soon, is very hard to foretell...

Moving on: Some relevant factors to consider

Background factors that will influence critically the relationship between technology and work include:

- **The level of national economic development**
- **Trade and investment relations (mobility of goods and capital, incl. mobility of technology)**
- **Education-Training-Skill levels and migration (development and mobility of labour)**

Some relevant factors to consider

While historical evidence may be suggesting that economic development benefits will overcome the costs of change, and in the longer run technological revolutions have all worked out well and positively, but it does not presently look like it is in all the aspects of the Fourth Industrial Revolution...

The big picture today looks like:

Yes, there are large rewards from technological change and even larger future promise, through globalisation and free trade

However, negative consequences are emerging and resistance is building both nationally and internationally

The distribution of economic and social costs and benefits is proving very uneven (statistics can also be problematic) and policies are not recognising and addressing these concerns

Political, economic, social, institutional tensions are emerging (nationally and internationally) and remedies are sought globally

Worker displacement: probably brings the worst social consequences with no obvious remedies...

The hardest problem to address will be mass displacement, how this is distributed and how its negative impacts could be ameliorated. Remedies should consider:

- Education and upskilling
- Social protection
- Institutional reform
- Ethical policies and institutions

I will conclude with a brief focus on the broader Asia-Pacific region, noting risks faced by the region as it embraces technological change, combined with globalisation and free trade, their consequences and the potential regional policy responses

The broader Asia-Pacific region: risks

The region has currently entered a period of instability, the main threats for growth being:

- Protectionism and trade wars
- The possibility of China slowing down
- A general slow down in world trade
- A lack of political leadership

Various sources incl. PECC survey on the State of the Region 2018

The broader Asia-Pacific region: displacement

In the midst of this geopolitical uncertainty comes a projected net displacement of workforces by 2030...

... by economic development cluster:

- Lower development, displacement around 10-15%
- Middle development, displacement around 20-30%
- Higher development, displacement above 30-50%

Various sources of estimates and author's calculations

The Asia-Pacific region: displacement expected impacts on work, jobs and skills

The region is expecting substantial changes in jobs, work and skills in the next decade (by 2030):

Sectors in decline: e.g. manufacturing, wholesale, administrative services, hiring vehicles, transport & storage

Growth sectors: IC, science & technology, education, health & social work, arts & entertainment

Source: PECC Survey on the State of the Region 2018

The Asia-Pacific region: displacement expected impacts on work, jobs and skills

The region is expecting substantial changes in jobs, work and skills in the next decade (by 2030):

Occupations in shortage: science, ICT, health, care

Surplus occupations: the list is as wide as is deep...

Note that these are predominantly occupations where re-training may prove problematic... The onus goes to the up-skilling infrastructure

Skills in shortage: complex problem solving, critical thinking, cognitive flexibility, judgement & decision

The last three slides gave us an indication that

(i) the size of displacement expected in the broader Asia-Pacific region could be large and

(ii) the combined impacts of this displacement at the micro level in terms of sectors, occupations and core skills in shortage will be not only sizeable, but also very complex in its composition

They indicate clearly that our present policies are storing up significant problems for our future

**Thus, we will need more and better education,
better and more flexible labour markets and
stronger social care infrastructure**

**Recent evidence from the region suggests that the region is not
prepared**

**In many Asia-Pacific countries there are grave concerns about
the readiness of the education, labour market, and social care
infrastructure to counter the impacts of technology-caused
displacement.**

Source: PECC Survey on the State of the Region 2018

Conclusion

Technological change is happening at speed and in depth

Presently we are focussing too much on the wealth generating capacity of the Fourth Industrial Revolution, at the expense of our preparedness to handle its future negative consequences

We need to pay more attention and provide more funding and planning towards innovative solutions to counter the social and economic problems that are presently being stored up

Thank you!

kostas.mavromaras@adelaide.edu.au



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