BIGMUN 2018
International Labour Organisation (ILO)

Research Report

Topic 2: The drastic changes in the future market for work caused by mass automatisation, machine learning, and similar technological impacts

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Introduction

From historical experience it can be established that most big technological shifts come with both applications and repercussions. The important part of this statement is in the term repercussion – what repercussions, and to what extent?

In BIGMUN 2018, one of the goals of the ILO is to try to mitigate some of the possible effects on the status of labour caused by advancements in certain types of production technologies, namely the expansion of automatization and the increasing capabilities of machine learning in the future. Delegates require a general picture of the stage and effects of these technologies today, as well as some insight into the most likely scenarios on this topic.

Key Terms

Automatization/automation: The process of manual labour being replaced by machinery. The term has different layers of effects; the lightest form of automatization can be described as the introduction of mechanical tools to speed up previously hand-operated tasks, while the "absolute" can be described as the full replacement of the manual labourer in an industrial process.

Productivity: Measure of efficiency of production by a certain metric, e.g. time, cost, employees.

Labour flux/job churn: Term for the rate of worker transitions from one job to another.

Employment sector: Umbrella categorisations of different jobs and job industries. Usually, four main sectors are referred to or discussed: The primary, secondary, tertiary and quaternary economic sectors. These consist of resource extraction, resource processing/manufacturing, commercial services and intellectual products, e.g. education, in respective order.

Employment structure: A statistical pattern of the relative sizes of employment sectors in a given country or region.

MEDC/LEDC/NIC: More/Less Economically Developed Country/Newly Industrialized Country

Artificial intelligence (AI): Umbrella term for machines that are created to display features we associate with intelligence (cognitive and conceptual learning, sense of art, types of memory, etc.).

Machine learning: A subcategory of artificial intelligence that involves data systems and machines that exhibit self-improvement to different effects. The term usually describes applications wired to "learn" how to complete given cognitive tasks through trial and error (physically or through simulations).

Main Issues

An important detail in the discussion on automation, machine learning and relevant demographic changes is the involvement of technology as a measure. Technology is a mix of invention, innovation and engineering, and as a result, it is very difficult to accurately predict some of its components in the future in different fields.

By far, the technological change we have had the most experience with is automation. The basic process is nothing new, as we have been experiencing it since the 1800s through the expansion of industry. For the debate, however, an important distinction to make is that the type of automation discussed refers to *post*-industrial automation. Hence it should not primarily cover ongoing and future industrialisation, but rather increases in productivity within existing industries. One exception to this is the issue of LEDCs developing to NICs and MEDCs, as this means they experience the same type of automation discussed in the debate.

The central debate around automation primarily surrounds productivity and cost and their effects on the jobs industry. This is due to the main idea behind automation; lowering costs through an increase in productivity. There are two prominent sides on this debate.

One side argues that as productivity increases due to automation, and as production starts covering demand, employment becomes less attractive to employers, due to staggering or dropping net revenue per employee carrying out a certain task. This ties heavily into the technical aspect of the

future of automation, as multi-purpose robots are becoming more and more available to individuals and industries. One idea behind this is that jobs are not yet being replaced by robots because the expenses associated with wages are still not comparable to the cost of advanced robotics. The specific argument only covers manual labour, although that will be elaborated upon.

A report by Conexus Indiana, Ball State University shows evidence to support the idea that manufacturing jobs are being "phased out" by advanced automation. Using US Census figures, the report extrapolates average productivity in the year 2000 with production growth in the manufacturing industry to year 2010, and arrives at the conclusion that 8.1 million potential jobs from 2000-2010 have not been created. Additionally, 5.6 million jobs were lost in the manufacturing industry in the same period, while productivity increased dramatically. The paper concludes that job losses are due to increases in productivity.[1]

The opposing side of the previous argument states that the reduction of production costs drives competition, and hence economic growth. For example, a positioning paper published by the International Federation of Robotics (IFR) outlines their main beliefs regarding the issue, stating "The IFR believes that… Increased productivity can lead to increased demand, Automation has led overall to an increase in labour demand and positive impact on wages."[2] Another possibility is that the effects of automation will not be as prominent in the near future as any projections suggest due to international factors. For example, an article in BBC Business outlines the status of the British steel industry, which is somewhat critical. It is stated that the British steel industry claims low-cost Chinese labour is the cause of the ongoing productivity and employment loss.[3]

In this case, the net job loss due to automation will not significantly affect global levels of employment in a given industry if replacement of manual labour with technology is only economically feasible in certain parts of the world.

[1] Devaraj, Srikant & Hicks, Michael J., PhD – The Myth and the Reality of Manufacturing in America
[2] International Federation of Robotics – "The Impact of Robotics on Productivity, Employment and Jobs"
[3] http://www.bbc.com/news/business-34581945

A different case for the effects of automation focuses on labour flux instead of a net gain or loss of jobs. The proposition takes root in the fact that automation undisputedly replaces certain tasks – this means that the process of automation continuously changes the skill requirements of occupations, resulting in frequently changes in occupation of the workforce.
However, a work series paper published in May 2017 by the Information Technology & Innovation Foundation disputes this, stating that job churn in the United States is at its lowest since the mid-90s,[4] and at a time when productivity is at its highest, as outlined previously. One criticism of this figure, however, is that it does not account for different job industries and the influence automation has had on them.

A much more recent technological development is the introduction of AI. Collectively, most types of AI are already changing the landscape of labour, and will continue to do so in the future. A lot of the large focus on AI in relation to the jobs industry is its ability to conduct human tasks with equal or superior results. In this discussion, the notion of labour replacement occurring at some stage is not as far-fetched, especially when AI is combined with advanced automation like multi-purpose robotics.
One example involves automation in the steelworks industry; Satyendra Sarna, a metallurgist, states on the topic of automation within it "In lay terms, however, it is easy to think of automated systems as not including humans. However, most of these "unmanned" systems, such as automatic circuit board assembly operations, involve human operators in supervisory or monitoring roles."[5] With the advent of advanced AI, this could potentially change as economic risks associated with purely automatic production drop due to machine learning on self-optimization.

Major Countries Involved

Technological development rarely ever affects a few countries exclusively – in the case of automatization, AI and a combination with increasing computing power, it is fair to say that this will affect all industrialized countries. However, there are still noteworthy cases in relation to the issue.

[4] Atkinson, Robert D. & Wu, John – "False Alarmism: Technological Disruption and the US Labor Market, 1850-2015" – Information Technology and Innovation Foundation
[5] Sarna, Satyendra – "Automation in Steel Industry"

An article published in Harvard Business Review maps countries with the highest share of jobs that could potentially be automated with current technology. Some of their results are:[6]

Japan – 55.7%

India – 51.8%

China – 51.2%

Mexico – 51.8%

United States – 45.8%

Indonesia – 51.8%

Germany – 47.9%

Major Organisations Involved

Several companies and groups have a say in the discussion and process of automation and artificial intelligence. Many of them are either affected by, or are direct contributors to the changes. These are some of the most prominent ones:

Google - The company is a front driver of computer technology in both hardware and software, as well as hosting the biggest search engine on the internet. In recent years, Google has been investing in creation and distribution of artificial intelligence. One example of this is the implementation of deep neural networks into the search engine.

ABB Ltd. - ABB is one of the largest investors in electrical equipment, electrical power and robotics, as well as automation – both as its own initiative and as a follow-up of the other industries.

[6] https://hbr.org/2017/04/the-countries-most-and-least-likely-to-be-affected-by-automation

Microsoft - The largest software producer in the world recently launched a subsidiary, Microsoft Ventures, that focuses on the development of AI.[7]

Relevant Conventions, Resolutions and Papers

C122

Convention adopted by the International Labour Conference on 9 July 1964 during the Forty-eighth session, on *Employment Policy*.

This prescribes labour standards on employment policy in terms of availability of jobs for all who have the ability and are willing to work. This relates to the presented issues on automation through a perspective of rights.

Further Reading:

http://www.ilo.org/dyn/normlex/en/f?p=NORMLEXPUB:12100:0::NO::P12100_INSTRUMENT_ID:312267

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[7] https://microsoftventures.com/

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