

VoxEU: The macroeconomic effects of automation and the role of Covid-19 in reinforcing their dynamics

Advancing technologies have mainly replaced the routine tasks of low-skilled workers, while the incomes robots generate flow to wealthier capital owners. The current Covid-19 pandemic is likely to reinforce these trends, [writes David Bloom and Klaus Prettner for VoxEU.](#)



Automation is rapidly advancing

Over the last decade, automation has increasingly been adopted as a full substitution of capital for labour—as opposed to a standard form of labour-augmenting technological change.

The number of industrial robots increased by a factor of three over the course of a decade, rising from a little over one million operative units in 2010 to a projected 3.15 million units in 2020. Over the same time, robots reportedly became capable of substituting for, or even outperforming, humans for many tasks, such as producing customised parts and medical implants using 3D printing technologies, diagnosing diseases, and assisting decision making, for example, by ‘robot judges’ (Ford 2015, Baldwin 2019, Re and Solow-Niederman 2019).

In a recently-released book (Prettner and Bloom 2020), we explore the theory, evidence, and policy related to the economic and social consequences of the world’s increasing reliance on robots, automated processes, and artificial intelligence.

Automation can be good for growth but not for income inequality

While automation can (and did) improve productivity, per capita output, and living standards in general (see, for example, Brynjolfsson and McAfee 2014, Acemoglu and Restrepo 2018, Graetz and Michaels 2018), two crucial aspects of automation raise concerns: its disproportionate impact on low-skill workers and its overall negative impact with respect to the share of income that goes to labour as opposed to capital. Both of these impacts tend to exacerbate income inequality.

Routine and low-skill tasks continue to be easier for robots to perform than non-routine, high-skill tasks (Arntz et al. 2017, Frey and Osborne 2017, Dauth et al. 2017, Acemoglu and Restrepo 2020). This implies that increases in the number of robots or improvements in their productivity tend to affect low-skilled workers much more adversely than high-skilled workers.

Moreover, high-skilled workers tend to specialise in tasks to which automation is complementary, such as robot design and maintenance, supervision, and management. The differential impact of automation implies that the wages of low-skilled workers might stagnate and even decline in the presence of automation (Lankisch et al. 2019). Simultaneously, high-skilled workers' wages may rise as a result of automation, potentially increasing wage and income inequality (Piketty 2014, Prettner and Bloom 2020).

A key quote from the article:

The COVID-19 pandemic will likely accelerate the development and implementation of automation technologies because of greater incentives to substitute capital for labour. The reason is that the former is obviously not susceptible to pathogens that affect humans (although they might be quite susceptible to digital pathogens). In addition, working from home might become much more widespread, now that it has been tested on a large scale, acting against the corresponding status quo bias against remote working of firms and bureaucracies.

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