Tech takeover of jobs: Threats, prospects

April 8, 2023

Kuka robots work on Tesla Model S cars in a factory in Fremont, California. credit: AP File Photo

Technological change is an indelible aspect of modern economic growth. While in the short run, economies might grow by accumulating capital and labour, healthy long-term growth cannot occur without sustained technological improvements. This enables economies to generate more output from a given amount of productive factors, either by designing new products or by innovating new ways to produce the same output. However, technological change has also been accompanied by significant anxieties: The fear of displacement of labour, unemployment and rising inequality being chief among them.

Also Read | <u>Bill Gates says calls to pause AI won't 'solve challenges'</u>

These anxieties and expectations have become turbocharged in recent weeks, with the release of ChatGPT, an artificial intelligence language tool developed by OpenAI. Artificially intelligent tools represent powerful innovations that can help spur growth and generate new kinds of jobs but also displace existing human labour by automating processes that earlier required human workers. Given India and the global economy facing significant headwinds — such as slowing growth, rising inflation and inequality — we require urgent study and significant policy interventions to realise the promises and prevent the threats of automation.

There exists significant academic literature on the impact of automation on employment and inequality. The ability to mechanise parts of the production process is easier when these tasks are largely routine and do not require cognitive thinking or person-to-person contact. The introduction of robots in factories reduced the need for factory workers. Simultaneously, economies saw an expansion of low-paid service sector workers in jobs that retained a significant aspect of human interaction — such as restaurant workers — since these jobs cannot easily be automated.

Also Read | Surgeons must push for robots in OTs

Automation also gives rise to new occupations that prioritise higher-order skills. The introduction of robots in a factory might displace some factory workers, but it gives rise to engineers and programmers specialised in the operation and maintenance of these new machines. A study by economists from MIT, Utrecht University and Northwestern University has found that 60% of US employment in 2018 was found in occupations that did not exist in 1940.

This phenomenon is known as "job polarisation", where routine processes fall prey to automation, while the economy sees an increase in low-skill and high-skill jobs at either end of the wage distribution.

Automation also has significant impacts on inequality. The substitution of capital for labour — that is, robots for workers — would raise the share of capital relative to labour. And the polarisation of employment into high-paid, high-skilled and low-paid, low-skilled workers would increase inequality among workers. The final outcome would depend on whether the increase in labour productivity is shared with workers in the form of rising wages, as well as the extent of the wage gaps between the bottom and top of the wage distribution.

Also Read | Artificial Intelligence better than humans at key heart test: Study

What does this imply for the Indian labour market? Tasks involving routine software coding and other processes might see a drop in labour demand. For example, the legal profession might see greater adoption of AI for the writing of routine legal briefs.

Economist Michael Webb has found a greater potential for the adoption of AI in occupations that are high-skilled, such as laboratory technicians and chemical engineers, while low-skill occupations are not as exposed. One might expect certain forms of low-skill software jobs — call-centre work that focus on human interactions — to be relatively shielded from the current effects of AI.

No doubt, new avenues would emerge. There would be growing demand for workers trained in working with AI, skilled in knowing what prompts must be used to instruct the AI to perform certain tasks. Automation would see an increase in tasks that rely on cognitive skills that human ingenuity cannot — as yet — be substituted. This would allow workers to focus their energies on higher-order tasks, freed from the burden of routine

operations, thus increasing productivity. But the spectre of greater job polarisation exists, with a smaller proportion of high-skilled workers and a large mass of low-skilled workers emerging.

There exists significant space for policy development, especially in the field of education. There would need to be a greater focus on teaching abstract problem-solving skills and how to leverage the power of these new technologies, rather than focusing on training students in routine operations. But this is, admittedly, no easy feat.

Labour demand

Consider a process of automation that displaces factory workers but creates new jobs for technicians. Whether employment rises or falls depends on whether there are enough factories with new machines to provide jobs for technicians, and whether labour demand in other sectors has expanded enough to absorb the displaced factory workers. Whether inequality rises or falls depends on whether the benefits of rising productivity are passed on in the form of rising wages. The final impact of automation on economy-wide levels of employment and inequality depends crucially on the macroeconomic policy environment.

These impacts have been extensively studied by economist Daron Acemoglu. In the US economy, the period from 1947 to 1987 witnessed healthy labour demand that compensated for the displacement brought about by automation, with wages rising in step with productivity, leading to relatively constant wage shares. However, the patterns of technological change look very different in the period from 1987 to 2017. Automation substitutes capital for labour, while labour demand in other sectors is relatively muted. This has resulted in slower growth of wages, and a reduction in the share of wages.

The changing nature of innovation — greater progress in the use of digital technology, for instance — might account for the evolving nature of technological change, but one must also look to the policy environment for an explanation. A strong union presence in the immediate era after World War II ensured wages rose in line with productivity, while easier access to education ensured a skilled workforce. In the new economy, reduction in labour's bargaining power and the increasing costs of education have been held by some as factors behind the changing fortunes of workers.

Eventual impact

The bargaining power of labour in India is low, given the presence of a large informal economy and weak union presence. Private consumption and investment growth remain muted, and the prospects of future growth remain uncertain. AI-fueled automation may well exacerbate the iniquities that already burden India's workers. It is imperative to ensure rising labour demand in the face of technological change — whether through fiscal and monetary policy or interventions that adequately redistribute productivity gains. It is also important to ensure that policy cushions the eventual impact on workers. For instance, one could imagine raising taxes on profits in order to ensure a fund that can upskill, educate and retrain displaced workers.

Also Read | AI may change everything, but probably not too quickly

One must not think that policy interventions to ensure some measure of distributive justice necessarily represents a tradeoff with economic efficiency. A level playing field can positively impact future technological change: Acemoglu and fellow economist Pascual Restrepo report positive impacts of automation in relatively high-wage economies.

The pace of technological change in the digital era can far outstrip the ability of institutions and policies to devise schemes to prepare for them. But the difficulty of the task is no excuse for tardiness in preparing for the challenge.

(Rahul Menon is an Associate Professor at O P Jindal Global University in Haryana)