

Executive Summary

There are many concerns that technological innovation will lead to increased unemployment, suppressed wages and greater inequality. However, the impact of the new technologies on labour markets and income distribution is not predetermined. The right policy mix and institutional arrangements can ensure that the benefits of innovation are shared broadly, an essential step to achieving the Sustainable Development Goals (SDGs) for all. This work provides an evidence-based analysis of the link between recent technological progress, labour markets and inequality.

The promise and pitfalls of technological progress

Technological progress is a main driver of aggregate economic growth and improvements in living standards over the long term. It increases overall productivity, thereby boosting per capita income and consumption. While technological progress has mostly been incremental and gradual over time, on a few occasions, technological change has been revolutionary, transforming the organizational structure of societies and economies. For instance, mechanization and productivity gains from technology led to large declines in agricultural employment and the reorganization of economies and societies around industrial and urban centers. However, for this to happen, breakthrough technological inventions alone are not sufficient, as diffusion of new technologies is critical.

Now again, technologies are encroaching in areas where human abilities were once deemed indispensable, threatening to do for cognitive ability what machines did for muscle power. The pace of breakthroughs in several clusters of technology—from gene editing to machine learning and advanced materials—may signify that a new technological revolution is at hand, which could be transformative for almost every industry and every country.

The growing ability of artificial intelligence (AI) systems to autonomously solve complex problems could fundamentally reshape our economy and society, for example by developing new forms of transportation

or revolutionizing health care. Additive or 3D manufacturing has the potential to change how products are made and to address many of the problems of industrialisation in disadvantaged countries, such as least developed countries (LDCs).

Just as these new technologies hold immense promise, they are also seen as a threat, potentially disrupting labour markets and contributing to income inequality. The biggest public fear is that robots and AI will replace human jobs on a large scale, resulting in mass unemployment or underemployment—and, consequently, widespread impoverishment—around the globe. In fact, labour has been losing its share of income. An ever-increasing inequality between technology owners and workers could lead to protracted social conflict.

The destruction, transformation and creation of jobs

Estimates of the share of jobs at risk to being automated vary widely and can reach staggering numbers of over 80 per cent. Most analyses suggest that AI and other new technologies will continue to benefit higher-skilled workers with a high degree of flexibility, creativity, and strong problem-solving and interpersonal skills. Low- and medium-skilled workers, both in manual and cognitive jobs, are expected to face further pressures from ever more capable machines and AI software. This could exacerbate the decline of middle-skilled jobs and rising wage inequality observed in the recent past, particularly in many developed countries. However, it is also possible that future AI-powered robots could increasingly displace highly educated and skilled professionals, such as doctors, architects and even programmers.

While there is no reason to downplay the impact of new technologies on labour markets and inequality, technology-induced unemployment rates of 80 per cent are not part of realistic future scenarios. Technologies replace certain tasks rather than complete occupations and, often ignored, new technologies also create jobs and demand new skills from workers. Throughout history, technological innovations have enhanced the productivity of workers and created new products and markets, thereby generating new

jobs in the economy. This will be no different for AI, 3D printing and robotics.

Both job destruction and job creation are determined not only by technological feasibility, but also by economic, legal, regulatory or socio-political factors. The mere possibility that a job could be eliminated does not mean it will be eliminated. Firms will weigh the benefits of new automation technologies (for example, a lower wage bill or higher productivity) against their costs.

In fact, low wages partly explain why most developing countries with abundant cheap labour have so far not been visibly affected by automation. There are also immense legal and regulatory issues. For AI to be deployed on a large scale in healthcare, for example, it must be decided whether the doctor or the artificial intelligence will be responsible for claims of medical malpractice.

The current technological changes also contribute to a shift away from traditional work arrangements to “contingent work”. While this increases worker flexibility and gainful employment opportunities, many non-standard work arrangements lead to precarious work relations, with workers having to bear employment and income risks by themselves.

In assessing the impact of new technologies, it is important to understand how technology interacts with other important trends. Changes in market structure—leading to increased monopolistic rents and high profits made by relatively few firms—are a key factor for explaining rising inequality in many countries. However, profit shares are not only rising in technology markets characterized by ‘superstar firms’ but also in other sectors, which points to the importance of regulatory policies and lobbying activities. Global value chains (GVCs) are driven both by technological advances and by changes in trade and investment policies. They have spurred trade and employment in several developing countries, though reshoring could limit this in the future.

Automation, enabled by new technologies, is accelerating not only in developed countries, but also in those developing countries that have established themselves as leading players in global

manufacturing. At the same time, many LDCs do not yet possess the required skills, energy infrastructure, broadband or transport networks to take advantage of the new production techniques. Hence, one of the biggest risks and international challenges is that a new technological revolution will cause gains from manufacturing and participation in GVCs to become even more concentrated, limiting the scope for structural transformation in countries left behind.

Conclusions and the way forward

Overall, technological innovation is a main engine of productivity growth, but can also be a major force of disruption. The influence of technology on economies is not preordained, but can be shaped by policies at the local, national, and global levels. Rather than taking a passive wait-and-see approach, Governments as well as the United Nations can and should influence these processes. The general policy stance should be to embrace and direct these new technologies. Rather than trying to block them out of fear of disruption, policy makers should adopt appropriate and flexible regulatory and legal policies and promote national capacities to innovate.

At the same time, proactive policies are needed to ensure that the gains are broadly shared and displaced workers receive support. If technology changes the nature of work and disrupts traditional social insurance systems, policies can reduce vulnerabilities by expanding social protection systems. If technology leads to less equal income distribution, policies are called to redistribute income. If new technologies change the nature of skills demanded on labour markets, curriculums in schools and universities can be adapted and on-the-job and life-long learning opportunities can be promoted.¹

National policies should be complemented by regional and global actions to address problems that are transnational in nature. Technological progress should not be used as an excuse for policy inaction, but rather as an incentive to find better solutions.

¹ See (ILO 2011, pg. 35) for some examples of funding allocated to retrain workers to meet the new demand for skills.