

A GLOBALISED WORLD THANKS TO DIGITAL TECHNOLOGIES

Amanpreet Kaur¹, Manminder Singh²

^{1,2}Guru Kashi University, Talwandi Sabo

ABSTRACT

The adoption and integration of advanced digital technologies (fifth-generation (5G) mobile networks, the Internet of things (IoT), cloud computing, artificial intelligence, big data analysis, robotics, etc.) means that we are moving from a hyper connected world to one of digitalized economies and societies. It is a world in which the traditional economy, with its organizational, productive and governance systems, overlaps or merges with the digital economy, with its innovative features in terms of business models, production, business organization and governance. This results in a new, digitally interwoven system in which models from both spheres interact, giving rise to more complex ecosystems that are currently undergoing organizational, institutional and regulatory transformation

Keywords: globalised, world, digital technologies

I. Digitalization and productivity

Productivity dynamics in Latin America and the Caribbean Latin America and the Caribbean is faced with the challenge of speeding up productivity growth and generating more and better jobs to drive sustainable and inclusive development. In recent decades, growth in the region's countries has lagged behind that in both emerging and developed economies. This performance has been closely associated with the nature of growth. While growth in emerging and high-growth economies has come mainly from productivity gains associated with structural change and the performance of technologically sophisticated sectors, in Latin America and the Caribbean most growth is explained by the expansion of the labour force.

II. Background

From a longer-term perspective, the past 60 years have witnessed a growing divergence between the region's productivity and that of the most developed and emerging economies, which has been particularly pronounced since the 1980s. In contrast to the developed countries and the emerging economies of Asia, the countries of the region have not reaped the benefits of successive great waves of technological transformation, particularly the digital revolution that began in the 1990s and the more recent and still nascent 4.0 era (Ting, *et al.* 2020). In contrast to the region, high-growth economies have seized the opportunity to accelerate productivity through large investments and a commitment to the adoption of new technologies. The Republic of Korea, for example, experienced rapid growth accompanied by the sectoral transformation of its industry and large-scale incorporation of technology into production activities from the second half of the 1960s. Similarly, Taiwan Province of China implemented an ambitious plan to industrialize its economy in the 1980s. Today, its technology sector is one of the most competitive in the world, especially in the production of electronic components and computers (Sahut, *et al.* 2021). Thus, the region's productivity gap relative to the technological

frontier has widened in recent decades, resulting in a performance that is insufficient to keep up with population growth.

III. Productivity

The region's weak productivity growth is mainly due to the lack of productive diversification and the concentration of production in natural resource-intensive activities (agriculture, fishing, mining and some industrial sectors) which, although strongly export-oriented, operate with few linkages to the rest of the production structure and do not have significant effects in terms of technological spillovers and capacity-building. These marked disparities and the region's structural heterogeneity are also reflected in the productivity gaps between small and large firms, which are substantially larger than in other countries and regions. The labour productivity of a medium-sized firm in Latin America averages less than half that of a large firm, a figure that falls to 23% for small firms and only 6% for microenterprises. On average, the productivity difference between micro and large firms is seven times larger in Latin America than in the European Union (Kolesnikov, *et al.*2020). This productivity gap is linked to the region's weak productivity performance. Stagnating productivity is the outcome of a dual dynamic in which strong productivity growth in technology-intensive large firms contrasts with declining or stagnating productivity in the vast majority of small firms, often associated with their slowness to adopt new technologies. Firm size is a crucial determinant of information technology investment decisions across all industries. Furthermore, returns to innovation are linked to the presence of complementary inputs, such as skills and financial resources, which are typically found in large firms.

IV. Digital technologies and productivity

Productivity growth is the main driver of sustained economic growth. Thus, in the long run, increasing productivity is the only way to maintain income growth and access to essential goods and services. Since the first industrial revolution, the introduction of new technologies has contributed to higher productivity in firms and in the economy as a whole. Crudely put, technical progress is the basis for productivity growth (Budd, *et al.*2020). The development and incorporation of new technologies into production processes is therefore essential for growth. The cost-effective adoption of new technologies depends on the capabilities and factor endowments of firms and countries (Linkov, *et al.* 2018). The production structure, technology intensity in industry and enterprise dynamics are vital in determining whether the full potential of digital technologies is exploited. Given the structure and limited level of technological sophistication of the production sector in the Latin American and Caribbean countries, and considering the business structure there, it is not enough to encourage and facilitate the adoption of technologies. Enhancing the digital ecosystem requires structural policies to support technological sophistication, innovation and productivity.

Disruptive changes in firms and the business environment resulting from advances in digitalization have accelerated recently with the COVID-19 pandemic and the increased use of digital technologies in response to it. The adoption of digital technologies has become even more of a priority to boost productivity and quality employment. Technical change has many potential impacts, and there is a strong positive correlation between the technology intensity of the production structure and the productivity of the economy; at the microeconomic level, digital transformation affects productivity and growth through four mechanisms that improve the

efficiency and effectiveness of firms (Banga, 2022). Besides the direct impacts on business, digitalization is leading to major changes in the competition dynamics of the value chain and in consumers. New business models are giving rise to increasing participation by new players who are “digital natives” and bring with them numerous implications for market dynamics and the economy in general. In some sectors, such as retail, there is direct competition between traditional offerings and digital disruption. When digital channels play a greater role, traditional players and channels may be displaced and have to adapt, develop their own digital channels and integrate with other players’ digital platforms. In some activities, the level of digital disruption may reach the point where digitalization becomes a matter of survival given the demands of the “new consumer”, an example being tourism service intermediation, particularly in the context of the pandemic.

V. Digital transformation

Digital transformation can lead to value consolidation and greater concentration of profits through intensification of economies of scope and “superstar” or “winner takes all” dynamics. The combination of these factors, together with changes in consumer habits (preference for digital channels and rapid delivery) is driving the boom in digital platforms. At the same time, digital transformation is also optimizing the supply chain and bringing it closer to users by reducing transaction, distribution and marketing costs. This process entails an increase in the disintermediation of the chain and in the importance of direct sales channels, as in the case of tourism (Urbinati, *et al.*2020). Lastly, in some sectors digitalization is resulting in a transfer of value to consumers in the form of larger consumer surpluses thanks to lower prices, greater transparency and lower search costs. An example is the digitalization of the music industry, where 96% of the gains from technology are estimated to have gone to consumers. The coexistence of value creation mechanisms and transfer dynamics means that a positive and significant relationship between digitalization and productivity growth is not always observed at the macro level, particularly in periods of transition and disruption. In this context, the region has a window of opportunity in which to implement the necessary structural reforms and adapt regulatory frameworks with a view to defining its position on the technological and economic trajectories towards which the world is moving.

VI. The digitalization of production chains

In the era of digital transformation, public and private activities are seeking to take advantage of the efficiency revolution brought about by the use and management of large volumes of data, thus benefiting from new economies of scope and scale. The new Industry 4.0 technologies create the potential for changes in emerging economies’ production processes to yield gains in productivity and competitiveness that are sustainable over time.

VII. Advanced analytics and artificial intelligence

Advanced analytics and artificial intelligence algorithms and high-performance computers can be used to identify patterns and perform predictive analytics to facilitate automated learning and decision-making (Elia, *et al.*2020). This typically involves combining traditional analytics methodologies (such as regression, search algorithms and linear optimization) with machine learning techniques, which employ methods such as clustering

algorithms, dimensionality reduction, deep learning networks and neural networks. By 2023, advanced analytics is expected to represent a market worth more than US\$ 270 billion globally.

VIII. The Internet of things

The Internet of things sensors and actuators enable the use of smart interconnected devices or products that can be remotely accessed or tracked. The Internet of things (IoT) allows “smart networks” to be developed to automate or improve the effectiveness of production and distribution processes, particularly when it interacts with technologies such as advanced analytics. The main applications of the Internet of things are in smart cities, smart industry, telemedicine and smart homes (Khotamov, 2019). In 2018, Amazon launched Amazon Go, a fully automated supermarket concept where consumers can shop without having to interact with anyone or pay at the store. Technologies such as computer vision, deep learning and sensor networks make it possible to identify consumers and the products they carry and to charge them automatically and fully digitally at the end of their visit.

IX. Advanced robotics

It advances in artificial intelligence, computer vision, sensors, motors and hydraulics are enabling robots to perform increasingly complex tasks, with less repetitive and predictable patterns. Industrial robotics, for example, represented a US\$ 12 billion market in 2016 and is expected to grow by 4.4% annually between 2016 and 2023. The market for service robots is particularly buoyant. For example, sales of logistics robots increased by 110% between 2018 and 2019, while sales of medical robots increased by 28% in the same period.

X. Cloud services and digital platform

A digital or virtual platforms are spaces on the Internet that facilitate the execution of applications or programmes in one place to meet different needs. Most digital interactions take place remotely in the cloud, reducing the need for storage and processing on local computers and devices. Cloud computing enables computing services to be delivered over a network, which reduces usage costs and facilitates the transmission of information (Choi, *et al.* 2020). By 2023, these services are expected to represent a market of more than US\$ 350 billion worldwide.

XI. Block chain

A blockchain is a digital ledger that works with a single decentralized, consensual register to validate information and transactions. The ledger is distributed across multiple nodes in a network and each block stores a number of valid records or transactions, along with information about that block and how it is linked to the previous and next block via a unique digital fingerprint. As new records are created, they are first verified and validated by the nodes in the network and then added to a new block that is linked to the chain. Furthermore, if this information is stored in encrypted form, its confidentiality is assured because only those with the encryption key can access it. This would make it possible, for example, to unify health records, such as individual patients' medical histories, in a secure and convenient way. The pharmaceutical industry could use this technology to check medicines and prevent counterfeiting. Cryptocurrencies, meanwhile, can be thought of as a ledger where every transaction is recorded.

XII. Conclusion

Virtual reality and augmented reality immersive technologies such as virtual reality and augmented reality are being used to reinvent the way content is created and experienced. For example, at Stanford University's Neurosurgical Simulation and Virtual Reality Center, virtual reality is being used for detailed planning of complex brain surgery (e.g., to remove tumours) based on simulations created using information obtained from CT scans. Immersive technologies have multiple impacts for businesses, such as reduced production costs thanks to the use of virtual prototypes and lower barriers to entry for new content creators. New technologies can be used at all stages in the operation of different sectors and activities. They are specific sources of value for companies and businesses that require a clear connection between business needs and the impact of the solution and a clear vision of how to use the solution that is going to be incorporated. The potential of these technologies is not common to all economic activities; it depends on each sector, its degree of sophistication and linkage with other activities, the technology incorporated and the capabilities and skills of workers, as well as the context in which companies and businesses operate. The adoption of new technologies entails a reconfiguration of the entire production chain, involving new links, services and companies, which opens up opportunities for sectoral diversification and skills development. Three sectoral cases of great transformative potential for the region in the agro-industry, manufacturing and retail sectors and chains.

XIII. References

- Banga, K. (2022). Digital technologies and product upgrading in global value chains: Empirical evidence from indian manufacturing firms. *The European Journal of Development Research*, 34(1), 77-102.
- Budd, J., Miller, B. S., Manning, E. M., Lampos, V., Zhuang, M., Edelstein, M., ... & McKendry, R. A. (2020). Digital technologies in the public-health response to COVID-19. *Nature medicine*, 26(8), 1183-1192.
- Choi, J., Dutz, M. A., & Usman, Z. (Eds.). (2020). *The future of work in Africa: Harnessing the potential of digital technologies for all*. World Bank Publications.
- Elia, G., Margherita, A., & Passiante, G. (2020). Digital entrepreneurship ecosystem: How digital technologies and collective intelligence are reshaping the entrepreneurial process. *Technological Forecasting and Social Change*, 150, 119791.
- Khotamov, I. S. (2019). World Tendencies and Development of the Digital Economy in Uzbekistan. *Ахуел научных исследований*.
- Kolesnikov, A. V., Zernova, L. E., Degtyareva, V. V., Panko, I. V., & Sigidov, Y. I. (2020). Global trends of the digital economy development. *Opción: Revista de Ciencias Humanas y Sociales*, (26), 523-540.
- Linkov, I., Trump, B. D., Poinatte-Jones, K., & Florin, M. V. (2018). Governance strategies for a sustainable digital world. *Sustainability*, 10(2), 440.
- Sahut, J. M., Iandoli, L., & Teulon, F. (2021). The age of digital entrepreneurship. *Small Business Economics*, 56(3), 1159-1169.
- Ting, D. S. W., Carin, L., Dzau, V., & Wong, T. Y. (2020). Digital technology and COVID-19. *Nature medicine*, 26(4), 459-461.
- Urbinati, A., Chiaroni, D., Chiesa, V., & Frattini, F. (2020). The role of digital technologies in open innovation processes: an exploratory multiple case study analysis. *R&D Management*, 50(1), 136-160.