Towards digital globalization and the covid-19 challenge

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Abstract

Digital globalization is a new form of globalization. It brings about relevant changes regarding how business is conducted across borders, the flow of economic benefits, and broadening participation. The growth of data and information related to digital globalization determines that global economic, financial, and social connections increase through digital platforms. Covid-19 is causing a shock to the global economy that is proving to be both faster and more severe than the 2008 global financial crisis. If the current crisis is pushing towards deglobalization, at the same time, Covid-19 represents a challenge for digital globalization and the digital transformation of economies. This research contribution examines the process towards digital globalization that is characterizing the world economy, its impact on businesses, consumers, and governments. It also discusses the challenge that the crisis caused by the coronavirus pandemic is posing to the globalization and digital transformation of economies.

Keywords: digital globalization, fourth industrial revolution, artificial intelligence, Covid-19, deglobalization, digital innovation policy
Jel Classification: D20, D78, F60, L86, 031

INTRODUCTION

Digital globalization, defined largely by flows of data and information, is a new form of globalization. It brings about relevant changes regarding how business is done across borders, the flow of economic benefits, and broadening participation.

Countries cannot be isolated from the global economy. However, today the pattern of globalization is shifting. In 2008, due to the global financial crisis, the global goods trade and financial flows had flattened. In addition, because of the crisis there was a slowdown in long-term, cross-border investments (i.e. foreign direct investments), which, in turn, provoked fears of a slowdown in globalization. Later, the adverse wind of protectionism, driven by the imposition of tariffs by the US government, contributed to a slowdown in global trade. Presently, the adverse effects of Covid-19 are severely affecting the global economy resulting in a retreat from freewheeling global supply chains. At the same time, the flow of data and information has been increasing. Digital flows are transmitting information, ideas, and innovations throughout the world, broadening participation in the global economy, and strengthening the digital globalization process. These data flows ensure that global economic, financial, and social connections in the digital era continue to grow and widen. Thus, the phenomenon of global digitalization is gaining momentum, so that governments, large multinational corporations, and major financial institutions are not the only central characters, but also artisans, entrepreneurs, app developers, freelancers, small businesses, and even individuals can participate directly on digital platforms with global reach.

This paper analyses the process of global digitization and discusses both the challenges and effects that the Coronavirus pandemic is having on it. This paper first examines the topics of globalization and the current shift towards digital globalization. Second, it presents an overview of the digital transformation of the economic and social environments, and the emergence of the fourth industrial revolution, involving Industry 4.0, the spread of artificial intelligence, and several other new technologies. Third, the paper discusses the spread of digitization favoured by the Covid-19 crisis. Policy discussion and conclusions are presented at the end of the paper.

GLOBALIZATION AND THE SHIFT TOWARDS DIGITAL GLOBALIZATION

Globalization describes the growing interdependence of the world's economies, cultures, and populations, brought about by cross-border trade in goods and services, technology, and flows of investment, people, and information (Kolb, 2008). For several centuries, countries have built economic partnerships to facilitate these movements. The first phase of modern globalization began with increase of world trade beginning around 1850 especially due to the conquests of part of the globe by some European countries that yielded valuable natural resources and helped fuel trade and investment between the European imperial powers, their colonies, and the United States.

The term again gained popularity in the early 1990s, after the Cold War, as cooperative arrangements shaped modern life. Therefore, the world is more interconnected than ever before. According to the World Bank (2020), in 1970, trade as a percentage of the world's gross domestic product (GDP), was equal to 27%; in 2018, this figure reached 59%. The increase was determined by a steady increase in the international exchange of goods and services. In addition, in this globalized world, emerging economies are the counterparts of more than half of the global trade flows.

The current Covid-19 pandemic is causing a strong shift of businesses, consumers, governments, investments, and trade, towards digital globalization. Digital globalization is a form of globalization in which the

digital transformation of economies changes the ways of consumption, commerce, investment, conducting business, and managing governments. It changes the modalities of economic and trade relations between countries.

Digital globalization in the twenty-first century is fostered by digital technologies and characterized by accelerating and increasing flows of data and information. In the process of digitalization of the economies, global data flows are surging and digital platforms allow more countries and smaller enterprises to participate (Schilirò, 2018).

As pointed out by the McKinsey Global Institute (2016), cross-border flows of data are also increasing (e.g., cross-border bandwidth has grown 45 times larger since 2005). Global flows of data primarily consist of information, searches, communications, transactions, video, and intra-company traffic. They underpin and enable virtually every other kind of cross-border flow. Thus, digitalization is having a profound effect on global trade and investments, transforming industries and sectors across the globe.

Data and information are the new basic resources, representing the "new oil." The more data and information that is gathered, the more it improves solutions that adopt artificial intelligence (AI) (i.e. machine learning-based solutions). Inflows and outflows of data, ideas, technologies, talent, and best practices around the world also impact investment decisions. All this translates into opportunities to monetize data. Data flows at the global level have contributed significantly to the increase of the world's GDP over the last decade. It now represents a larger share of impact on growth as compared to global trade in goods.

According to the UNCTAD *World Investment Report* (2019), the emergence of the digital economy has had a major influence on global patterns of investments and foreign direct investments. Although it offers new opportunities, it also involves serious policy challenges (e.g., bridging the digital divide). Regardless, the digital economy has favoured the emergence of digital globalization.

According to the *Connectedness Index* (McKinsey Global Institute, 2016), countries such as Singapore, The Netherlands, the United States, Germany, the United Kingdom, China, Ireland, Saudi Arabia, and the United Arab Emirates top the digital transformation. China is one of the leading global investors in digital technologies. It has one of the most active digital investment and start-up ecosystems in the world[1]. In general, advanced economies are still the most globally connected. However, data flows offer stronger economic benefits to countries on the periphery of the world's digital networks.

Moreover, the global adoption of digital technologies has changed the way organizations operate. In fact, digital technologies are changing how business is conducted across borders and how people are communicating, broadening participation. There is an improvement in operational efficiency, cost reductions in marketing, sales, and information gathering.

In the public sector, this digital revolution creates significant opportunities for all levels of government to improve the delivery of public goods and services and to raise more and better revenue. In the private sector, digital transformation is no longer an option. It is now imperative for every company, large, medium, or small. Companies must be able to reinvent themselves, radically transforming I their models and processes, in a path that involves substantial changes in terms of technology, culture, operations, and value generation.

Digital transformation and innovation in digitalization are boosted by consumers' and investors' expectations, as well as by prospects of greater economic and social benefits. Much of the literature claims that successful digital transformation comes not only from implementing new technologies, but also from transforming the organizations to take advantage of the possibilities that new technologies provide. Major digital transformation initiatives are centred on re-envisioning customer experience, operational processes, and business models. Successful digital transformation comes not from creating a new organization, but from reshaping the organization to take advantage of valuable existing strategic assets in new ways.

Furthermore, many companies tend to grow more complex and inefficient as they expand across borders. Digital technologies can tame complexity and create leaner models for going global. Digital globalization also pushes companies to change their business models as they rethink their organizational structures, products, assets, and competitors. Big corporations, as well as small- and medium-sized enterprises (SMEs), are taking advantage of digital globalization. They profit in the same way, transforming themselves into micro or "pocket" multinationals. SMEs are using digital platforms (e.g., eBay, Amazon, Facebook, Alibaba) to connect with customers and suppliers in other countries. In addition, small start-ups tend to become global quickly by exploiting digital platforms[2].

Digital platforms change the economics of doing business across borders, as they decrease the cost of international interactions and transactions. They create more efficient, transparent markets and user communities with global scale. This gives businesses a large base of potential customers and effective ways to reach them. Individuals are using global digital platforms to learn, find work, showcase talent, and build personal

[1] In China, for instance, the rapid rise and expansion of players like Alibaba and Tencent have led to the creation of massive "ecosystems" spanning e-commerce, entertainment, finance, and logistics.

[2] McKinsey Global Institute (2016), in its survey, shows that over 85% of tech-based start-ups report some type of cross-border activity.

networks. More than three billion people have international connections on social media. Thus, digital platforms are key to this new era of globalization.

E-commerce is another important aspect of the digital economy and digital globalization. This fast form of trade is modifying sales strategies and consumer behaviour. Retail sales ecommerce worldwide reached $3.5 trillion. In addition, the World Trade Organization (2019) shows that the 2018 U.S. business-to business (B2B) e-commerce was six times larger than business-to-consumer (B2C) e-commerce. In the case of B2C, Amazon dominates the U.S. market. In 2020, over one-fifth of the multitrillion-dollar U.S. retail market will shift to the Web. Alibaba, on the other hand, accounts for 80% of all online retail sales in China. Since 2015, the company has 350 million active users, which is larger than the total population of the U.S.

Despite the benefits, digital globalization poses a number of challenges. Although companies can enter new markets, they are exposed to pricing pressures, aggressive global competitors, and disruptive digital business models. Data must be protected against cybercrime. Social media creates global communities but connects networks of extremists. It will take more international coordination to deal with many of these issues. Today's version of globalization is complex and fast-paced. The connectedness, however, can be a path to growth (McKinsey Global Institute, 2016).

Finally, the growing nationalism not only can hinder trade, but also it can favour various forms of digital wars, slowing down the process of digital globalization. In conclusion, new features of digital globalization include (Schilirò, 2018):

- Intangible and accelerating flows of data and information
- Greater participation by emerging economies
- More knowledge-intensive flows
- Importance of digital infrastructure
- Growing role of SMEs, start-ups, and individuals
- More exchanges of free content and services
- Instant global access to information
- Innovation flows in both directions for advanced and emerging economies

DIGITIZATION AND THE FOURTH INDUSTRIAL REVOLUTION

Digitization has become one of the most significant global business trends over the last few years. The on-going digital transformation is featured by advances in big data, predictive analytics, and artificial intelligence. These tools offer many opportunities for improved, data-driven decision-making (Leonardi, 2020).

Digitization, together with artificial intelligence (AI),[3] is characterizing the fourth industrial revolution. This revolution is changing the way we produce, as it exploits different technologies. Its main development, the use of objects of the Internet of things (IoT), includes smart and connected devices that create and manage data as it makes a business interactive. The fourth industrial revolution also involves the affirmation of Industry 4.0, namely a paradigm shift from a centralized production model to a decentralized, intelligent, and always connected production model. The transformation involved with Industry 4.0, with its scale, scope, and complexity, alters the way in which companies are going to operate, as well as the relationship between suppliers, customers, and other third parties. The connected ecosystem that is being built has many benefits, and taking advantage of these is going to generate a competitive edge. The key technologies that will thrive in Industry 4.0 will be robotics, analytics, artificial intelligence, cognitive technologies, nanotechnology, quantum computing, wearables, the Internet of things, additive manufacturing, and advanced materials.

Therefore, the fourth industrial revolution allows for better, cheaper, and faster production. It is transforming the way we communicate and interact. As highlighted by Gwata (2019), in order for the fourth industrial revolution to flourish, it is necessary to rethink education, employment, and entrepreneurship. Education must change and become interdisciplinary. People must have an in-depth knowledge of a specific field, with sufficient knowledge in other fields outside their own specialisation. Regarding employment, already automatization and computerization allow businesses to scale, new industries to be created, and for the employment sector to expand globally. The fourth industrial revolution provides much wider range of technology options to choose from, from social media to block chain. These broader options will affect the quality and distribution of employment across sectors. In addition, robotization in particular is likely to shift production locations and foreign direct investment (FDI) flows, with important repercussions on employment. Finally, regarding entrepreneurship, the fourth industrial revolution requires that people become more entrepreneurial in their approach to employment, and this new spirit can be exercised indirectly by being an "intrapreneur"—an employee who works for someone

[3] Experts, like data scientists, define AI as a collection of the following six techniques: (1) image processing (convolutional neural nets); (2) natural language processing (recurrent neural nets); (3) question answering machines (e.g., Watson); (4) generative adversarial neural nets; (5) reinforcement learning; and (6) robotics.

else, but embodies the entrepreneurial spirit of being innovative and seeking continuous improvement of the things around them—or directly as an entrepreneur.

As far as AI is concerned, it is not a single technology but a family of technologies. AI can be considered in five broad categories: (1) computer vision; (2) natural language; (3) virtual assistants; (4) robotic process automation; and (5) advanced machine learning. AI, being a general-purpose technology, has large potential to contribute to global economic activity and to digital globalization. By 2030, 70% of companies may have adopted at least one type of AI technology (Zhao, 2018).

In particular, among the five different types of technology, there is a special link between AI and machine learning. Before the start of machine learning in the 80s, business decision rules were mostly hand-coded sets of instructions based on the knowledge of business experts. With machine learning, those rules are inferred from the previously collected data where business expertise plays a key role for the feature engineering part. The business expert needs to determine which factors may impact the results of the desired prediction, and the algorithm automatically selects the optimal way to combine these factors.

Additionally, there is concern that AI and other digital technologies may replace, and cause the lay-off of large numbers of workers. However, AI and the related Industry 4.0 will have inter-industry effects. Productivity gains from new technology in one industry will likely lower production costs in others through input–output linkages. All this will contribute to increased demand and employment across industries.

At the global average level of adoption, according to a simulation by Bughin, Seong, Manyika, Chui, and Joshi (2018), AI has the potential to deliver additional global economic activity of around $13 trillion by 2030. This is approximately a 16% higher cumulative gross domestic product (GDP) as compared to the present. This is due to the positive, direct impact on company productivity and externalities linked to the adoption of AI as related to the broad economic environment. This amounts to 1.2% of additional GDP growth per year. If delivered, this impact would compare well with that of other general-purpose technologies through history. Definitely, the sectors that are going to experience greater impact from AI and that will be more digital savvy are: retail, healthcare, high tech, telecommunications, automotive, and assembly (Zhao, 2018).

Finally, AI has a huge potential on the educational front (Luckin, Holmes, Griffiths, & Forcier, 2016). For instance, AI helps to provide an intelligent, personal tutor for every learner. It can ‘track’ the behaviours of students—for example, collect data on class attendance and assignment submission in order to identify (and provide support) to students at risk of abandoning their studies. AI can provide intelligent virtual reality to support learning in authentic environments.

Additionally, AI can leapfrog development through "smart and tech" systems of education, especially in several developing countries and in a continent such as Africa, with a population of 1.3 billion, where 60% of individuals are under the age of 25. The most difficult problem is to offer a fair teaching opportunity for everyone. We are probably still far from this goal, but there remains many opportunities and spaces for improvement.

It is undoubtedly true that a key problem and challenge that affects AI is that its adoption could widen the gaps between countries, companies, and workers. Artificial intelligence can boost economic activity, but the distribution of benefits is likely to be uneven. In addition, there are risks for humanity concerning poor or unethical digital practices that are increasing rapidly and can no longer be ignored, such as the malevolent use of AI, such as the impact of a total loss of personal privacy, and the social and economic costs of unregulated gig-economy jobs with few or no social protections. This is why targeted and balanced policies aimed at using digital technologies and their spread, including AI, are necessary in order to avoid preventing the potential of these technologies.

Another important technology in the process of digital globalization is blockchain. Blockchain technology enables distributed public ledgers to hold immutable data in a secure and encrypted way and ensure that transactions can never be altered (Schilirò, 2018).[4] The technology promises to speed up and reduce the cost of transactions. Particularly, it boosts financial inclusion by providing more opportunities to participants. However, the blockchain as distributed ledger technology is finding a broad range of uses: data storage, financial transactions, real estate, asset management, agri-food, and many more uses are being explored. In fact, blockchain is finding other innovative uses, such as supply chains, health, education, and the environment, not only in developed economies, but also in developing countries. The main reason for this array of applications is that users of distributed ledger technology significantly benefit from the efficiencies and economies by creating a more robust environment for real-time and secure data sharing.

Finally, among the protagonist of digital transformation and digital globalization there is the FinTech industry. FinTech today comprises five major areas: (1) finance and investment; (2) operations and risk management; (3) payments and infrastructure; (4) data security and monetization; and (5) customer interface (Arner, Barberis, & Buckle, 2015). FinTech is experiencing strong development in Asia, the Middle East, and Africa. Digital finance, particularly in developing countries, could have a great impact. Market and institutional

[4] A distributed ledger is a consensus of replicated, shared, and synchronized digital data geographically spread across multiple sites, countries, and/or institutions.

factors are promoting the birth and growth of the FinTech industry in this part of the world so that a paradigm based on a combination of entrepreneurial and regulatory forces emerges. However, several problems remain to be addressed to reach a digital financial transformation. First, it is necessary to have a framework to achieve various goals for each actor in the financial sector. Second, regulators must secure the necessary understanding and scope of operations to oversee the use of technology within the financial industry. In addition, banks should compete equally in terms of regulatory burden with FinTech companies, which offer exact or close substitutes for regulated products. At the same time, start-ups need to operate within a regulatory framework that allows them to develop their business before becoming subject to expensive compliance costs. Digital finance has the power to favour the process of digital globalization, transform the economic prospects of billions of people, and inject new dynamism into small businesses, unlocking economic opportunity and accelerating social development, especially in the context of the Covid crisis.

DIGITIZATION AND COVID-19

Digitization can improve the quality of life for citizens by offering new tools for health and education, providing access to information, and fostering greater civic participation. Presently, however, Covid-19 is causing enormous damage to the world economy with a cumulative cost that could become devastating.[5] The containment measures enforced by countries worldwide are severely affecting global economic activity and strongly curtailing global trade (Battistini & Stoevsky, 2020).

The Covid-19 pandemic is adding fuel to the trend away from globalization. The economic disruption brought about by the coronavirus has added further momentum to the deglobalization trend. Irwin (2020) reports that the World Trade Organization's forecast is that there will likely be a decline of between 13% and 32% in world trade in 2020; a much more than expected fall in world GDP.

Das and Handfiled (1997) highlighted that production chains are highly internationalized, with intermediate products being shipped across the world in order to minimize production costs. The coronavirus irruption, with its restrictions on international travel justified by the protection of public health, is disrupting these global chains, also bringing out the opportunity to have productions developed entirely locally, and generating national security concerns about certain strategic goods that could face production shortages, such as health devices, food, and civil aviation.

In the fight against the Covid-19 crisis, digitization becomes a basic need. Digital technology plays an unprecedented role in the maintenance of daily life and economic and social activities, as well as the recovery of industries and business activities. Therefore, the Coronavirus-pandemic could become a tipping point for digitization—a dawn of a new era—by accelerating the maturity of digital technology (Sneader & Sternfels, 2020).

Fighting a pandemic while minimising the associated economic costs calls for an appropriate digital infrastructure for the design and enforcement of containment measures, as well as to ensure access by the population and enterprises to critical government services (de Mello & Ter-Minassian, 2020). The business response to the coronavirus crisis is an energising adoption of new technologies. In fact, the Covid-19 crisis has accelerated the shift to digital. Acceleration of digital, tech and analytics is already the path companies, especially large organizations, are following. However, the best companies are going further, by enhancing and expanding their digital channels. They are successfully using advanced analytics to combine new sources of data, such as satellite imaging, with their own insights to make better and faster decisions and strengthen their links to customers. Moreover, since business are more reliant on technology, new manufacturing techniques, such as 3-D printing and the automation of factories, are experiencing a boost in this Covid period, and also reducing the economic incentives to offshore production. The digital technology is affecting most of the processes of the firms, enabling communications that are more efficient. The use of smartphones is becoming increasingly pervasive and an accelerator of digital globalization (Donnan & Leatherby, 2019).

Digital solutions are, in fact, adopted to improve surveillance and security. Such tools also make it possible to determine the geo-location of sick or at-risk people through artificial intelligence and big data, for example. Countries, such as Israel and South Korea, are using digital technologies to curb the Covid-19 infection. There is also an extensive use, in many countries, of digital technology and their applications to promote remote work and e-learning initiatives. Digital technology has, therefore, a key role to play in reducing the impact of the Covid-19 crisis. In short, not only can digital solutions be used to raise public awareness about the pandemic, but also to develop online pre-screening and diagnosis, and improve surveillance and security. Digital technology is allowing people to contribute to broader efforts to minimize the spread of Covid-19. However, many citizens across the world will be excluded by the use of digital technologies. They do not have compatible smartphones for the use of apps that allow tracking, such as the less well-off, older citizens, and many inhabitants in the poorest areas of the planet, as well as many young students do not have Internet access and cannot exploit the potential of e-learning.

[5] In particular, Covid-19 poses challenges to the European Union from digital to climate change, from migration to refugees, from defence to the common financial market.

Another aspect of this crisis is that it accelerates digital transformation in many sectors, including education, and the particular segment of executive education. In this context, digital skills are more in-demand than ever. Even more so, for the post-Covid world, digital skills are essential for economic development and growth. In addition, a new awareness has emerged, and healthcare has never been more important. Thus, the role of digital technology in this context becomes crucial. We think about sharing data on the spread of the epidemic, but above all, the information and epidemiological data that can be shared in research laboratories globally. Education has also shifted online. This shift allows remote tutoring to enable students to continue their learning. In short, one thing we can be certain about in a post-Covid climate is—the future is definitely digital.

POLICY DISCUSSION AND CONCLUSION

First of all, the coronavirus crisis highlights the importance of science and research but, above all, the strategic role of the public sector. Massive economic support programs through monetary and fiscal stimulus have been implemented across the world because of the Covid crisis. However, each state must play a primary role in encouraging access to health care, fighting inequalities, and also the use of digital technologies as fundamental rights. Therefore, the on-going digital transformation of the economies characterized by new technologies, and pressed by the Covid-19 emergency, requires inclusive, coherent, and well-coordinated policies, reflecting a multi-stakeholder and whole-of-government approach to policy making that pro-actively consider those who will benefit from the digital transformation and those who risk being left behind (OECD, 2017). In addition, global cooperation is another important aspect in terms of policies aimed at promoting digital transformation and the affirmation of digital globalization.

Digitization and the related fourth industrial revolution determine a structural transformation that needs a proactive policy. This policy must seize the opportunities digital transformation can spur through innovation and productivity growth across many activities, transforming public services, and improving wellbeing as information, knowledge, and data become more widely available. It will be instrumental in addressing pressing policy challenges, such as the health system, the care for ageing populations, the shift to renewable energy, and injecting efficiency and transparency into the delivery of government services.

Digitization forces policymakers to rethink procedures to keep pace with the rapid shift in technology, facilitating a transition toward new sectors and activities with higher productivity and added value. The digital transformation will provide new job opportunities for many, but raises challenges for others, with the risk of growing inequalities in access to jobs. Sound labour, skills, and social policies, can make it easier for workers to grasp the new opportunities and help navigate the challenges.

Any successful policy for digital transformation depends on having a clear vision, defining goals, and setting priorities. The issue focuses on how governments should intervene rather than if they should intercede. Among the policy responses to the Covid-19 crisis, several Arab Gulf countries have implemented financial support programmes for projects that include diagnostics, the role of telemedicine, and the application of AI. They have also carried on projects to evaluate the impacts on business and the economy. These countries are promoting digital transformation and new technologies, favouring digital innovators as start-ups in the field of research and applied digital technologies.

In conclusion, a global-scale crisis, such as Covid-19, strips leadership in companies and governments back to its most fundamental element: making a positive difference in people's lives. This crisis triggers a series of economic, technological, and psychological responses that must meet economic difficulties, communication problems, the digital divide, and a sense of distress among citizens. For this reason, the sense of belonging to a global, supportive, and interconnected, community can help overcome the difficulties of this profound crisis. Digital transformation and digital globalization could become an opportunity to improve the economic, human, and psychological condition of citizens around the world.

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