

DIGITAL GLOBALIZATION

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December 2018

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I. Introduction

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 (*What is globalization*, 2018, www.PiIE.com). For several centuries, countries have built economic partnerships to facilitate these movements. The term gained popularity in the early 1990s after the Cold War as cooperative arrangements shaped modern life. Therefore, the world is more interconnected than ever. In this globalized world, emerging economies are counterparts of more than half of global trade flows.

Countries cannot be isolated from the global economy. However, the pattern of globalization is shifting. While global goods trade and financial flows have flattened due to the global crisis and, more recently to the adverse wind of protectionism, global economic connections in the digital era are growing and becoming wider.

II. The Fourth Industrial Revolution

We are living in the fourth industrial revolution, which is driven by advances in artificial intelligence (AI) (e.g., robotization)¹ and digitalization. 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 which 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 to a decentralized, intelligent, and always connected production.

This new revolution allows better, cheaper, and faster production. It is transforming the way we communicate and interact. Particularly, robotization is likely to shift production locations and foreign direct investment (FDI) flows. Furthermore, digital flows are transmitting information, ideas, and innovation around the world, broadening participation in the global economy.

AI is considered in five broad categories: (1) computer vision; (2) natural language; (3) virtual assistants; (4) robotic process automation; and (5) advanced machine learning. At the global average level of adoption, according to a simulation by McKinsey², 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 with today. 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.

AI has a huge potential to leapfrog development, especially on the educational front. It could bolster growth in a continent like Africa with a population of 1.3 billion. In addition, 60% of those individuals are under the age of 25.

Digital technologies are changing how business is done across borders and broadening participation. In the process of digitalization of the economies, global data flows are surging. Cross-border flows

¹ 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.

² Notes from the AI Frontier: Modeling the Impact of AI on the World Economy, September 2018

of data are also increasing (e.g., cross-border bandwidth has grown 45 times larger since 2005). Thus, digitalization is having a profound effect on global trade and investment, transforming industries and sectors across the globe. Moreover, digitization can improve the quality of life for citizens by fostering greater civic participation, providing access to information, and offering new tools for health and education.

Data and information are the new basic resources, representing the “new oil.” The more that is gathered, the more it improves machine learning-based solutions. This results in additional opportunities to monetize data. Inflows and outflows of data, ideas, technologies, talent, and best practices around the world also impact investment decisions. 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.

The digital economy has a major influence on global patterns of investment and foreign direct investment (World Investment Report, 2017). Although it offers new opportunities, it also involves serious policy challenges (e.g., bridging the digital divide). In any case, the digital economy has favored the emergence of digital globalization. According to the *McKinsey Global Institute (MGI) Connectedness Index*, countries like Singapore, The Netherlands, the United States, Germany, the United Kingdom, China, Ireland, Saudi Arabia, and the United Arab Emirates top the digital transformation³. 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 world⁴. 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.

III. Digital Globalization

Digital globalization in the 21st century is characterized by accelerating and increasing flows of data and information. Global flows of data primarily consist of information, searches, communications, transactions, video, and intracompany traffic. They underpin and enable virtually every other kind of cross-border flow. Moreover, the global adoption of digital technologies has changed the way organizations operate. There is an improvement in operational efficiency, and cost reductions in marketing, sales, and information gathering. Digital globalization is a new form of globalization. It brings about relevant changes regarding who is participating, how business is done across borders, and the flow of economic benefits.

Digital transformation and innovation in digitalization are boosted by consumers’ and investors’ expectations, as well as by prospects of greater economic and social benefits. 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 in 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 platforms⁵. A survey by McKinsey showed that more than 85% of tech-based start-ups report some type of cross-border activity.

³ Singapore and UK are the two largest FinTech hubs.

⁴In 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.

⁵ A survey by McKinsey shows that over 85% of tech-based start-ups report some type of cross-border activity.

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 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 digital economy and digital globalization. This fast form of trade is modifying sales strategies and consumer behavior. The World Trade Statistical Review (2018) by the World Trade Organization (WTO) shows that the 2016 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. Its revenue for the 12 months ending September 30, 2018 was \$220.957 billion, which is a 37.11% increase year-over-year. Analysts predict that by 2020, one-fifth of the multitrillion-dollar U.S. retail market will have shifted 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. This company is performing better than Amazon in terms of revenue. In fact, its revenue for the 12 months ending September 30, 2018 was \$48.837 billion, which is a 70.15% increase year-over-year.

However, 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 more complex and fast-paced. The connectedness can be a path to growth (Mckinsey, Digital Globalization, 2016).

In conclusion, new features of digital globalization include:

- 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

IV. Policies for a New Industrialization in the Digital Era

The structural transformation determined by the fourth industrial revolution requires a proactive policy. This must facilitate a transition toward new sectors and activities with higher productivity and added value. In addition, it must foster sustainable and inclusive development. Digitalization forces policymakers to rethink procedures to be at pace with the rapid shift in technology. 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.

Foreign investment is a strategic key in the case of industrial policies in the digital era. According to the economic literature, positive spillovers of FDI include the introduction of business linkages, new technologies, and innovative know-how. FDI, as several investors' surveys have shown, are heavily

influenced by a stable legal and regulatory environment and political stability. It is less influenced by low tax rates and labor costs. In fact, offshoring and relocation toward destinations offering cheaper domestic labor become less relevant in a world of increasingly automated manufacturing. Finally, the greater part of FDI flows (approximately 55%) is long distance. Therefore, it is interregional. The smallest part (approximately 45%) is short distance, making it intraregional.

Dubai is a case in point. Dubai successfully developed as a global transit hub in transportation and trade flows. The emirate devised its Vision 2021 strategic plan to transform into a smart city where innovation and digitization drive economic growth in a sustainable manner. Above all, the digital transformation of international production, coupled with Dubai's on-going transformation into a knowledge-based economy, has reshaped both the source and the composition of FDI flows into the emirate. Between 2015 and the first quarter of 2018, investors from the European Union (EU) and the U.S. launched 66% of the projects in Dubai. They also contributed to 45% of the FDI flows into Dubai, creating 28,241 jobs. These investments ushered in a new era of sustainable economic growth in Dubai driven by higher productivity growth. They also created opportunities for business while boosting Dubai's competitiveness across all sectors. In addition, the new investment law allows 100% foreign ownership. The new 10-year visas for international investors and innovators, skilled professionals, and exceptional students are expected to boost FDI inflows, especially in high-tech activities.

V. The Digital Future of FDI

The blockchain technological innovation can revolutionize our world. Consisting of an encrypted, parallel ledger system, the blockchain innovation is structured as an incentive, driving individuals to run it on their computers. More specifically, the technology is made up of a chain of in-sync "blocks" in a peer-to-peer system of distributed databases. Links between blocks and content are protected by cryptography. Therefore, previous transactions cannot be destroyed or forged⁶. This means that the ledger and the transaction network are trusted without a central authority or "middleman." According to experts, the blockchain is secure and tamper-proof by design because transactions cannot be changed once verified by the network. The technology promises to speed up and reduce the cost of transactions. It boosts financial inclusion by providing more opportunities to participants.

Blockchain publicly emerged with the introduction of bitcoin cryptocurrency, which is why the two terms are often used synonymously. Joe Lubin is the co-founder of Ethereum, a platform to trade cryptocurrencies in real time, and founder of ConsenSys, a global community of developers, businessmen, and programmers who create and promote blockchain infrastructure and peer-to-peer applications. Lubin believes that distributed ledger technology (DLT) will be able to create a decentralized Internet, or Web 3.0, to represent a different sort of World Wide Web. This technology will have the potential to rebalance the information asymmetries. However, it needs time to be developed fully.

Although radical early innovators look at blockchain to implement their idealistic vision for a universal "truth machine," big corporations and financial intermediaries have shared the idea with more pragmatic purposes. According to a report by the International Data Corporation, corporate spending on blockchain technologies is expected to rise from under \$2 billion in 2018 to \$11.7 billion by 2022. This firm looked at 16 use cases, including regulatory compliance, food safety, and digital identity. The most aggressive spenders come from financial services firms, the very industry the

⁶ A special feature of blockchain is that the information in the block (i.e., the story on the page) calculates the encryption for the entire block. This encryption (or fingerprint) is termed "hash." Hashes are algorithms that turn the content of the block into a fixed length number. Each block on the chain contains the hash of the previous block as part of its content.

original bitcoin blockchain sought to bypass. Moreover, a 2015 R3 consortium had more than 100 of the world's largest financial services firms as members (e.g., Bank of America, Credit Suisse, Deutsche Bank, ING, HSBC, etc.). These members created Corda, an open-source ledger platform geared toward the financial world. It aimed to handle more complex transactions and restrict access to transaction data. This open-source ledger platform is not a blockchain. However, it was inspired by blockchain databases.

A nexus between blockchain and FDI makes it interesting to look at blockchain start-ups. In many countries (for example, the U.S.), blockchain start-ups launch initial coin offerings (ICOs). Although there is an underlying common factor of blockchain technologies and cryptocurrency-based ICOs, these start-ups can also be dedicated to other services, including real estate project funding, medical research programs funding, logistical support, and e-commerce. Many ICOs do not restrict individuals who can participate in crowdfunding, which is a new dimension of FDI. The FDI, in this regard, becomes a global fundraising phenomenon. At the same time, ICOs are growing. Between January and mid-July 2018, ICOs across the globe managed to raise \$16.9 billion. The crowdfunding model has realized success if \$550 million was collected by blockchain start-ups in June 2018 vs. \$300 million in a similar period last year. ICOs are largely deemed as investment options because cryptocurrencies and tokens are often forecasted to appreciate with time.

The new cryptocurrencies⁷ offer investors an opportunity to eliminate their reliance on third-party financial institutions like banks and investment firms. In the beginning, cryptocurrencies were meant to be applied to regions with inefficient banking systems. Today they complement banks in developed countries. Additionally, cryptocurrencies ensure personal anonymity and privacy lacking in conventional networks. There is also the aspect of total control as investors take charge of processing and authorizing their transactions without depending on third-party intervention. The ease of cryptocurrency transactions makes it easy for digital asset holders to participate in ICOs and participate in the global FDI phenomenon.

ICOs are disrupting traditional stock markets as they can also be used by foreigners to raise funds in a different country for local projects. This factor enhances globalization and enables individuals to make a footprint in lucrative markets (e.g., U.S., India). Also, cryptocurrencies through ICOs are an important source of funding for developing countries lacking a strong local investment funding base.

Of course, there is a regulation challenge regarding ICOs. A high percentage of ICOs with more than \$50 million in collection targets have been found to be either partially or wholly fraudulent. This vehicle remains very important for the FDI and globalization process.

Many laws in both developed and developing countries have not kept pace with digital advancements. They continue to require paper-based documentation, preventing participants from taking full advantage of this technology.

A. Industries Impacted by Blockchain

The finance industry has developed the most advanced applications, particularly the process of transferring cryptocurrency values. Increasingly, there are also blockchain-based solutions in more advanced areas of the financial industry. These include securities trading, foreign exchange, or over-the-counter (OTC) trading derivatives via smart contracts.

⁷ There are large numbers of cryptocurrencies (nearing 700). The best known are Bitcoin, Ethereum, Ripple, Litecoin, Monero, and Zcash.

However, blockchain is finding other innovative uses apart from banking and financial services. These include supply chains, health, education, and the environment. In developing countries like India, Kenya, and other East African countries, innovation is occurring in agriculture and the management of land ownership records (land titling).

B. Smart Contracts

Smart contracts are promising applications of blockchain. Blockchain technology allows businesses to build decentralized models, conducting transactions and making agreements independently from intermediaries. Smart contracts through blockchain guarantee payment and implementation of contracts while avoiding consumer risk. In the blockchain environment, smart contracts are software programs that translate real-world contracts or expressions of will into a cryptographic code⁸. Certainly, blockchain can revolutionize legal processes via smart contracts.

There are possible interactions between smart contracts (and blockchain technology)⁹ and the IoT. For instance, smart contracts allow for the automated exchange of energy and money between neighbors, one of whom has IoT solar panels and excess energy capacity and the other who does not. Smart contracts will determine (automatically and without human intervention) the basis of exchange, including variable tariffs (based on time of day and usage).

⁸ More specifically, a smart contract is a piece of software tasked with storing rules for negotiating the terms of an agreement. It automatically verifies fulfillment and executes the agreed terms. The Ethereum platform is built for creating smart contracts.

⁹ *Blockchain* can manage all IoT usage. It will be the ledger of everything.