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# **A note on the benefits and challenges of the digital economy for economic development**

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## **1. Introduction**

The digital age is transforming everything: the nature of markets and products, how to produce, how to deliver and pay, the scale of capital to operate globally, and human capital requirements. The digital age is also boosting productivity, exposing companies to new ideas, technologies, new management and business models and creating new channels of market access. And all this at relatively low costs. It is no exaggeration to predict that firms will increasingly rely on artificial intelligence for basic routines and for more complex tasks. Soon, advanced versions of virtual assistants will be part of our day-to-day work, school, home and leisure activities.

These technologies can have substantial positive effects for economic development. Cross border e-commerce platforms, for instance, offer a wide range of benefits for firms from emerging economies in participating more and better of global trade and reap the benefits of economies of scale and efficiency. As a result, they can have a leapfrog-effect and therefore boost the competitiveness of emerging economies' firms. They also benefit consumers that can access a wider range of products and services at more attractive prices, promote new opportunities for entrepreneurship and job creation, and improve productivity and economic growth.

However, for the digital technologies to impact economic development, the appropriate policies have to be in place to remove the obstacles preventing emerging economies to fully engage and optimize the benefits of the digital economy, and to minimize the risks involved.

This note discusses the relationship between digital economy and economic development and identifies the benefits and challenges for emerging economies. It identifies two sets of benefits – the so-called first and second order benefits. While the former is related to the

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direct, more visible, advantages of accessing and using digital technologies by consumers, firms and governments, the last is related to the less visible, but much more relevant, benefits related to developing, managing and distributing digital technologies. We make use of the concept of digital commoditization to help frame and examine those benefits and to identify the challenges that emerging economies may face as a consequence of digital commoditization.

## **2. Digital commoditization**

The rise of the digital economy is creating opportunities for new business models. While the global trade in goods and financial flows appear to have peaked in terms of share of GDP, the data flows are growing almost exponentially. According to McKinsey (2016)<sup>2</sup>, between 2005 and 2014 the global data flow grew 45 times, and it is projected to grow by another nine times in the next five years. Expansion of connectivity infrastructure, network-effect, falling computing and sensor costs, open software architectures and deregulation of digital markets are accelerating the adoption and use of digital technologies and enabling the emergence of a whole new generation of investment and business models. Also according to McKinsey, only in 2014, the data flows added \$ 2.2 trillion to global GDP directly and another \$ 2.8 trillion indirectly.

However, while the dissemination of digital technologies is highly valuable for productivity, wellbeing and for the creation of wealth, it is necessary to take into account their limits because of the "digital commoditization". This term refers to the impact that popularization of access and use of standardized and general-purpose digital technologies have on competitiveness advantage.

It seems reasonable to assume that the impact of adopting a new digital technology on competitiveness follows a path similar to that described in Figure 1. While few firms in a given industry have access to a new technology, its impact on competitiveness will increase rapidly. However, if access and use of that technology are popularized beyond an optimal economic viability point (A), then the

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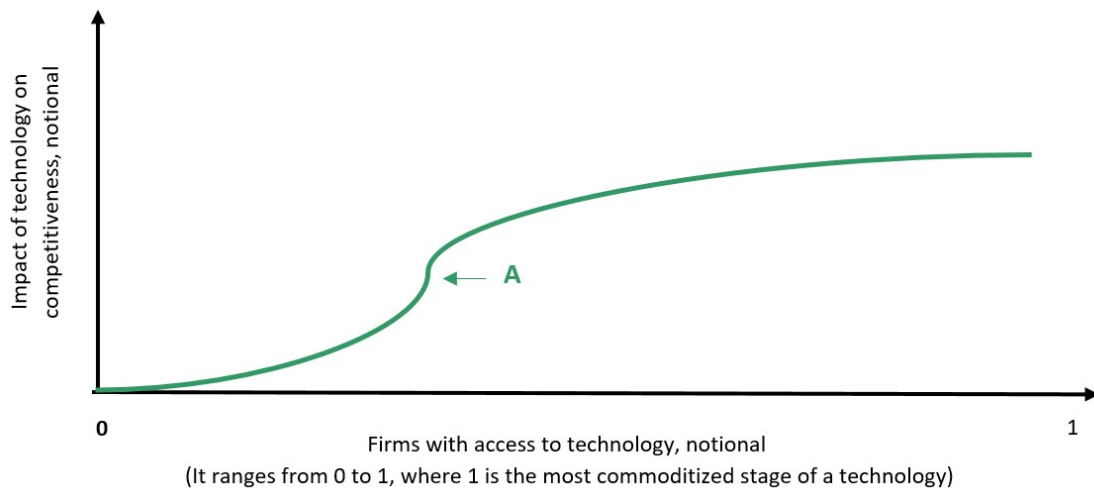
<sup>2</sup>McKinsey, 2016. Digital Globalization: The New Era of Global Flows. Available at: <https://www.mckinsey.com/~media/McKinsey/Business%20Functions/McKinsey%20Digital/Our%20Insights/Digital%20globalization%20The%20new%20era%20of%20global%20flows/MGI-Digital-globalization-Full-report.ashx>

benefit of that technology will continue to grow, but at decreasing rates until its impact on competitiveness becomes insignificant.

The dissemination of several digital technologies is therefore increasingly becoming an entry requirement and no longer a competitive advantage. That is, the new technology becomes a requirement to put the firm in the 'game', but does not guarantee that it will 'win the game'.

The failure to depict the relevance of the digital commoditization may drive one to the fallacy of composition, that is, the error of assuming that what is true of a member of a group is also true for the group as a whole. Applied to the context of the digital economy, it can be a mistake to assume that, *ceteris paribus*, the broad adoption of digital technologies will necessarily continue to generate increasing returns in terms of relative productivity and competitiveness.

Figure 1: Relationship between digital commoditization and competitiveness



This concept may be illustrated with the case of the productivity impact that personal computers (PCs) had in the mid-1980s in simple activities such as text editing, inventory control, and accounting management. Access to PCs was limited to a few firms because of the high cost of machines and limited capacity of people to operate computers and software. Firms and universities that had access to PCs at that time experienced improvements in efficiency and performance indicators. However, over time, the use of PCs and software in basic and even more complex activities started to make less difference, since such resources became 'commoditized'.

Information technology equipment, cloud services, standardized software for various purposes, web and device applications and e-commerce and other platforms are also subject to digital

commoditization. Growing access to the Internet, altogether with network- and platform-effects are accelerating digital commoditization and expanding its scope.

The reach of digital commoditization goes far beyond the virtual environment. Industry 4.0 and other new management and manufacturing technologies based on digital technologies such as the internet of things, big data, artificial intelligence, machine learning, to name but a few, also fit the logic of digital commoditization. This is because, just like on digital platforms, its developers are aiming to popularize those technologies as much as possible – even with lower margins of return. This makes sense since the more popular a platform becomes, the bigger is the network-effect, and thus the number of users of the platform.

This represents, therefore, an entire change in the business model as conceived until now. Although this change is more visible in the cases of e-commerce and other virtual business platforms, it is also valid for the case of hardware. Indeed, the next generation of factories and capital goods – robots, 3D printers and alike – will run on pre-paid or pay-as-you-go management and production virtual platforms sitting in the offices of the robots and printers' developers.

In addition, digital commoditization makes low production costs a less relevant factor to international competitiveness. The mounting increase of the intangible component in the final value of goods and the recurring and ease access to digital technologies, platforms and advanced capital goods are radically transforming the way we understand the production and distribution of wealth and cross-border trade on a global scale and even the conventional notion of capital shortage and access to technologies. In fact, the sharp fall in the prices of robots and other sophisticated technologies and cheap and quick access to markets via e-commerce platforms are among the manifestations of this trend. Affordable and cheap labor, tax incentives and other conventional forms of attracting and retaining investment to emerging countries therefore require revision.

Digital commoditization also helps to explain the paradox of the slowdown in the rate of productivity growth in the context of the popularization of information technologies and of the fall in the relative prices of capital goods. This may indeed be one of the keys to understand secular stagnation.<sup>3</sup>

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<sup>3</sup> Teulings, Coen and Baldwin, Richard, *Secular Stagnation: Facts, Causes and Cures*, CEPR, 2014.

### **3. Benefits and challenges of the digital economy for emerging countries**

#### **3.1 First order benefits**

The benefits of the digital economy for emerging economies are potentially large. That is because it can have significant competitiveness and productivity-boosting opportunities related to access to digital products and services that help optimize processes and production, reduce transaction costs and transform supply chains. Declining ICT prices encourage investment and adoption of digital technologies in emerging economies, providing their firms with cutting-edge services at competitive prices. All this enable firms to participate in global value chains and directly access customers in foreign markets in ways previously only feasible for large and established companies from advanced economies.

For consumers, the benefits are associated to access to a wider range of goods and services at competitive prices, thus improving wellbeing, especially of those at the bottom of the income distribution. It also offers new opportunities for entrepreneurship and job creation. Governments also benefit from the digital economy to the extent that they have access to technologies that help them deliver more and better public services, improve governance, evaluate policies and deliver better results overall.

There is plenty of evidence that the economy also benefits from the digital economy via productivity growth and wealth creation. The potential for productivity gains remains far from fully exploited in many emerging countries. World Economic Forum research suggest that more connected economies and firms are also more productive and efficient. There is also evidence that firms from emerging economies that buy and sell online are more likely to export, and export to more destinies (Suominen 2017).<sup>4</sup>

Many digital economy benefits have not yet materialized a scale however, which is due to adoption barriers, lag effects, transition costs and digital commoditization. It is widely agreed that governments of emerging economies need to work on several frontlines to make the transition to the digital economy and to reap the benefits of it. They include reducing capacity constraints and broadly improving skills; investments in ICT ecosystem, connectivity and digital infrastructure; agreements to promote ICT adoption and diffusion as well as market access; regulatory frameworks that

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<sup>4</sup> Kati Suominen, Fueling digital trade in Mercosur: A regulatory roadmap, Inter-American Development Bank, 2017.

fosters competition and market conditions; and policies to boost investment and innovation. This policy agenda is key to accelerate technology adoption and reduce digital divides, which will have undeniable positive effects to firms, consumers and governments of emerging economies.

Despite the fact that the digital economy may play an important development role, there are also challenges that have to be taken into account. And the most important one is perhaps the digital commoditization and the fallacy of composition. In this sense, it is reasonable to suppose that, say, the increasing participation of SMEs in e-commerce is likely to reduce the marginal benefits of it.

Digital commoditization is also putting the fragmented production model in check. As stated before, digital technologies such as 3D printers, robots, artificial intelligence, internet of things, advanced manufacturing, new energies, nanotechnology, among others, are rewriting the conditions of production and enabling local/regional production of what used to be produced by partners spread across continents. These technologies allow one to produce on competitive basis from sophisticated goods to simple ones, as is the case of sport shoes and T-shirts. This is likely to displace from markets highly dependent garment production countries such as El Salvador and Bangladesh. Market access speed and doing business environment are supplanting factors such as production costs and tax incentives as sources of competitiveness. These technologies help explain the so called 'reshoring', that is, the return to advanced countries of industrial plants previously operating in low-cost countries.

### **3.2 Second order benefits**

The previous part suggests that broad technology adoption will not necessarily be a competitive panacea for its users. On the contrary, to the extent that sophisticated technologies and platforms are becoming commodities within a sophisticated business model, their impacts for consumers and businesses will probably be large in the first instance but limited afterwards.

In this new global context, it is important to distinguish 'use' from 'development, distribution and management' of digital technologies. While on one hand the great majority of businesses are only users of digital commodities, on the other hand, a much smaller portion falls into the category of developers, distributors and managers of those technologies. Therefore, they are the ones defining the standards and

the platforms on which digital commodities and cross-border trade are operated and employed.

The countries that have firms in the category of developers of platforms and managers of digital technologies are those more likely to reap the second order benefits that arise from the digital economy, in the sense that those economies are the ones with larger prospects in terms of long-term growth, job and wealth creation, and long lasting positive effects in productivity and competitiveness. Their populations and firms are the ones that tend to benefit the most from the indirect effects of being in a more rich, open and innovative environment.

Indeed, companies such as Google, Amazon, Apple, Microsoft, Facebook, Baidu, Alibaba, SAP, PayPal, AT&T, Uber, Tencent, Cisco, Oracle, Huawei, Siemens, Bosch and others are developing digital devices and platforms in which third companies operate using predefined standards within a given framework. The shortening technology lifecycles along with network- and platform-effects are establishing a highly asymmetric model in which the 'winner-takes-all' ensure competitive advantages mostly for the 'superstars',<sup>5</sup> keeping them well ahead of the digital commodity users.

Although participation in e-commerce platforms allow firms from emerging economies to theoretically reach millions of consumers worldwide, presence in such platforms is not neutral. The blockbuster factor works together with other discriminatory practices reinforcing the algorithm-effect that drives consumers to the most researched firms and items. As a result, as pointed out by The Economist (2016)<sup>6</sup>, global e-commerce platforms provide a long tail of vendors, but only a very few of them are likely to be successful.

That is, competition may be limited by discriminatory policies, including non-neutral treatment of vendors and similar products and services in global platforms, and inadequate enforcement of competition rules, thus leading to cross-subsidization.

Moreover, to the extent that platform developers set the rules of product and service development as well as marketplace interaction, this affects access, market conditions and prices. But perhaps the most important value of platforms stems from data extracted almost

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<sup>5</sup> Autor, David; Dorn, David; Katz, Lawrence F.; Patterson, Christina; and Van Reenen, John, The fall on the labor share and the rise of the superstar firms, Working Paper, MIT, 2017.

<sup>6</sup> Available at: <https://www.economist.com/news/special-report/21716467-technology-has-given-billions-people-access-vast-range-entertainment-gady>



for free from users. But considering that most digital data are somehow personal, then it may not be treated as a commodity.

In e-commerce, everything else constant, the marginal benefits for a typical vendor participating in a given platform may decrease the higher the number of vendors. By contrast, the marginal benefits for platform developers may increase the higher the number of participating vendors. So, while the first order benefits may have decreasing returns, the second order benefits may have increasing returns.

The winner-takes-all dynamics altogether with network- and platform-effects have therefore massive implications for competition. With the data collection and analytics becoming crucial for the rise of new services and new solutions, as mentioned by UNCTAD (2017)<sup>7</sup>, this makes it even more difficult for an entrant to challenge incumbents.

Big e-commerce firms and platforms developers are therefore in a position to capture a significant and growing share of the private benefits of digital commodities with little chance of being challenged. This would be one of the explanations for the loss of the brightness of the "unicorns," start-ups that have been worth about \$ 1 billion and have been crushed or acquired by the superstars.

Consequently, we are witnessing a growing division in the global economy between those who use and those who develop, distribute and manage digital technologies and set the standards. The first group is largely composed of emerging and developing countries and even some high-income countries, the ones exposed to capturing some of the first order benefits. The second group is largely composed of some advanced countries, such as Germany, Japan, Sweden and the United States, and China.

By focusing on first order benefits and not looking at the crucial importance of being developers and managers of technologies, many countries are giving away the opportunities of tapping the second order benefits. In its turn, second order benefits are becoming more concentrated on a group of economies that are home of the 'digital commodity producers' firms.

#### **4. Implications**

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<sup>7</sup> Information Economy Report, 2017. Available at [http://unctad.org/en/PublicationsLibrary/ier2017\\_en.pdf](http://unctad.org/en/PublicationsLibrary/ier2017_en.pdf)

Emerging economies need to develop policies that are built with ambitious goals of not only reaping first order benefits, but that can also enable them to reach second order benefits. Policies to increase participation on e-commerce and digital platforms, for example, can only boost the country's competitiveness in the long-term if there is a clear view that an extra effort needs to be done to push countries to the position of developers and managers of digital technologies.

The emerging economies need therefore to combine different initiatives under a single national strategy aimed at preparing the economy to go beyond the position of adopters and users of such technologies. In this sense, it requires a combination of policies that optimize the capture of first and second order benefits. Of course, this is not an easy task, especially because some of the policies designed for the former may not reconcile in the first place with the reach of the last one.

Well beyond tackling infrastructure and to take into account the generation, storage, processing and transfer of data issues, both within and across national boundaries, data privacy and security, taxation in the digital economy, and non-discriminatory policies and access, countries should pursue a bold agenda focused on knowledge, with policies reflecting the fundamental changes that are occurring in the forms of production, the importance of intangible capital, technology and branding, and the production of goods with built-in services in an increasingly digital environment.

To highlight the importance of this crosscutting approach, the strategy to digital development should have a symbiotic relationship with policies for trade, education, technology, innovation, services and competition. The foreign trade policy, for example, has increasingly included elements that go beyond the trading of goods, such as services, e-commerce, data flows and the digital economy, intellectual property, public procurement, among others.

There is also need to bring competition policies to the digital age, so they can be up to the challenge of refraining oligopoly and monopoly positions and protecting consumers' interest. If the benefits of the digital economy accrue mostly to the developers and managers of technologies and platforms, there should be clear space for policies and for regulation.

The coordination of those policies at a high political level, for subsequent translation into actions, can determine the success of future programs designed to development of platforms.

As we are dealing with new trends, latecomer countries will have to have a proactive, flexible and smart engagement to learn how to navigate in those waters and to benefit from them. To this end, one will have to coordinate policies from the start, experiment, monitor, evaluate, be pragmatic and collaborative.

Addressing digital divides is key to enable countries to reap and share the benefits of digital transformation. However, the asymmetric distribution of first and second order benefits within and between countries can increase income inequality within and between them, and therefore be an additional obstacle for implementing the policies above and promoting further income convergence.

Finally, as several economic development experiences suggest, this strategy will probably be more successful if government, business and workers combine interests and cooperate in their design and implementation.

A lot can be done to develop and expand the role of the digital economy in emerging economies. However, the success of the venture will probably be so much greater the more it is anchored in the fundamental principles of wealth creation of the 21st century.