

The digital economy and its impact on countries' economic growth

الاقتصاد الرقمي وأثره على النمو الاقتصادي للدول

Nassima Bouri ¹

¹ University of Oran 2, nassimabouri@rocketmail.com

Received: 30/04/2019

Accepted: 03/06/2019

Published: 04/06/2019

Abstract

For digital technologies to have an impact on socio-economic development, appropriate policies must be put in place to encourage the integration of the digital economy into the daily economic life of citizens, and to remove the obstacles that prevent emerging economies from be fully involved in the digital economy and maximize benefits, while minimizing risks. This article present and explain the impact of the digital economy on the macroeconomic growth of nations. We will first discuss direct and indirect contributions, and secondly macroeconomic influences based on growth indicators in developed and developing countries.

Keywords: Digital economy, ICT, growth, digital applications, macroeconomic indicators.

Jel Classification Codes : O10, O14, O47, F47, O11.

ليكون للتكنولوجيات الرقمية تأثير على التنمية الاجتماعية والاقتصادية ، يجب وضع سياسات مناسبة لتشجيع دمج الاقتصاد الرقمي في الحياة الاقتصادية اليومية للمواطنين ، ولإزالة العقبات التي تمنع الاقتصاديات الناشئة من أن تشارك بشكل كامل في الاقتصاد الرقمي وتعظيم الفوائد ، مع تقليل المخاطر . يهدف هذا المقال إلى عرض وشرح تأثير الاقتصاد الرقمي على نمو الاقتصاد الكلي للدول . سنناقش أولاً المساهمات المباشرة وغير المباشرة للتأثيرات الرقمية ، والثانية في الاقتصاد الكلي بناءً على مؤشرات النمو في البلدان المتقدمة والنامية .

الكلمات المفتاحية: الاقتصاد الرقمي ، تكنولوجيا المعلومات والاتصالات ، النمو ، التطبيقات الرقمية ، مؤشرات الاقتصاد الكلي .

تصنيف Jel : O11. ، F47 ، O47 ، O14 ، O10

Associate Professor: Nassima bouri , e-mail: nassimabouri@rocketmail.com

1. INTRODUCTION

The digital economy refers to both companies and ICT users in their day-to-day activities and to the ICT industry, which includes manufacturers and service providers. It has been defined as the network formed by the providers and users of digital content and technologies used in everyday life. These content and technologies are ubiquitous and essential to almost every activity in our economy and society. They enable businesses to be innovative and productive, governments to deliver services, and citizens to interact and share information and knowledge.

Indeed, the digital age is transforming everything: the nature of markets and products, how to produce, how to pay and pay, the scale of capital to be exploited at the global level and the need for human capital. It also boosts productivity, exposing companies to new ideas, technologies, new management and business models, and creating new channels for market access. It is no exaggeration to predict that companies will rely more and more on artificial intelligence for basic routines and more complex tasks.

For digital technologies to have an impact on economic development, appropriate policies must be put in place to remove the barriers that prevent emerging economies from fully engaging in the digital economy and maximizing benefits, while minimizing risks.

To this end, this article aims to present and explain the impact of the digital economy on the macroeconomic growth of nations. We will first discuss direct and indirect contributions, and secondly macroeconomic influences based on growth indicators.

I. Digital Economy: Conceptualization and Neology

The concept of "digital economy" attempts to cover sectors of digital business activities. The digital economy refers to the interrelation between all economic activities related to the economic circuit; through the production, distribution, intermediation and consumption of goods and services of an informational nature, digitized and therefore reproducible or transmissible at costs that are often almost nil.

2. Digital Economy: Multiple Definitions

The digital economy encompasses the two concepts that compose it: the economy and digital. Indeed the term "economy" has already been defined and explained in several research and several economic references:

"Economics can be defined as a discipline of the social sciences whose object of study is the allocation of scarce (or limited) human resources to the satisfaction of its multiple and competing needs. It focuses on the production, distribution and consumption of goods as well as institutions, regulatory frameworks and the environment facilitating these activities "(Alexandre Nshue M. Mokime, [2012]).

- The second notion "digital", "brings together information and communication technologies and all the techniques used in the processing and transmission of information such as for example telecommunications, internet or computer. The digital sector refers to the business sector related to Information and Communication Technologies and the production and sale of digital products and services.

2.1. Temptation of a global definition of the digital economy

"The digital economy is a science that covers different concepts, dominations and technological, economic and social expressions according to the authors, especially since this notion has evolved over the years: new technologies, new economy, telecommunications, interconnections, technologies information and communication, electronic commerce, electronic economy. The digital economy refers to all processes, transactions, interactions, interconnections and economic activities between different economic agents and based on digital information and communication technologies and the internet economy ».

2.2. Definition of the digital economy according to INSEE

The digital economy is assimilated to information and communication technologies (ICT), and in particular to the productive sectors. According to the OECD and INSEE, the ICT sector groups companies that produce goods and services supporting the process of digitization of the economy, that is to say the transformation of the information used or provided into digital information (computer, telecommunications, electronics) ". Given the difficulty of defining the digital economy and the complexity of quantifying it, INSEE likens it to ICT producing sectors. The ICT sector groups companies that produce goods and services supporting the process of digitization of the economy, that is to say the transformation of information used or provided in digital information (computer, telecommunications, electronic) (Lemoine. P, Lavigne. B and Zajac. M, [2011]).

According to INSEE statements, the digital economy is at the origin of the new innovative sectors and has made the existence of other sectors dependent on it. It brings together the ICT sector, user sectors and sectors with high digital content, the latter could not exist without these technologies.

Digital applications and the economic and managerial growth of companies
Digital applications have participated in the digital transformation. The growth of different techniques has changed the strategies of production, distribution, intermediation and even consumption of products and services.

This means that internal IT will have to abandon the development of software and module tests and play the role of technology and services broker. Prashant Kelker, [2018] proposed the five rules of engagement for the future of application management as follows:

- Translating business needs into business opportunities: To do this, IT needs to move from a deep understanding of technology to an in-depth understanding of the business to learn how to create solutions with technology and technology, appropriate partnerships. Application managers must be proactive.
- Design solutions with partners: The days of decisions "purchase against sale" are completed. Today, the decision is more complex: buy, build, and reuse. By doing what is good for a business, the IT department must now play the role of architect

of business solutions informed by technology. If IT buyers and sellers believe that this change in core competency is an opportunity, the end result is likely to be better for all parties involved.

- Component selection: The boundaries between "service" and "product" are unclear, involving multiple IT vendors: those who provide components as services and those who add know-how and skills to their services so that they become products. Organizations need to carefully consider how they can leverage different types of IT vendors and solutions on the market to create and modernize their application environment.
- Creating an initial solution: Instead of just testing if the software works, it's about testing if that's what the market needs. Rapid deployment allows you to try two variations of the same feature on the market and keep the one that works the best.
- Continuous improvement of managerial decisions: The success rate of an application depends on the speed at which the company can incorporate features that the user community appreciates and needs, whether internal or external.

Through these digital transformations, today's consumers are more inconstant than ever and instant gratification is the norm. Whether it's an online sales site that recommends a new product that can be easily purchased at the click of a mouse, a banking application that warns customers of real-time fraud or streaming video that allows you to watch the favorite programs of its users. An optimal digital experience, regardless of the sector, is a key competitive differentiator and now essential to a sustainable success!

3. Theoretical Impacts of the Digital Economy on Growth

A Coe-Rexecode study theoretically presented the contribution of the digital economy to economic growth in general. Indeed, there is the direct contribution from the increase of digital capital as a factor of production, and the indirect contribution generated by the fact that this increase of digital capital has a positive effect on the overall productivity gains of the economy.

3.1. The direct contribution of the digital economy

In terms of direct contribution, the digital economy has a macroeconomic effect linked to the increase of business productive investment, investment in tangible goods (digital equipment and materials); or intangible (software, used in the production process). The increase in productive capital leads to an increase in aggregate gross fixed capital formation (GFCF) and therefore a direct change in GDP. Another contribution is related to the acceleration of the productivity of the employees, following a good training of the employees adequate to the use of the digital in company. This is what makes it possible to increase the productivity of the work, the economic and financial profitability of the companies, thus a process improvement. This reorganization indeed improves economic growth.

3.2. The direct contribution of the digital economy

Regarding the indirect contribution: the use of ICTs and digital technologies contributes to an improvement in overall factor productivity (TFP), which reflects the impact of technical progress on growth. The improvement of FMP is partly attributed to the digital material producing sectors but also to the digital innovation user sectors.

Overall factor productivity also depends on the wide diffusion of digital innovations throughout the economy. In fact, digital innovation has "network" externalities, and digital innovations are widely disseminated and adopted, the greater the benefits (learning effect, economies of scale). Thus their diffusion allows all other economic sectors to gain in innovation and productivity as well.

4.Impacts of the digital economy on growth (analyzes by macroeconomic indicators)

We will summarize the influence of the digital economy on the growth of nations based on the following three macroeconomic indicators:

4.1. Impacts of the digital economy on Productivity (D'Souza. C and Williams. D, [2017])

"Productivity is not everything, but in the long run, it's almost everything. A country's ability to raise the standard of living of its population depends almost entirely on its ability to increase output per worker "(Krugman, [1997]).

Productivity is an economic factor that reflects the efficiency of transforming inputs into outputs. Labor productivity growth - or GDP per hour worked - can be defined as the weighted sum of the following:

1. Capital intensification - increase in capital contribution per hour;
2. Improving the quality of the workforce - increase in productivity per unit of labor, which is a function of the age profile and skill levels of the workforce;
3. Multifactor productivity growth (MFP) - growth in output that is not explained by 1) and 2).

Regarding the impact of the digitization of the economy on the productivity of firms, it should be pointed out that investments in ICT contribute to the improvement of the production process, which thus intensifies in capital. In addition, lower prices for digital technologies are encouraging companies to innovate their tangible and intangible assets, in order to make successive profits.

4.2. Labor markets

Digitization could have a positive impact on job creation in the labor market. Indeed, to what extent does the accelerated development of the digital economy contribute to the political process of deconstruction of employment and the reformulation of the category of "workers"?

Four studies of ICT labor markets show how technology makes the difference for growth. Different skills are integrated into the economy as a whole. Technologies in mature manufacturing industries are evolving slowly and employment growth is having a lower impact than new sectors, such as smartphone services. Cloud

computing reduces and redeploys internal information management workers, but the overall effects, even with a cautious view of productivity gains, are unlikely to reduce the total employment of technically skilled people.

These studies have modest growth, mainly, but significant gains in local areas, such as the dynamism of the London labor market brought about by the "digital in London". The fact that employment is developing as we have described concerns the common, often glaring, warnings about skill shortages.

Transportation and logistics, administrative support as well as jobs in the areas of manufacturing, sales and services are the trades most likely to experience automation are, among others, that do not require social skills pointed (Liebenau, Jonathan, [2018]).

Among other things, the jobs that are least likely to be automated include those that require creativity and social skills, where persuasion or originality is required, where negotiation skills are required or require negotiation.

4.3. Impacts of the digital economy on inflation and monetary policy

The Bank of Sweden (2015) has highlighted three potential channels through which digitization is likely to affect inflation:

- 1) Productivity and cost structures: of which digitization could lead to an increase in productivity and growth in potential output.
- 2) Competition and market structures: With regard to the intensity of competition, market structures and pricing practices, the Bank of Sweden pointed out that these competitive pressures could prove to be some local businesses, but opening up new markets to other companies, which would have the opportunity to significantly expand their activities. Canadian service exporters appear well positioned to take advantage of these trends (Poloz, [2016]).

That said, digital technologies facilitate networking and economies of scale; for this reason, they may also foster the concentration of market power among a small number of extremely successful global businesses (Autor et al., [2017]).

And 3) direct effects on the components of the Consumer Price Index (CPI): the decrease in production costs could have direct effects on the components of the CPI, a trend that has been observed for some time (Bank of Sweden, [2015]). However, price pressures on a growing range of products could be influenced by lower production and distribution costs for digital goods and services.

5. The digital economy and emerging economies: a challenge of international competition or a lever for growth

The digital economy is an opportunity for emerging countries to redefine their economic growth model. Specifically, the digital economy can play a key role in the expansion and modernization of markets in these countries, by facilitating the collection and dissemination of information, by improving the management of transactions, development in these countries is partly a result of the poor functioning of the markets.

The challenge for emerging countries such as the Maghreb is to create around digital technologies a growth dynamic, truly autonomous and adapted to the needs of consumers and businesses in these countries, and not just dedicated to outsourcing. For companies wishing to position themselves in this digital economy, it is also a question of defining specific business models, which take into account production and consumption behaviors specific to emerging countries and which do not seek to simply replicate the models of the economy. Business set up in developed countries (Raphaël Suire, Thierry Pénard, [2009]).

In Algeria, investments in the Algerian Internet market are helping to increase wage productivity, which requires the mastery of digitized tools to carry out digitizable activities, so the production process is becoming more capital intensive. Thus, the increase in the use of the Internet recorded by the importance of the number of Internet subscribers relating to private state companies combined, accompanied by diversified Internet offers as needed and quality control.

Telecommunications companies with high levels of organizational capital (high-quality personnel management and decision-making processes) and human capital (skilled labor) that invest in digital technologies.

In addition, soaring prices for digital technologies discourage companies from upgrading their equipment in order to achieve efficiencies and increase their capacity, so the high prices of 4G-compatible smartphones reduce its diffusion.

Digitization then causes an acceleration of the growth of the world economy. However, according to his research sources, during the transition to a digital economy, there is a risk of an increase in the asymmetry of skills and long-term unemployment.

To successfully manage the transition to the digitization and generation of Internet networks in Algeria, the economy must have the capacity to adapt; that companies are brought by positive properties of the market to be flexible; that economic gains are widely distributed.

Thus, in order to solve the imperfections of the "digital" domain, it is essential that "the various Algerian education, apprenticeship and employment programs combine well with the new information and communication technologies. Communication and new business processes".

In addition, Algeria's commitment to the digitization of the administration prompts us to reflect on the direction of Algerian monetary policy as the economy becomes more focused on digital technologies and services. Indeed, digital technologies influence and transform the functioning of Algerian telecommunications companies by facilitating tasks that are highly dependent on connectivity, use of information, forecasts and collaboration.

It should be noted in this regard, the opportunities of the Internet Market in Algeria can enrich the new structure of the economy, and this when the productivity gains at the scale of the Algerian economy could be realized that 'At the deployment stage, a stage where new technologies and new business processes are ubiquitous.

So to minimize the threats; and that tools (statistics, taxation, competition and industrial relations policies) and related institutions that manage the economy are current and able to fulfill their mandate.

6. CONCLUSION

A digital economy is essentially defined as a global network of new economic and social activities that can be digitized, reproduced and transmitted. This new economy has opened a set of possibilities unknown or unthinkable before. Digitization could have effects of all kinds throughout the economy.

Investments in the Algerian Internet market are helping to increase wage productivity, which requires the mastery of digitized tools to carry out digitizable activities, so the production process is becoming more capital intensive.

To successfully manage the transition to the digitization and generation of Internet networks in Algeria, the economy must have the capacity to adapt; that companies are brought by positive properties of the market to be flexible; that economic gains are widely distributed. More and more operational activities currently being carried out by humans will be performed electronically. Many of these processes will take the form of digital components that will "speak" to other digital economy processes and will thus continue a constant exchange between several servers and several semi-intelligent nodes that update, search, verify and readjust. Things, then finally make a return to processes and humans in the physical economy "(Arthur, [2011], P 3).

7. Bibliography

- 1- Agrawal, A., J. S. Gans and A. Goldfarb (2017). "What to Expect from Artificial Intelligence," MIT Sloan Management Review, Vol. 58, No. 3.
- 2- Arthur, W. B. (2011). "The Second Economy," McKinsey Quarterly, October, p. 1-9.
- 3- Autor, D., D. Dorn, L. F. Katz, C. Patterson and J. Van Reenen (2017) Concentrating on the Fall of the Labor Share, Working Paper No. 23108, National Bureau of Economic Research.
- 4- Baldwin, J. R., and W. Gu (2013). Measuring Multifactor Productivity at Statistics Canada, Research Paper No. 31 in the series "The Canadian Productivity Review", Statistics Canada. Publicationno 15-206-X in the catalog.

- 5- Baldwin, J. R., W. Gu, R. Macdonald and B. Yan (2014). What is productivity? How are we measured? What was Canada's productivity for the period from 1961 to 2012 ?, Research Paper No. 38 in the series "The Canadian Productivity Review", Statistics Canada. Catalog no. 15-206-X.
- 6- Bank of Sweden (2015). Digitization and Inflation, Monetary Policy Report, February, p. 55-59.
- 7- Boston Consulting Group (2015). The Robotics Revolution: The Next Great Leap in Manufacturing. Broadberry, S., B. M. S. Campbell and B. van Leeuwen (2013). "When Did Britain Industrialise? The Sectoral Distribution of the Labor Force and Labor Productivity in Britain, 1381-1851, "Explorations in Economic History, vol. 50, No. 1, p. 16-27.
- 8- Derviş, K., and Z. Qureshi (2016). The Productivity Slump-Fact or Fiction: The Measurement Debate, working paper, coll. Global Economy and Development, Brookings.
- 9- Ericsson, N.R. (2016). Economic Forecasting in Theory and Practice: An Interview with David F. Hendry, Board of Governors of the Federal Reserve, coll. "International Finance Discussion Papers", No. 1184.
- 10-World Economic Forum (WEF) (2016a). Digital Transformation of Industries: Logistics Industry, World Economic Forum white paper prepared in collaboration with Accenture.
- 11-World Economic Forum (WEF) (2016c). Digital Transformation of Industries: Automotive Industry, World Economic Forum white paper prepared in collaboration with Accenture.
- 12- Frey, C. B., and M. A. Osborne (2017). "The Future of Employment: How Susceptible Are Jobs to Computerization? "Technological Forecasting and Social Change, vol. 114, No. C, p. 254-280.
- 13-Fung, B., and H. Halaburda (2016). Central Bank Digital Currencies: A Framework for Assessing Why and How, Staff Analysis Paper No. 2016-22, Bank of Canada.
- 14-Fung, B., M. Molico and Gerald Stuber (2014). Electronic Money and Payments: Recent Developments and Issues, Staff Analysis Paper No. 2014-2, Bank of Canada.

- 15-** Gordon, R. J. (2014). The Demise of U.S. Economic Growth: Restatement, Rebuttal, and Reflections, Working Paper No. 19895, National Bureau of Economic Research.
- 16-**Mr. Sand (2015). "Has the Canadian Labor Market Polarized? Canadian Journal of Economics, Vol. 48, No. 2, p. 612-646.
- 17-**Kaplan, G., B. Moll and G. L. Violante (2016). Monetary Policy According to HANK, Working Paper No. 2016/2, Council on Economic Policies.7
- 18-**Lev, B., S. Radhakrishnan and P. C. Evans (2016). Organizational Capital: A CEO's Guide to Measuring and Managing Intangible Enterprise, coll. "Measuring and Managing Organizational Capital Series", No. 1, The Center for Global Enterprise.
- 19-**Poloz, S. S. (2016). From Wood Cutters to IT Professionals: The Expansion of Canada's Service Economy, delivered at the C.D. Howe Institute, Toronto, November 28.