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Problems and prospects of digital economy in Nigeria

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Abstract
The developments of the digital economy have a fundamental impact on economic systems and how economic values will be created. Understanding the emerging developments in this context form the foundation of the definition of new and appropriate business models tagged 'Digital Economy'. The paper therefore discusses the basic characteristics of the digital economy, the problems and prospect of digital economy in Nigeria as a country. This study highlighted the significant bottlenecks inhibiting the growth of high-speed Internet in Nigeria. These include a complex institutional setup to govern and promote the development of ICT infrastructure and sector development, and a legacy of operators investing in proprietary network deployments, compounded by poor infrastructure quality. Pushing market bounds further to underserved areas, given high costs of infrastructure deployment and low revenues, and this has created market failures. High price sensitivity of markets further contributed to lack of innovative service propositions. This study identified that digital economy has the potential to transform Nigeria's economy provided that all sectors put in place effective policies that encourage its use as an essential input for growth. The study therefore recommends that use of innovative solutions to mobilize substantial private sector investment and expedite development of ICT infrastructure that will improved digital connectivity combined with digital skills and literacy, Nigeria will be able to harness its digital economy and partake in the 25 percent GDP increase in a few years' time.

Keywords: Digital Economy, ICT, Nigeria, Technology.

1.0 Introduction

Introducing and developing modern information and communication technologies (ICT) is one of the key factors in digital sector development (Banning, 2016; Domazet and Lazić, 2017). Significant ICT investments can contribute to a strong economy based on knowledge and information technologies. Digital technologies that have been recently introduced like the Internet of Things (IoT) and Big Data have strong potential, and can help develop the Product Service Systems (Accenture Strategy, 2016; Dorofeyev *et al.*, 2018).

The digital economy enabled the use of blockchain technology in financial transactions. This technology is to ensure

that contracts between economic agents are implemented at a high level (Vovchenko *et al.,* 2017a; Dorofeyev *et al.,* 2018). Electronic currency serves as one of the essential infrastructure elements of digital economy (Pshenichnikov, 2017; Vovchenko *et al.,* 2017b).

The digitalization of the economy is considered as a key driver of innovation, economic growth and societal change (Mizintsevaa and Gerbina, 2018). The digital economy has the following features that distinguish it from traditional economy: the irrelevance of geographical location, meaning it is no longer a competitive advantage, the key role played by platforms, the importance of network effects, and the use of big data (Dorofeyev *et al.,* 2018). Digitization radically changes the very nature of products, the process of value creation and, above all, the competitive environment of firms. Based on the network-centric view, the firms may achieve competitive advantage by actively shaping the digital environment and by connecting firms within the digital environment (Chaplyha *et al.,* 2018).

Digital economy is defined as the economic activity which arises as a result of billions of everyday online connections among people, businesses, devices, data, and processes (Dorofeyev *et al.,* 2018). In other words, it can be said that it is an economy that focuses on digital technologies that are based on digital and computing technologies. Thus, there is no specific digital economy definition. So, it includes activities that are supported by the web and other digital communication technologies and namely include business, economic, social, cultural activities. There are three main components of the Digital economy which are: e-business, e-business infrastructure, and e-commerce

Rapid digital transformation is reshaping our global economy; permeating virtually every sector and aspect of daily life; and changing the way we learn, work, trade, socialize, and access public and private services and information. In 2016, the global digital economy was worth some USD 11.5 trillion, equivalent to 15.5% of the world's overall GDP. It is expected to reach 25% in less than a decade, quickly outpacing the growth of the overall economy. However, countries like Nigeria are currently capturing only a fraction of this growth and need to strategically invest in the foundational elements of their digital economy to keep pace Dorofeyev *et al.,* 2018. The digital economy is made up of various components, including a platform economy, a gig economy, an industry 4.0, a digital economy, data analytics, robotics and Artificial Intelligence (AI), machine learning, 3-D printing, and e-commerce among others. (Ernst & Young: Nigeria, 2018).

The growth of the digital economy is not without its problems. Digitalization creates new jobs, while reducing old ones, causing significant changes in the labor market. This contributes to the changes that are the main cause of growing income inequality. Such changes in the labor market are worrying, because digitalization can lead to increased unemployment and exacerbate existing differences in income distribution. The digital economy, characterized by the cross-border production and consumption of digital goods and services, challenges the state policy in the field of taxation and trade, which is traditionally based on geographical principle. The growth of the sharing economy and digital platforms, such as Uber challenges national tax systems, health insurance systems, and education and training. Transnational data flows passing

through individual countries raise problems related to their protection. The growing dependence of state structures and enterprises on digital systems also makes them more vulnerable to attacks in cyberspace.

Digitalization creates special problems for developing countries. Maximizing the benefits of the digital economy depends on a basic level of digital infrastructure, which is quite low in many emerging economies. In addition, there is a certain technological dependence of developing countries. At the same time among the developing countries, Nigeria particularly have chance to derive maximum benefit from digitalization, since the country do not need to spend enormous resources on the development of innovative digital solutions. This study would help to inform policymakers on the benefits or rather prospects of digital economy to Nigeria. The study would also highlight the problems associated with digital economy in Nigeria.

2.0 Literature Review

Overview of Digital Economy

Coined in 1995, digital economy is a term that merely refers to a country's economy that is based on digital payment technologies. The digital economy, apart from making transactions and payments easier, is expected to create new market growth opportunities and jobs. Some experts even anticipate that the digital economy will become the most significant business opportunity in the next few years. Digital technologies, and digitized modes of communication, have driven hugely transformative changes in the global economy. But most of the available evidence on digital economies remains focused on high-income economies, with relatively little known about the implications of the digital for those at the global margins. And yet, optimism abounds about the potentials of digital economies to transform livelihoods in low-income countries. Commentators, policymakers, development organizations, and many others are increasingly promoting and funding plans and projects that aim to support or create digital economies. But without sustained and critical inquiry into how digital economies are being envisioned and enacted, as well as into the effects of digital economies in these countries, it is difficult to move beyond hype and hope.

Researchers interrogate these increasingly digital economies in two ways. Instead of seeing the digital only as a discrete end product, it recognizes how digital information, services, and goods are always embedded in, and part of, broader sociotechnical systems. No end product is therefore purely digital. One can thus think of the digital economy as producing outcomes on a spectrum. On one end of the spectrum, digital information is used to alter constellations of value creation and capture, by enhancing, complementing, or replacing economic transactions and processes that have traditionally been analog, a process called digitalization.

A growing body of research in economics, economic sociology, economic geography, and economic anthropology is pointing to the potential advantages that can be gained in global production networks through producing, capturing, manipulating, and moving all sorts of digital and digitized information. On the other end of the spectrum, a key component of the end product or service might itself be digital or digitally transmittable (e.g., software development, graphic design, writing and editing, etc.). Places in every corner of the planet now aspire to become centers of digital production. In 2016, the global digital

economy was worth about $11.5 trillion which is equivalent to 15.5 percent of the world's overall GDP. The digital economy is expected to reach 25 percent in less than a decade, quickly outpacing the growth of the overall economy.

Digital Economy in Nigeria

In 2015, the Nigerian Communications Commission's (NCC) 8-Point Agenda proposed the transition of Nigeria's economy into a digital economy through investment in digital infrastructure, and more specifically broadband, which represents a key growth driver of the digital economy. The agenda's goals were to facilitate broadband penetration, improve quality of service, optimize usage and benefits of spectrum, and promote Information Communication Technologies (ICTs) innovation and investment opportunities across the country (Nigerian Communication Commission, 2015).

Despite the recent growth in fiber installations, national fixed-line infrastructure is still poor, and mobile systems remain the primary means for carrying retail and enterprise data traffic in Nigeria. According to the ITU, in 2018 19.9% of the population used their cell phones to connect to the Internet. Overall Internet usage in Nigeria stands at 27.7%, above the average for Africa (22.1%) (ITU, 2018). Thus, Nigeria's 2017 ranking at 143rd of 176 countries in the ICT Development Index (IDI) underlined its limited broadband subscriptions. The International Telecommunication's Union's (ITU's) IDI is a composite index combining 11 indicators to monitor and compare developments in information and communication technology (ICT). Measuring the country's ICT readiness, intensity, and impact, the model correlates directly to the enabling environment for a growing Digital Economy. Nigeria's place of 143rd (15th regionally) highlighted its low number of broadband subscriptions (fixed and mobile) and demonstrated the limited usage of the broadband infrastructure and Internet in Nigeria.

According to ITU, 3G coverage reaches 54% of the population and LTE/WiMAX, 50.8%. These figures are below the regional average for the former (62.7% in Africa), and almost twice for the latter (28.4% in Africa) (ITU, 2018). According to the report "The State of ICT in Nigeria 2018," there is an important digital gap regarding mobile broadband. With just over 20% of Nigerians owning a smartphone, 44.84% have a feature phone, and 32.16% basic phones. Furthermore, the gender gap in mobile phone ownership is also significant, with a higher probability of mobile phone ownership among males than females. In addition, the report reveals that males are more likely to own a smartphone than females, while females are more likely to own a feature phone and basic phone (Gillwald, et al., 2018).

Despite the enormous growth and intensive competition among operators, there is still poor quality of service and network congestion. Lack of coverage and quality of services in terms of network quality and download speed often force subscribers to own multiple SIM cards. As a result, according to the report "The State of ICT in Nigeria 2018," at least half of mobile subscribers own more than one SIM card (Gillwald, et al., 2018).

In Niger, the private sector platforms can be classified into either fintech, e-payment channels, social media, or e-commerce, all of which are accessed through digital channels such as smartphones and laptops. Others are platforms for education,

agriculture, health, and legal (Gillwald, et al., 2018).

a. *Fintech:* Out of the 99 million financially eligible adult population in Nigeria, about 36.8% are excluded from the financial system (Gillwald, et al., 2018). The digitization of financial services spearheaded by financial technology companies (fintechs) has the potential to serve a large part of this population. The fintech ecosystem has been growing steadily and has contributed immensely to the development of the Nigerian digital economy. An important contribution has been in the attraction of investments. Investment funding for Nigerian start-ups, including fintechs, was more than $100 million in 2016,22 and increased to $117 million in 2018.23 Recent deals have included $9 million for Flutterwave, $8 million for Paystack, and $13 million for Mines (Gillwald, et al., 2018).
b. *e-Payment platforms:* Nigeria's steady transition into the new realities of the digital economy is also reflected in the increasing adoption of e-payment channels. There has been a sustained growth in transactions carried out across e-payment channels as more people are included in the financial systems and have access to mobile phones and the Internet. Also, the government's willingness to implement digital and cashless policies and guidelines, such as the 2012 cashless policy and the National Payment Systems Vision 2020 (PSV 2020), has been a catalyst for the growth in e-payment transactions. Data shows that overall, e-payment channels (ATM, POS, Mobile, Web, NIP, and E-Bills) have continued recording a positive trend in the value and volume of transactions. In 2018, these channels recorded transactions worth NGN 92 trillion from 1.9 trillion transactions, a 40% increase from the previous year.
c. *e-Commerce:* In 2018 the e-commerce spending in Nigeria was estimated at $12 billion and was projected to increase to $75 billion in revenues by 2025 by McKinsey. (Dorofeyev *et al.,* 2018) Not in market size, but in overall rankings, Nigeria was ranked second in Africa below Mauritius by UNCTAD in 2018. e-Commerce companies are doing well in this market. The major e-Commerce retailers have over 1 million customers and receive an average of 300,000 unique visits per day. The market for online payments in Nigeria was valued at NGN 167 billion in 2016 (Gillwald, et al., 2018). Nigeria's e-commerce sector has attracted foreign investments, with leading players having received multi–million-dollar investments in recent years. This subsector shows tremendous potential for growth and for contributing jobs and tax revenues that would remain in Nigeria. A Nigerian start-up, Jumia, is now part of the NY Stock Exchange and has expanded to 22 countries in Africa. Konga and Yakata are other start-ups that are operating successfully through adopting the standard e-commerce model to be adapted to suit the Nigerian situation. As described in the Digital Financial Services pillar, most shoppers (67%) opt for cash on

delivery, and only 23% use credit cards, with another 10% using mobile payments. This is reflective of the low level of trust the population has in making digital payments and the preference for cash transactions.

3.0 Discussion

A holistic approach to digital economy development is necessary to maximize Nigeria's chance of attaining its digital potential. Rather than implementing multiple, a fragmented intervention, a coordinated and high-level cross-boundary approach that maximizes complementarities is needed to build an inclusive digital economy. This would ultimately spur the development of high-impact applications for health, education, e-commerce, agriculture, and social service delivery, among others, while mitigating exclusion, fraud, and cyber risks. One of the most important conclusions that can be drawn from present study is that digital economy contribute tremendously to global GDP and countries such as Nigeria, is currently capturing only a fraction of this growth and needs to strategically invest in the foundational elements of its digital economy to keep pace.

Problems Associated with Digital Economy in Nigeria

Despite a rapid increase in business spending on capital and services in ICT, the New Digital Economy (mobile technology, the internet, and cloud) has not yet generated any visible improvement in productivity growth (Van Ark, 2016; Nelson *et al.*, 2017). However, one should note that digital economy is still in the middle of formation, so any effects on productivity will occur only with a developed digital technology. Productivity in industrialized countries now confronts an apparent decline raising the question of a possible productivity paradox in the digital economy (Gorelova, 2016; Watanabe *et al.*, 2018). The advent of the digital economy and, implicitly, of competition in the online marketplace has triggered new challenges in terms of consumer protection approaches (Gazzola *et al.*, 2017; Vatamanescu *et al.*, 2017).

Issues concerning the limitation of GDP statistics in measuring the advancement of the digital economy became crucial. The digitalization of economy creates challenges for measuring international transactions and assets, as well as the scope of works and services (Ahmad and Schreyer, 2016; Cockayne, 2016). Another postulated aspect is the concept of uncaptured GDP (Watanabe et al., 2018). To address the limitation of using GDP statistics in the digital economy, certain developments, associated with the presentation and transformation of GDP accounting approaches, were made.

Moreover, decline in revenues for the operators, attributed to pricing pressure induced by competition, while they have not transitioned to generating significant revenues from data as they have in more mature markets, translated into reduced investment and in rollout of infrastructure. These effects have been compounded by the macroeconomic situation that forced operators to slow down or postpone their investment plans for network expansion. Nigeria's lack of a national backbone network for the transmission of high-speed data is at the heart of prevalent poor quality of voice and data services. While the InfraCo model sought to address this through the licensing of new players to provide regional backbone infrastructure, the response of industry has been limited. Therefore, in order to fulfill the National Broadband Policy objectives, the regulator needs to develop policies that can lead to a

new open access common carrier network, with guaranteed national rights-of-way by attracting new investments.

The costs to acquire a broadband-enabled device, digital illiteracy, lack of local content, and low electrification rates are major barriers to access broadband in Nigeria. An ICT use survey reveals that, of those unconnected, 50% stated that they cannot use Internet because they cannot afford devices to access the Internet, over 25% of them gave 'no electricity' as the reason, while over 20% said 'there is no signal'(mobile coverage) (Gillwald, et al., 2018). Finally, according to USAID's Power Africa program there are 20 million households in Nigeria without any access to power, and 55% of rural areas without electricity (Anon., 2019b).

A major issue is emerging regarding the application of the Nigerian tax regime on digital platforms. Digital platforms were not originally contemplated by Nigerian tax laws. Although most of the private sector platforms, including e-commerce platforms are taxable, the Nigerian tax regime, which is driven by payer presence and residence, does not provide any guidance or clarity on how they should be taxed. This is largely because most of these platforms have little physical presence to aid tax enforcement. These platforms, such as fintechs, like Paystack and Flutterwave, also operate across continents and in several jurisdictions, making income tax assessment extremely difficult. For instance, Flutterwave enables the processing of any form of payment anywhere in Africa. It has processed over $2.3 billion in payments across 60 million transactions (Gillwald, et al., 2018). It accepts 350 currencies Taxation of digital platforms therefore is still very much a grey area in Nigeria. Digital platforms, like e-commerce companies, are indeed emerging markets which, are not being adequately captured in the tax laws, provide an explorable opportunity for the government. There is, however, a current debate in Nigeria about whether these platforms should be taxed. Obviously, this emerging market of digital platforms has "succeeded in compounding the existing or traditional tax structure in terms of source of income and residence principle."

Prospects of Digital Economy in Nigeria

Digital economies are creating unprecedented opportunities for countries to unleash new opportunities, create jobs, and transform people's lives. Fast Internet provides a platform for innovation that is used as a key input across sectors and reverberates throughout the entire economy. It potentiates entrepreneurship, with businesses and individuals using fast Internet to create new applications and services in areas such as e-commerce and financial services. It also enables game-changing digital service delivery in sectors critical to inclusive growth, such as education, health, and agriculture. Likewise, it allows the public sector to deliver services to citizens and businesses more effectively and more inclusively. On these accounts, broadband has the potential to transform Nigeria's economy and help the country leapfrog development stages, provided that all sectors of the Nigerian economy put in place effective policies that encourage its use as an essential input for growth.

High-speed Internet (or broadband) has the potential to accelerate Nigeria's socioeconomic development. An extensive body of research confirms the impact of increased investment in broadband on economic growth. World Bank research estimates that a 10% increase in broadband penetration in developing countries is

associated with a 1.4% increase in Gross Domestic Product (GDP) (Kim, et al., 2010). Connectivity can shape countries' development path through several interrelated channels: It can bridge the information gap, alleviating asymmetry problems, and improve communication. It is the most cost-effective and fastest means of connecting all citizens, especially those living in remote areas, to markets and services and; It increases productivity, lowers transaction costs, and optimizes supply chains (Aker and Blumenstock, 2015).

The World Bank Group launched its first *Nigeria Digital Economy Diagnostic Report* on Thursday, November 28, 2019, during an eSummit hosted by the Nigerian government. The report gives a breakdown of Nigeria's current digital state, unfolds the strength of its digital economy which is pioneered by both private and public stakeholders. And also proffers solutions on how to increase the productivity of the digital sphere in order to raise the nation's GDP.

With improved digital connectivity combined with digital skills and literacy, Nigeria will be able to harness its digital economy and partake in the 25 percent GDP increase in a few years' time. Shubham Chaudhuri, The World Bank Country Director for Nigeria, said that the country needs to focus on "accelerating improvements in five fundamental pillars of the digital economy; digital infrastructure, platforms, financial services, entrepreneurship and skills." Subsequently, these five pillars of the digital economy have to be properly structured so as to make the country digitally enabled before 2030. Nigeria's 2017 ranking at 143rd of 176 countries in the *ICT Development Index* (IDI) underlines its limited broadband subscriptions. Proper Digital Infrastructure is the key to driving a good digital economy, without which it cannot thrive. Fast internet provides a platform for innovation, helps entrepreneurs create new applications and allows the public sector to deliver more effective and inclusive services to its citizens. It, therefore, means that broadband has the potential to transform Nigeria's economy provided that all sectors put in place effective policies that encourage its use as an essential input for growth.

By implementing digital payment methods, like Digital Point of Sale (Digital POS), Unified Payments Interface (UPI), mobile wallets, Mobile Point of Sale (mPOS), etc., Nigeria would be moving towards creating a digital economy that will benefit the people and the government in various ways. Some of the prospects associated with the digital economy include:

1. **Removal of Black Economy:** When the transactions are made digitally, they can be easily monitored. Any payment made by any customer to any merchant will be recorded. This way, there will be no means for illegal transactions to occur. By restricting the cash-based transactions and using only digital payments, the government can efficiently expel the black economy.
2. **Increase in Revenues:** This is one of the most obvious and common benefits of the digital economy. When the transactions are digitized, monitoring sales and taxes becomes convenient. Since each transaction is recorded, the customers will get a bill for their purchase, and the merchants are bound to pay the sales tax to the government. This, in turn, increases the revenue of the government – thus resulting in growth of the overall financial status of the country.

3. **Empowerment to People:** One of the biggest advantages of moving towards digital economy is that it gives an empowerment to the citizens. When the payments move digital, each individual is bound to have a bank account, a mobile phone, etc. This way, the government can easily transfer the subsidies directly to Aadhaar-linked bank accounts of people. In short, people no longer have to wait to receive the incentives and subsidies that they are bound to receive from the government. This feature is already in place in most cities. One example of that would be the petroleum subsidy that government gives to the common people. This subsidy payment is done via bank transfers these days.
4. **Paves the way to e-governance**: The quicker, safer, and more efficient alternative to traditional governance, e-governance will be the ultimate outcome of the digital economy. From birth certificate to death certificate, everything is available online – thus it is convenient for people to access the information they need on the go. Digital economy will definitely pave a way to e-governance, where delivery of all government services would be done electronically.
5. **Creation of new jobs:** The digital economy has a lot of potentials to enhance job opportunities in new markets as well as increasing employment opportunities in some of the existing occupations in the government. This way, the unemployment rate in the country is bound to decrease.

4.0 Conclusion and Recommendation

Policymakers need to make choices that can help reverse current trends towards widening inequalities and power imbalances brought by the digital economy. This is a huge challenge that will involve the adaptation of existing policies, laws and regulations, and/or the adoption of new ones in many areas. For most countries, the digital economy and its long-term repercussions remain unchartered territory, and policies and regulations have not kept up with the rapid digital transformations taking place in economies and societies. Even in developed countries, few approaches have been tried and tested. The evolution of the digital economy calls for unconventional economic thinking and policy analysis. Policy responses need to take into account the blurring of the boundaries between sectors due to servitization, as well as the increased difficulties of enforcing national laws and regulations with respect to cross-border trade in digital services and products. They should also explore new pathways for local value creation and capture, and further structural transformation through digitalization. While some issues can be addressed through national policies and strategies, the global nature of the digital economy will require more dialogue, consensus-building and policy-making at the international level. Given the paucity of relevant statistics and empirical evidence, as well as the rapid pace of technological change, findings and policy responses will need to be constantly reassessed.

As Nigeria kick-start its digital transformation, the policy makers, private sectors and other stakeholders in the field may key into the recommendations outlined to take full advantage of the opportunities abound in the country's digital economy. Based on the outcome of the in-depth analyses of this study, the following recommendations were made;

1. Use innovative solutions to mobilize substantial private sector investment and expedite development of broadband infrastructure in underserved areas. This can be achieved through promoting innovative Public-Private Partnerships (PPP). With competitive awards of subsidies to private operators to support infrastructure development in areas where market forces alone are insufficient to provide adequate broadband coverage. PPPs could be implemented through joint programs.
2. Activating government pre-purchase of international bandwidth, which, if well-advertised, would reduce investment risks for private operators.
3. Considering preferential taxation for providers who agree on specific universal access targets (e.g., reduction of annual telecommunications fees, income tax holidays, lower fees for deployments, tax exemptions on data value added tax, devices, and equipment). This must be done on the basis of a stringent cost benefit analysis. Citizens in underserved communities mostly do not use broadband because they have no access, cannot afford it, or are not aware of its benefits. Current government initiatives could be further leveraged.
4. Construct more Community Resource Centers (CRCs). Sustainability should be aimed for, so that facilities and equipment can be maintained, and operational costs covered. The government should explore partnership opportunities with private sector actors that could use these centers to market their activities and enroll customers (e.g., for mobile money).
5. Leveraging a Rural Broadband Initiative (RUBI) network, to provide connectivity to underserved communities; and by establishing a coordinated policy approach to provide public access. A number of programs providing access points (CRC, RUBI, incubators, etc.) are being implemented by different agencies with different resources and priorities. The government should try to build on synergies to improve program efficiency and generate economies of scale by establishing a technical working group to bring all ministries/agencies involved in the ICT sector together, avoid overlaps, and strengthen coordination between the different agencies that govern ICT policy, regulation, and implementation, and consider streamlining the institutional and regulatory framework.

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