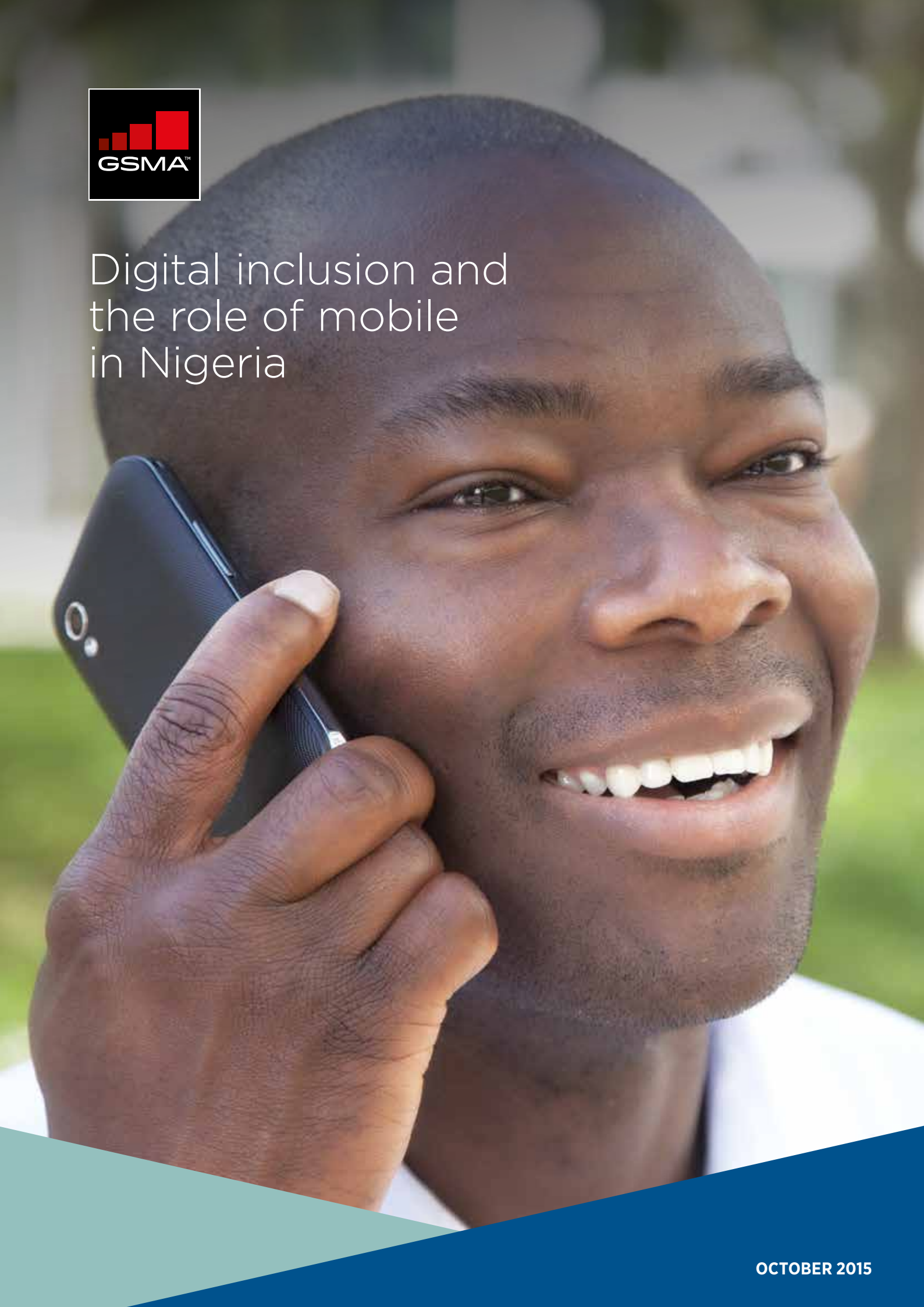

Digital inclusion and the role of mobile in Nigeria

OCTOBER 2015

Digital Inclusion

About GSMA Digital Inclusion
GSMA's Digital Inclusion programme supports the connection of an additional two billion people to the mobile internet by 2020. The programme focuses on working with mobile operators, development organisations and governments to address the barriers to mobile internet adoption through network infrastructure and policy, affordability and tax, digital literacy and local content.

For more information, please visit the GSMA Digital Inclusion website: **www.gsma.com/digitalinclusion**
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GSMA Intelligence

About GSMA Intelligence
GSMA Intelligence is the definitive source of mobile operator data, analysis and forecasts, delivering the most accurate and complete set of industry metrics available. Relied on by a customer base of over 800 of the world's leading mobile operators, device vendors, equipment manufacturers and financial and consultancy firms, the data set is the most scrutinised in the industry. With over 25 million individual data points (updated daily), the service provides coverage of the performance of all 1,400+ operators and 1,200+ MVNOs across 4,400+ networks, 65 groups and 237 countries worldwide.

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CONTENTS

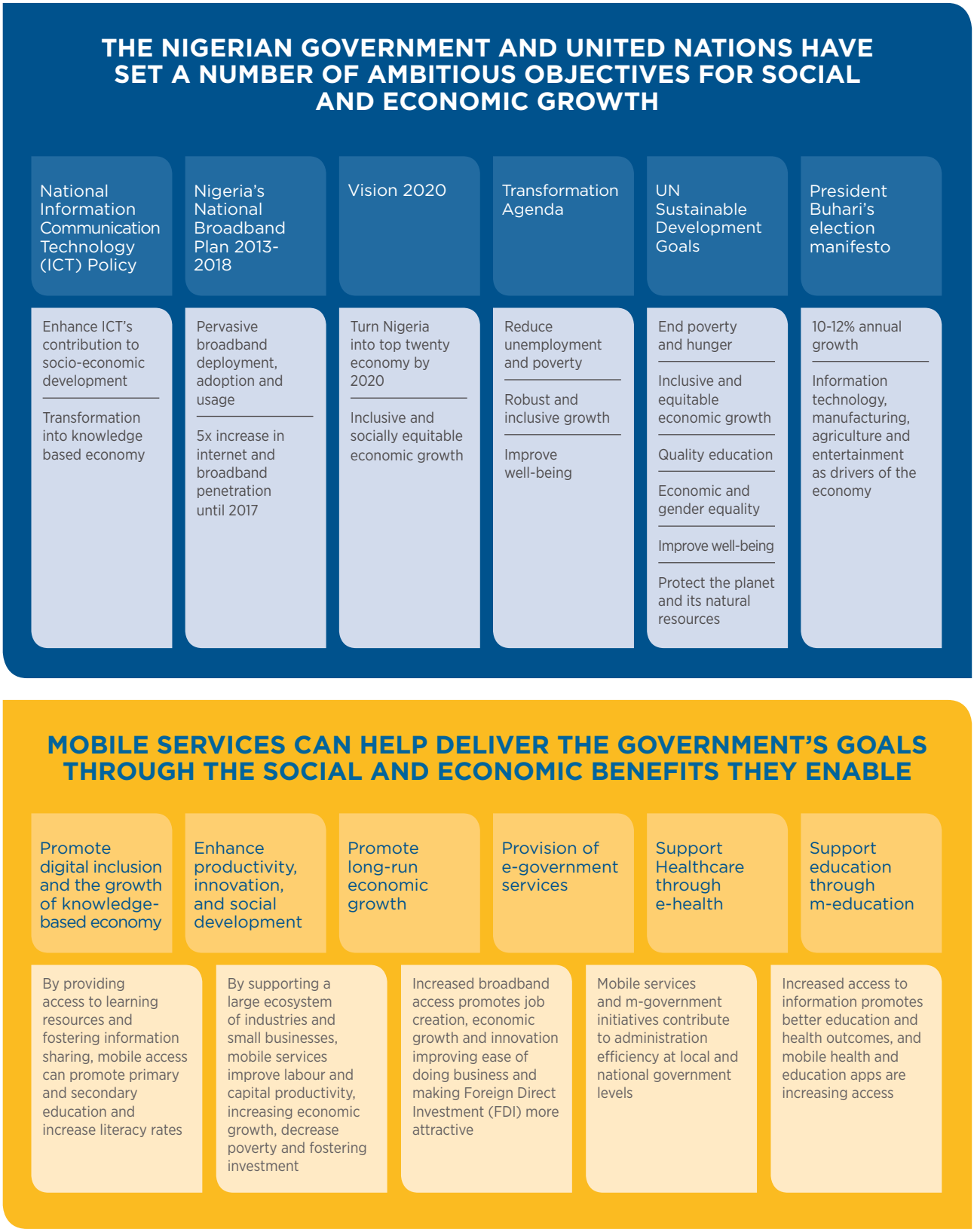
Executive Summary

Mobile services are driving digital inclusion and supporting socioeconomic development in Nigeria

Since mobile services were first introduced in Nigeria in 2001, the market has grown rapidly, extending connectivity to over 83 million unique subscribers, or 45% of the population, today. The mobile market is competitive with four operators – MTN, Globacom, Airtel and Etisalat – each offering both 2G and 3G services, and 4G services are being rolled out by smaller operators such as Smile, Spectranet and Swift. Only 0.2% of Nigerians have access to fixed telephone lines, so for the majority of Nigerians, mobile has represented their first opportunity to have access to communications services.

The role of mobile in delivering economic and social impacts in Nigeria is widely recognised. The government and international institutions have defined strategies for increasing growth in a number of documents, such as the Vision 2020 and President Buhari's election manifesto. The increase in telecommunications access – referred to as "digital inclusion" in this report – that mobile has enabled supports these government growth strategies by delivering wide-ranging benefits to the Nigerian economy and society.

How mobile can help the Nigerian government achieve its growth objectives



Source: Deloitte review based on the National ICT Policy, National Broadband Plan, Vision 2020, Transformation Agenda, UN Sustainable Development Goals, and President Buhari's election manifesto

Figure 1

Mobile is already delivering a number of socio-economic benefits in Nigeria:

Mobile promotes digital inclusion, enabling many Nigerians to benefit from the exchange of information for business and social purposes, increased productivity, and improved access to information. Mobile subscribers can use mobile services to reduce transportation, communication and transaction costs. Benefits have been especially notable in the agricultural sector, where mobile has enabled improved efficiency of agricultural production and distribution. A recent study found that in countries such as Nigeria, a 10% increase in mobile penetration increases Total Factor Productivity, a measure of an economy's long-term technological dynamism, by 4.2 percentage points in the long run.

Mobile services are enabling users to access essential information such as health advice, educational tools, and government services. Mobile operators and other local innovators are already using apps and SMS-based services to deliver content to subscribers. For example, Nova-Lumos mobile electricity, a joint project between MTN and Nova-Lumos, will provide electricity to MTN customers living in rural areas that are not connected to the electricity grid; the m4change programme supports the health of pregnant women and new mothers in Abuja and Nasarawa state; Glo has partnered with the National Health Insurance Scheme to enable subscribers to access healthcare in exchange for premia paid over the mobile phone; the Nokia Life+ English Teacher mobile app, in partnership with UNESCO, allows primary school teachers to access professional development support free of charge; and iPolice is an app that allows Nigerians to report crimes and provide other information to police.

Nigeria's four mobile operators are already at the centre of a diverse and growing local ecosystem formed by players such as equipment providers, app developers and value added service providers, handset and airtime dealers, and suppliers of other services used by mobile operators.

The innovative potential of mobile broadband is apparent from the rapid development of the digital economy in Nigeria. Usage of apps is growing by up to 30% annually, and a number of apps and websites have been developed locally, including BudgIT, an app that provides information on the government budget, and Traclist, an e-commerce app. In addition, businesses in Nigeria are increasingly using mobile apps, websites and SMS to advertise to subscribers. As of the end of 2013, Nigeria is the 13th largest generator of mobile ad impressions globally and has over 3 billion monthly mobile ad impressions. This growing mobile advertising market has been supported by the presence of a number of local mobile advertising platforms and advertising companies.

Mobile telecommunications ecosystem in Nigeria

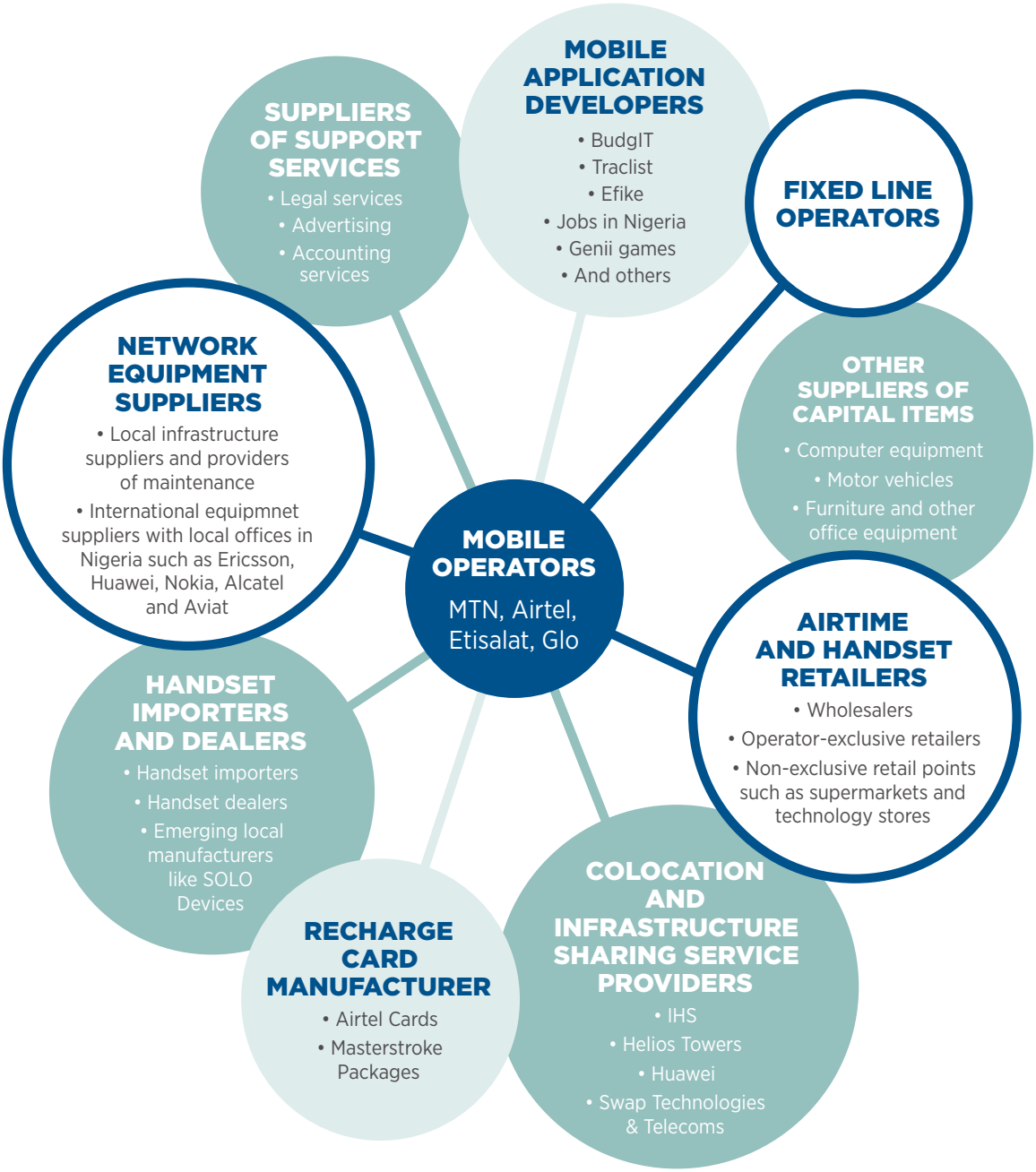


Figure 2

The economic activity and innovation across the mobile ecosystem has the potential to increase GDP growth and employment throughout the economy, increase tax revenues for government, and support long-term economic and fiscal stability.

In 2014, the mobile ecosystem contributed USD 8.3 billion in value add to the Nigerian economy

This report uses an economic model of the mobile industry and its supply chain to estimate the economic contribution in terms of value add, which is measured by three components:

- The direct impacts generated by mobile operators' expenditure on wages, dividends and taxes.
- The indirect impacts generated by mobile operators' direct expenditure within the mobile ecosystem that remains within Nigeria. This is the value add generated by wider ecosystem players, including their expenditure on wages, profits and taxes.
- The induced impacts created as a result of subsequent rounds of expenditure created by direct and indirect spend, including for example when employees across the ecosystem spend their wages on consumption. These effects are captured using a multiplier.

In 2014, taking into account all three components, the mobile industry contributed USD 8.3 billion from supply-side impacts to the Nigerian economy. This includes a direct impact of USD 2.2 billion in value add generated by mobile operators' expenditure, an indirect impact of USD 3.7 billion generated across the wider ecosystem, and induced impacts of USD 2.4 billion.

Supply side value add of mobile communications in Nigeria, USD billions

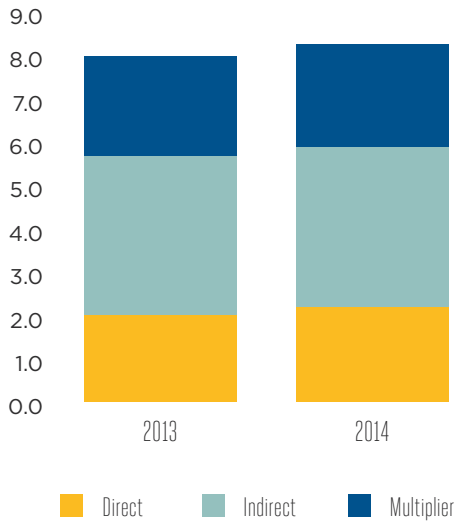


Figure 3

The overall estimated impact generated by the mobile ecosystem in 2014 represented 1.4% of Gross Domestic Product ("GDP").

This contribution includes USD 850 million paid directly by mobile operators to government. Mobile operators pay general taxes like VAT, customs duties and corporation tax, as well as a number of sector-specific regulatory fees and several local taxes and fees levied by different government bodies.

A further contribution to government is made across the mobile ecosystem, as businesses within the mobile supply chain spend a portion of their revenues from operators on taxes. Through these effects, mobile operators support a further USD 810 million

in payments to government. Further tax payments as a result of induced impacts in the wider economy amounted to USD 660 million.

Mobile operators supported the creation of 164,000 jobs across Nigeria in 2014

Employment is created by mobile operators and across the mobile ecosystem. It is estimated that in 2014, mobile operators directly employed over 13,000 Full Time Equivalent employees ("FTEs") in Nigeria, with a further 151,000 FTEs estimated to be generated in the wider mobile ecosystem as a result of the interactions with the mobile operators. Of these, over 118,000 are airtime dealers and retailers operating from supermarkets, technology stores and smaller independent points of sale.

Employment generated by the mobile communications ecosystem (direct and indirect effects) in 2014 (FTEs)

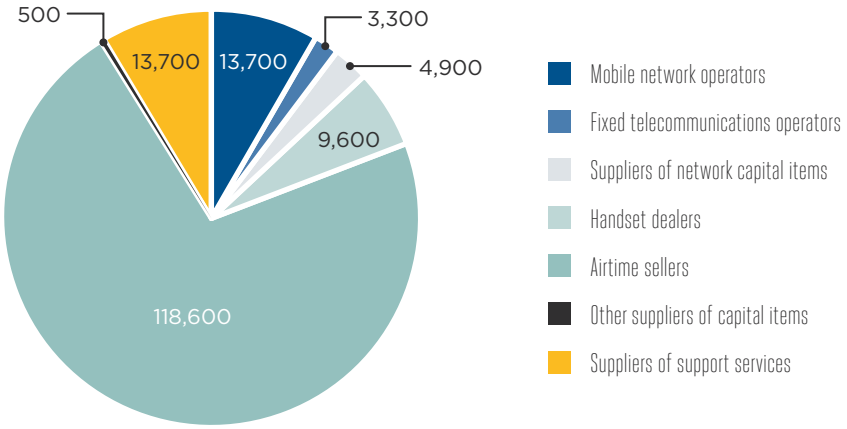


Figure 4

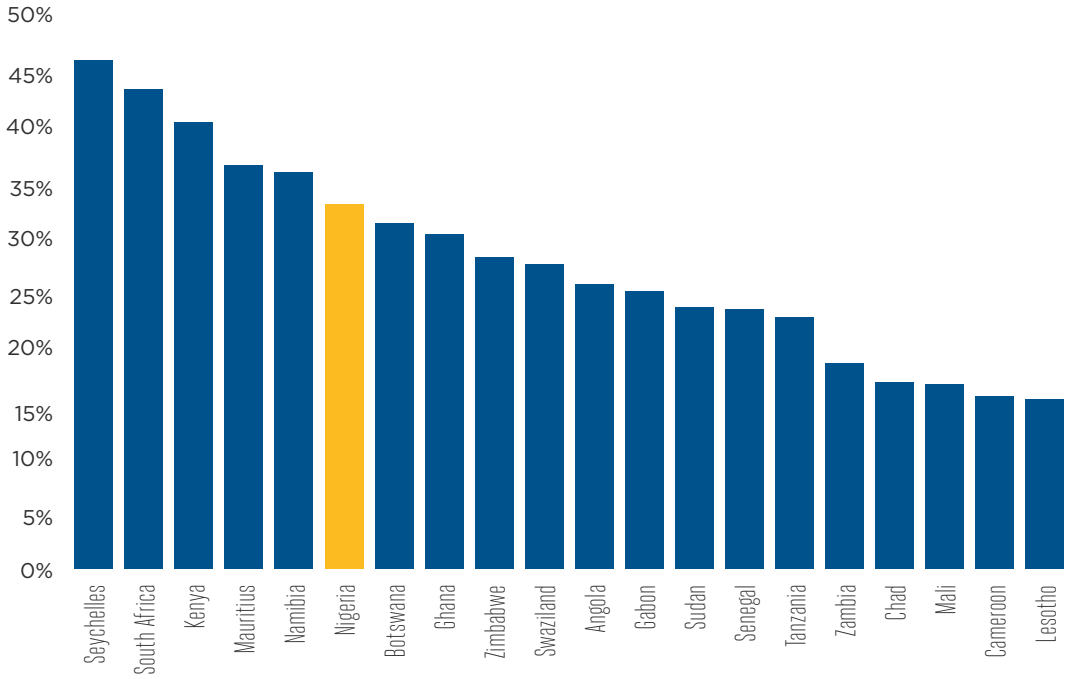
Additional induced employment is created by employees and beneficiaries across the ecosystem spending their earnings, thereby creating more employment, estimated at 60,000 FTEs.

Mobile has the potential to reach its full development in Nigeria, and supportive policies could increase digital inclusion and drive even greater growth

Despite mobile's progress in extending the benefits of digital inclusion, the sector has yet to fully deliver its potential.

Although the Nigerian economy overtook South Africa's as the continent's largest economy in 2014, Nigeria has only the sixth highest mobile internet penetration in Sub-Saharan Africa, ranking behind several countries with lower per capita incomes. The adoption of mobile money services is also lagging behind regional leaders; only 1% of Nigerians use mobile money services, compared to 59% of Kenyans.

Mobile internet penetration (unique subscribers as percentage of population) in top 20 Sub-Saharan African countries, Q1 2015



Source: GSMA Intelligence database

Figure 5

Those Nigerians who do have access to mobile phones use them less than subscribers in other countries, limiting their ability to fully take advantage of services. The outgoing average monthly minutes of use per connection in 2014 was 86 compared to the African average of 115 minutes.

A number of barriers exist to increasing mobile internet access and usage:

- Affordability is a concern for many Nigerians, particularly those with lower incomes. The cost of using a mobile phone represents around 5% of personal income in Nigeria, which significantly exceeds the cost in many developing countries
- 3G coverage is available for 51% of the population, while 2G coverage is available for 87%. Access and coverage gaps are especially limited in for rural and northern populations, and this threatens to worsen Nigeria's socio-economic divide.
- Further investment is needed to improve quality of service and to introduce innovative services to consumers. Industry investment is constrained by a number of policy and environmental issues, such as the high costs of rights of way, delays in obtaining permits, disruptions to the electricity supply, underdeveloped road infrastructure, frequent damage to networks, and a complex tax structure. These issues add to the cost of network investment and cause delays to mobile operators' activities. Particularly in the context of declining average revenue per user, this can make it more difficult for mobile operators to make a business case for investment, especially in poorer, rural areas.

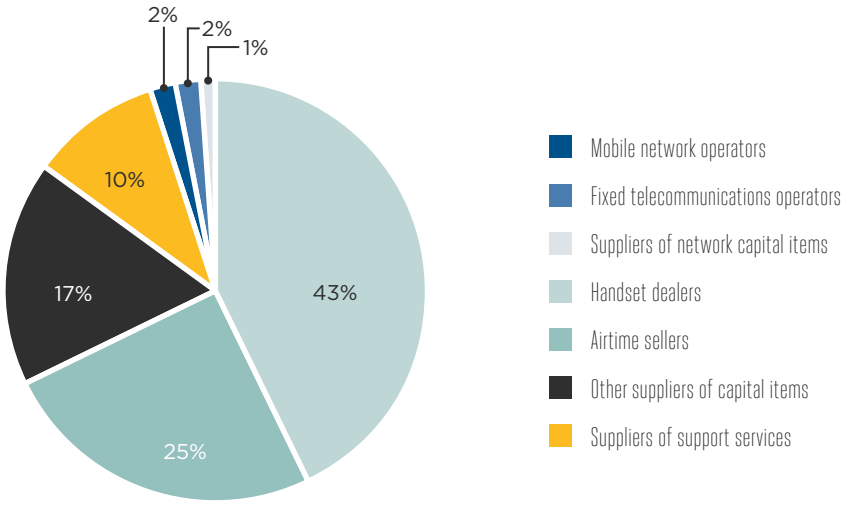
Addressing barriers to mobile investment and affordability could help extend the benefits of digital inclusion and enable mobile to deliver on its growth potential. There is an opportunity for the new government to evaluate the key areas and promote policies to overcome these challenges. The GSMA has estimated that a 1% increase in mobile penetration could lead to a long run increase in the annual rate of GDP growth of 0.28%, while the World Bank has found that in developing economies, such as Nigeria, every 10% increase in broadband subscriber penetration

accelerates economic growth by 1.38% in the long run. Based on this research, doubling the 3G mobile broadband penetration rate from 17% to 34% has the potential to result in a 2.35 percentage point increase in the growth rate of annual GDP per capita in the medium term.

This report identifies key policy enablers that have the potential to extend digital inclusion and investment in connectivity in Nigeria:

- Reducing inefficiencies in the tax structure represents an opportunity to improve affordability for consumers and operators' incentives to invest in networks and services. The multiple levels of taxation constrain mobile operator investments. Local and regional authorities target taxes and fees specifically to the mobile sector. In addition, due to mobile operators' national footprint, they must engage with – and frequently pay – authorities and regulatory bodies in every jurisdiction. In some cases, the national telecommunications regulator has even found that these taxes are actually illegal. Added to these costs, mobile operators also pay a number of fees to the national telecommunications regulator, and an Education Tax and Information Technology Development Levy that apply only to selected industries.

Mobile operator tax payments by type, 2014



Source: Deloitte analysis based on operators' data

Figure 6

- Allocating more low frequency spectrum will be key to ensure better quality of service and expand network coverage. In addition, clarity and efficiency in the assignment of future spectrum is important to encourage investment by operators in rural and remote areas. This can be achieved with a well-designed auction process devised in collaboration with mobile operators and other key stakeholders.
- Poor quality of service has been a major problem in Nigeria since the launch of mobile services. This has often led to frequent interruptions of services. The NCC has identified a series of reasons that should be addressed for the poor quality of service, these include inadequate power supply, multiple taxation and regulations, vandalisation of telecom infrastructure, right of way challenges, and infrastructure deficit.

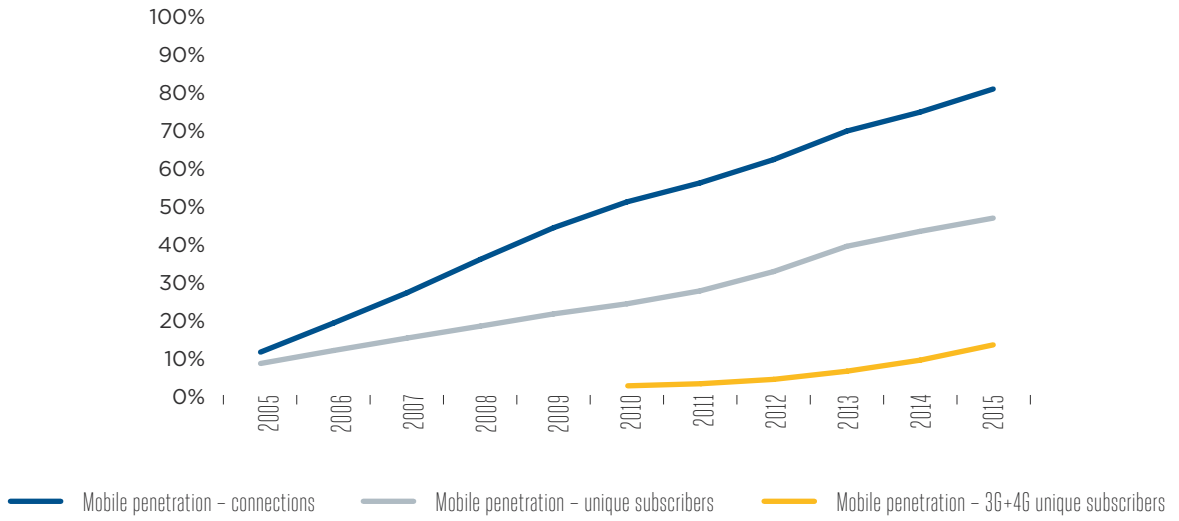
1. Expanding digital inclusion in Nigeria

1.1 The current state of digital inclusion in Nigeria

Nigeria is now the largest economy in Africa and has the largest mobile market in the continent in terms of subscribers. Since the introduction of mobile services in 2001, the Nigerian market has grown to over 83 million unique subscribers, or 45% of the population[1]. The sector's growth has been supported by a competitive market, the introduction of 3G services in 2007, and regulatory reforms such as the introduction of mobile number portability in 2013[2]. All four major mobile operators (MTN, Globacom, Airtel, and Etisalat) now provide both 2G and 3G services. 4G is still new in Nigeria, representing only 0.15% of total connections.[3]

Relative to neighbouring countries and those with a similar level of economic development, unique subscriber mobile penetration is low in Nigeria. Although mobile phone access is boosted by sharing of handsets between individuals[4], fewer than half of Nigerians have their own connections, and many Nigerians therefore remain unable to access the benefits of even basic mobile services.

Mobile penetration rates in Nigeria

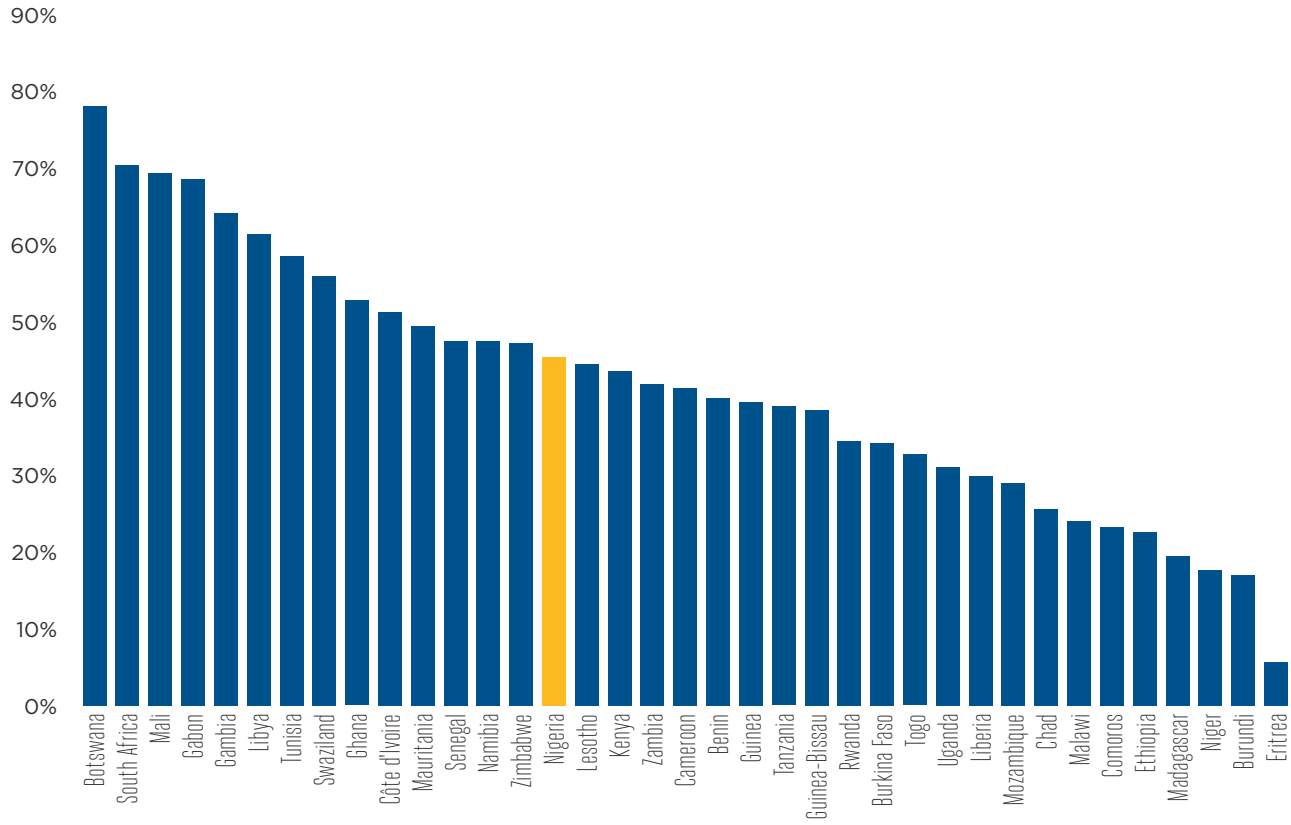


Source: GSMA Intelligence Database

Figure 7

1. GSMA Intelligence database. In total, there are 143 million connections, representing a subscriber penetration rate of 79%; however, due to widespread multi-SIM ownership, only an estimated 45% of the population has at least one mobile connection. The total number of connections is comparable to the statistics from the National Communication Commission, which show total connections at 142.6 million as of February 2015, available at http://www.ncc.gov.ng/index.php?option=com_content&view=article&id=125&Itemid=73
2. Buddecomm, Nigeria – Mobile Market – Insights, Statistics and Forecasts, 2015, and GSMA – The Mobile Economy: Sub-Saharan Africa 2014.
3. GSMA Intelligence database.
4. GSMA Intelligence database, GSMA Country Overview: Nigeria, and EIU Nigeria – Telecommunications report: Mobile.

Total unique subscriber penetration in selected African countries, Q1 2015



Source: GSMA Intelligence database

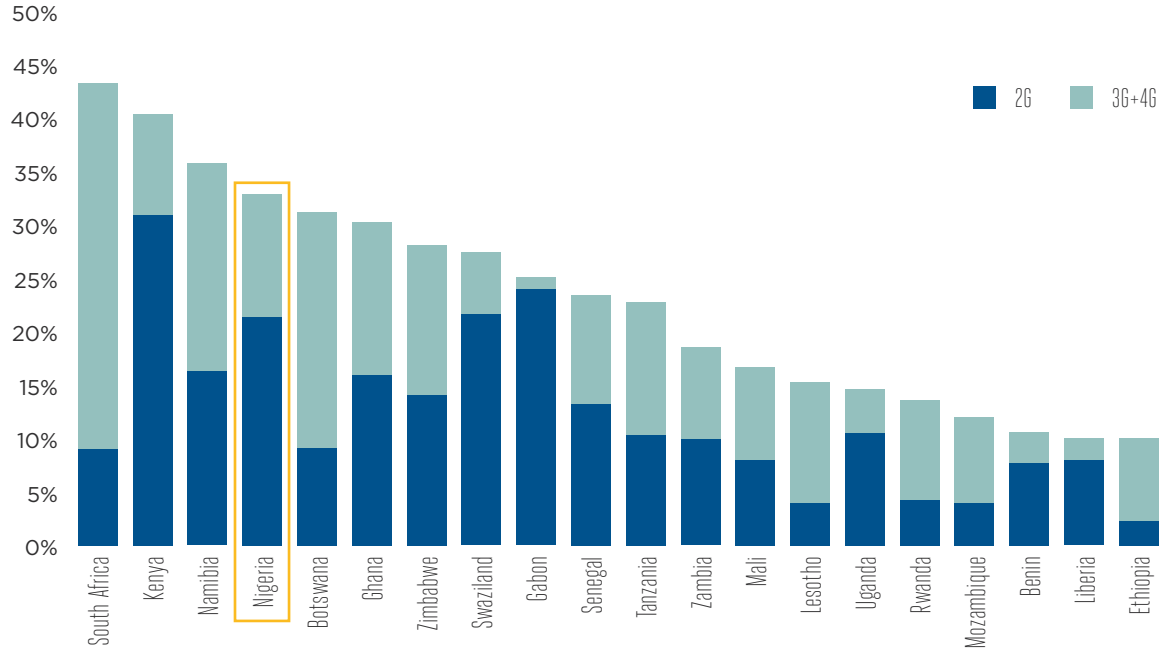
Figure 8

In a country where only 0.2% of the population has access to fixed lines[5], mobile has made a critical contribution to the country's access to telecommunications services, referred to as "digital inclusion" in this report[6], facilitating wider economic development. Yet, with over half of the population without a connection, there is potential for mobile to expand its footprint and its impact further, especially at a time of expansion of mobile broadband through affordable smartphones and tablets.

In Nigeria mobile internet usage is relatively low. Among Sub-Saharan African countries, Nigeria has the 8th highest percentage of mobile internet penetration at 33% of the population, lagging behind some major mobile markets like South Africa and Kenya, at 43% and 40% respectively. Those Nigerians who do use the mobile internet are primarily using slower 2G connections, as smartphone adoption and mobile broadband access have remained low; only approximately 17% of total connections are via a smartphone[7], and only 11% of the population has a 3G or 4G connection[8]. Fewer people in Nigeria access the benefits of higher-speed mobile broadband than in many African countries, including some poorer countries like Sudan, Tanzania and Zimbabwe. Greater access to 3G and 4G would enable more Nigerians to access faster mobile broadband services and the greater economic benefits enabled by mobile broadband.

5. ITU statistics. In 2013 there were 0.21 fixed telephone subscriptions per 100 inhabitants in Nigeria.
6. Digital inclusion refers to the ability of people to access use digital resources and services. In a fully digital inclusive environment the benefits of mobile internet should be available to all, regardless of location or socioeconomic status.
7. GSMA Country Overview: Nigeria and GSMA Intelligence database.
8. GSMA Intelligence database.

Unique mobile internet subscribers by technology in selected Sub-Saharan African countries, Q1 2015

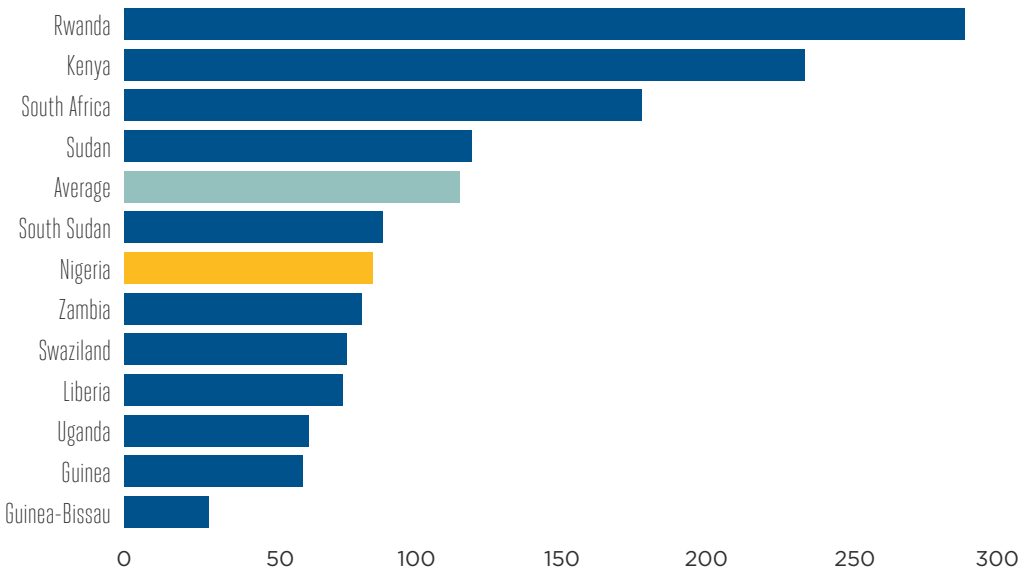


Source: GSMA Intelligence database

Figure 9

Mobile subscribers also use services relatively less in Nigeria compared to other African countries. In 2014 average outgoing minutes of use per connection in Nigeria was 86, lower than the African average of 115 minutes and far behind Rwanda and Kenya at 289 and 234 minutes respectively.

Average monthly outgoing minutes of use per connection in selected African countries, 2014



Source: GSMA Intelligence database. Countries selected on the basis of data availability.

Figure 10

1.2 Investment barriers need to be addressed in order to improve coverage and service quality

Investment in Nigeria is comparatively more difficult than in other countries due to both the geographic characteristics of Nigeria and security concerns and issues which may act to increase investment risks. In addition, investing in mobile sites depends on the existence of a functioning road network, and while gaps in electricity grids can be overcome by employing diesel generators, this proves costly to mobile operators.

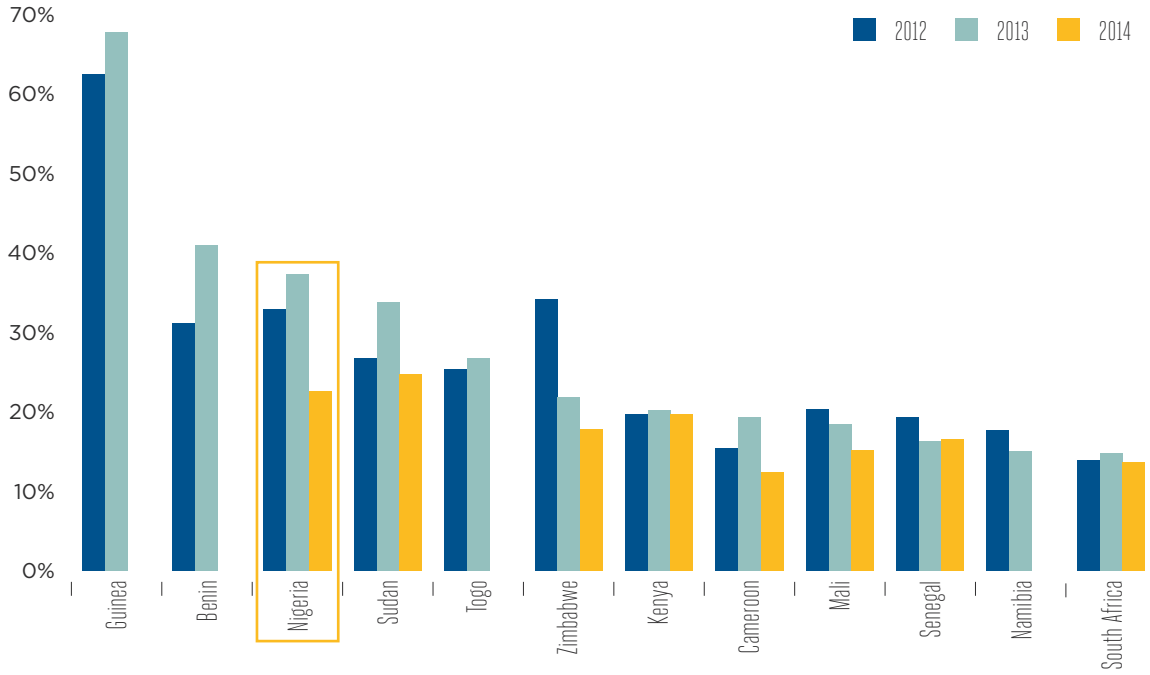
These challenges have contributed to a situation today where many Nigerians are not covered by mobile networks; 2G coverage is available for 87% of the population, and 3G coverage is available for only 51% of the population[9]. This particularly impacts Nigerians who live in rural areas: urban mobile ownership is 1.4 times higher than rural ownership. Even where coverage exists, services are sometimes reportedly unreliable; while network infrastructure is being upgraded in many areas, service penetration and usage have increased at a very fast pace, mobile networks have suffered from congestion[10]. Extending service availability to uncovered regions and improving quality of service require significant network investment by mobile operators. To ensure a high quality of service and extend coverage, it is necessary to have more low frequency spectrum available. In addition, to encourage investment by operators in rural and remote areas, the regulator needs to provide a clear long term strategy for spectrum allocation and licence renewal.

Added to this, investment is needed to provide new, innovative services to consumers. An example is mobile money ("m-money") services. M-money is taking off in many African countries, such as Kenya and Tanzania, where 59% and 43% of the population are m-money users, respectively[11]. Although m-money could make a significant impact on the Nigerian economy through greater financial inclusion, few Nigerians are m-money users[12]. In 2013, there were fewer than 1 million m-money users in Nigeria[13], representing less than 1% of the population.

Mobile operators have recognised this need and are undertaking significant investment. Compared to other Sub-Saharan African countries, mobile operators spent a relatively large proportion of revenue on capital expenditure annually. For example, in 2012 and 2013, operators invested more than twice as large a proportion of revenue than operators in South Africa (33% and 38% in Nigeria compared to 14% and 15% in South Africa in 2012 and 2013, respectively[14]).

9. GSMA Intelligence database, based on the most recent data available. 2G coverage is reported for MTN only as of Q4 2013. 3G coverage is reported as of Q1 2015. On 3G coverage Nigeria is ranked 13 of 51 Sub-Saharan African countries, behind leaders South Africa and Mauritius with 96% and 90% coverage of the population, respectively.
10. Buddecomm, Nigeria – Mobile Market – Insights, Statistics and Forecasts, 2015.
11. GSMA The mobile Economy: Sub-Saharan Africa 2014
12. M-money services are used to send and receive money, and to pay for goods, services and bills, among other uses.
13. EFInA – Access to Financial Services in Nigeria 2014 Survey and GSMA Country overview: Nigeria, 2014.
14. The figures include spectrum payments.

Average monthly outgoing minutes of use per connection in selected African countries, 2014



Source: GSMA Intelligence database. Countries selected on the basis of data availability

Figure 11

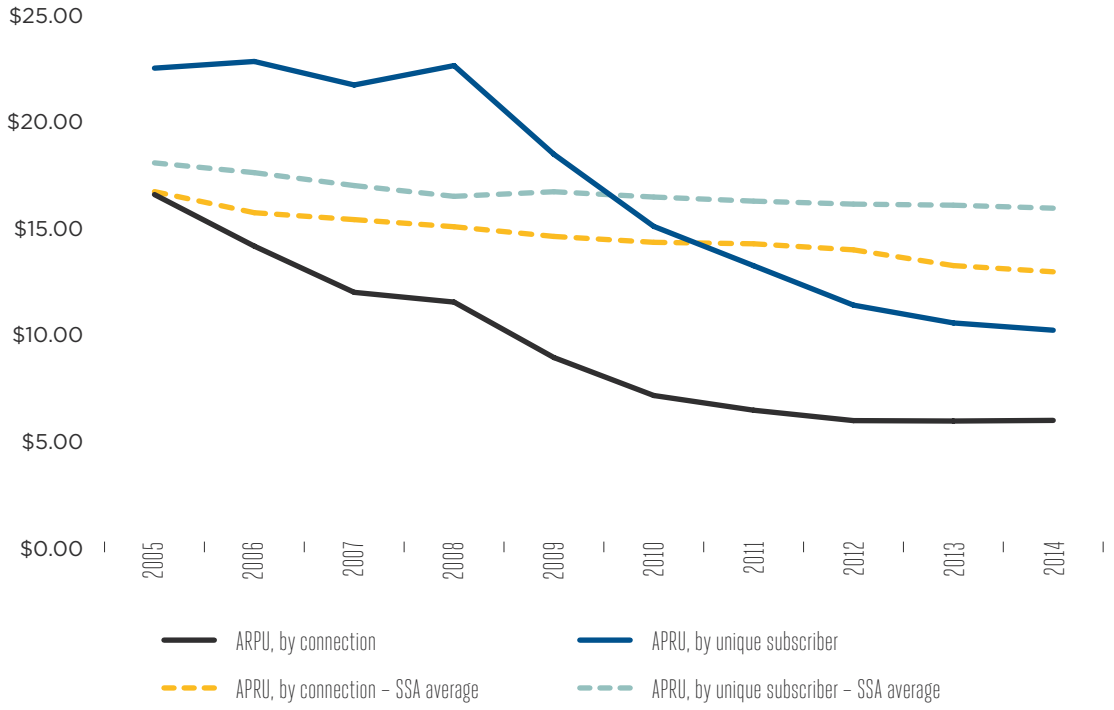
INVESTMENT IN NETWORKS AND SERVICES IS CONSTRAINED BY A NUMBER OF BARRIERS

Challenges remain that are limiting operators' incentives to invest. Mobile operators have identified several policy and environmental issues that add to the cost of network investment in Nigeria, including: high costs of rights of way[15], delays in obtaining permits, an inadequate electricity supply that severely disrupts network services and forces mobile operators to use diesel generators to power base stations[16], underdeveloped road infrastructure, and frequent and costly damage to networks caused by road construction accidents, sabotage and terrorism[17]. The Central Bank of Nigeria's recent ban on purchasing electronics and telecommunications equipment with official foreign exchange has also raised the cost of infrastructure investment[18]. Added to this, mobile operators are also exposed to multiple regulation and taxation at various levels of government that make investment more costly, limiting mobile operators' ability to undertake upgrades and roll-out of network infrastructure[19]. These taxation issues are discussed in detail in Section 4.

These added costs can particularly constrain investment in Nigeria, especially in a competitive market where mobile operators have been experiencing declining average revenue per user (ARPU) and ARPU levels below the regional average. This can make it more difficult for mobile operators to make a business case for investment, particularly in poorer, rural areas where average revenues may be expected to be lower.

15. Rights of way refer to the allowance of undertakings, such as installing network equipment, on public or private properties.
16. Operators use 1.4m litres of diesel per day to power base stations. Source: Nigeria Communications Week, February 2, 2015, "Operators use 1.4m litres of diesel daily to power BTS"
17. GSMA Country Overview: Nigeria, 2014, Nigeria's National Broadband Plan 2013-2018, Buddecomm, Nigeria – Key statistics, telecom market and regulatory insights, 2015.
18. Pan African News Agency, December 29, 2014: "Nigeria: New forex policy slows down telecoms expansion in Nigeria"
19. Nigeria's National Broadband Plan 2013-2018

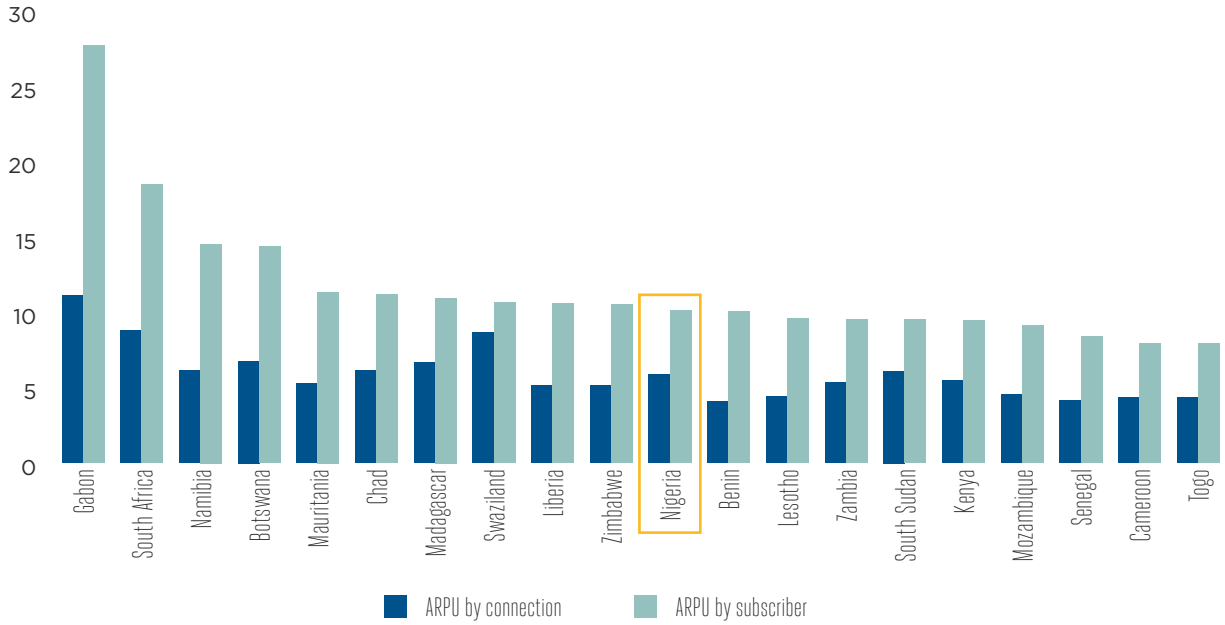
Comparison of annual average ARPU in Nigeria and Sub-Saharan Africa over time (USD)



Source: GSMA Intelligence database

Figure 12

Annual ARPU in selected Sub-Saharan African countries, 2014



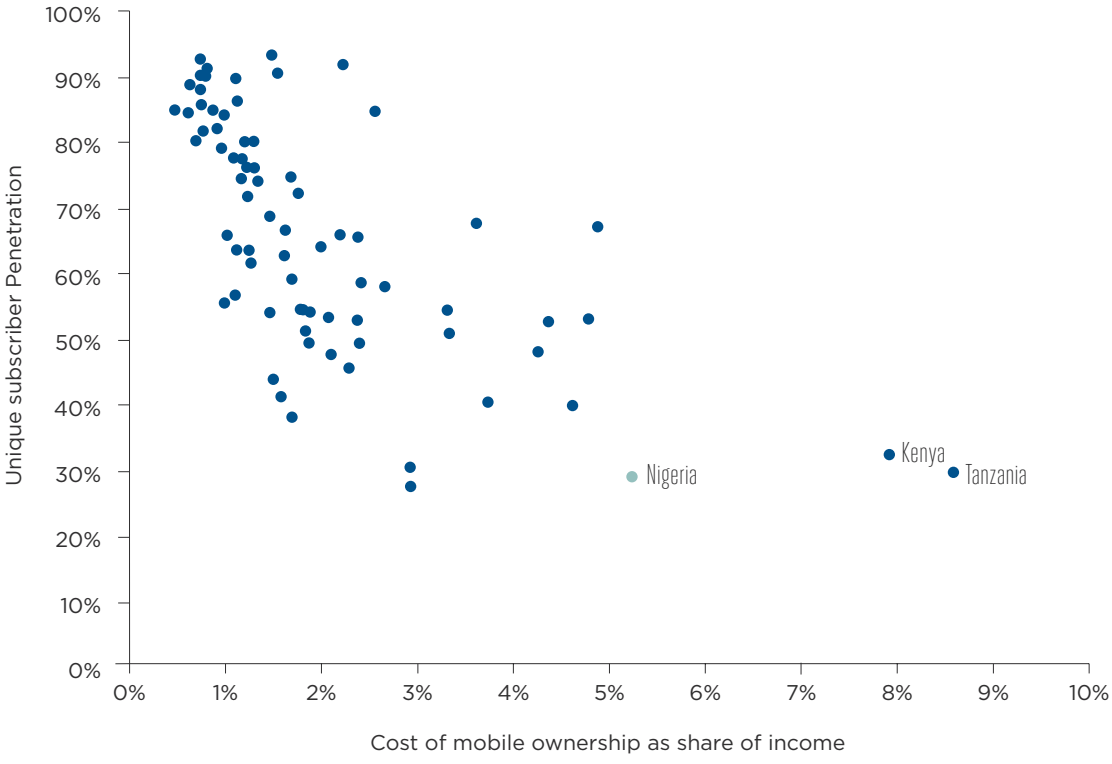
Source: GSMA Intelligence database

Figure 13

1.3 Affordability barriers prevent many Nigerians from accessing mobile services

Even where coverage exists, service affordability remains a challenge for many Nigerians. Especially for poorer Nigerians, the price of owning and using a mobile phone can represent a significant barrier to access and regular usage. Although Nigeria is Africa's largest economy, 33.1% of Nigerians live in poverty, earning $1.4 or less per day[20]. The cost of using a mobile phone represents on average around 5% of personal income in Nigeria[21], but can be higher for poorer consumers, making basic mobile services unaffordable for many. This ratio significantly exceeds the cost for many developing countries, as shown in the figure below.

Cost of mobile ownership compared to penetration in selected countries



Source: GSMA Intelligence: Country overview - Nigeria

Figure 14

Even those Nigerians who do own mobile phones, many do not access the mobile internet or mobile broadband due to affordability concerns. Although mobile is the most affordable means of internet access in the country, Nigeria ranked 99th out of 126 countries for a prepaid 500MB mobile broadband connection in 2013[22]. A survey by Research ICT Africa found that 67% of non-internet users in Nigeria say affordability is one of the key issues for not using the internet[23]. Improving device and service affordability could enable more Nigerians to access the benefits of digital inclusion.

20. World Bank (2014): Nigeria Economic Report. The measure was constructed by calculating a poverty line from the panel data GHS based on the number of calories (3000), which mimics the method of the official Nigerian measurement of poverty and measures the percent of the population living under less than 1.4 dollars per capita per day (adjusted for purchasing power parity)
21. ITU (2013): Measuring the Information Society Report.
22. ITU (2013): Measuring the Information Society Report.
23. Research ICT Africa (2012): "Understanding what is happening in ICT in Nigeria", available at http://www.researchictafrica.net/publications/Evidence_for_ICT_Policy_Action/Policy_Paper_6_-_Understanding_what_is_happening_in_ICT_in_Nigeria.pdf

Even where coverage exists, service affordability remains a challenge for many Nigerians

2. The contribution of mobile to digital inclusion and economic growth in Nigeria

2.1 Mobile services are a key driver of social and economic development

Fixed line broadband is both underdeveloped and expensive in Nigeria, with subscription prices estimated to account for 17.6% of gross national income (GNI) per capita. Mobile broadband on the other hand is estimated to cost only 2.8% of GNI per capita and is a more affordable means of internet access[24]. As such, and in comparison with Africa as a whole, mobile services appear to provide the most cost-effective way of achieving Information and Communications Technology (ICT) access.

There is a large body of literature showing the link between mobile penetration and economic growth[25]. The premise of this work is that mobile telephony generates a positive impact on workers' productivity, which in turn impacts business productivity through routes such as improved information flows on prices, quantities and quality; reduced travel time and costs; improved efficiency of mobile workers; improved job search and promotion of entrepreneurialism. Mobile services can reduce transaction costs, making it less expensive for Nigerians to communicate and conduct everyday business operations, supporting the expansion of businesses and enterprises. Through wider effects on the economy, this helps to increase living standards in Nigeria and improve Nigeria's international competitiveness.

A recent joint study conducted by Deloitte, GSMA and Cisco[26] considered the impact of mobile penetration on countries Total Factor Productivity (TFP), a measure of economic productivity which accounts for effects in total output not caused by traditionally measured inputs such as capital and labour and that often measures an economy's long-term technological dynamism. Based on a sample of developing countries and recent figures on penetration, this study found that in countries such as Nigeria a 10% increase in mobile penetration increases TFP in the long run by 4.2 percentage points.

Mobile can also enable more effective delivery of public services and support social development. In particular, mobile and broadband communication

24. ITU, Measuring the information society report 2014
25. For example, see Qiang, C.Z. W., Rossotto, C.M., 2009. Economic Impacts of Broadband, in Information and Communications for Development 2009: Extending Reach and Increasing Impact, World Bank, Washington D.C., 35- 50., Lam, PL., Shiu, A., 2010. Economic growth, telecommunications development and productivity growth of the telecommunications sector: Evidence around the world., Thompson, H. G., Garbacz, C., 2011. Economic impacts of mobile versus fixed broadband., Gruber, H., Koutroumpis, P., 2011. Mobile telecommunications and the impact on economic development, and Lee, S.H., Levendis, K., Gutierrez, L., 2011. Telecommunications and economic growth: an empirical analysis of sub-Saharan Africa.
26. Deloitte/GSMA, 2012. "What is the impact of mobile telephony on economic growth?"

offers an effective means of bringing healthcare and education services to remote and under-served areas, through m-Government initiatives and mobile applications. Many initiatives have been launched that demonstrate the potential of mobile to support social development, innovation and productivity, including:

- **Nova-Lumos mobile electricity** is a joint project between MTN and Nova-Lumos that will provide electricity to MTN customers living in rural areas that are not connected to the electricity grid. By utilising solar power the service allows users to purchase electricity on demand using mobile phones, much like purchasing airtime and other mobile services[27].

- **Etisalat Mobile Baby** is a mobile tool that facilitates information sharing and diagnostics by allowing users to send media for remote diagnosis, report symptoms and handle referral management and money on the phone for transportation payments The improvements in diagnostics and information sharing offered by the application allow birth attendants and midwives to ensure safer pregnancies and deliveries[28].

- **Glo has partnered with the National Health Insurance Scheme** to enable subscribers to access healthcare in exchange for premia paid over the mobile phone[29].

- **Glo Xchange:** The country's first Mobile Money Agent Network was launched in late 2014 as the result of a cooperative project between the operator Globacom and three mobile money operators, First Bank, Ecobank, and Sanbic IBTC. By using mobile phones, financial services can be offered without a bank account, and thus raises an opportunity to extend banking to the unbanked in Nigeria[30].

- **iPolice** is an app that allows Nigerians to report crimes and provide other information to police via their mobile phones and provides security news and alerts, enhancing governance and security[31].

27. http://www.nova-lumos.com/mtn-nigeria-and-nova-lumos-partner-to-bring-affordable-alternative-mobile-electricity-tonigeria-for-the-first-time/
28. GSMA feasibility report and Etisalat.
29. Euclid Infotech, April 29, 2015: "Nigeria: GLO rolls out health insurance through mobile handset"
30. http://www.gloworld.com/ng/business/mobile-money/glo-xchange/
31. Nigeria Communications Week, January 19, 2015: "#Election2015: Complustech to release iPolice app to electorate, others"

2.2 Mobile services support Nigeria's development objectives

Although the Nigerian economy overtook South Africa's as the continent's largest economy in 2014, economic growth, poverty reduction, and social cohesion remain critical goals for Nigeria. Through the positive benefits of mobile, the mobile industry can support many of the development objectives outlined by the government and international organisations:

- Under Vision 2020 the government's goal is to transform Nigeria into one of the top twenty economies in the world by 2020, with a growth target of no less than $900 billion GDP and $4000 per capita income per annum[32].

- To support the realisation of Vision 2020, the Transformation Agenda emphasises reducing unemployment while promoting robust and inclusive growth and improved well-being[33].

- President Muhammadu Buhari's election manifesto stated the goal of making Nigeria one of the fastest growing economies of the world with real GDP growth averaging at least 10-12% annually while ensuring that information technology, manufacturing, agriculture and entertainment are the key drivers of the economy[34].

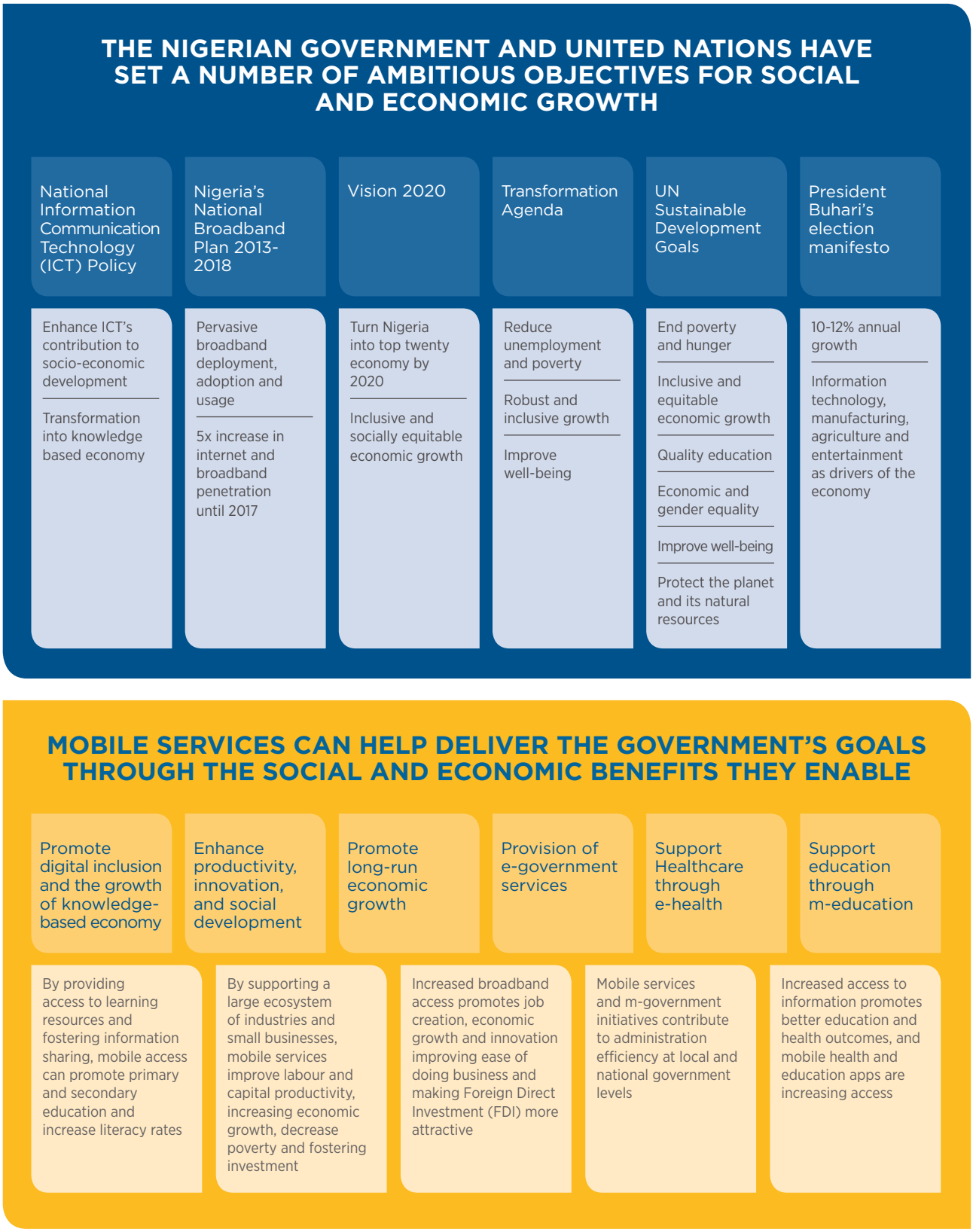
- The UN Sustainable Development Goals (SDGs) set out to end poverty and hunger, ensure inclusive and equitable economic growth and quality education and achieve economic and gender equality and improve well-being of people of all ages.[35] The SDGs build on the UN Millennium Development Goals (MDGs) which included eradicating extreme poverty and hunger, achieving universal primary, promoting gender equality and as well as maternal and child health and ensuring environmental sustainability.

- The importance of broadband in achieving the above objectives was highlighted in the Nigeria's National Broadband Plan 2013-2018, that aims to promote pervasive broadband deployment, adoption and usage to enable a fivefold increase in internet and broadband penetration until the end of 2017[36].

The figure opposite demonstrates some of the ways in which mobile can support these objectives.

32. The Nigerian National broadband Plan 2013-2018.
33. The Transformation Agenda.
34. http://abusidiqu.com/manifesto-vision-nigeria-muhammadu-buhari/
35. For the SGD proposal, see: https://sustainabledevelopment.un.org/post2015/transformingourworld
36. Nigeria's National Broadband Plan 2013-2018.

The role of mobile in driving economic growth in Nigeria



Source: Deloitte and the National ICT Policy, National Broadband Plan, Vision 2020, Transformation Agenda, UN Sustainable Development Goals, and President Buhari's election manifesto

Figure 15

2.3 The impacts of mobile on the supply side of the Nigerian economy

This section focusses on quantifying one component of this contribution by calculating the economic benefits generated on the supply side of the economy by the mobile ecosystem. Using an economic impact model constructed for Nigeria[37], this section estimates the value add and employment generated through the direct economic activity of mobile operators as well as the indirect economic activity stimulated within the mobile ecosystem and across the wider economy.

Estimation of the economic impacts of mobile telephony

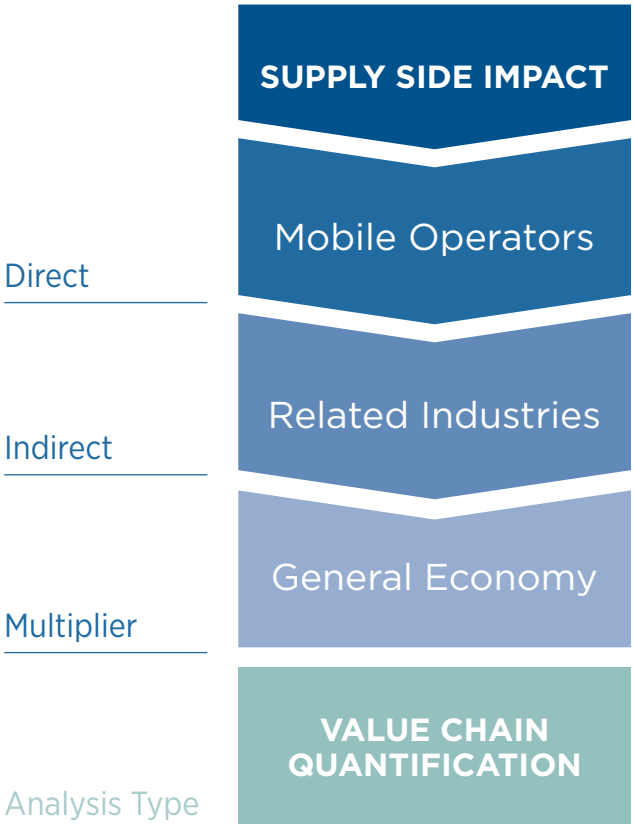


Figure 16

THE MOBILE ECOSYSTEM IN NIGERIA

In addition to the mobile operators, the Nigerian mobile industry is composed of a wider ecosystem of players, including mobile operators' value chain:

- **Network equipment providers and international equipment manufacturers**, such as Ericsson, Huawei, Nokia, Alcatel and Aviat all have offices in Nigeria.
- **Providers of other network services such as installation and maintenance**, largely formed by local companies that train and employ local engineers and technicians, thus boosting local skills and high-skilled labour.
- **Handset manufacturers, importers and distributors**. Imported Nokia phones are the leading mobile devices in Nigeria[38], but several other global brands, including Samsung, Blackberry, and HTC as well as African brands like Tecno are also common[39]. While none of the major global device manufacturers have assembly plants in Nigeria,[40] locally designed and manufactured devices such as SOLO Devices[41] are beginning to enter the market.
- **Airtime distributors and sellers** (including a host of retail points throughout the country).
- **Suppliers of other services** (such as advertising and accounting) to mobile operators.

37. The estimation methodology and assumptions are described in detail in Appendix A
38. StatCounter statistics show that 47% of internet access in 2014 was over Nokia devices
39. http://connectnigeria.com/articles/2013/08/15/top-ten-mobile-phone-brands-in-nigeria/
40. http://www.africanmanager.com/site_eng/detail_article.php?art_id=19688
41. http://www.gosolo.ng

Additionally, mobile serves as a platform for other mobile-related businesses that are not directly a part of mobile operators' value chain:

- **Developers and providers of mobile value-added services,** like apps and m-money. Usage of apps is growing by up to 30% annually in Nigeria,[42] and a number of apps and websites have been developed in Nigeria. These include:
  - BudgIT[43] (an app that provides information on the government budget).
  - Traclist (an e-commerce app[44]).
  - Efiko (an m-education app that provides self-assessment tools and other educational support for secondary school students[45]).
  - Jobs In Nigeria (an app providing job vacancies[46]).
  - Genii games (a games company providing multiple apps, including Yoruba and Igbo language instruction apps[47]).

  App developers have been supported by incubators like the Co-Creation Hub Nigeria, which has partnered with leading global technology brands like Google, Nokia and Microsoft to provide support for local technology innovators[48].

- **Mobile advertisers**. Businesses in Nigeria are increasingly using mobile apps, websites and SMS and other means to advertise to subscribers. As of the end of 2013, Nigeria is the 13th largest generator of mobile ad impressions globally[49] and has over 3 billion monthly mobile ad impressions in Nigeria[50]. This growing mobile advertising market has been supported by the presence of a number of local mobile advertising platforms and advertising companies. MTN now offers an advertising platform called MTN Mobile Ads which allows targeted advertising, and 25 million subscribers have already opted in[51]. For example, Ad Dynamo is one of the leading mobile ad platforms in Nigeria, and between South Africa and Nigeria, it alone has 42,000 advertisers[52].

- **Retailers**. Nigerian businesses are increasingly using the internet to drive sales. From 2013 to 2014, online purchases increased by 15%, and 60% of online buyers used their mobile phones for their purchases[53]. Nigeria's e-commerce market attracted $200 million in foreign investment as of October 2014, and created 12,000 jobs between 2012 and 2014[54].

42. Nigeria Communications Week, March 5, 2015: "Carmundi.com says mobile apps take Nigeria by storm"
43. http://www.yourbudgit.com/
44. http://techcabal.com/2014/08/05/traclist-is-beautiful/
45. http://efiko.com.ng/
46. https://play.google.com/store/apps/details?id=com.jobsinnigeria.android
47. http://www.geniigames.com/
48. http://cchubnigeria.com/
49. http://operamediaworks.com/sites/default/files/file_attachment/omw_sma_q2_2014.compressed_0.pdf
50. As of 2012. http://www.ihub.co.ke/ihubresearch/uploads/2012/october/1351001605_819_249.pdf
51. http://www.mtnbusiness.com.ng/services-solutions/mobile-ads
52. https://www.addynamo.com/en/index.cfm?event=v3_about_ad_dynamo
53. Vanguard-Nigeria, August 6, 2014: "Study shows high growth of e-commerce in Nigeria"
54. Leadership Nigeria, October 7, 2014: "Nigeria's e-commerce market potential worth $10bn"

Nigeria's mobile ecosystem

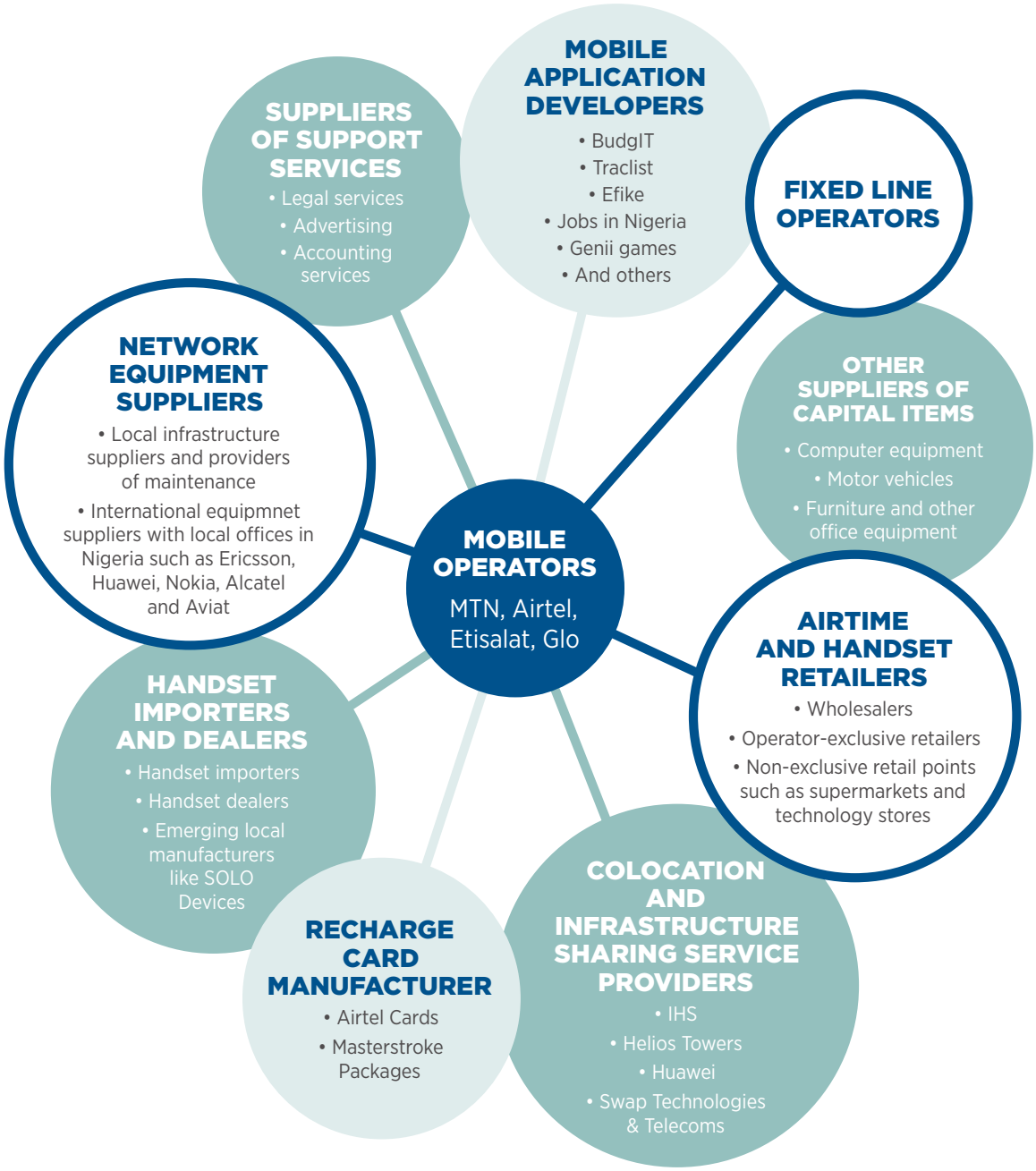


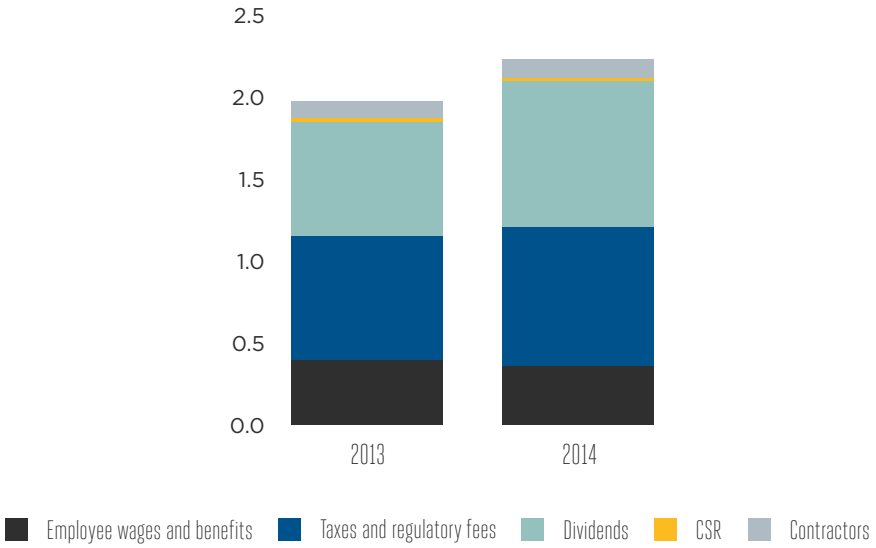
Figure 17

IMPACT ON VALUE ADD

The total supply side value add created through mobile operators and the wider mobile ecosystem is estimated as the sum of three components: direct, indirect, and induced impacts.

The direct impacts generated by mobile operators include mobile operators' expenditure on wages, dividends, and taxes. Tax is the greatest component of value add, followed by dividends and wages. Mobile operators' greatest operational expenditure is on diesel payments, largely due to the unreliability of the power supply. These direct impacts were estimated at approximately USD 2.2 billion in 2014.

Direct domestic value add of mobile operators (excluding multiplier effect), USD billions



Source: Deloitte analysis based on data provided by the mobile operators, interviews and analysis of company accounts. Figures exclude multiplier.

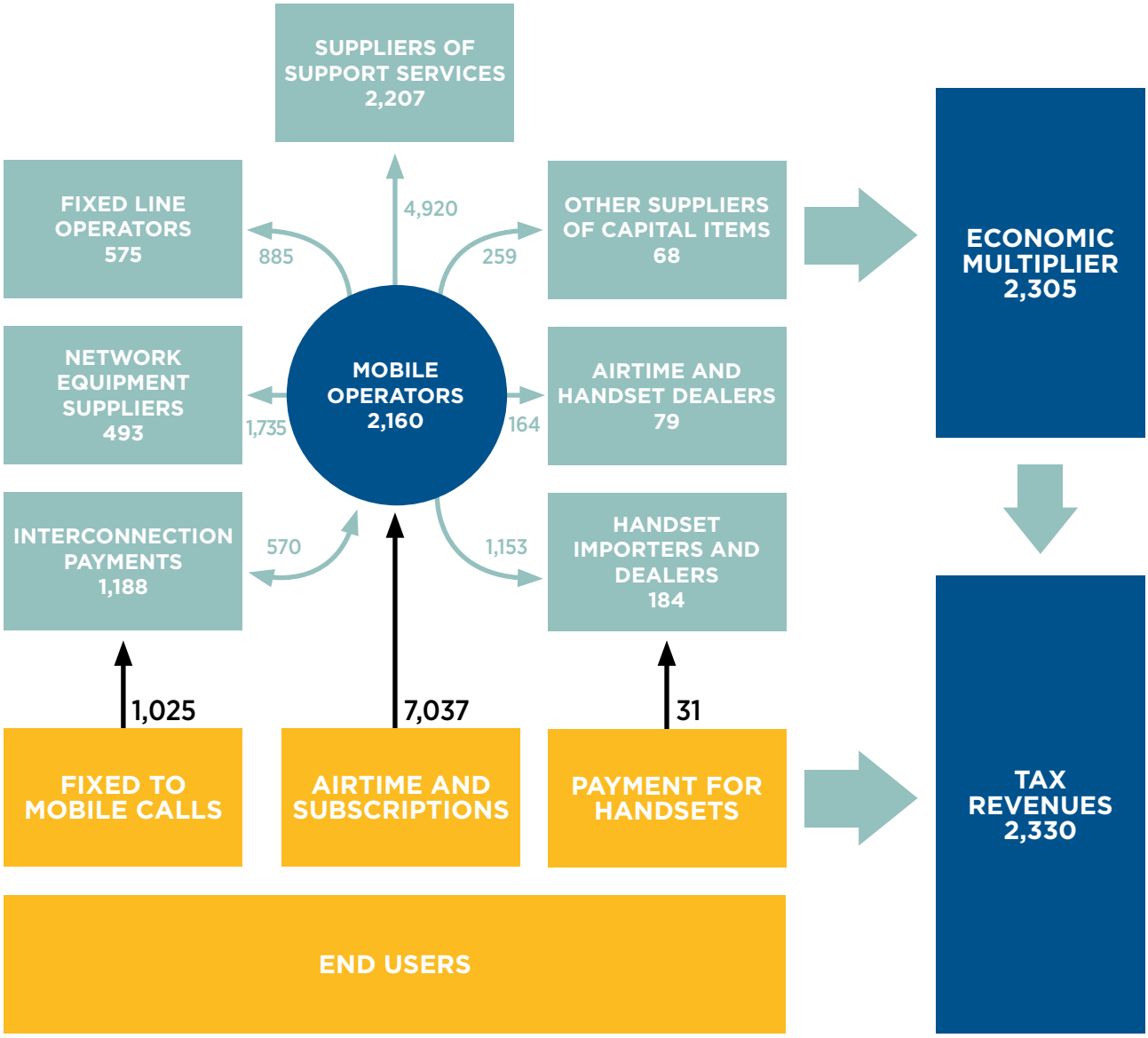
Figure 18

In previous years, direct impacts would have also included the significant expenditure undertaken by mobile operators to roll out networks, including investment in roads in rural areas, as well as spectrum payments and licence fees, and would have therefore been larger.

Mobile operators' direct expenditure within the mobile ecosystem generates a second round of indirect impacts. These indirect impacts represent the value of mobile operators' expenditure that is spent by other players in the ecosystem and that remains within Nigeria. These are calculated by examining mobile operators' payments to their suppliers in the wider mobile ecosystem. The amount of value add, including wages, profits and taxes generated by these players, is then estimated. These effects are estimated at USD 3.7 billion in 2014.

Finally, the induced impacts reflect the subsequent rounds of expenditure created by direct and indirect spend. For example, they include the increased domestic consumption afforded by increased employment. The induced effects were estimated using a spending multiplier of 40% to capture the broader effects on the wider economy. These were estimated at USD 2.4 billion in 2014.

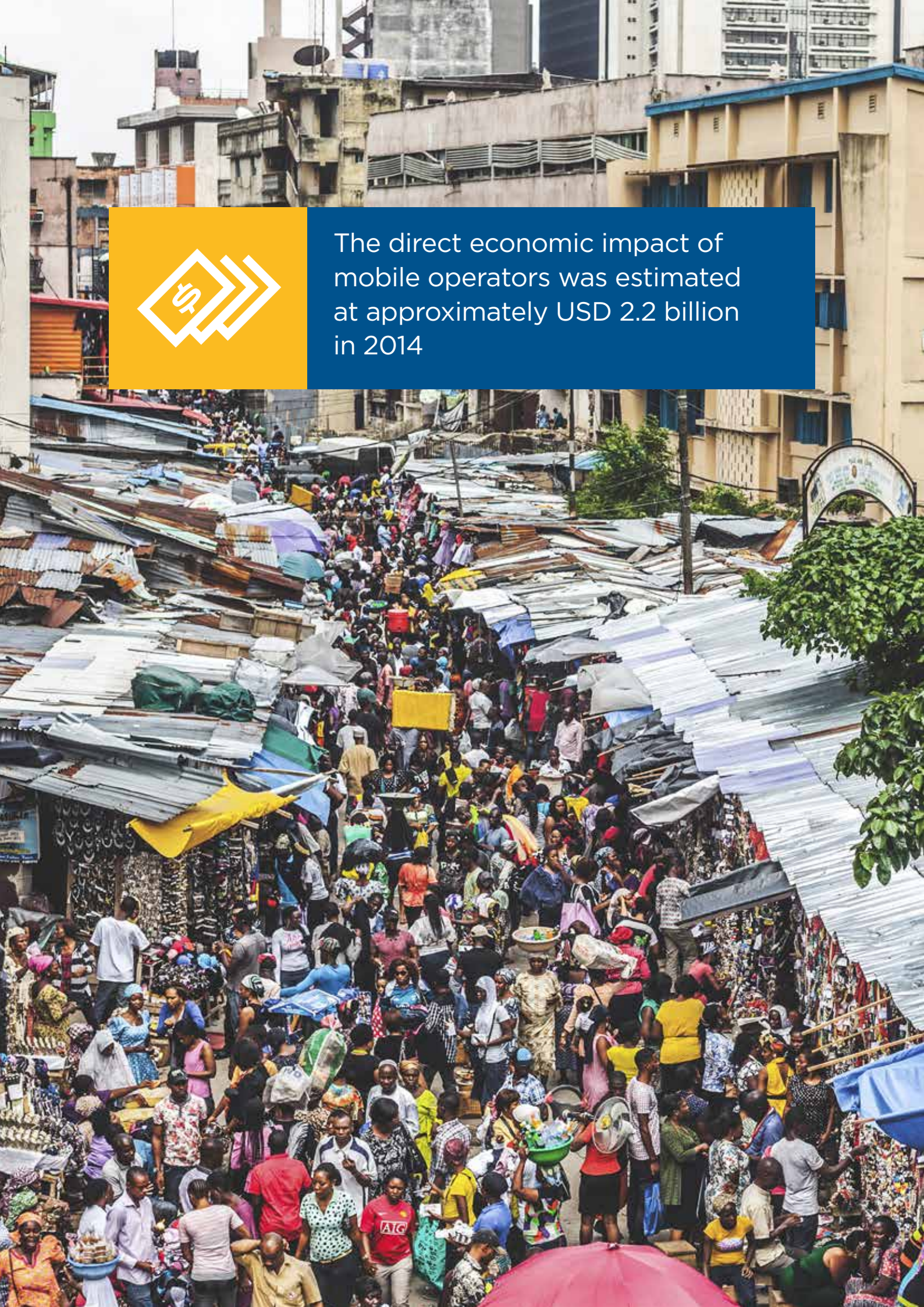
Mobile value chain and value add in 2014, USD millions



Source: Deloitte analysis; Values in the boxes are value add

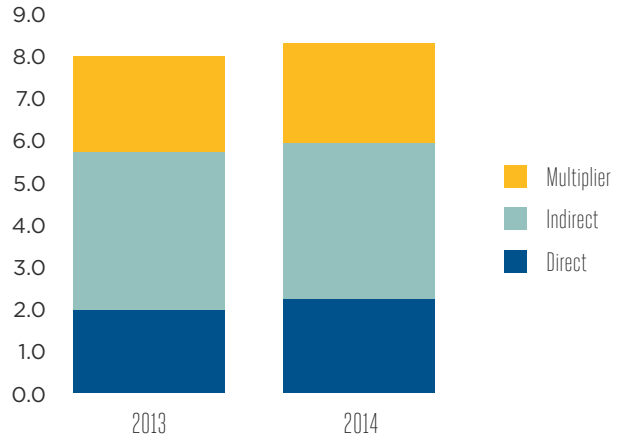
Figure 19

Combining the impacts described above, mobile operators in Nigeria in 2014 created an estimated USD 8.3 billion in value add in through the supply side 2014.



The direct economic impact of mobile operators was estimated at approximately USD 2.2 billion in 2014

Mobile value chain and value add in 2014, USD millions



Source: Deloitte analysis

Figure 20

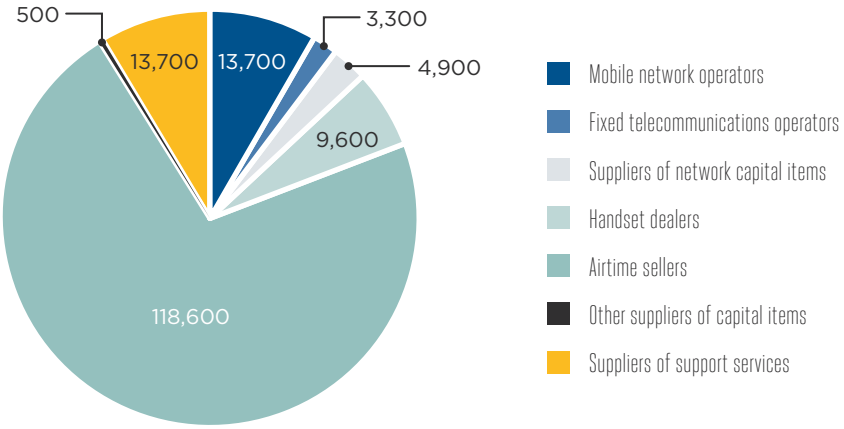
IMPACT ON EMPLOYMENT

Mobile operators in Nigeria contribute to employment in several ways, including:

- Direct employment by the mobile operators.
- Indirect employment generated in the wider mobile ecosystem as a result of mobile operators' expenditures and by other parties that use the mobile platform.
- Employment generated through government expenditure on employment-creating activities using tax revenues generated directly and indirectly by the mobile sector.
- Induced employment created by mobile ecosystem employees and beneficiaries spending their earnings, thereby creating more work.
- Employment created as a result of mobile customers using mobile services to facilitate their businesses.

It is estimated that in 2014 mobile operators supported the employment of over 13,000 Full Time Equivalents ("FTEs") in Nigeria. A further 151,000 FTEs were estimated to be generated in the wider mobile ecosystem as a result of mobile operators' expenditures.

Employment generated by the mobile telecommunications ecosystem in 2011 (FTEs)



Source: Deloitte analysis (differences due to rounding). Figure excludes multiplier

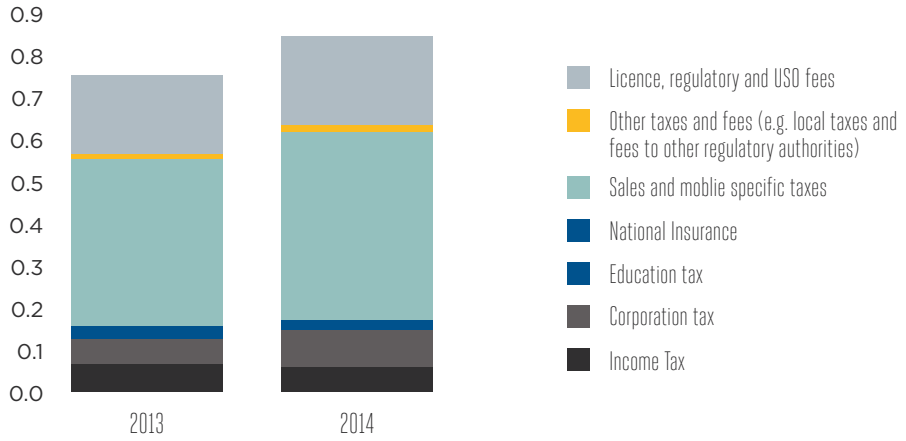
Figure 21

Of the FTEs employed by the wider mobile ecosystem as a result of mobile operators' expenditures, over 118,000 were the airtime dealers and retailers operating from supermarkets, technology stores and smaller independent points of sale, with the majority of airtime being sold by convenience stores.

VALUE ADD FROM TAXATION

A major source of the value added created by mobile operators is the tax revenues they generate. In 2014, mobile operators in Nigeria paid approximately USD 0.85 billion to the government in taxes and regulatory fees. This represents an increase from approximately USD 0.76 billion in paid in taxes and regulatory fees in 2013.

Tax and regulatory payments from mobile operators, USD billions



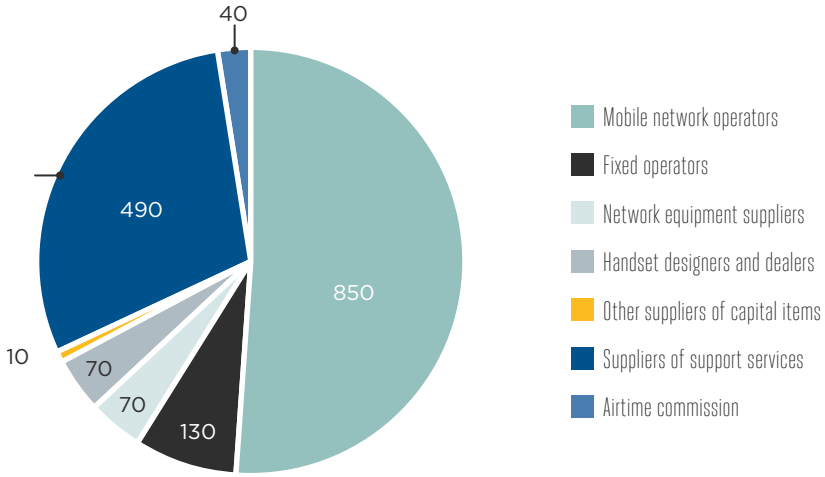
Source: Deloitte analysis based on mobile operator data

Figure 22

In addition to the direct tax revenue received from mobile operators, other players in the mobile industry value chain generated another USD 810 million for the government in 2014.

A further USD 660 million tax revenues were estimated to be generated in the wider economy as a result of interactions with the mobile ecosystem.

Total tax revenues from the mobile telecommunications ecosystem in 2014, USD millions



Source: Deloitte analysis based on company accounts, mobile operators' data and interviews. Note: Thisrepresents tax revenues directly created by revenue flows from the mobile operators and not total tax revenues from the sector.

Figure 23

2.4 The wider economic benefits of mobile

The economic benefits of mobile extend beyond those quantified above for the supply side of the economy. Mobile also delivers significant economic benefits for users, particularly in Nigeria where many subscribers would otherwise not have access to ICT, as described in Section 2.1. These impacts, including the productivity benefits for mobile users, are not captured in the economic impact model. However, a number of studies have estimated the economic growth potential of mobile, in particular:

- Studies by the GSMA and the World Bank have estimated that a 1% increase in mobile penetration could lead to an increase in the GDP growth rate of 0.28%, while a 1% increase in internet user penetration in high-income countries can lead to an increase of up to 0.077% in the GDP growth rate[55].
- The World Bank has found that in developing economies, such as Nigeria, every 10% increase in broadband subscriber penetration[56] accelerates economic growth by 1.38%[57].

These studies suggest that doubling the 3G penetration rate in Nigeria from 17% to 34% has the potential to result in an increase in the annual GDP per capita growth rate by 2.35 percentage points to 4.85% in the long run.

55. This is based on a study of 40 economies over the period 1996-2011; for full details of the methodology, see http://www.gsma.com/publicpolicy/wp-content/uploads/2012/11/gsma-deloitte-impact-mobile-telephony-economicgrowth.pdf; Qiang, C. Z. W., Rossotto, C.M., 2009. Economic Impacts of Broadband, in Information and Communications for Development 2009: Extending Reach and Increasing Impact, World Bank, Washington D.C., 35-50.
56. The distinction between users and subscribers of telecommunications services should be noted. Users refer to individuals who do not necessarily own or pay for telecommunications services, but who have access to such services through work, family etc. Subscribers, on the other hand, are individuals who pay for subscriptions to such services, to which a number of individuals may have access. Based on ITU, 2014. Manual for measuring ICT Access and Use by Households and Individuals.
57. Qiang, C. Z. W., Rossotto, C.M., 2009.

3. Policy enablers to expand digital inclusion in Nigeria

Mobile is already delivering an important contribution to the Nigerian economy through the direct, indirect and induced impacts of mobile operators' expenditure and the wider benefits enabled by digital inclusion. However, industry investment is constrained by a number of policy and environmental issues, such as the high costs of rights of way, delays in obtaining permits, disruptions to the electricity supply, underdeveloped road infrastructure, frequent damage to networks, complex tax structure and lack of availability of the right spectrum. These issues add to the cost of network investment and cause delays to mobile operators' activities. Particularly in the context of declining average revenue per user, this can make it more difficult for mobile operators to make a business case for investment, especially in poorer, rural areas. Following Nigeria's 2015 national election, the country is at a crossroads in regards to its digital development, with regulators and policymakers facing important decisions that will impact the future of communications for all Nigerians.

Tax administration issues are a key barrier to network investment, potentially constraining mobile operators from expanding coverage and enhancing quality of service. A review of all taxes paid by the industry – including those paid to local authorities and fees paid to other regulators – indicates that the industry faces complex tax challenges.

In addition, a number of key policy considerations and regulatory challenges must be carefully studied, including but not limited to the need for improved government transparency and public consultation in an effort to sustain industry investment, rising consumer demand for data services and a lack of available radiofrequency spectrum to support this trend, and a shortage of clarity surrounding Nigeria's plans to award this high-demand spectrum to those who will use it to deliver the greatest socio-economic benefits.

3.1 The wider economic benefits of mobile

3.1.1 Overview of taxes on mobile operators and consumers in Nigeria

The table below summarises all taxes and fees paid by mobile operators and consumers in Nigeria. In total there are 26 different taxes and fees levied on mobile operators and consumers in Nigeria. These include national and local taxes on revenues, businesses and business sites as well as regulatory fees such as spectrum and permits fees.

Tax and regulatory payments from mobile operators, USD billions

Payment base			Type	Tax rate
Taxes	Imported network equipment		VAT	5%
			Customs duty and port levy	Varies: e.g. Feeder-cables: 24%, Fibre optical cable: 7%, Antennas: 24%, Towers: 7%, Battery: 24%, SIM cards: 20%, Radio equipment: 10%
	National	Profits	Corporation tax	30%
			Information Technology Development levy (paid only by communications operators, banks, oil and gas operators with an income of over N100m)	1%
			Education tax	2%
	local	Per business	Local business tax	Vary, but exceed rates charged to other businesses; N30,000 average rate per site
		Per site	Town planning fees – One-off levy	N650,000 average per site
			Environment / Tower tax	Tower taxes vary
			Civil aviation tax	N152,500 per site and N50,000 per site annually
Fees	Annual regulatory fees	Revenues	Annual operating levy (also funds Universal Service Fund)	2.5%
		Fixed	Annual spectrum fee	Fee determined per state by NCC based on usage * assigned bandwidth* band factor * tenure duration factor
			Annual numbering fee	Access fee of N10m per block of 10m lines + between N10/line and N20/line (graduated)
	One-off regulatory fees	Fixed	One-off licence fee	Each operator paid $285m in 2001 for the Digital Mobile Licence, including frequency on the 900MHz and 1800MHz bands
			One-off spectrum fee	Each operator paid $150m in 2007 for 3G spectrum at auction
Telecom specific	Fees		Annual building permit by Town Planning Authorities (TPAs)	
			Operational permit	
			GSM Mast renewal	
			Capitation rate	
			Industrial training fund	
	Taxes		Environmental taxes: (i) Toxic gas/Effluent Discharge Fees, (ii) Pollution Charges, (iii) Forestry permits for felling down trees to erect telecom masts, (iv) Environmental remediation fees, (v) Ecology fees, (vi) Registration of generators.	
Handsets			VAT	5%
			Customs duty	12%
SIM cards			VAT	5%
			Customs duty	20%
			Special levy	35%
Mobile broadband, mobile money, calls, and SMS			VAT	5%

Source: IBFD and operator data

Table 1

GENERAL TAXATION ON MOBILE OPERATORS

At the national level, a corporation tax is applied on incomes derived by companies operating in Nigeria. The standard rate of corporation tax in Nigeria, which applies to mobile operators, is 30% of profits. Mobile operators also pay customs duties on imported network equipment, SIM cards and vouchers at standard rates.

In April 2015, the Nigerian government approved the ECOWAS Common External Tariff (CET) as well as the supplementary 2015 Fiscal Policy Measures[58]. Under the CET, the customs duty on imported SIM cards was raised from 5% to 20%, and the customs duty on imported radio equipment increased from 5% to 10%. The Fiscal Policy Measures consist of additional taxes on 177 imported goods and include the introduction of a 35% Special Levy on SIM cards.

Domestic production of SIM cards in Nigeria is still in early stages, with only one active producer. As a result, domestic supply of SIM cards is constrained, and operators report that they are unable to substitute from imported to domestic SIM cards. Therefore these changes have resulted in an increase in the price of imported SIM cards, raising operators' costs and potentially resulting in a pass-through of the duty to consumers in the form of higher prices.

In addition to these standard taxes, which are applied to all businesses in Nigeria, the mobile sector is subject to two taxes that impact only on selected groups of businesses:

- An Education Tax of 2% of profits is levied on companies incorporated in Nigeria; and
- An Information Technology Development Levy of 1% of profits is levied on communication operators, banks, and oil and gas operators with incomes over N100m.

TELECOMMUNICATIONS REGULATORY FEES PAID BY MOBILE OPERATORS

Fees paid to the telecommunications regulator amount to a substantial part of the mobile operators' contributions to government, and include both one-off regulatory fees and annual fees:

- Mobile operators are subject to an annual operating levy of 2.5% of revenues, which serves as an annual licence fee, and 40% of which is also used to finance the Universal Service Fund (USF). A recent GSMA study on USFs in Africa estimated that 60% of the fund has not yet been disbursed but that a number of administrative improvements are underway to improve the fund's performance and transparency[59].
- Mobile operators are subject to non-recurring spectrum and licence fees, which represent a significant part of operator's payments. These are intended to cover the costs of spectrum management and ensure the efficient use of spectrum[60]. In 2001, each operator paid $285m for the Digital Mobile License, including frequency on the 900MHz and 1800 MHz bands, and in 2007 each operator paid $150m and a 10% deposit for 3G spectrum at auction. After two unsuccessful auction attempts in 2008 and 2009 due to legal disputes, 4G spectrum on the 2.3GHz band was auctioned to three companies in 2010 who paid $9m each, and again in 2013 to a single operator for $23.251m[61]. Following delays, it was announced that auctions will be held for spectrum in the 2.6GHz band in 2015 by the Nigerian Communications Commission (NCC), with a reserve price of $16 million per lot[62].
- Mobile operators pay annual spectrum fees and numbering fees. Spectrum fees are determined by the NCC per state and are based on usage variables. Numbering fees are access fees to the numbers in the national numbering plan and based on the number of connections.

REGULATORY AND LOCAL FEES PAID BY MOBILE OPERATORS

In addition to national taxes and regulatory fees, mobile operators are subject to numerous local and mobile-specific regulatory fees:

- Local business taxes vary across jurisdictions but average around N30,000 per mobile site. Mobile operators have indicated that these exceed rates charged to other sectors and the legal limit established by the national government.

58. http://leadership.ng/blogposts/customs-focus/425579/new-ecowas-common-external-tariff-takes-effect
59. GSMA (2014): "Sub-Saharan Africa – Universal Service Fund Study" available at http://www.gsma.com/publicpolicy/wpcontent/ uploads/2012/03/Sub-Saharan_Africa_USF-Full_Report-English.pdf
60. ITU, ICT Regulation Toolkit, http://www.ictregulationtoolkit.org/5.5
61. Buddecomm, Nigeria – Mobile Market – Insights, Statistics and Forecasts, 2015.
62. Nigerian Communications Commission (NCC), 2015. 2.6 GHz Spectrum Auction Information Memorandum.

Enforcement of these taxes can lead to delays in network investment.

- Environmental/tower taxes include several taxes charged for environmental impact assessments, verifications, field studies, initial processing, and environmental remediation and pollution management as well as other fees. The rates for these taxes vary from state to state.

- A one-off town planning fee is also levied per site, on average N650,000 per site, and a civil aviation tax of N152,500 per site and N50,000 per site annually.

- Additional taxes including annual building permits required by local Town Planning Authorities, operational permits, GSM mast renewal fees, capitation rates, and support to industrial training funds.

- An additional tax is levied on mobile operators who generate their own electricity supply[63].

- Kano State increased the tenement rate to N100,000 for telecoms facilities, compared to N40,000 for other economic activities. Other charges such as emission charges, installation and monitoring fees and fumigation and pest control fees have been imposed in different regions on the sector whilst other sectors have been exempt.

GENERAL TAXATION ON MOBILE CONSUMERS

Mobile consumers are subject to standard taxes on mobile devices and services, which are:

- Standard VAT of 5% is imposed on devices and services, and

- Standard customs duty of 12% is imposed on imported devices.

3.1.2 The administrative and opportunity costs of mobile taxation

The numerous regulatory fees and local taxes imposed on mobile operators raise their operational costs. Currently, up to 70% of the investment costs in the mobile sector in Nigeria account for taxes and fees[64], according to the former Minister of Communications Technology Dr. Omobola Johnson.

In addition to the direct cost of taxation, the complex tax structure, coupled with uncertainty and other administrative issues, raise the cost of tax compliance for mobile operators. The World Bank's Paying Taxes 2015 report shows that Nigeria has relatively low tax rates in general but that there are deficiencies in the tax system. When measuring the time required to comply with taxes (prepare, file, and pay each tax), Nigeria ranks as the most time-consuming country in the study. For a representative case study firm, 908 hours are required for compliance, compared to a global average of 264 hours and the African average of 317 hours. Corporate and labour taxes are the most time consuming taxes. The number of payments required for tax compliance is 47 in Nigeria compared to the global average of 26 and the African average 36 payments[65].

63. GSMA/Deloitte – Sub-Saharan Africa Mobile Observatory 2012.
64. http://www.punchng.com/business/business-economy/taxes-levies-gulp-70-of-telecoms-investment-minister/
65. PWC and the World Bank: Paying Taxes 2015

Tax administration burden – Comparison of Nigeria to regional averages

Country	Total tax rate (%)	Time to comply (hours)	Number of payments
Nigeria	33%	908	47
South America	55%	620	23.7
Africa	47%	317	36.2
Central Asia & Eastern Europe	35%	245	23.3
Asia Pacific	36%	229	25.4
North America	39%	213	8.2
Central America & the Caribbean	43%	211	33.8
E U & EFTA	41%	176	12.3
Middle East	24%	160	16.8

Source: World Bank, "Paying Taxes" 2015

Table 2

The World Bank's Doing Business 2015 report ranks Nigeria as 170 out of 189 countries in the Ease of Doing Business ranking. There are large differences in the Ease of Doing Business within the country, with Lagos in particular and the southern states generally scoring better than the northern states; this may have a particularly adverse impact on digital inclusion because northern states have less coverage than southern states. Nigeria scores particularly poorly on dealing with construction permits, getting electricity, paying taxes, and registering property[66]. These administrative and regulatory hindrances to businesses that are associated with tax administration issues can decrease firm creation and disincentivise entrepreneurship as well as foreign investment.

IMPACTS OF TAX ADMINISTRATION ISSUES ON THE MOBILE SECTOR

Tax administration issues may be particularly adverse for mobile operators. Because all three levels of government in Nigeria (federal, regional, and local) are granted taxation rights, multiple authorities impose a number of fees; due to mobile operators' national coverage, they are required to pay taxes and fees in every jurisdiction where they operate. Additionally, mobile operators have indicated that in some cases the rates charged for mobile operators exceed those charged on other sectors. The National Broadband Plan highlights that some authorities target these taxes and fees specifically on the telecommunications sector:

> *"It has been suggested that revenue generation has in many cases been the primary purpose of some public authorities in getting involved in exercising regulatory interest in the telecommunications industry; thus making telecommunication companies prime targets for revenue generation and imposition of all kinds of taxes and levies on telecommunications infrastructure build."* [67]

These tax issues raise administrative costs for mobile operators and resources from more productive uses like network investment. As a result of administrative complexity, mobile operators must devote more resources or staff to handle tax affairs than otherwise would be necessary. In 2014, mobile operators devoted approximately 40 full-time staff to handle tax administration, imposing a cost of nearly USD 3 million. Those resources could have been spent more productively on other purposes, such as investment in networks. The costs associated with tax

66. World Bank – Doing Business 2015: Going Beyond Efficiency and World Bank – Doing Business in Nigeria 2014
67. http://commtech.gov.ng/images/docs/The%20Nigerian%20National%20Broadband%20Plan%202013_19May2013%20 FINAL.pdf

compliance also reduce mobile operators' profitability and could therefore make it more difficult for mobile operators to attract the capital needed for network investment.

Tax administration issues have led to disruption in mobile services. In addition to increasing the operational costs of mobile operators, tax administration issues have also led to disruptions to services and deterioration of quality of service for consumers, limiting the expansion and functionality of the mobile sector[68]. For example, one operator reported that due to disputes over local taxes (tenement rates, parking permits and shop rates), three retail shops were closed off in November 2014 and November 2015, preventing customers from accessing airtime and customer support.

Disruptions in services and reduction in quality of service can ultimately lead to reduced government revenue by impairing the sector's growth. In addition, disruptions and reduced quality of service can have negative consequences for socio-economic development, which depends on mobile as an effective and functional means of communication.

As a result of these impacts, the issue of multiple regulation and taxation has become increasingly pressing for the industry, and this has been acknowledged by the Ministry of Communications through the establishment of the Industry Working Group on Multiple Taxation[69] in January 2012. A comprehensive review of the issue was undertaken by the Working Group in 2012, which identified a number of instances where the mobile industry was required to pay multiple levies and taxes. In some cases, the NCC working group identified that these levies and taxes were actually illegal. The failure of mobile operators to comply with such requirements has often resulted in "disruptive enforcement actions… harassment, forcibly selling of site installations in their bid to compel compliance" according to the report, resulting in disruption of service, lower quality of service and higher operational costs[70].

The government has acknowledged the harmful effects that the multiple taxation issue is having on the mobile sector and the wider economy. In 2015, the list of applicable taxes and fees in Nigeria was amended with the intention of minimising multiple taxation; however, it is reported that the number of applicable taxes was actually increased from 39 to 61[71]. In the National Broadband Plan 2013-2018, the government "… encourages the streamlining of regulation to eliminate the phenomenon of multiple taxations and other potential sources of uncertainty in the market". Additionally, several government initiatives have been created to streamline regulation and taxation in the mobile sector, such as a resolution by the National Economic Council (NEC)[72] and the "Smart State Initiative" led by the Minister of Communication Technology. The initiative is aimed at reducing right of way fees, standardising levies and taxes on ICT infrastructure and simplifying licensing fees. Currently five states have been declared as smart states and are streamlining taxation under the initiative[73], though the impacts of this have not yet been observed.

3.1.3 Best practice in taxation policy

An effective tax policy has to balance a number of potentially competing factors. These include the government's revenue needs, supporting key sectors and the practicalities of enforcement and collection, as well as the desire to minimise any detrimental impact on the wider economy. Consequently tax policy frequently must strike a balance between the theoretically correct response and one that recognises the practicalities of taxation in a market[74].

68. NCC industry working paper 2012.
69. Buddecomm, Nigeria – Key statistics, telecom Market and Regulatory Insights, 2015 and http://www.ncc.gov.ng/index.php?option=com_content&view=article&id=741&Itemid=166
70. Nigeria's National Broadband Plan 2013-2018 and NCC industry working paper 2012.
71. The then Minister of Finance and Coordinating Minister of the Economy, Dr. Ngozi Okonjo-Iweala, on May 26, 2015, amended the Taxes and Levies (Approved List for Collection) Act, Cap. T2, Laws of the Federation of Nigeria, 2004. http://businessdayonline.com/2015/08/levies-approved-list-for-collection-act-amendment-order-2015-harmonisation-orlegalisation-of-multiplicity-of-taxes-and-levies/
72. The Resolution of the National Economic Council (NEC) on Multiple Taxation, Levies and Charges on ICT Infrastructure in Nigeria seeks to simplify and streamline right of way application processes, fees and levies, administrative processes and standards for fibre duct building specifications.
73. http://allafrica.com/stories/201412170912.html
74. IMF, Tax policy for developing countries, 2001.

There are however a number of principles that are generally recognised as contributing to aneffective tax system and if applied in Nigeria, these principles have the potential to expand investment in the mobile sector and lead to significant economic growth and increased tax revenues for the government. The following principles have been indicated by organisations such as the IMF:

1 **In general, taxation should be broad-based:** Taxation alters incentives for production and consumption, and so economic distortions will generally be minimised where the burden of taxation is spread evenly across the economy. In practice this equates to adopting broadly defined bases for taxation, limiting rate variations and effectively enforcing tax compliance.

2 **Taxes should account for sector and product externalities:** The case for taxation to address negative externalities[75] (such as those arising from tobacco consumption) is recognised. The same logic also applies to sectors and products with positive externalities. Taxation policy should encourage sectors, such as mobile, that create positive externalities in the wider economy. Higher taxation on mobile may discourage consumption of mobile services and prevent the realisation of the positive spillovers from the sector.

3 **The tax and regulatory system should be simple, easily understandable and enforceable:** Uncertainty and lack of transparency over taxation systems and liabilities may deter investors and are also likely to increase enforcement costs for government.

4 **Dynamic incentives for mobile operators should be unaffected:** Taxation should not disincentivise efficient investment or competition in the ICT sector. In situations where the tax system does provide disincentives, tax revenue could be significantly reduced in the long run.

5 In addition, it is widely accepted that **taxes should be equitable, and that the burden of taxation should not fall disproportionately on the poorer members of society.**

6 Spectrum prices and other regulatory fees should cover the cost of spectrum management and reflect the rent associated with this scarce resource. At the same time, they should maintain the incentives to invest, by appropriately incorporating all costs incurred during the duration of a licence, including taxes[76].

In addition to general and specific taxes levied on the mobile sector, spectrum and licence fees are intended to correct the externalities related to the use of these scarce resources and cover the costs related to spectrum management, while at the same time maintaining the incentives on investment. In particular, these fees should achieve the following objectives[77]:

- Cover the costs of spectrum management.
- Ensure the efficient use of the spectrum scarce resource by ensuring sufficient incentives are in place.
- Maximise the economic benefits to society obtained from telecommunication services.
- Ensure that users benefiting from the use of the spectrum resource pay for the cost of using spectrum.

These principles are intended to minimise the inefficiencies associated with taxation and regulatory fees and the distortive impacts that they may have on the wider economy. The table below summarises how the taxes and fees levied in Nigeria align with these principles.

75. An externality refers to an impact on the wider economy that is not accounted for by the consumer purchasing the good. For example, consumers of tobacco create an additional cost for others through second-hand smoke, but do not take into account this impact when choosing whether to smoke.
76. ITU, ICT regulation toolkit, 2014.
77. ITU, ICT Regulation Toolkit, http://www.ictregulationtoolkit.org/5.5

Alignment of taxes and regulatory fees on the mobile sector in Nigeria with the principles of taxation

	Broad-based	Accounts for externalities	Simple and enfoceable	Incentives for competition and investment	Equitable
Corporation tax	✓	✗	✓	✓	✓
VAT	✓	✗	✓	✓	✗
Customs duty on Devices and equipment	✓	✗	✗	✗	✗
Information Technology Development Levy	✗	✓	✓	✗	✓
Education tax	✗	✓	✓	✗	✓
Operating levy	✓	✗	✓	✗	✓
Numbering fee	✗	✗	✓	✗	✓
Licence fee	✗	✗	✓	✗	✓
Spectrum fee	✗	✗	✓	✗	✓
Environmental taxes	✗	✓	✗	✗	✓
Local taxes and fees	✗	✗	✗	✗	✗

Source: Deloitte analysis

Table 3

As discussed in Section 3.1, the significant administrative costs caused by Nigeria's complex local taxation and regulatory fee system are misaligned with the principle that taxation should be simple and enforceable. Reforming these taxes could significantly improve the efficiency of Nigeria's tax system.

A number of additional tax issues highlighted in the table above also have ramifications for the development of the sector and the wider economy. In particular, those taxes that have a high negative impact are misaligned with the established principles of taxation:

- **High licence and spectrum fees could distort mobile operators' investment decisions:** Regulatory fees represent a significant part of mobile operators' tax and fee payments and are a key determinant of investment in the sector. They could reduce incentives to invest and create distortions across industries. Moreover, fees that are subject to frequent changes increase uncertainty and discourage investment both domestically and internationally. According to the National Broadband Plan the high cost of spectrum licences "... contributes to high sunk cost and challenges associated with accessing spectrum for the rollout out of high speed networks" and it has "eroded resources for rolling out networks"[78]. Efficient, equitable and stable pricing of spectrum and licence fees could incentivise the development of new technologies and encourage mobile operators to invest in new spectrum and network roll-out, while covering the cost of spectrum management, ensuring efficient use of spectrum and providing a source of revenue to the government.

78. Nigerian National Broadband Plan 2013-2018

- **The VAT system does not allow mobile operators to reclaim taxes paid on inputs:** Mobile operators are not able to reclaim input VAT on most of their inputs, including network equipment, because claimable input VAT is limited to VAT on inventory. Analysis shows that "this increases the true cost of VAT borne by taxpayers on goods and services consumed much beyond the 5% nominal rate"[79]. Reform of Nigeria's VAT system would make the tax more efficient and aligned with international best practice.

The inefficiencies created by these various taxation issues not only limit the development of the mobile sector, but also hinder economic growth and the realisation of the positive externalities created by mobile services, specifically mobile broadband.

Simplifying tax administration processes and reducing the number and complexity of taxes levied on the mobile sector could free additional capital for investment in Nigeria's mobile networks and services and could make the market more attractive to investors.

Although taxation on the mobile-sector may deliver short-term benefits to the government, inefficient taxation risks undermining the long-run socioeconomic benefits delivered by the mobile sector. Aligning Nigeria's taxes and regulatory fees to international best practice while implementing the NEC's and the Smart State Initiative's recommendations could help promote digital inclusion and unlock the mobile sector's contribution to the economy.

3.2 Releasing sufficient spectrum

While opportunities for market growth and increased connectivity in Nigeria remain substantial, they are highly dependent on the efficient assignment of future spectrum to operators. The NCC should therefore avoid waiting until all spectrum is assigned and used before making new allocations to mobile services. As the process between allocation and the actual licensing and use of spectrum can take several years, it is imperative that Nigeria plans for its future and makes allowances for additional spectrum allocations to cater for future growth.

3.2.1 Underutilisation of 800 MHz (CDMA) spectrum

At the end of Q1 2015, the total combined number of CDMA connections[80] was just over 2 million across the whole of Nigeria. This is a significant drop from the almost 7 million CDMA connections that were recorded in Q1 2010 and highlight the global shift away from CDMA technology.[81] This lack of alignment between a fully-cleared 800MHz band and the proportionate number of CDMA subscribers in Nigeria highlights that the NCC's decision to not implement "use-it-or lose it" regulation in this important spectrum band is increasingly hard to justify.

If incumbent CDMA operators are not using the spectrum at all then it should be withdrawn and granted to those that will use it efficiently and effectively. Furthermore, whilst there is certainly a need to provide continued mobile services to existing CDMA customers, the NCC should consider the migration of incumbent operators to a different portion of the 800 MHz band in order to free up this spectrum to meet increasing demand for mobile broadband and data services.

3.2.2 Channel plans and regional harmonisation of the Digital Dividend (700/800 MHz)

The retention of the 2x30 MHz channel plan in the 800 MHz band, as well as the adoption of the 2x30MHz channel plan that consists of 703-733MHz (uplink) paired with 758–788MHz (downlink) is the mobile industry's preferred 700MHz channel plan for the ITU's Region 1, to which Nigeria belongs. This channel plan is based on the reuse of the lower duplexer of the APT channel plan (i.e. 2 x 30 from the APT 2 x 45 MHz). The opportunity for the Asia Pacific 700 MHz channel plan (3GPP Band 28) to become virtually a global band, means the ecosystem (and reuse of part of the APT plan in Region 1) will offer the greatest benefit for consumers and mobile operators.

79. http://www.pwc.com/en_NG/ng/pdf/nigeria-top-50-tax-issues.pdf
80. Code-Division Multiple Access (CDMA) is a technology used for basic mobile access.
81. GSMA Intelligence, Q1 2015.

The importance of regional harmonisation of the Digital Dividend is another critical consideration for Nigerian regulators to undertake. Such alignment would drive economies of scale, offering lower costs to consumers as device manufacturers could mass-produce less complex devices that function in multiple countries on a single band. A wider portfolio of devices, driven by a larger, international market would also be available through regional harmonisation of channel plans. Lastly, harmonisation of the regulatory and technical conditions of the full Digital Dividend will result in reductions in cross-border interference and will maximise economies of scale including interoperability and roaming.

3.2.3 The auction process: planning for the efficient and effective assignment of 2.6 GHz and 700/800MHz spectrum

A well-designed auction process will be instrumental in allowing Nigeria to realise the full value of mobile for its economy and society. Auctions can provide an economically efficient means to assign spectrum when there is competition for scarce spectrum resources and demand is expected to exceed supply. To be effective, auctions need to be well designed and well implemented.

When governments use an auction process to assign spectrum, it is critical that a clear, transparent and consultative process in determining the auction approach is followed. The NCC has a tremendous opportunity to initiate such an approach with industry stakeholders, in order to boost investor confidence, improve transparency and drive commercial certainty in regards to future investment. Key elements of this type of process include the following

- Consultation with operators and other stakeholders throughout the auction design process is essential. This will ensure that any potential flaws and distortions to the efficient outcome of an auction are highlighted in advance. Whilst individual operators will have preferences for particular solutions, they will also have a deep understanding of the potential risks related to poor auction design. A well-executed consultation process will highlight these risks and mitigate undesirable auction outcomes.

- A clear and open process is critical. Most auction formats are a transparent way of assigning scarce resources between competing operators and mitigate against many of the transparency risks (such as subjective judgements). A clear and open process can avoid the potential for corruption and litigation related to beauty parades and administrative procedures.

- Auction rules need to be complete, clear and consistently applied. These rules need to be published, and consulted on, in advance. The execution of the auction should also be transparent and logistically equal for all bidders. Online auctions (rather than paper based) are always preferred as they remove most logistical and physical risk and allow for greater transparency in the bidding process.

- Spectrum roadmaps and plans are critical to valuing spectrum effectively. More bands are becoming available for mobile use, and existing licences are also coming up for renewal. Without a clear roadmap of spectrum plans and a clear understanding of licence renewal plans, there is significant risk that the valuation of individual spectrum awards will not accurately reflect local market conditions. With this said, the NCC is yet to publish such a document for either the 2.6 GHz and Digital Dividend bands (700 and 800 MHz). This auction framework will set an agenda for accelerating mobile broadband connectivity to all Nigerians and will enable mobile operators to work closely with the NCC and the Ministry of Communications, providing them with a degree of certainty in the market and driving investment.

- Uncertainty needs to be minimised. Bidding for spectrum is a significant commercial risk for operators. Having a clear understanding of what spectrum resources they are bidding for, what the obligations related to any particular licence will be, what rights are attributed to the spectrum, what charges will be levied during the life of the licence and the duration of the licence, all defined before the auction, is required for operators to determine an appropriate value for the spectrum. The greater clarity and certainty that can be provided, the more likely an efficient assignment of spectrum will happen and the greater the return for governments and society.

3.3 Improving quality of service

A major problem that has posed concern since the launch of mobile services in Nigeria is the Quality of Service (QoS) offered by mobile operators. High QoS is important to provide value for money and uninterrupted connectivity, however, the targets that mobile operators have to meet should be established by the regulator in collaboration with the mobile operators, to align expectations. Between 2013 and 2014, the NCC has raised the targets of the Key Performance Indicators (KPIs) that operators had to meet. This led to operators missing the target and the regulator banning MTN, Airtel and Globacom from selling new SIM cards for a month (see Table 4).

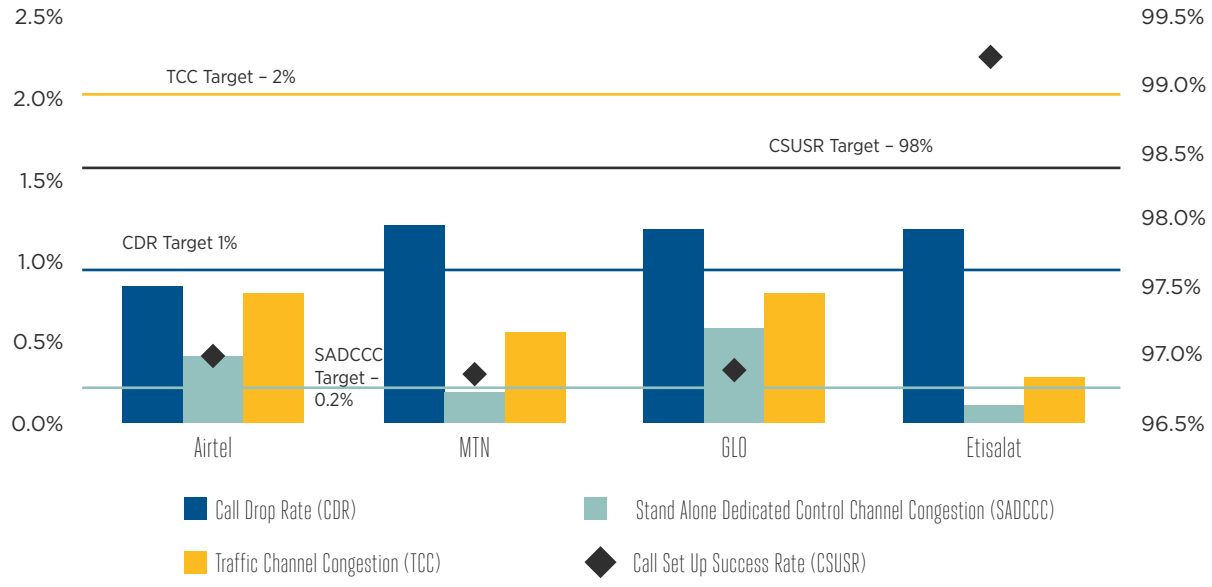
Comparison of Key Performance Indicators for QoS

KPI	Target (Feb 2013)	Target (Jan 2014)
Call Set Up Success Rate	95.5%	98.0%
Call Drop Rate	1.9%	1.0%
Stand Alone Dedicated Control Channel Congestion	1.0%	0.2%
Traffic Channel Congestion	1.8%	2.0%

Source: GSMA Intelligence: Country overview – Nigeria

Table 4

Quality of service performance v/s NCC targets for January 2014



Source: NCC

Figure 24

Nigeria ranks 90th out of 145 countries for average 3G and 4G mobile internet speed, with download speed at 1.52 Mb/s and upload speed at 0.48 Mb/s[82]. The NCC has identified a series of reasons for the poor quality of service, these include inadequate power supply, multiple taxation and regulations, vandalisation of telecoms infrastructure, right of way challenges, and infrastructure deficit. Inadequate power contributes more than 40% to the bad quality of service. With only 55% of Nigerians having access to electricity[83], and this often being interrupted, mobile operators are forced to spend a lot of money to power their base stations – MTN, Globacom, Airtel and Etisalat power their over 25,000 base stations with 50,000 generators. The cost for mobile operators to power the generators has been estimated to be around 80% of their operating cost (OPEX)[84].

While building infrastructure involves a lot of effort and money from the operators, in Nigeria, mobile operators also have to deal with issues of petty theft and vandalism. Some operators have reported to the ministry that they suffered more than 70 cuts on their nationwide fibre networks on a monthly basis. One of the mobile operators has reported that it spends on an annual basis approximately $90 million to repair the infrastructure from damage. Such issues not only impact operator revenues but also significantly hamper the quality of mobile connectivity for consumers[85]. In May this year, the former President Goodluck Jonathan, passed a Cybercrime Prohibition and Prevention Act to address the vandalism of infrastructure. The Act stipulates that any crime or injury on critical national information infrastructure, sales of pre-registered SIM cards, unlawful access to computer systems, Cyber-Terrorism are punishable.

82. Source: Internet Society
83. Source: World Bank
84. http://www.thisdaylive.com/articles/ncc-not-complacent-about-challenges-of-service-quality/209232/
85. Nigeria's National Broadband Plan 2013-2018

4. Conclusions

Mobile is key to delivering digital inclusion in Nigeria, and with 45% of the population currently using mobile services, the industry is already delivering substantial economic and social benefits to consumers and the wider Nigerian economy. Already, the mobile industry is contributing over USD 8 billion annually on the supply side of the economy and generating 164,000 jobs, and Nigeria is a leading generator of mobile content within Sub-Saharan Africa. Further to this, mobile's ability to improve productivity and connectivity and to deliver essential information related to health, education and governance, make mobile an important development tool.

However, mobile's development potential has not yet been fully realised in Nigeria, and there are significant digital inclusion gaps. Nearly half of Nigerians are still uncovered by 3G networks, preventing them from accessing high-speed mobile broadband, and 13% of the population cannot even access 2G services. Affordability is also a challenge, and usage of mobile services is limited.

To enable mobile to fully deliver on its development potential, barriers to network investment and service affordability should be reduced.

The first key barrier identified in this report is the high administrative and opportunity costs that result from inefficiencies in the tax system, as well as due to a number of local taxes and regulatory fees that target the sector. In 2014, mobile operators paid USD 850 million in taxes and regulatory fees. Adding to this cost, international comparisons reveal that the amount of time needed to comply with tax duties is the highest in the world, and the number of different taxes paid are high, particularly for mobile operators who are subject to numerous sector-specific taxes and to local taxes across their national footprint.

Addressing the administrative issues and streamlining taxes and fees could allow mobile operators to instead invest their financial and human resources in increasing network coverage and service quality, leading to greater digital inclusion that would further support the important contribution that mobile makes to the Nigerian economy and society. While the importance of the mobile industry in contributing to government revenues is recognised, an equitable and balanced taxation structure could benefit the economy as a whole and support growth and fiscal stability in the medium term. A balanced and predictable taxation regime on mobile could boost digital inclusion and broadband penetration and further enhance the industry's contribution to economic and social development.

A second barrier that has been identified is the efficient allocation of future spectrum to operators. The availability of spectrum, in particular low frequency spectrum, is key to enable a better quality of service and to increase network coverage. Bidding for spectrum is a commercial risk for mobile operators, therefore having a clear roadmap of future spectrum plans and an understanding of licence renewal plans will help drive investments in the market. The NCC has an opportunity to establish an auction process which is clear, transparent and done in consultation with key industry stakeholders. This will help boost investor confidence, improve transparency and drive commercial certainty in regards to future investment and will help Nigeria realise the full potential that mobile can have on the economy and society.

Other barriers to increasing mobile access and usage in Nigeria are those impacting the quality of service and network roll-out. High quality of service is important to provide value for money and uninterrupted services, however this has often proved challenging in Nigeria. The NCC has identified a series of reasons for the poor quality of service, which include inadequate power supply, multiple taxation and regulations, vandalisation of telecom infrastructure, right of way challenges, and infrastructure deficit. The government can support the development of an efficient mobile communications network across the country including rural areas, by ensuring law enforcement,

providing a simple and predictable regulatory and policy regime and preventing crimes on critical national information infrastructure.

Based on evidence from a series of studies[86] and the best practice principles outlined in Section 3,[87] as well as in consultation with GSMA and mobile operators, a number of areas for reform have been identified which could support the mobile sector to further contribute to economic growth and government revenues over and above its current impact:

- **Avoid specific taxation of the mobile sector:** higher than normal taxation on mobile operators and consumers distorts production and consumption behaviour: it may limit usage of digital services, reduce the ability of mobile operators to finance investment in digital infrastructure, and can in the long term reduce government revenues.

- **Reduce complexity and uncertainty of mobile taxation:** taxation on mobile operators in Nigeria implies a high administrative cost. Reforming Nigeria's VAT system would make the tax more efficient and aligned with international best practice. Moreover, any unpredicted tax change that occurs after investment in spectrum licence is made may negatively impact an operator's business plan. The risk of future tax rises is priced into investment decisions and can therefore be expected to reduce both Foreign Direct Investment (FDI) and domestic investment in the medium-term.

  Avoid high licence and spectrum fees: High regulatory fees could distort mobile operators' investment decisions. Spectrum prices and other regulatory fees should cover the cost of spectrum management and reflect the rent associated with this scarce resource, while maintaining the incentives to invest.

- **Facilitate the development of emerging services through supportive taxation:** the growth of mobile broadband and Machine to Machine communications opens up the possibility for the sector to increase its economic value through a whole new generation of products and services ranging from health care services to education and finance.

- **Utilisation of 800 MHz spectrum:** as incumbent CDMA mobile operators are not using all the spectrum available to them, the NCC should consider the migration of incumbent mobile operators to a different portion of the 800 MHz band in order to free up this spectrum to meet increasing demand for mobile broadband and data services

86. Four GSMA/Deloitte forthcoming studies; GSMA/Deloitte, Mobile taxes and Fees - A Toolkit of Principles and Evidence, 2014.
87. IMF, Tax policy for developing countries, 2001.

Already, the mobile industry is contributing over USD 8 billion annually to the supply side of the economy and generating 164,000 jobs in Nigeria. Through policy reform it could contribute even further.

Appendix A Economic impact estimation: methodology and assumptions

A.1 Estimation of the economic impact of mobile telephony

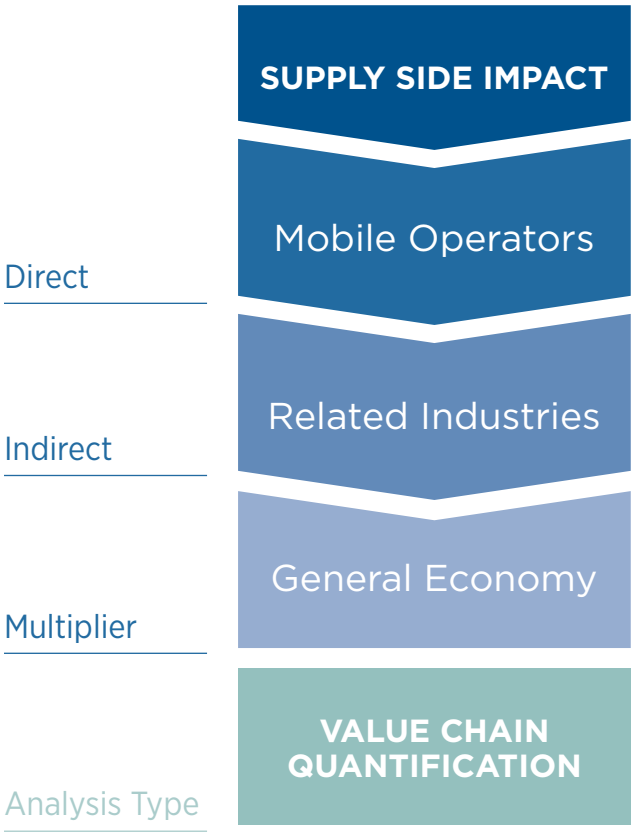
The economic impact estimation uses a static analysis methodology. "Static analysis" means that the impact of mobile the mobile sector is estimated for a particular period of time and does not take into account the longer term impacts of mobile services on economic welfare; this methodology gives a snapshot view but does not take into account the future benefits to the economy resulting from growth. Dynamic analysis would typically require a greater number of assumptions, whereas static analysis benefits from greater availability of disaggregated data.

Publicly available data, mobile operator data, interviews, and assumptions based on economic literature were used to estimate the value of mobile telecommunications to the economy in Nigeria in terms of employment and GDP, both direct and indirect. The total economic impact is defined as the sum of the following elements[88]:

- Direct impact from the mobile operators;
- Indirect impact from other industries related to mobile services; and
- Induced impacts from the spending of wages in the wider economy.

The static analysis structure is illustrated by the following figure. The different impacts are summed together to calculate the total economic impact[89].

Structure of the analysis of economic impact on GDP and employment



Source: Deloitte

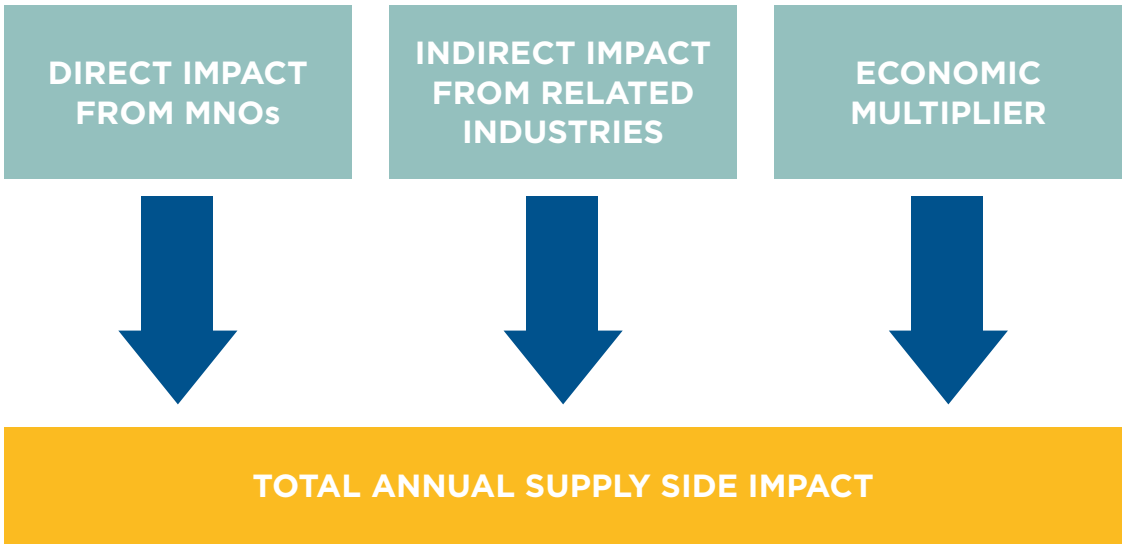
Figure 24

88. The approach adopted is consistent with that adopted across the economic literature, see for example: McKinsey & Co. (September 2006): "Wireless Unbound: The surprising economic value and untapped potential of the mobile phone."
89. To obtain the total economic impact, it is necessary to sum together the supply side, demand side and intangible impacts. Whilst these are intended to capture different impacts of mobile telephony, there is a potential for limited double counting.

A.2 Supply side impact

The contribution of the mobile industry to the economy includes mobile operators and the wider mobile ecosystem. This is calculated by aggregating the direct, indirect and economy-wide (multiplier) effects that have occurred in each year.

Structure of the supply side analysis



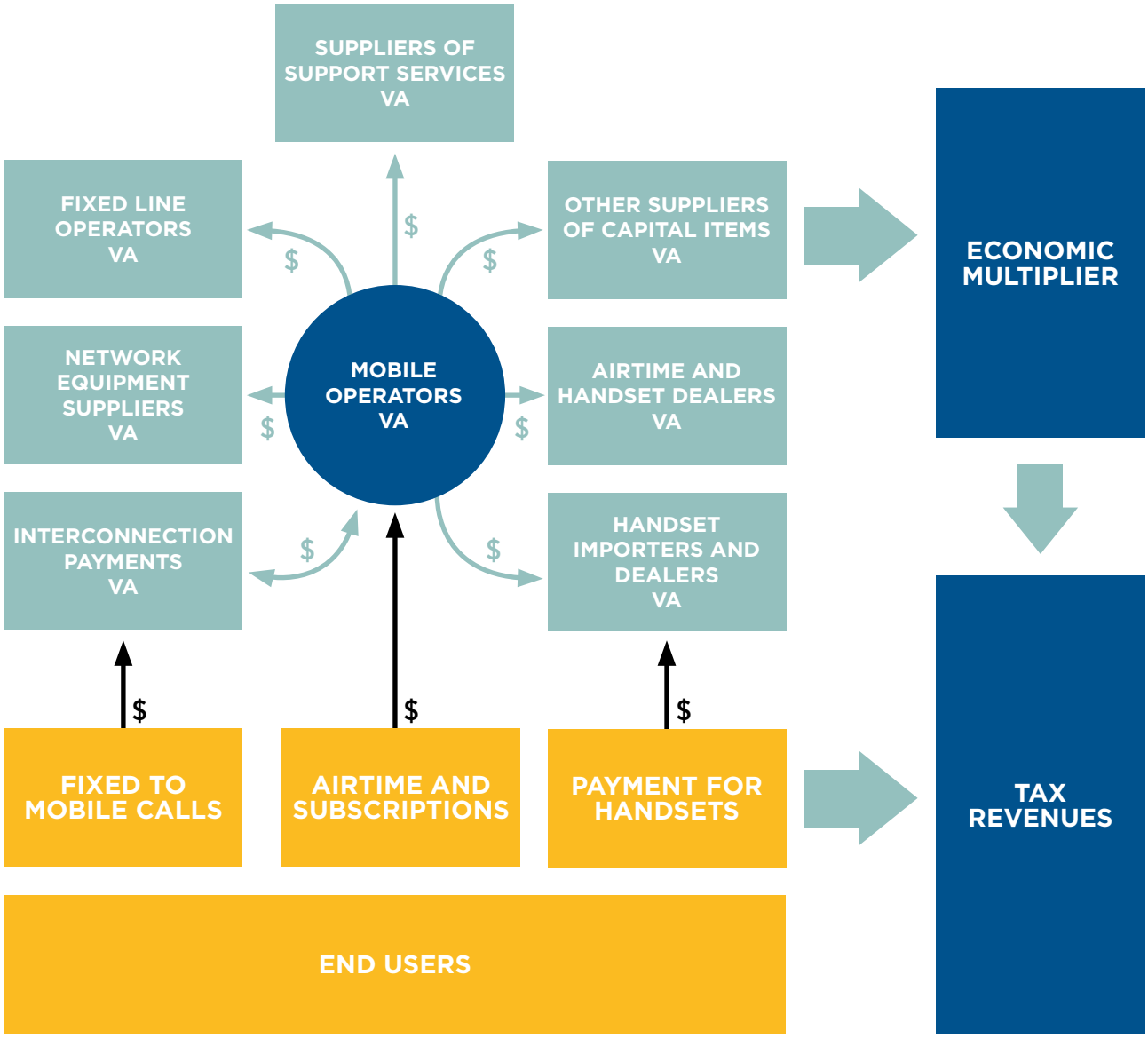
Source: Deloitte

Figure 25

A consumer's spending on mobile services (operator revenues) flows throughout the mobile ecosystem: mobile operators, suppliers, distributors and others. Money flows between these economic agents and are used to pay for wages, taxes, corporate social responsibility, and other costs. In this assessment, the focus is limited to the economy of the country in question and ignores international impacts.

Each of the main stakeholders in the Nigerian mobile ecosystem has been identified. Flows of value between ecosystem players are shown in the diagram below.

Mobile value chain



Source: Deloitte

Figure 26

Estimates of the flows are based on:

- Discussions with and data collected from mobile operators,
- Interviews with local market experts, handset and airtime dealers,
- Analysis of government taxation statistics, and
- Analysis of published accounts.

Following the identification of the revenue flows, the proportion of these flows that remains within the domestic economy was estimated; this is the positive economic benefit, referred to in this Report as "value add".

DIRECT VALUE ADD FROM MOBILE OPERATORS

Five categories of economic value which are directly created by the mobile operators have been determined:

- Wages and employee benefits,
- Contractor costs,
- Taxes and regulatory fees,
- Corporate social responsibility costs, and
- Dividends.

For each of these categories, the proportion of value add which relates to the domestic economy was identified. This analysis is based upon data collected from mobile operators.

INDIRECT VALUE ADD

The revenues that flow directly from the mobile operators to other domestic ecosystem players have been identified. The proportion of revenues that is value add was then estimated, using the five categories of value add used in the mobile network operator analysis above.

THE MULTIPLIER

The value add created by the mobile sector has a subsequent positive impact on the economy, generated by further rounds of expenditure. For example, the indirect domestic ecosystem players incur operating expenses which are paid to additional players. These players then create value as they pay wages, taxes, etc. The economic literature quantifies these effects by applying an "economic multiplier" to the initial rounds of value generated.

An economic multiplier of 1.4 was utilised to estimate the 'knock-on' impact on the rest of the economy of the direct and indirect effects of mobile telephony on GDP and employment. This was assumed following a literature review, considering the multipliers used for countries in the region with similar characteristics for previous studies, and using the data provided by mobile operators about the proportion of expenditure by key players which remains in Nigeria. The table below shows the values of multipliers identified in the literature review.

Comparison of Key Performance Indicators for QoS

Title of study	Multiplier
O2 for ONS (2002): "The contribution of mobile phones to the UK economy"	1.13
Ovum studies on economic impact of mobile telephony in Bangladesh and USA based on review of various other studies*	1.6
Association Française des Opérateurs Mobiles	1.7
Europe economics, based on ONS: "Economic impact of spectrum use in the UK"	1.1
Sicrana, R., and de Bonis, R.: "The Multiplier Effects of Telecommunications Investments on Economic Growth and Restructuring"	1.5
Radio authority UK (1995): "Economic impact of radio"	1.4
Deloitte for Telenor (2008): "Economic Impact of mobile telephony in Ukraine, Malaysia, Thailand, Ukraine and Pakistan"	1.2 – 1.4
Deloitte for Telenor (2008): 'Economic Impact of mobile telephony in Serbia"	1.3
Zain/Ericsson (2009): "Economic impact of Mobile Communications in Sudan"	1.2
Aloyce R. Kaliba, et al (2004) "Multipliers for Tanzania: implications on developing poverty reduction programs", (transport and communication multiplier estimate)	1.63
Deloitte/GSMA (2011): "Mobile telephony and taxation in Croatia"	1.3
Deloitte/GSMA (2011): "Mobile telephony and taxation in Kenya"	1.2
Deloitte/GSMA (2011): "Mobile telephony and taxation in Bangladesh"	1.4
Deloitte/GSMA (2012): "Mobile telephony and taxation in Turkey"	1.4

Source: Deloitte

Table 5

A.3 Calculating tax revenues

Government tax revenues are raised through taxes on mobile consumers and mobile operators, including consumption taxes, customs duties, corporation taxes, local taxes, and regulatory fees. Tax revenues are collected from all components in the mobile telecommunications ecosystem. Based on interviews with the key stakeholders, assumptions were made on the percentage of money flows that are subject to the national tax regime.[90]

Information on revenues for various taxes was collected as follows:

- Economy-wide taxes: value added (sales) taxes, customs duties, corporate taxes and income tax paid by employees.
- Mobile-specific taxes: licence, spectrum and other regulatory fees.
- Local taxes and other regulatory fees.

Tax revenues were calculated directly from the mobile operators and also from other entities in the value chain.

90. Following interviews with the main parties, only a limited degree of leakage from the informal sector has been assumed.

A.4 Calculating the impact on employment

Mobile services contribute to employment in several ways:

- Direct employment by the industry,
- Direct employment by the wider mobile ecosystem,
- Support employment created by outsourced work and by taxes that the government subsequently spends on employment-generating activities, and
- Induced employment resulting from the above employees and beneficiaries spending their earnings, thus creating more employment.

The first impact was estimated directly by collecting data from the mobile operators. For the related industries, information from interviews with the mobile operators was given priority. Whenever direct information was missing, employment in related industries was calculated by dividing the proportion of revenue spent on wages by the average wage rate in the sector. Finally, support and induced employment were estimated using a multiplier: other studies have used a ratio of 1.1 to 1.7 for induced employment. The use of such multipliers can often be criticised for the lack of consideration of the economic basis of the industry and country that are the object of the study. Discussions with stakeholders were conducted on this issue, and it was chosen to apply a multiplier of 1.4 on all value add, including employment.

<table>
<tr><th>Assumption</th><th>Value</th></tr>
<tr><td>Employment levels</td><td>Direct employment by mobile operators
Data was obtained directly from MTN, Airtel and Etisalat, while estimates were used for the other mobile operators based on publicly available information, including market shares.

Indirect employment
Employment figures for most segments of the value chain were estimated based on discussions with mobile operators. However, employment figures for some segments were estimated as revenue inflow multiplied by wages as percentage of revenue divided by average wage. Wages as percentage of revenue was estimated based on discussions with mobile operators. Average wage was estimated by using assumptions on operator wage and average wage in Nigeria.

For airtime employment, interviews with mobile operators' staff identified the number of points of sale and distributors by type. Based on interviews, an appropriate level of employment was assumed for each type.

For the employment generated by handset manufacturers and assemblers, information was based on direct data provided by a major handset manufacturer and an uplift was applied based on market shares in order to capture the FTEs for the entire Nigerian market.

A multiplier of 1.4 was applied to indirect levels to gauge the total employment effect in the economy. No multiplier was applied to direct mobile operators' employment as a large amount of employment will already be captured by the first round flows.</td></tr>
<tr><td>Value add margins for each segment of the value chain</td><td>Value add margins are the total percentage of revenue spent domestically on (i) sales, import, income, corporate and regulatory taxes; (ii) wages; (iii) CSR; and (iv) profit.

Direct value add of mobile operators
All data was obtained directly from mobile operators

Indirect value add
These percentages are estimated based on interviews and a review of accounts of companies in Nigeria. The value add margins used for the supply chain are as follows:

<table><tr><th>Margin on domestic revenues</th><th>% value add margin</th></tr><tr><td>Fixed telecommunications operators</td><td>64%</td></tr><tr><td>Network equipment suppliers</td><td>89%</td></tr><tr><td>Handset producers and dealers</td><td>95%</td></tr><tr><td>Other suppliers of capital items</td><td>63%</td></tr><tr><td>Suppliers of support services</td><td>79%</td></tr><tr><td>Airtime, SIM and commission</td><td>74%</td></tr></table></td></tr>
<tr><td>Airtime commission</td><td>Commissions data was based on interviews with mobile operators.</td></tr>
<tr><td>Handsets</td><td>Handset prices, percentage of handsets sold by mobile operators, proportion of illegal and second hand sales were estimated based on interviews and estimates from mobile operators.</td></tr>
<tr><td>Multiplier</td><td>A multiplier of 1.4 was applied to supply side direct and indirect value add in order to capture the full impact on the Nigerian economy.

This multiplier was selected following a literature review and interviews. This choice is discussed in more detail in Appendix A.2.</td></tr>
</table>

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