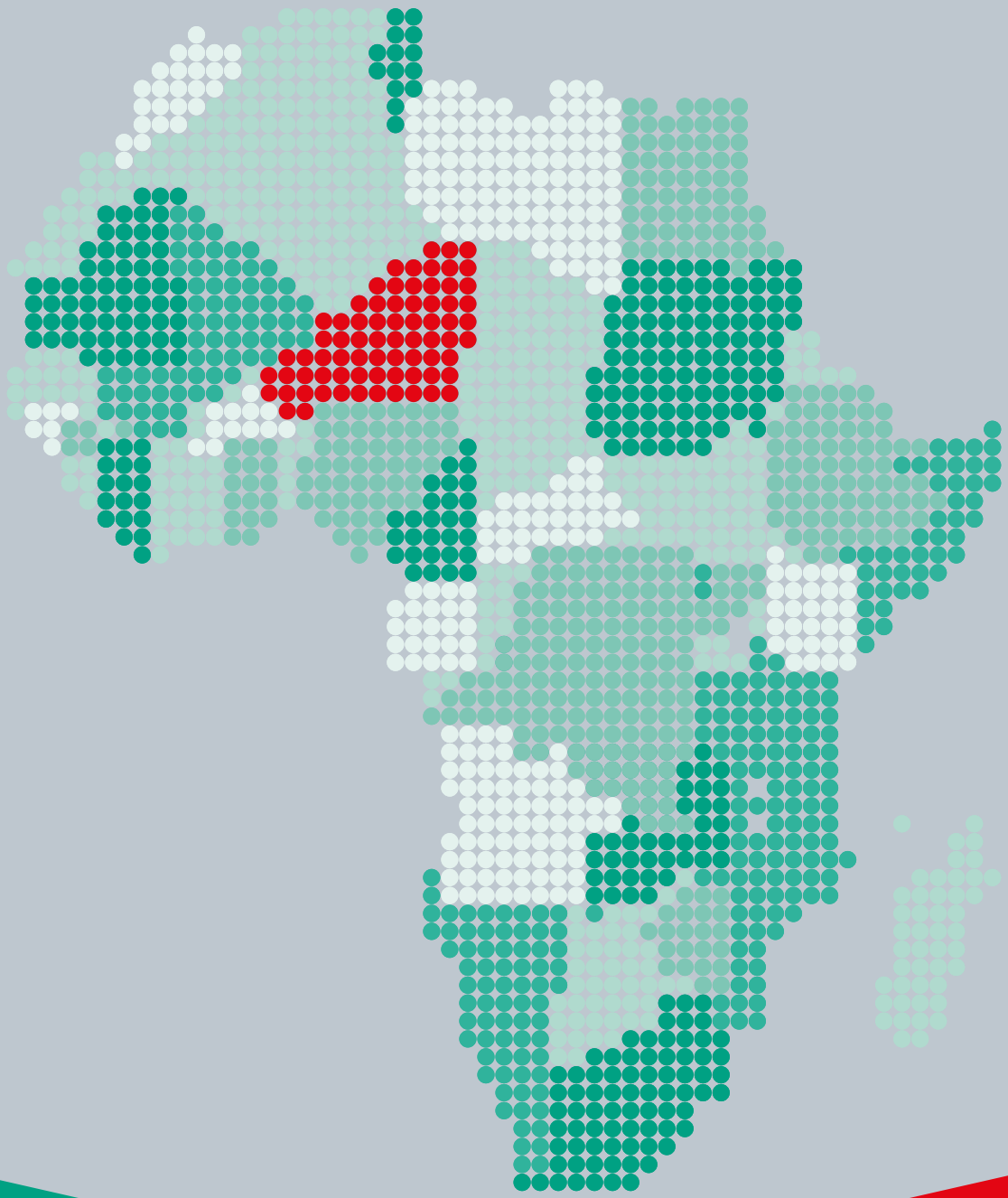
Digital inclusion and mobile sector taxation in Niger



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Executive Summary

Over 13 million people in Niger remain unconnected

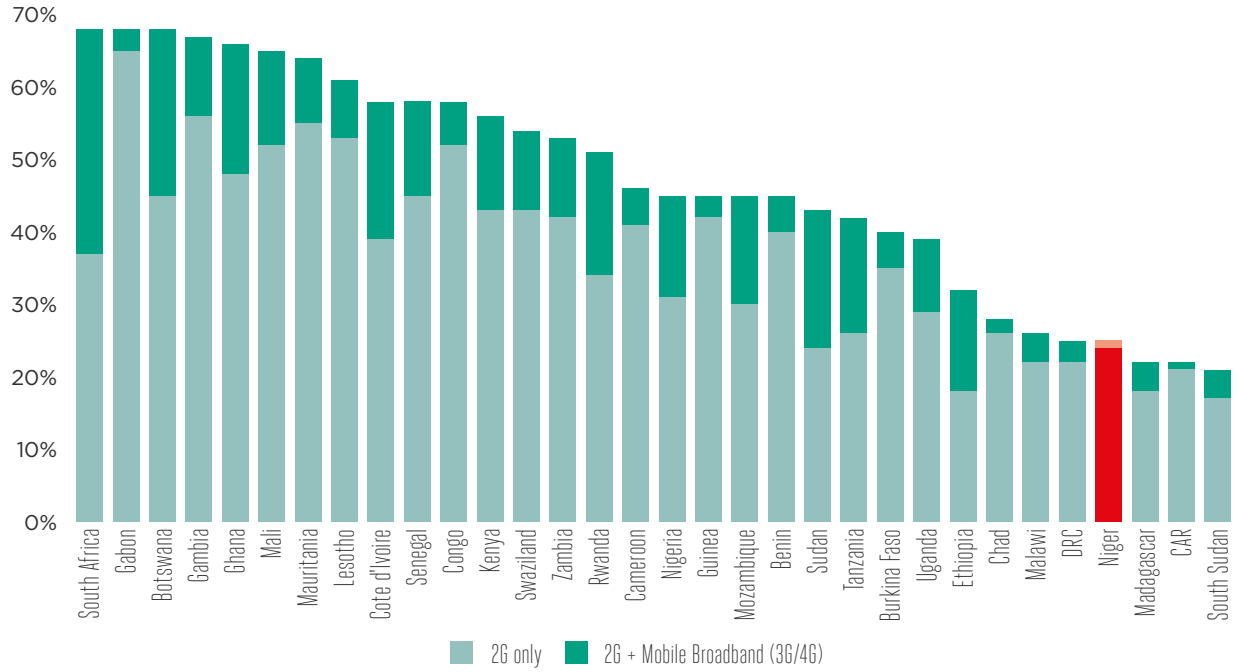
The Republic of Niger is among the world's least developed countries, and its annual Gross Domestic Product (GDP) per capita stood at US$ 359 (or CFA Franc (XOF) 212,000) in 2015. While the country's economic outlook is positive as a result of its natural resources endowment, according to the International Monetary Fund (IMF) Niger faces significant domestic security challenges and a recent slowdown in economic activity.[1]

The mobile sector represents a success story: the total revenue of the sector represented 5% of the country's Gross Domestic Product (GDP) in 2015.[2] Despite 81% of the population living outside of urban centres[3], mobile operators have increasingly brought connectivity to rural communities and are estimated to have re-invested close to half of their revenue between 2001 and 2015.[4]

Though the vast majority of Niger's dispersed population is now being covered by a mobile network, mobile penetration in terms of unique subscribers stands at 24% in 2016, lagging behind many other African countries.[5] Mobile broadband networks are still in their infancy, with 3G penetration among the lowest worldwide, at 1% in 2016.[6]

Figure 1

Mobile penetration (unique subscribers) by technology in selected African countries, 2016



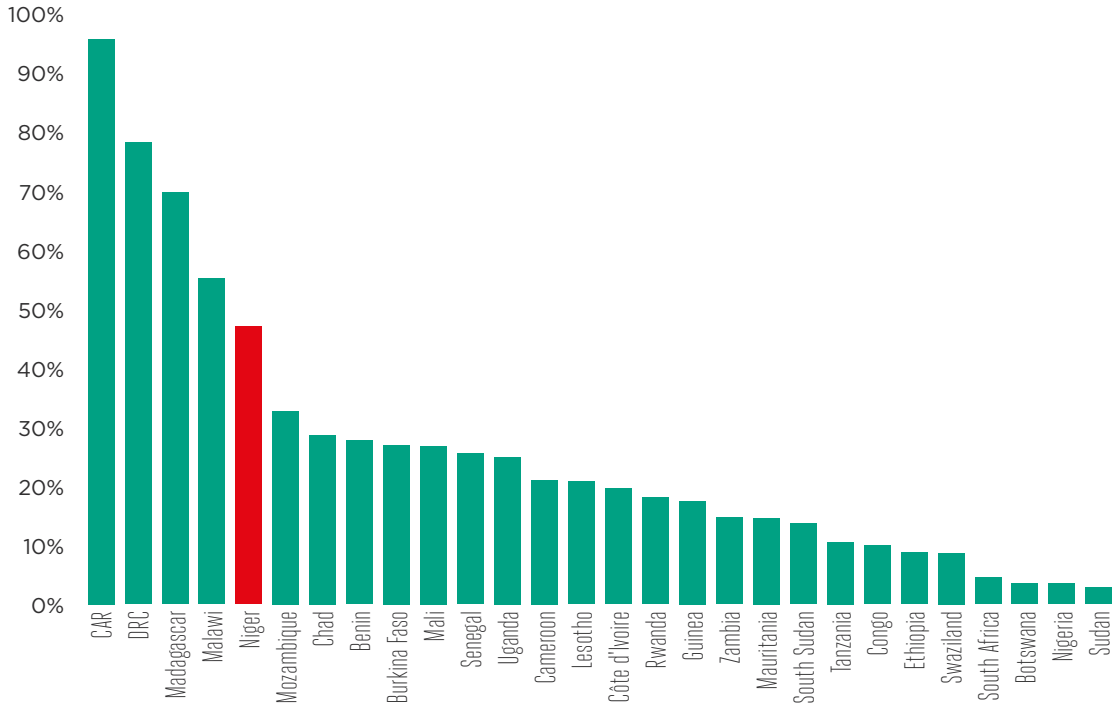
Source: Deloitte analysis based on GSMA Intelligence (2016)

1. IMF (2016). 'IMF Country report No. 16/247'.
2. Deloitte analysis based on GSMA Intelligence, mobile operator data for 2015 and IMF (2016). 'IMF Country Report No. 16/247'.
3. World Bank data.
4. Deloitte analysis based on: Ministère de la Communication et des Nouvelles Technologies de l'Information (2012). 'Document de Politique Sectorielle des Télécommunications et des Technologies de l'Information et de la Communication'; ARTP (2014). 'Rapport Annuel 2014'; ARTP (2015). 'Rapport Annuel 2015' ; GSMA Intelligence.
5. Deloitte analysis based on GSMA Intelligence and World Bank data.
6. Deloitte analysis based on GSMA Intelligence.

Affordability of mobile services is the key barrier preventing higher penetration and usage. The typical monthly cost of voice and SMS services corresponds to 47% of average monthly Gross National Income (GNI) per capita, compared to 14% on average across Least Developed Countries (LDCs), as illustrated in Figure 2.[7] Mobile services become even less affordable for the lowest 20% of earners, with the monthly cost of a mobile subscription representing 96% of monthly income.[8] The cost of mobile ownership may be a further barrier; even a basic mobile phone priced at US$ 20 (XOF 13,000) would represent over 40 days' income for the poorest 20% of the population.[9]

Figure 2

Monthly mobile-cellular cost as a share of average monthly GNI, for selected African countries, 2014



Source: Deloitte analysis based on ITU (2015): 'Measuring the internet society' and World Bank data

In countries with low levels of economic and social development such as Niger, increased use of mobile services is widely recognised as a driver of social inclusion and economic growth.[10] Mobile based applications have already given Nigeriens access to life-changing services and many more people could stand to benefit. For example, mobile money has been used by organisations such as the UN and the World Food Programme to distribute aid in Niger[11] and allows Nigeriens to receive cross-border remittances. However, only around 3% of Nigeriens used mobile money in 2014.[12] Extensions in mobile penetration and usage have the potential to contribute to wider economic activity.

7. ITU (2015). 'Measuring the internet society' and World Bank data. The reference basket is comprised of 30 outgoing calls per month and 100 SMS messages.
8. Deloitte analysis based on ITU (2015). 'Measuring the internet society' and World Bank data.
9. Deloitte analysis based on World Bank data.
10. For example: World Bank (2012): 'Maximising Mobile'; McKinsey & Company (2012): 'Online and Upcoming: The Internet's impact on aspiring countries'; Goyal, A. (2010): 'Information, Direct Access to Farmers, and Rural Market Performance in Central India'. American Economic Journal: Applied Economics; Aker, J.C. and Mbiti, M. (2010): 'Mobile Phones and Economic; Development in Africa', Journal of Economic perspectives.
11. GSMA (2014). 'Disaster Response. Mobile Money for the Displaced'. World Food Programme (2012). 'In Niger, Using Mobile Money to Buy Food on Local Markets.
12. World Bank data.

Higher taxes and fees on mobile services compared to other goods and services may be constraining connectivity

Mobile consumers and operators are subject to general taxes, but also face nine different sector specific taxes and regulatory fees. Sector specific taxes include special consumer taxes on SIM cards and mobile usage (TURTEL); and an operator tax on international incoming calls (TATTIE). In addition to spectrum and numbering fees, mobile operators pay several regulatory fees levied on revenue, with a combined rate of 6.5% that is amongst the highest in the region.

Taxation over and above that which applies to other standard goods and services is not fully aligned with the best practice principles of taxation, set out by international organisations such as the World Bank and IMF, which recommend taxation to be levied on broad bases as opposed to narrow sector specific bases. These sector specific taxes and fees, and the way they are levied, may create a number of issues:

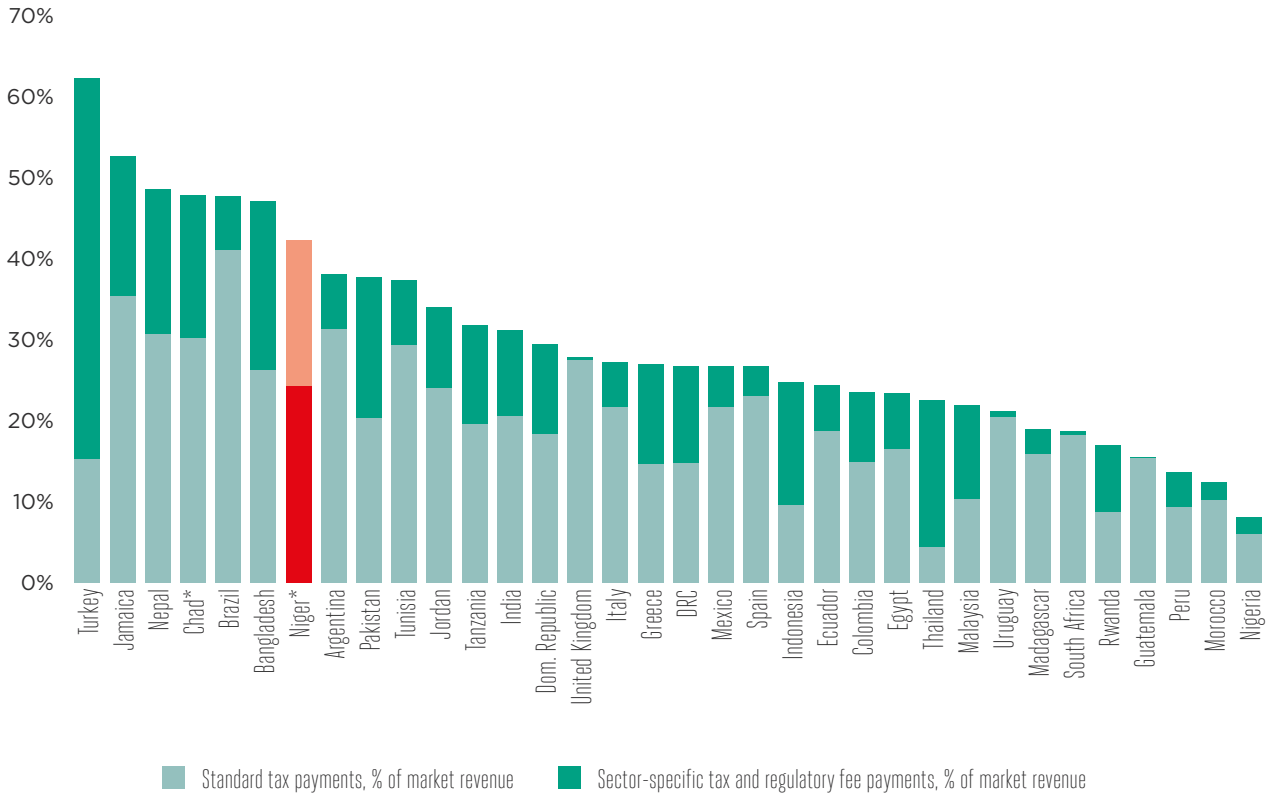
- **Reduced affordability of mobile services:** sector specific taxes and regulatory fees can be passed onto consumers either directly, through retail prices, or indirectly, through quality reductions. In 2015, average tax and regulatory fee payments by the mobile sector per subscriber represented over a fifth of income for the poorest 20% of consumers.[13] This is high compared to most other African countries for which data is available.
- **Disincentives for investment:** sector specific taxation reduces the returns on investment, potentially leading to inefficient investment decisions, which could slow the development of the sector and delivery of the positive effects of mobile on the wider economy.

As a consequence of sector specific taxes and regulatory fees levied on top of general taxes, the mobile sector paid around US$ 147 million (XOF 87 billion) in taxes and regulatory fees in 2015. This represents approximately 42% of sector revenue, one of the largest share compared to other African and other countries for which data is available.[14] Sector specific taxation, representing 43% of tax payments[15], adds significantly to general tax contributions that are already relatively high. As a result, the mobile sector makes a large contribution relative to its economic footprint. The mobile sector's contribution to government tax revenue, taking into account all tax and regulatory fee payments, is 2.6 times its share of GDP.[16]

13. Deloitte analysis based on operator data and World Bank data.
14. Deloitte analysis based on operator data and GSMA Intelligence.
15. Deloitte analysis based on operator data and GSMA Intelligence.
16. Deloitte analysis based on GSMA Intelligence, mobile operator data for 2015 and IMF (2016). 'IMF Country Report No. 16/247'.

Figure 3

Tax and regulatory fee payments as a share of market revenue in selected countries for which data is available, 2014 and 2015



*Source: Deloitte analysis based on operator data, GSMA Intelligence. *Indicates 2015 data*

When sector specific taxes and regulatory fees represent a high proportion of revenue, tax reductions can be more effective in driving positive sector and economic impacts. Given Niger's low penetration and higher level of tax as a proportion of revenue than in many other African countries, reductions in sector specific taxes and regulatory fees may be crucial in order to achieve ambitious government targets of 100% national coverage and 70% penetration rate by 2021.[17] Tax reforms would also align Niger to the recommendations of international organisations, which support harmonising and simplifying complex tax and fee frameworks: for example, by reducing and simplifying the plethora of regulatory fees so that these only cover the costs incurred by regulatory authorities; and by reducing or eliminating special taxes on usage of mobile services.

17. Parti Nigérien pour la Démocratie et le Socialisme - PNDS-TARAYYA (2016). 'Programme de Campagne 'Renaissance II'.

Rebalancing sector specific taxes and regulatory fees has the potential to promote connectivity, economic growth, investment and fiscal stability

The mobile industry recognises that its fiscal contribution remains critical to financing public expenditure, especially in light of government revenue shortfalls in recent years.[18] However, the current treatment of the mobile sector may be limiting growth in mobile connectivity that would benefit Niger's economy and society. Reducing taxation on mobile services, to be more in line with other goods and services, and simplifying the number of taxes and regulatory fees, has the potential to support growth and fiscal stability in the medium term.

Removing the tax on incoming international calls (TATTIE)[19] has the potential to lead to price reductions for consumers and reduced incentives for illegal traffic routing

The TATTIE draws the largest payment among sector specific taxes and regulatory fees. A rate of XOF 88 (US$ 0.14) per minute is imposed on international inbound calls. This rate has more than trebled over the past three years.[20] Studies by the GSMA and OECD have highlighted a range of potential problems with this type of tax:

- The price of incoming calls may increase markedly, causing incoming traffic to fall. While the direct price impact affects foreign users, reciprocation may mean that prices for outgoing international calls rise domestically.[21]
- The tax may create incentives for illegal traffic routing, taking away revenue from operators and governments, while reducing quality of service for consumers.[22]
- Due to a need for extensive traffic monitoring – often carried out by an external body receiving around 50% of proceeds from the tax – it may be an inefficient form of taxation. Because of the impact on traffic, tax increases may be ineffective in raising additional revenue.[23]

While the tax accounts for around 2.5% of government tax revenue in 2015,[24] removing the tax has the potential to improve operators' ability to lower prices and invest in networks. Based on an analysis that examines the impact of this reform on mobile penetration and economic growth, price reductions following the removal of the TATTIE have the potential to generate an additional 820,000 connections over the five-year period to 2021, of which 140,000 could be mobile broadband connections. The increase in mobile ownership and usage has the potential to increase GDP by a total of US$ 540 million (XOF 340 billion) over the five years to 2021, meaning that GDP could be almost 2% higher in 2021 than it would have been without this reform.[25] Increased investment in the mobile sector can potentially result in an additional 260 new or upgraded mobile sites by 2021, while investment in the wider economy could increase by US$ 200 million (XOF 120 billion) over the five years to 2021.

Reducing the tax on usage (TURTEL) has the potential to reduce the cost of mobile services for consumers, attracting new subscribers

This tax is levied at 3% on revenue earned from mobile usage, and may further increase the prices of mobile services already subject to general taxes such as VAT. A reduction of the TURTEL, from 3% to 1.5%, equates to a tax payment reduction of around US$ 3.5 million (XOF 2.1 billion)[26] in 2015. This represents 0.3% of government tax revenue and 2% of the mobile sector's total tax and regulatory fee contribution.[27]

Based on an analysis that examines the impact of this tax reform on mobile penetration and economic growth, price reductions following the reduction in the TURTEL have the potential to generate an additional 150,000 connections over the five-year period to 2021. The increase in mobile ownership and usage has the potential to increase GDP by a total of US$ 100 million (XOF 60 billion) over the five years to 2021, adding an extra 0.3% to GDP in 2021. Increased investment in the mobile sector has the potential to increase employment in the sector and the wider economy by 500.

18. IMF (2016). 'IMF Country Report No. 16/247'.
19. Taxe sur la Terminaison du Trafic International Entrant
20. Deloitte analysis based on mobile operator data.
21. GSMA/Deloitte (2014). 'Surtaxes on International Incoming Traffic in Africa'; and International Traffic Termination, OECD Digital Economy Papers No. 238.
22. GSMA/Deloitte (2014). 'Surtaxes on International Incoming Traffic in Africa'.
23. GSMA/Deloitte (2014). 'Surtaxes on International Incoming Traffic in Africa'.
24. Deloitte analysis based on Niger GDP and tax revenue data in IMF (2016). 'IMF Country report No. 16/247'.
25. Based on Niger GDP and tax revenue data in IMF (2016). 'IMF Country report No. 16/247'.
26. Deloitte analysis of operator data.
27. Deloitte analysis based on Niger GDP and tax revenue data in IMF (2016). 'IMF Country report No. 16/247'.

Reducing and rationalising regulatory fees has the potential to create a more favourable environment for investment

As an illustrative example, reducing the regulatory licence fee from 2% to 1% would move the combined rate of regulatory fees levied on revenue to 5.5%, saving operators around US$ 3.3 million (XOF 2.0 billion) based on 2015 data,[28] which represents 0.3% of government tax revenue and 2% of the mobile sector's tax and regulatory fee contribution.[29]

Based on an analysis that examines the impact of this tax reform on mobile penetration and economic growth, price reductions following the reduction in the regulatory licence fee have the potential to generate an additional 130,000 connections over the five-year period to 2021. The increase in mobile ownership and usage has the potential to increase GDP by a total of US$ 90 million (XOF 50 billion) over the five years to 2021, adding an extra 0.3% to GDP in 2021. Increased resources for investment can potentially result in an additional 40 new or upgraded mobile sites by 2021.

Reduction or removal of other taxes on the mobile sector have the potential to boost growth in penetration

Various other tax reform options could drive further benefits in Niger, and there is evidence of success from other African countries in driving mobile sector development through tax reform. For example:

- Countries such as Kenya, Rwanda and Senegal have exempted mobile handsets from VAT. In Kenya the VAT exemption in 2009 led to a 200% increase in handset sales over the following three years, outpacing growth elsewhere in Africa.[30]
- Mobile phone imports are exempt from customs duty in Senegal.[31] Ghana appears set to reduce customs duty on mobile phones (and also exempt them from VAT).[32]
- Imports of network equipment are exempt from customs duty in Togo[33] and subject to reduced rates in Côte d'Ivoire.[34]

Limited increases in general taxation may be sufficient to cover tax revenue shortfalls

In the medium term, tax and regulatory fee reductions on the mobile sector have the potential to increase wider tax revenue for the government, due to the benefits from increased mobile usage and increased investment across the economy. In the short term, the government may consider alternative ways to cover the tax revenue shortfall from removing sector specific taxes.

Directors of the IMF have recently *"encouraged the authorities [of the West African Economic and Monetary Union] to increase domestic revenue by broadening the tax base and strengthening tax administration"*. Increasing general taxes across all sectors of the economy, while reducing sector specific taxation, could allow the government to collect equivalent tax revenue in a simpler and more efficient way across a broader base.[35]

28. Deloitte analysis of operator data.
29. Deloitte analysis based on Niger GDP and tax revenue data in IMF (2016). 'IMF Country report No. 16/247'.
30. GSMA/Deloitte (2015).' Digital inclusion and mobile sector taxation, 2015'.
31. PwC (2016). Worldwide Tax Summaries.
32. IT Web Africa (2015). 'Ghana slashes tariff on imported phones by 50%'. Retrieved from: http://www.itwebafrica.com/mobile/352-ghana/236954-ghana-slashes-tariff-on-imported-phones-by-50
33. IBFD (2016). 'Togo – Corporate Taxation'.
34. IBFD (2014). 'Ivory Coast – Corporate Taxation'.
35. Mooij and Keen (2014). 'Taxing Principles'

Based on data for 2015, a modest increase in general VAT (currently 19%) may be sufficient to cover a shortfall in government tax revenue resulting from reductions in the TURTEL and regulatory fees. The removal of the TATTIE may require larger adjustments, though the government may also realise savings if it currently makes payments to the traffic monitoring body. The need to increase general taxation may also be reduced if the government is able to further improve administration capacity and modernise tax collection.

Table 1

Indicative estimates of VAT rate required to cover tax revenue shortfall

Tax change	Estimated VAT rate required
Removal of the TATTIE	20.43%
Reduction in the TURTEL by 50%	19.17%
Reduction of regulatory licence fee by 50%	19.17%

Source: Institut National de la Statistique; IMF; operator data; Deloitte analysis

Possible changes to the VAT rate are provided as an illustrative option. Other options may be available, including changes to other general taxes that raise significant revenue, such as corporation tax.

1. The mobile industry in Niger

The Republic of Niger is among the world's least developed countries. In 2015, the country ranked at the bottom of the United Nation (UN) Human Development Index[36] and its annual Gross Domestic Product (GDP) per capita stood at US$ 359 (or CFA Franc (XOF) 212,000)[37]. The economy is reliant on agriculture, which accounts for around 40% of total GDP.[38] Niger is also the world's fourth largest producer of uranium[39]; while this creates economic opportunity for the country, it may also leave it exposed to price shocks and fluctuations in global demand that have been witnessed recently.[40]

Niger's economy grew at an estimated 3.5% in 2015, down from 7% in 2014.[41] The country's macroeconomic outlook remains positive; infrastructure and natural resource projects are anticipated to support growth of over 6% in the medium term.[42] However, the International Monetary Fund (IMF) notes that significant economic challenges remain, including *"domestic security, lack of capacity, effective implementation of reforms, project management, domestic revenue mobilization, expenditure prioritization, agriculture modernization, and food security."*[43]

The mobile sector plays an important role in Niger's economy and has been identified by the government as a key sector for supporting economic development in the medium-term.[44] In 2015, mobile services generated market revenue of US$ 348 million (XOF 206 billion),[45] equal to 5% of Niger's GDP.[46] The largest mobile operator, Airtel (Bharti Airtel) had a market share of 56% of connections in 2016, while Orange and Moov (Maroc Telecom) served around 24% and 15% of the market respectively. Finally, the publicly owned operator SahelCom[47] had a market share of 5%.[48]

The *Programme de Renaissance II* of 2016 reaffirmed the government's commitment to promoting mobile uptake and infrastructure investment.[49] Against this background, this report examines the role of tax policy in stimulating mobile uptake, digital inclusion, network investment and economic growth.

- The remainder of this Section discusses the state of mobile uptake and digital inclusion and its benefits for the Niger's social and economic development.
- Section 2 sets out the taxes and regulatory fees levied on the mobile sector in Niger and their implications for affordability of mobile services and investment incentives. The section also compares mobile taxes and regulatory fees to international benchmarks and internationally recognised best practice principles.
- Section 3 analyses how potential mobile tax and regulatory fee reforms could affect affordability and investment in mobile services and stimulate wider economic growth.
- Section 4 concludes, discussing options for tax reform.

36. United Nations Development Programme (2015). 'Human Development Report 2015'.
37. World Bank data.
38. United Nations Statistics Division (GDP by industry).
39. Extractive Industries Transparency Initiative (2013). 'Niger'.
40. IMF (2016). 'IMF Country report No. 16/247'.
41. IMF (2016). 'IMF Country report No. 16/247'.
42. IMF (2016). 'IMF Country report No. 16/247'.
43. IMF (2016). 'IMF Country report No. 16/247'.
44. Ministère de la Communication et des Nouvelles Technologies de l'Information (2012). 'Document de Politique Sectorielle des Télécommunications et des Technologies de l'Information et de la Communication'.
45. GSMA Intelligence.
46. Deloitte analysis based on GSMA Intelligence (data for 2015) and IMF (2016). 'IMF Country report No. 16/247'.
47. In September 2016, the government announced plans to merge SahelCom with the state-owned fixed line incumbent Sonitel. Source: TeleGeography (2016). 'Govt to merge Sonitel, SahelCom into Niger Telecom'.
48. GSMA Intelligence (data for Q2 2016).
49. Parti Nigérien pour la Démocratie et le Socialisme - PNDS-TARAYYA (2016). 'Programme de Campagne 'Renaissance II'.

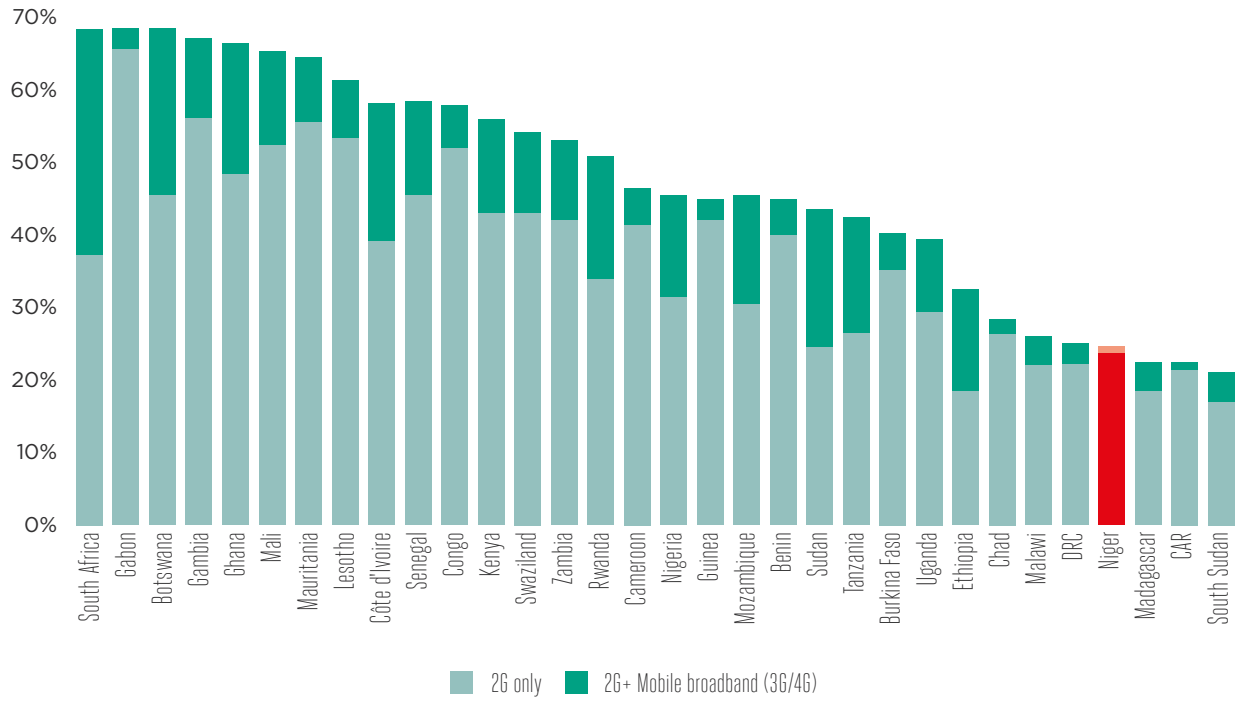
1.1 The large majority of Nigeriens are yet to benefit from mobile connectivity

As of 2015, 81% of Niger's population live in rural areas[50] and less than 1% of the population have access to fixed line telephony.[51] Mobile networks have the potential to connect the country's geographically dispersed population and mobile operators have made efforts to achieve this. For example, in 2012 Orange and Altobridge deployed mobile services to over 50 remote village communities using solar energy and advanced satellite technology, connecting around 60,000 people.[52]

While 2 million more Nigeriens have access to mobile services compared to five years ago, unique subscriber penetration remains low compared to other African countries, at 24% in 2016.[53] The vast majority of the 5 million mobile subscribers use 2G services and mobile broadband penetration is among the lowest worldwide, at 1% in 2016.[54]

Figure 4

Mobile penetration (unique subscribers) by technology in selected African countries, 2016



Source: Deloitte analysis based on GSMA Intelligence (2016)

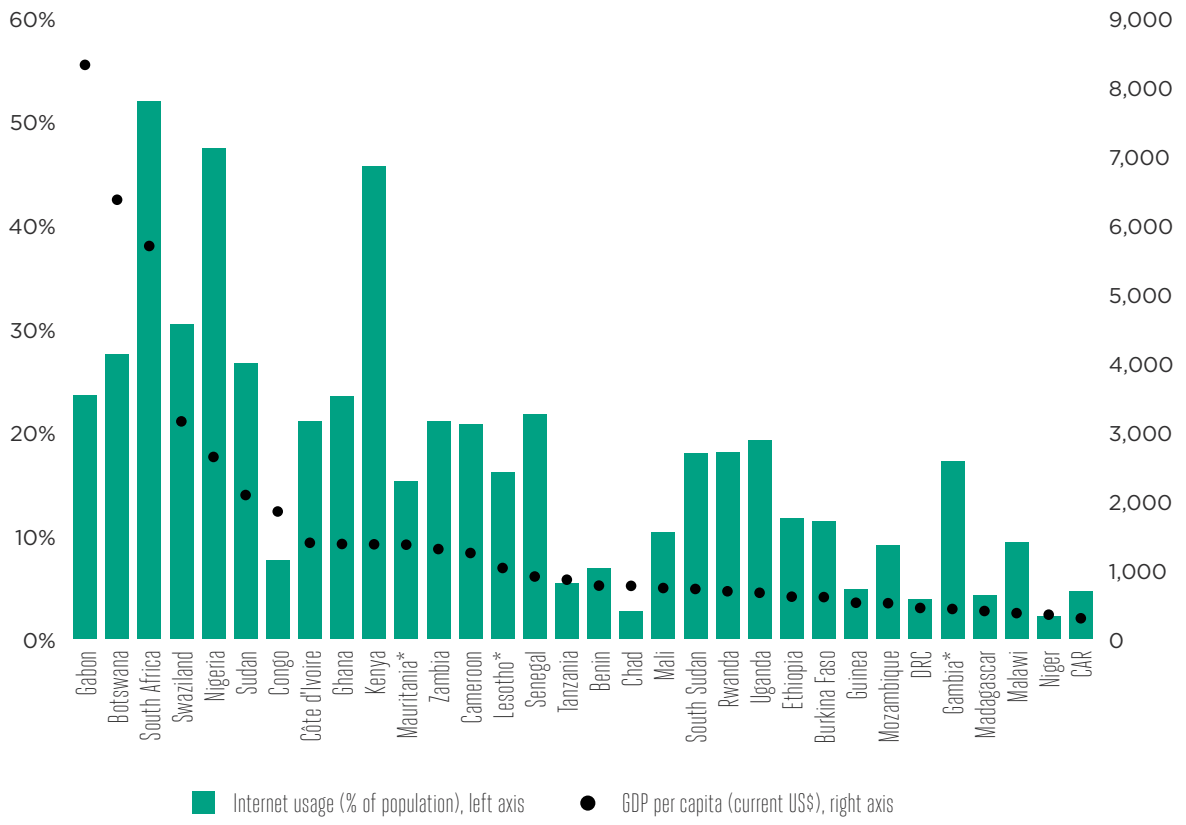
50. World Bank data.
51. ARTP (2015). 'Rapport Annuel 2015'.
52. TeleGeography (2012). 'Orange teams up with Altobridge to connect remote communities'.
53. Deloitte analysis based on GSMA Intelligence. Where possible Niger is compared to a broad set of other countries in the region. In some instances the choice of comparator countries is dependent on data availability.
54. Deloitte analysis based on GSMA Intelligence.

Despite mobile operators' efforts to connect rural communities, mobile uptake remains unbalanced across different regions of Niger. Government research in 2012 showed that mobile utilisation was around four times higher in urban communities than in rural areas.[55]

The limited fixed infrastructure and relatively low uptake of mobile broadband is reflected in low internet uptake, which was 2% of the population in 2015. This is lower than in many African countries with comparable GDP per capita.

Figure 5

Internet usage and GDP per capita in selected African countries, 2015



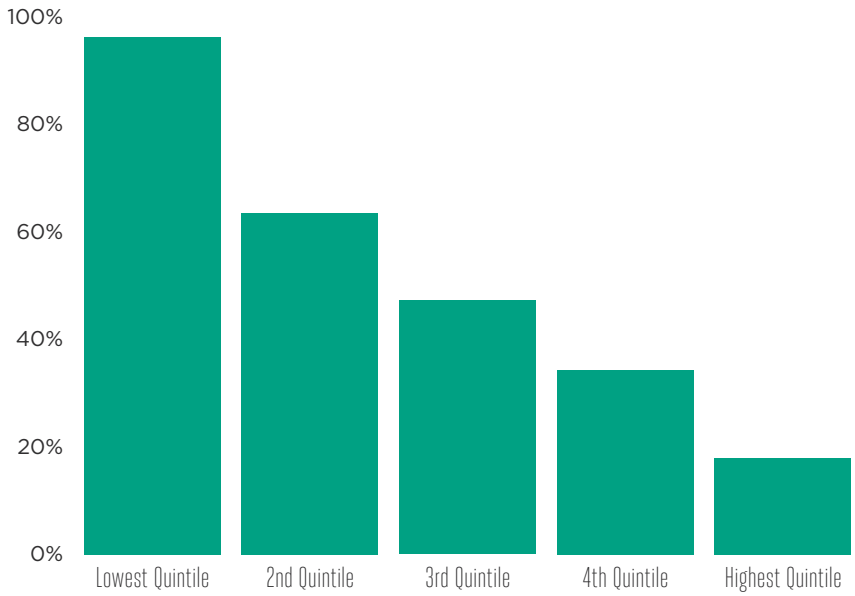
*Source: ITU Statistics (2016), World Bank data. * 2014 values for GDP per capita*

Low rates of mobile and internet usage may exist when a large share of the population are unable to afford mobile services. Data from the International Telecommunication Union (ITU) suggests that the typical cost voice and SMS services in Niger in 2014 was US$ 13 (XOF 7,700) per month, not including the cost of a device or mobile broadband. This corresponds to 40% of average monthly Gross National Income (GNI) per capita, compared to 14% on average across Least Developed Countries (LDCs).[56] Mobile services become even less affordable for the lowest 20% of earners, with the cost of a mobile subscription representing 96% of monthly income.[57]

55. Ministère de la Communication et des Nouvelles Technologies de l'Information, Niger (2012). ‚Projet d'étude: mesure des indicateurs TIC au service du développement au Niger'.
56. ITU (2015). 'Measuring the internet society' and World Bank data. The reference basket is comprised of 30 outgoing calls per month and 100 SMS messages.
57. Deloitte analysis based on ITU (2015). 'Measuring the internet society' and World Bank data.

Figure 6

Mobile cellular bundle cost as a proportion of the average monthly income in Niger, by income group, 2014



Source: Deloitte analysis ITU (2015). 'Measuring the Internet Society', World Bank data. A quintile represents 20% of the population, ranked from the lowest to the highest 20% income bracket

The absence of universal mobile network coverage may be a further barrier to digital inclusion. Outdoor coverage in many urban centres is close to 100%, though indoor coverage is limited to 50-70% in most cities.[58] There is further scope for improvement in coverage across rural areas, which appears significantly lower.[59] Mobile broadband coverage in particular has the potential to increase, as the current level of 20% is lower than in countries with similar levels of income, such as the Democratic Republic of Congo and the Central African Republic which have almost 40% mobile broadband coverage.[60] Further investment in infrastructure could expand mobile networks across the country.

58. ARTP (2016).'Rapport annuel 2015'.
59. Based on the analysis of one operator with national coverage of 80% and urban coverage of almost 100%. Source: GSMA Intelligence; and ARTP (2016).'Rapport annuel 2015'.
60. GSMA Intelligence.

1.2 Mobile services are key to economic development and social inclusion

Niger has one of the lowest GDP per capita levels in the world, with 41% of the population living below the poverty line in 2011.[61] In countries with low levels of economic and social development and high levels of poverty, increased use of mobile services is widely recognised as a driver of social inclusion and economic growth.[62]

Increased mobile service provision may be vital to promote the United Nations Sustainable Development Goals (SDGs), which define a broad set of objectives to coordinate and focus development efforts globally.[63] A recent GSMA/Deloitte study found that the mobile sector can support all SDGs.[64] In particular, in LDCs such as Niger, mobile uptake may impact the following SDGs:

- **Eradicating poverty (SDG 1):** Poverty remains widespread in Niger. The mobile sector stimulates economic activity and provides affordable connectivity and financial services—including platforms for mobile remittances that can be valuable for underserved communities.

- **Zero hunger (SDG 2):** Nearly one quarter of the population in Niger is facing moderate to severe food insecurity[65] and food prices are affected by droughts and other production risks.[66] Mobile uptake in agricultural communities can increase access to markets and information that can increase productivity.

- **Industry, innovation and infrastructure (SDG 9):** The IMF states that Niger's infrastructure, especially its road network, is in *"poor condition"*.[67] Mobile operators make a strong contribution by extending and upgrading critical infrastructure that connects remote communities and acts as a catalyst for the evolution of other industries.

- **Quality education (SDG 4):** 70% of the population in Niger is illiterate and only 44% of primary school girls will reach sixth grade.[68] Mobile services enable schools and learners to access digital resources, and simplify school-related payments through mobile money.

The study finds that the greatest potential for such impacts is in Sub-Saharan Africa (SSA), given the relatively low take-up of mobile devices and services. There is evidence that the mobile sector already generates a variety of benefits in Niger, which could be spread more widely across society with higher mobile penetration. Some impacts are discussed in more detail below.

MOBILE MONEY

Mobile money services, as offered by Niger's mobile operators since 2010,[69] can contribute to greater financial inclusion in the country, providing access to basic banking services and potentially more advanced services such as credit. Only around 3% of adults used their mobile phone to pay bills or transfer money in 2014,[70] highlighting that there may be ample potential for increased usage of such services to the benefit of Nigeriens.

Mobile money may be a cheaper, more efficient way to supply aid than traditional methods of cash dissemination, as shown by a study on urban refugees in Niamey.[71] An expansion of mobile money services may particularly benefit displaced populations.[72] In 2013, a mobile operator partnered with humanitarian organisations to provide aid using mobile money to over 300 refugee households, each of which was provided with a mobile phone and SIM card.[73] Another partnership successfully distributed cash in urban areas of Niger using mobile money, through the World Food Programme.[74]

61. IMF (2015). 'IMF Country Report No 15/342'. The Poverty Rate is defined as the percentage of population below US$ 1.25 (PPP) per day.
62. For example: World Bank (2012): 'Maximising Mobile'; McKinsey & Company (2012): 'Online and Upcoming: The Internet's impact on aspiring countries'; Goyal, A. (2010): 'Information, Direct Access to Farmers, and Rural Market Performance in Central India'. *American Economic Journal: Applied Economics*; Aker, J.C. and Mbiti, M. (2010): 'Mobile Phones and Economic; Development in Africa', *Journal of Economic perspectives.*
63. Four of the 17 goals mention ICT-specific targets. Furthermore, there are 38 other targets whose attainment implicitly depends on universal access to ICT and Broadband.
64. GSMA/Deloitte (2016). 'Mobile Industry Impact Report: Sustainable Development Goals'.
65. European Commission. Humanitarian Aid and Civil Protection (2016). 'Sahel: Food and Nutrition Crisis'.
66. World Bank (2013). 'Tackling Climate Change in Niger'.
67. IMF (2015). 'IMF Country Report No. 15/64'.
68. USAID (2015). 'Niger Fact sheet'.
69. GSMA Mobile Money Deployment Tracker.
70. World Bank data.
71. Creti, P. (2014). 'Mobile Cash Transfers for Urban Refugees in Niamey, Niger'.
72. As of February 2016, 137,000 Nigeriens had been internally displaced and Niger was hosting almost 200,000 refugees from conflicts in Nigeria and Mali. IMF (2016). 'IMF Country Report No. 16/247'.
73. GSMA (2014). 'Disaster Response. Mobile Money for the Displaced'.
74. World Food Programme (2012). 'In Niger, Using Mobile Money to Buy Food on Local Markets.

Mobile money platforms can also support international transfer payments between individuals, allowing Nigeriens to receive cross-border remittance payments without having to travel to foreign exchange bureaus or needing a bank account. Such services can therefore reduce transaction costs, which may particularly benefit those at the bottom of the pyramid. For example, a service launched in 2015 allows for money transfers between Niger and Benin and Côte d'Ivoire; these two markets account for almost 40% of Niger's total annual remittances received.[75]

MOBILE AGRICULTURE

Agriculture is the principal source of income for over 80% of the population and the sector is exposed to production risks as well as global market price fluctuations.[76] Mobile services may be a low-cost means of improving information flows and making agricultural markets work more efficiently. For example, Orange's Labaroun Kassoua mobile service was introduced in 2011 and by October 2012, over 8,000 people used the service,[77] which gives access to the information on the agricultural commodities' and cattle's prices in over 70 markets via SMS.[78]

> *"[With a mobile phone], in record time, I have all sorts of information from markets near and far"*
> – Grain trader in Magaria, Niger
>
> *Source: Aker (2010). 'Information from Markets Near and Far: Mobile Phones and Agricultural Markets in Niger'*

An academic study has found that the introduction of mobile phone services between 2001 and 2006 led to a 10% - 16% reduction in grain price dispersion across grain markets in Niger.[79] Another study shows that access to mobile services in Niger appears to increase the diversity of crops planted.[80]

MOBILE HEALTH

Access to healthcare is limited, with fewer than two physicians per 100,000 people.[81] Mobile health technologies in African countries may facilitate the delivery of basic health services, especially to rural populations. The Mobile Midwife Service in Nigeria, for example, provides medical information to pregnant women, their families and nursing mothers via voice messages in the local language. This service has targeted 200,000 women in its first year in 2014.[82]

There may be indirect health benefits from access to mobile services. A recent study has found that mobile money cash transfers in Niger have a positive impact on diet diversity of recipient households, allowing them to purchase more protein- and energy-rich foods. Compared to households receiving traditional cash payments, children of mobile money recipients were found to eat one third more of a meal per day.[83]

MOBILE EDUCATION

Mobile phones allow Nigeriens to use a simple form of information technology, which may enhance educational development and achievement. The 'ABC project', which taught adult students in over 110 villages in the Dosso and Zinder regions of Niger how to use simple mobile phones, appears to have improved educational attainment and information retention.[84]

Mobile connectivity may also provide access to valuable educational resources. For example, the on-demand information service Vodafone 3-2-1 aims to improve civic education in Ghana by providing free and accurate information on the electoral process, as well as news, weather forecasts and information on maternal and sexual reproductive health, family planning, water and sanitation.[85]

75. MFS (2016). 'MFS Africa Enables Mobile International Money Transfer for Airtel Niger'
76. World Bank (2015). 'Niger Agricultural Sector Risk Assessment'.
77. ICT Update. 'A telecom operator in West Africa'.
78. Orange (2014). 'Orange's services for agriculture in Africa'.
79. Aker, J. (2010). 'Information from Markets Near and Far: Mobile Phones and Agricultural Markets in Niger'. *American Economic Journal: Applied Economics.*
80. Aker, J. and Ksoll, C. (2012). 'Information Technology and Farm Households in Niger'.
81. World Bank data.
82. GSMA (2014). 'Snapshot: Grameen Foundation's "Mobile Midwife" Service in Nigeria - How to generate and use consumer insights to localise mHealth content'.
83. Aker J. et al. (2015). 'Payment Mechanisms and Anti-Poverty Programs: Evidence from a Mobile Money Cash Transfer Experiment in Niger'.
84. Aker J. et al. (2012). 'Can Mobile Phones Improve Learning? Evidence from a Field Experiment in Niger'. *American Economic Journal: Applied Economics.*
85. Prime News Ghana (2016). 'Vodafone partners two others to educate Ghanaians on Elections'.

MOBILE CONNECTIVITY PROMOTES LONG-RUN ECONOMIC GROWTH

Mobile services contribute to economic growth, employment and productivity. The GSMA estimated that in 2014, mobile operators and their associated ecosystems made a direct contribution of just over US$ 100 billion (XOF 495 trillion) or 5.7% of the total GDP in SSA; employed nearly 4.4 million people; and supported the development of a number of technology innovations.[86] Mobile connectivity may have indirect benefits across sectors of the economy by improving information flows and lowering transaction costs, helping businesses and consumers to make more efficient and effective decisions. These benefits may grow as mobile penetration becomes more widespread.

Several studies show that mobile use can play a central role in driving economic progress in the developing world:

- Studies by the World Bank and the GSMA/Deloitte have found significant positive relationships between mobile penetration and economic growth in developing countries.[87]

- Mobile broadband may deliver economic benefits over and above those generated by basic mobile telephony.[88] A World Bank study has found that in developing economies such as Niger a 10% increase in broadband subscriber penetration[89] could accelerate economic growth by 1.38%.[90] Evidence from the literature on the impact of broadband on productivity suggests that every 10% increase in broadband penetration increases productivity by 1%.[91]

- A study conducted in Nigeria finds a positive impact of increased investment in telecommunications infrastructure on economic growth, including through indirect effects on the output of other sectors, such as agriculture, manufacturing, oil and other services.[92]

- A joint study conducted by Deloitte, GSMA and Cisco considered the impact of mobile penetration on Total Factor Productivity (TFP), a measure that often reflects an economy's long-term technological dynamism. The study found that in developing countries such as Niger a 10% increase in mobile penetration may increase TFP by 4.2 percentage points.

86. GSMA (2015). 'The Mobile Economy – Sub-Saharan Africa 2015'.
87. See for example 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-economic-growth.pdf; Qiang, C. Z. W., Rossotto, C.M. (2009). 'Economic Impacts of Broadband'. *Information and Communications for Development 2009: Extending Reach and Increasing Impact.*
88. ITU (2012). 'Impact of broadband on the economy'.
89. 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'.
90. Qiang et al.(2009)
91. LECG (2009). 'Economic impact of Broadband: An empirical study'.
92. Onakoya, BOA, et al. (2012). 'Investment in Telecommunications. Infrastructure and Economic Growth in Nigeria: A Multivariate Approach'. *Research Journal of Business Management and Accounting.*

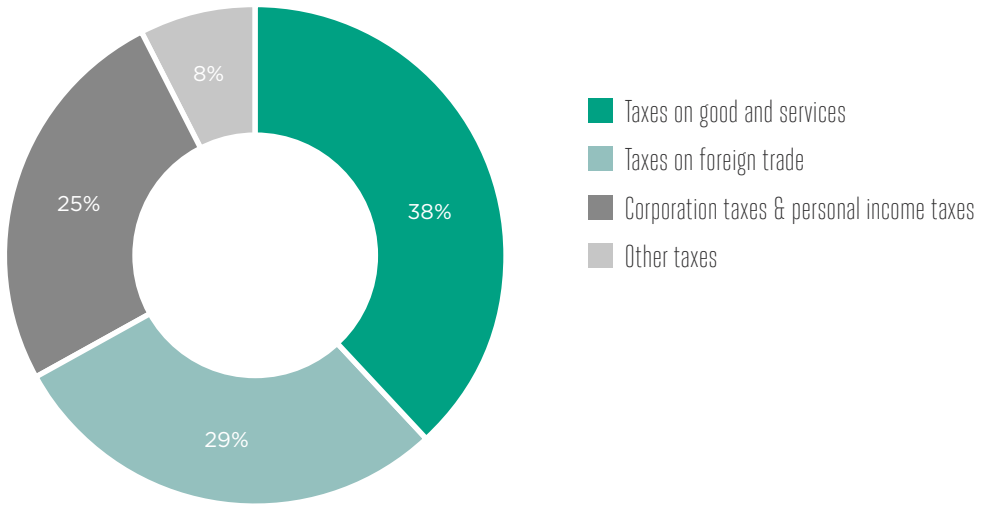
2. Taxation on the mobile sector

Taxation is an important issue for Niger, especially in light of government revenue shortfalls in recent years resulting from regional hostilities and slower activity in the agricultural and natural resource sector.[93] The IMF has welcomed recent reform efforts, observing that *"Revenue mobilization is progressing, but more needs to be done"*, including further development of customs and tax administration capacity.[94]

In 2015, total tax revenue of US$ 1.2 billion (XOF 690 billion) constituted 16% of Niger's GDP.[95] Based on data from 2015, the majority of fiscal revenue is raised through indirect taxes, such as taxes on goods and services and foreign trade.[96]

Figure 7

Breakdown of total government tax revenue, 2015



Source: Deloitte analysis based on: Ministère de l'Economie et des Finances, Institut National de la Statistique (2015). 'Rapport Economique et Financier'

93. IMF (2016). 'Country report No. 16/247'.
94. IMF (2015). 'Country Report No. 15/342'.
95. Deloitte analysis based on: IMF (2016). 'IMF Country report No. 16/247'.
96. Deloitte analysis based on: Ministère de l'Economie et des Finances, Institut National de la Statistique (2015). 'Rapport Economique et Financier'.

Mobile services are subject to a broad range of taxes and regulatory fees, with nine out of the 22 identified in this report being specific to the mobile sector.[97] These taxes and fees may reduce usage of mobile devices and services. The extent to which these charges fall on consumers or operators depends on specific market conditions and on the nature of each tax or fee. Some taxes and fees may be absorbed by operators in the form of lower profits, while others may be passed on to consumers via higher prices, or a combination of both. The following sections discuss these taxes and fees in more detail.

2.1 Taxes on mobile consumers

Mobile subscribers are subject to taxes applied to mobile devices, SIM cards and mobile usage. These taxes are likely to affect the prices ultimately paid by consumers and may impact on poorer consumers in particular.

Figure 8

Key consumer taxes on mobile services, 2016

PAYMENT BASE		TYPE	RATE
Handsets and other devices		VAT	19%
		External Tariff on imported devices	14%
Services	SIM cards	★ TURTEL (fixed component)	XOF 250 per SIM
		External Tariff on SIM cards	9% per SIM
		VAT	19%
	Usage (Calls, SMS, & mobile broadband)	★ TURTEL (variable component)	3% on turnover
		VAT	19%

★ Sector specific

Source: Deloitte analysis based on operator data, Code Général des Impôts à jour, and IBFD Niger tax report.

97. Deloitte analysis based on operator data.

TAXES ON HANDSETS AND OTHER DEVICES

Taxes on mobile devices may increase the upfront costs of accessing mobile services. Consumers purchasing a handset face the following taxes:

- A standard VAT rate of 19% is applied to all devices sold domestically, including those that are imported.[98] VAT is also levied on each tax payment made (with the exception of VAT tax payments themselves).[99] The tax rates reported in this section are the nominal rates, exclusive of VAT.

- Any device imported from outside the West African Economic and Monetary Union (UEMOA)[100] region is additionally subject to the External Tariff which is comprised of a number of elements:[101] the customs duty itself, applied at 10% of the import value, and several additional charges and duties totalling 4%.[102]

TAXES ON SIM CARDS

New users may be affected by taxes on SIM cards, in addition to the handset taxes described above:

- A fixed-rate component of the tax on the usage of the telecommunication network, *Taxe sur l'Utilisation des Réseaux de Télécommunications* (TURTEL), was introduced in 2011[103] with a charge of XOF 250 (US$ 0.40) for each new SIM card.[104] This type of activation charge is relatively rare both internationally and when compared to neighbouring countries; a GSMA/Deloitte survey of 112 countries found that only ten of these countries applied such taxes in 2014.[105]

- The customs duty and additional charges of the UEMOA External Tariff apply at a combined rate of 9% on each SIM card that is imported.

- A standard VAT at 19% is issued on the sale of each SIM card.

These charges may increase the barriers to accessing mobile services. For example, the TURTEL fixed activation charge alone is equal to average daily income for the poorest 20% of the population in 2015.[106]

TAXES ON USAGE OF MOBILE SERVICES

The following charges are levied on the usage of mobile services:

- A standard VAT rate of 19% apples to calls, SMS and mobile broadband usage, which is high when compared to other African countries.[106]

Table 2

Overview of VAT rates on mobile services for selected African countries for which data is available, 2015

Country	VAT rate on mobile services
Niger	**19%**
Chad	18%
Tanzania	18%
Burkina Faso	18%
Sierra Leone	15%
South Africa	14%
Nigeria	5%
Rwanda*	0%
Senegal*	0%

*Source: Deloitte global indirect tax rates and mobile operator data. *Reduced mobile specific VAT rate*

98. IBFD (2016). 'Niger – Corporate Taxation'.
99. Code Général des Impôts à jour.
100. The members of UEMOA are: Benin, Burkina Faso, Côte d'Ivoire, Guinea-Bissau, Mali, Niger, Senegal, and Togo.
101. Operator discussions.
102. These charges and duties are the *Prélèvement Communautaire de Solidarité (PCS)* (1%), *Redevance Statistique à l'Import (RSI)* 1%, *Prélèvement Communautaire (PC)* (1%) and *Taxe de Vérification Import (TVI)* (1%). Based on World Bank (2008). 'Niger - La modernisation du commerce pendant un boom minier' and operator data.
103. Operator data.
104. The TURTEL is comprised of two components, a fixed and a variable element. The variable component is discussed below.
105. GSMA/Deloitte (2016). 'Digital inclusion and mobile sector taxation 2016'.
106. Deloitte analysis based on World Bank data.

- The variable component of the TURTEL for the use of the public telecommunications network is an additional, sector specific tax. Mobile operators are required to collect payments, at a rate of 3%, on all money they receive from their customers as a result of their access and use of the network.[107] Operators report that VAT is charged on payments of other taxes such as TURTEL, meaning that the effective TURTEL rate inclusive of VAT is 3.57%. The TURTEL adds to a standard VAT rate that is already relatively high. Together with the upfront costs of mobile ownership, usage charges could create further pressure on affordability.

Further, operators have reported that mobile money payments may in future be subject to a stamp duty charge of XOF 150 (US$ 0.24), potentially increasing to XOF 200 (US$ 0.32).[108] This may have the potential to lead to an increase in the costs of such services and risks limiting their uptake.

2.2 Taxes and regulatory fees on mobile operators

Several taxes and regulatory fees are levied on mobile operators, including sector specific taxes and fees, as summarised in the figure below.[109]

107. République du Niger. 'Code générale des impôts'.
108. République du Niger. 'Code générale des impôts' and operator discussions.
109. Operators face some further taxes that account for relatively small payments and are not displayed in Figure 9

Figure 9

Key operator taxes, regulatory fees and other payments to regulators

PAYMENT BASE		TYPE	RATE
Profits		Corporation tax	30% on profits
Salaries		Social security & unemployment contribution	15.4% + 0.5% on wages
		Payroll tax (TAP)	3% - 5% on wages
Withholding taxes (WHT)		WHT on foreign services	16%
		WHT on local services	2%, 3% or 5%
Network Equipment		External Tariff on imported equipment	4% - 24%
		VAT	19%
International traffic		★ TATTIE	XOF 88 per minute
Regulatory fees and other payments to regulators	Levied on Revenue	★ Regulatory licence fee	2% on revenue
		★ Universal Service Fund	4% on revenue
		★ R&D fund	0.5% on revenue
	Spectrum	★ One off spectrum license	License specific fees
		★ Spectrum royalty fees	Determined annually based on frequency holdings
	Numbering	★ Numbering fee	XOF 100 per number

★ Sector specific

Source: Deloitte analysis based on operator data, Code Général des Impôts à jour, and IBFD Niger tax report.

CORPORATION TAX

Operator's taxable profits generated are subject to a corporate income tax levied at a rate of 30%. Special taxes apply on capital gains from shares, equities or bonds.[110]

WITHHOLDING TAXES

Operators pay withholding taxes on some domestic and foreign payments as follows:

- Payments to resident companies are taxed at rates of 2%, 3% or 5%.[111]

110. Code Général des Impôts à jour and IBFD (2016). 'Niger – Corporate Taxation'.
111. Operator data.

- Payments to companies in the form of dividends, interest or administrative allowances are subject to a 15% tax.

- Payments to non-resident companies outside of the UEMOA region and France are subject to a final withholding tax of 16%.[112]

SALARY TAXES

In 2015, employers' payroll taxes were made up of the social security contributions of 16.4%, which were increased from 15.4% in 2014,[113] and unemployment contributions of 0.5% on salaries.

Additionally operators pay an apprenticeship tax (TAP), charged at 3% on salaries for Nigeriens and 5% for foreign workers.[114] The rates for the TAP were increased from 2% and 4% respectively from 2013.[115]

TAX ON NETWORK EQUIPMENT

Operators pay the following taxes on imported network equipment:

- The UEMOA External Tariff comprised of a custom duty between 5% and 20%[116], depending on the type of equipment, and additional charges of 4%.[117] The total charges therefore range between 9% and 24%.[118]

- The standard VAT rate of 19% is levied on the value of the equipment and on the payments of the UEMOA External Tariff.

TAX ON INCOMING INTERNATIONAL CALLS (TATTIE)[119]

A tax of XOF 88 (US$ 0.14) per minute is imposed on international inbound calls. The mobile-specific surcharge is paid directly by mobile operators to the government. This tax was introduced in January 2014 at a rate of XOF 25 (US$ 0.04) per minute and has been increased three times in the three years that followed. Incoming traffic is monitored by a third party intermediary.[120]

Payments for the TATTIE made up around 20% of the overall tax and regulatory fee payments by Niger's mobile sector in 2015.[121]

REGULATORY FEES LEVIED ON REVENUE

Mobile operators pay several regulatory fees and contributions each year:

- A recurring regulatory licence fee, which contributes to financing the regulator, based on 2% of revenue.[122]

- A further fee, amounting to 0.5% of revenue for the development of research and training in telecoms and ICT.[123]

- A 4% contribution to a Universal Service Fund (USF)[124] applied to revenue, introduced in 2003.[125]

Operators report that the 2% licence fee and 4% USF contribution are based on gross revenue without any adjustment for interconnection costs; that is, the fees are levied on revenue including interconnection revenue, but without deducting interconnection costs. As a consequence, operators effectively retain only part of their interconnection revenue, but continue to pay full interconnection charges. Best practice internationally supports the application of these fees on revenue net of interconnection costs, as occurs in countries such as Ghana, Algeria, Senegal and Mali.[126]

SPECTRUM FEES

Mobile operators are subject to the following fees in relation to spectrum:

- One-off spectrum acquisitions and licence renewals typically entail costs for operators. These occur infrequently, when new spectrum is released to the market or when existing licences expire. While there is limited information available on the allocation of spectrum and prices paid, in 2014, one new 3G licence was been awarded together with one licence being renewed, for a total of XOF 34 billion (US$69 million)[127] which the operators paid in its entirety in 2015.[128] This payment is equivalent to 4% of total government revenue in that year[129] and 17% of mobile sector revenue.[130]

112. Operator data.
113. Operator data
114. IBFD (2016). 'Niger – Corporate Taxation'.
115. Operator data.
116. Operator data
117. These charges and duties are the *Prélèvement Communautaire de Solidarité (PCS)* (1%), Redevance Statistique à l'Import (RSI) 1%, *Prélèvement Communautaire (PC)* (1%) and *Taxe de Vérification Import (TVI)* (1%). Based on World Bank (2008). 'Niger - La modernisation du commerce pendant un boom minier' and operator data.
118. Operator data.
119. Taxe sur la Terminaison du Trafic International Entrant (TATTIE)
120. Operator data.
121. Deloitte analysis based on operator data.
122. ARTP. 'Cahier des charges pour la license de téléphonie mobile'.
123. Operator data.
124. ARTP. 'Cahier des charges pour la license de téléphonie mobile'.
125. GSMA/Ladcomm Corporation (2014). 'Sub-Saharan Africa – Universal Service Fund study'.
126. Based on operator data
127. TeleGeography (2014). 'Airtel Niger secures 3G license'.
128. IMF (2016). 'IMF Country report No. 16/247'.
129. Based on tax, non-tax and special accounts revenue. Source: IMF (2016). 'IMF Country report No. 16/247'.
130. GSMA Intelligence.

- Spectrum royalty fees (*redevance de fréquence*) are paid on a recurring basis. These are determined on the basis of the amount of spectrum held, the commercial value of the spectrum and the geographic characteristics of the network.[131]

NUMBERING FEES

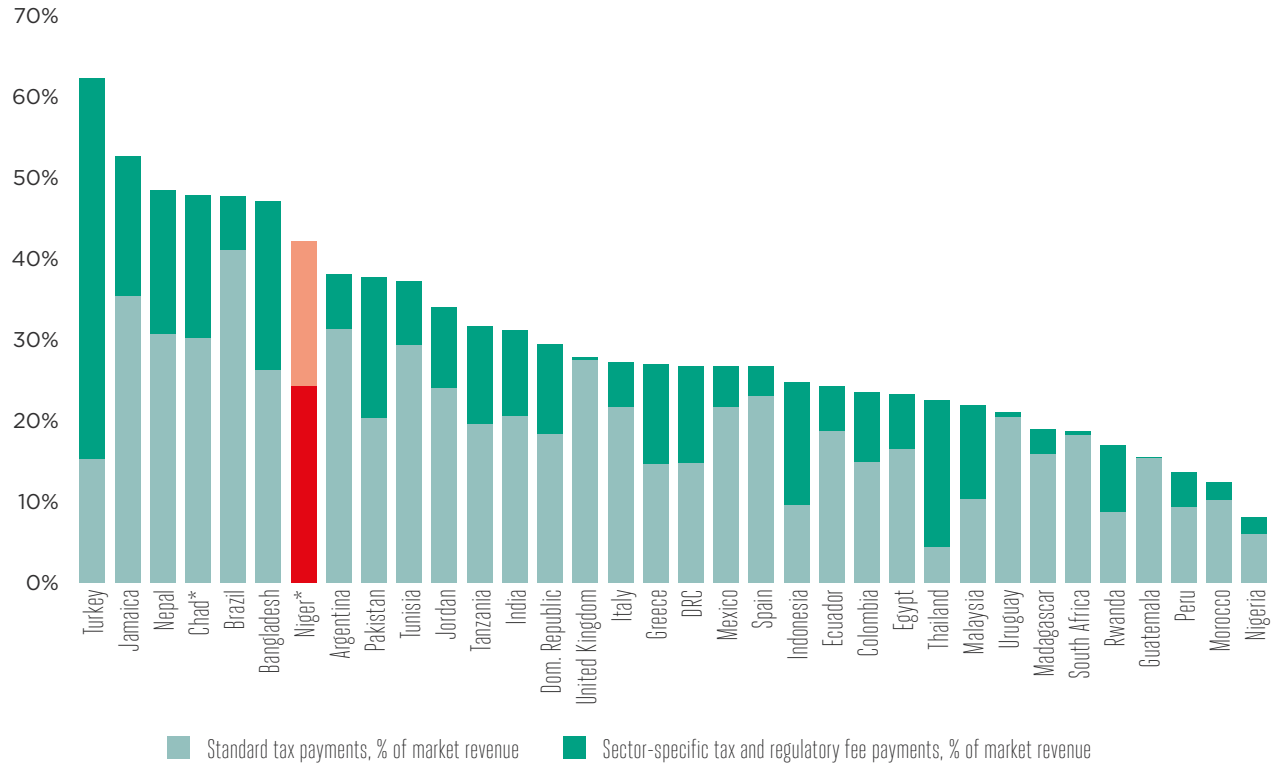
For each standard mobile phone number, a numbering fee of XOF 100 (US$ 0.16) is charged by the regulator *Autorité de Régulation des Télécommunications et de la Poste* (ARTP).[132]

2.3 The tax and regulatory fee contribution of the mobile sector

The mobile sector as a whole paid around US$ 147 million (XOF 87 billion) in taxes and regulatory fees in 2015, which represents approximately 42% of sector revenue.[133] A comparison with other countries shows that general tax payments already account for a large share of revenue, reflecting relatively high VAT rates on the mobile sector. Additional payments for sector specific taxes and regulatory fees levied on top of general taxes further increase the mobile sector's financial contribution.

Figure 10

Tax and regulatory fee payments as a share of market revenue in selected countries for which data is available, 2014 and 2015



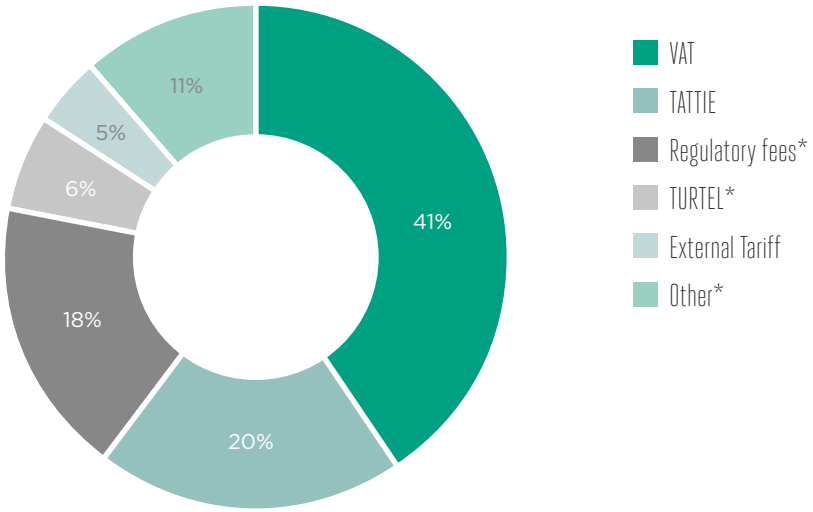
*Source: Deloitte analysis based on operator data, GSMA Intelligence. *Indicates 2015 data*

131. Annexe a l'arrêté no 81/MC/A/C/DPT du 6 Décembre 2006. Méthode de fixation des redevances de gestion du spectre des bandes de fréquences.
132. Operator data. This fee increases to XOF 1,100,000 for commercial three digit numbers and XOF 600,000 for four digit numbers.
133. Deloitte analysis based on operator data and GSMA Intelligence.

VAT payments make up the largest share of total payments by the mobile sector, at 41%. Mobile-specific taxes and regulatory fees together account for 44% of total payments. Of these, the TATTIE draws the largest payments; regulatory fees account for almost a fifth of total payments and the TURTEL constitutes a share of 6%.

Figure 11

Share of total payments by type of tax and regulatory fee excluding corporation tax, 2015



*Source: Deloitte analysis based on operator data. *TURTEL: Includes fixed and variable component; Regulatory fees: Numbering fees, recurring spectrum fees, regulatory fees levied on revenue; Other taxes: Withholding taxes, payroll taxes, stamp duties, other small taxes*

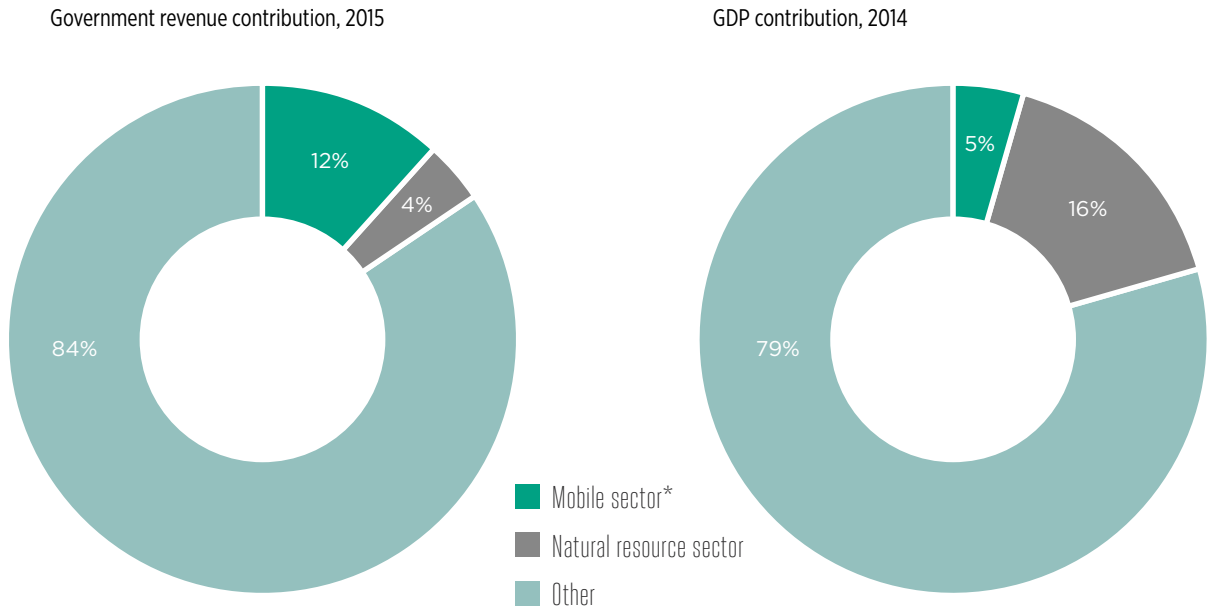
As a consequence of sector specific taxes and regulatory fees levied on top of general taxes, the mobile sector makes a large contribution relative to its economic footprint. The mobile sector's contribution to government tax revenue, taking into account all tax and regulatory fee payments, is 2.6 times its share of GDP.[134] A value greater than 1 indicates that the sector over-contributes to tax revenue, relative to the size of the sector in the economy. That is, despite only accounting for around 5% of GDP, the sector's tax and regulatory fee payments contributed approximately 12% of total government tax revenue in 2015.[135]

There is limited visibility of the fiscal contribution of other economic sectors. Data is available on revenue collection for the natural resource industry for the year 2015, which indicates that the mobile sector is making a relatively large contribution.

134. Deloitte analysis based on GSMA Intelligence, mobile operator data for 2015 and IMF (2016). 'IMF Country Report No. 16/247'.
135. Deloitte analysis based on GSMA Intelligence, mobile operator data for 2015 and IMF (2016). 'IMF Country Report No. 16/247'. This excludes one-off payments such as payments for spectrum awards.

Figure 12

Government revenue and GDP breakdown, 2015 and 2014



*Source: Deloitte analysis based on operator data; GSMA Intelligence; World Bank data; IMF (2016). 'IMF Country Report No. 16/247'. Due to data limitations, for this figure government revenue includes both tax and non-tax revenue. *Includes tax payments and regulatory fee payments but excludes exceptional payments of XOF 34 billion related to spectrum awards. Including the spectrum award payments, the mobile sector's contribution to total government revenue would be 20% in 2015.*

2.4 Best practice in taxation policy and mobile sector taxation in Niger

There are a number of established principles that are generally accepted as contributing to an effective tax system, as provided by international organisations such as the World Bank[136], the IMF[137], the ITU[138] and the Organisation for Economic Co-operation and Development (OECD).[139] These principles are generally recognised as minimising the potential distortionary impacts caused by taxation and take into account important practical aspects such as the role of informal activity or limited institutional capabilities.[140]

This section outlines the framework of best practice principles which balances the five important economic factors — efficiency, equity, simplicity, transparency and incidence — and compares it to mobile sector taxation in Niger. The principles support specific steps for implementing effective taxation in practice:[141]

- Setting low tax rates on wide tax bases.
- Minimising use of tax exemptions.
- Using a low number of taxes.
- Applying the same tax treatment to similar or competing sectors.

136. Bird and Zolt (2003). 'Introduction to Tax Policy Design and Development'
137. Mooij and Keen (2014). 'Taxing Principles'
138. ITU (2013). 'Taxing telecommunication/ICT services: an overview'
139. OECD (2014). 'Fundamental principles of taxation', in Addressing the Tax Challenges of the Digital Economy. *OECD Publishing.*
140. For more details, see GSMA/Deloitte, Taxation on the mobile sector - Principles, best practice and options for reform, (Forthcoming).
141. Course on Practical Issues of Tax Policy in Developing Countries, World Bank, April 28-May 1, 2003 and OECD, 2014, 'Fundamental principles of taxation'

Figure 13

Best practice principles and implications for effective taxation

BEST PRACTICE

Efficiency	Equity	Simplicity	Transparency	Incidence
• Taxes may affect transactions by increasing costs and prices • An efficient tax system minimises impact on behaviour while raising the required revenue	• Horizontal equity: similar taxpayers should have a similar tax treatment • Vertical equity: those who are better off could bear a larger tax burden	• Reducing complexity may lower the costs of compliance • With complex taxes it may be more difficult to make sound business decisions e.g. investment	• Limited transparency may facilitate tax avoidance through loopholes • With low transparency it may be difficult to challenge tax payments	• Need to consider effect on firms (lower profits) and/or consumers (higher prices) • Impacts – e.g. lower investment / purchasing – may depend on demand elasticity

IMPLICATIONS FOR EFFECTIVE TAXATION

Low rates on wide bases	Limited exemptions	Low number of taxes	Same treatment for similar / competing sectors
• Low rates are less likely to distort behaviour • Low taxes over a wide base may raise the required revenue while minimising distortions	• Exemptions may increase complexity of the tax system • They may introduce new distortions • They may reduce the tax base	• A small number of taxes may reduce complexity and costs of compliance • E.g. a single corporate tax rate and VAT rate applied to a wide base	• This may minimise distortions in firm profits and consumer prices • It favours efficient allocation of capital across sectors, promoting economic growth

Source: IMF, World Bank, OECD publications, Deloitte analysis

The establishment of effective taxation policy in Niger, in line with best practice, is subject to practical challenges including the presence of a large informal sector. In 2014, informal activity was estimated to account for over 65% of Niger's GDP, with agriculture forming the largest industry in the informal economy.[142]

The scale of the informal economy indicates that tax collection relies on a relatively narrow tax base, with formal sectors such as the mobile industry making a large contribution relative to their size. Sector specific taxes and regulatory fees on the mobile sector may currently represent an important source of revenue, but they risk causing negative distortionary impacts on the broader economy. Evidence from academic literature suggests that general indirect taxation remains the most viable option to improve tax collection in the short term,[143] even in the presence of an informal sector.[144]

In the medium term, efforts to expand the tax base may lead to more effective taxation. To this end, IMF Directors have recently *"encouraged the authorities [of the West African Economic and Monetary Union] to increase domestic revenue by broadening the tax base and strengthening tax administration"*.[145] In a separate report, the IMF notes the importance of raising tax revenue from the natural resources sector, highlighting that economic outcomes *"will depend on the materialization of major projects in the natural resource sectors and the authorities' ability to leverage related revenue to reduce the infrastructure gap and promote inclusive growth"*.[146]

The tax structure applied to the mobile sector could be reformed in line with best practice principles of efficiency, simplicity, transparency and equity.

142. INS Niger (2015). 'Comptes Economiques de la Nation'.
143. IEhtisham et al, 2012, 'Tax Reforms in the Presence of Informality in Developing Countries'
144. IKaplow, 2004, 'On the undesirability of commodity taxation even when income taxation is not optimal'.
145. IMF (2016). 'IMF Country Report No. 16/96'.
146. MF (2015). 'IMF Country Report No. 15/342 (Niger)'.

EFFICIENCY OF TAXATION

There are several sector specific taxes and regulatory fees levied on top of general taxes, accounting for over 40% of total payments collected from the mobile sector.[147] Sector specific taxation, such as the TATTIE or the TURTEL, alters the price of mobile services relative to other goods and services in the economy, without taking into account the positive effects of the mobile sector on economic and social development (see section 1.2). As a consequence, the current taxation of the mobile sector may distort consumer and business decisions, constraining uptake of mobile services and investment that could further benefit the economy and society. A greater reliance on broad-based general taxation could promote a more efficient, less distortionary tax system.

Regulatory licence fees may also be inefficient when set at excessively high rates. International best practice suggests that regulatory fees should cover the cost to the regulator for undertaking their activities (a 'fee for service' approach). For example, in the UK, the telecom regulator Ofcom has to ensure that the *"relationship between meeting the cost of carrying out those functions and the amounts of the charges is transparent"*.[148]

However, the comparatively high combined rate of 6.5% across regulatory fees levied on operator revenue, and the availability of alternative revenue sources for ARTP,[149] suggest that regulatory fees may also act as a means of revenue generation, which is not economically efficient. The combined rate of 6.5% is high compared to several other African countries.

Table 3

Selected examples of operator taxes and fees on revenue in African countries for which data is available, 2015

Country	Tax type	Tax rate
Chad	Regulatory fees, USF and R&D fund	7.0%
Niger	**Licence fee, USF and R&D fund**	**6.5%**
Nigeria	Annual operating levy (including USF)	2.5%
DRC	Regulatory revenue fee	2.0%
Ghana	Investment fund and licence fee	2.0%
Tanzania	Local service levy, USF, and licence fee	1.4%

Source: GSMA/Deloitte (2015). 'Digital inclusion and mobile sector taxation in the Democratic Republic of the Congo'; GSMA/Deloitte (2015).' Digital inclusion and the role of mobile in Nigeria'; GSMA/Deloitte (2015). 'Digital inclusion and mobile sector taxation in Tanzania'; GSMA/Deloitte (2015). 'Digital inclusion and mobile sector taxation in Ghana'; and Deloitte analysis based on operator data.

147. Deloitte analysis based on operator data.
148. http://stakeholders.ofcom.org.uk/binaries/consultations/fees/summary/pdf_version.pdf
149. ARTP (2015). 'Rapport Annuel 2015'.

These regulatory contributions, together with the variable component of the TURTEL, are levied on operator revenue as opposed to profits. Revenue taxes and regulatory fees may create a number of inefficiencies:[150]

- Discourage investment: taxes and regulatory fees applied on revenue directly reduce the profitability of all operators, independently of their level of investment. In a given year, these taxes and regulatory fees have the same effect on operators undertaking high or low levels of investment, including operators with negative profits due to recent network investment.
- Distort volumes and prices: imposing taxes and regulatory fees on firms' revenue may produce lower market volumes and higher prices than a revenue equivalent tax on profits from the government's perspective.

SIMPLICITY AND TRANSPARENCY OF TAXATION

Reducing complexity and increasing transparency of a tax system may be important in order to lower the costs of compliance, expand the formal economy and improve the investment climate. The Nigerien tax system is relatively complex, as reflected in the overall rankings of the 'Paying Taxes' index, in which Niger ranks 165 out of 189 countries worldwide.[151]

Table 4

Paying Taxes Index ranking for selected African countries, 2016

Country	Paying Taxes rank	Number of payments per year	Time comply (hours) per year
Sudan	141	42	180
Mali	144	35	270
Eritrea	147	30	216
Burkina Faso	150	45	270
Angola	157	31	287
Gabon	161	26	488
Zimbabwe	164	51	242
Niger	**165**	**41**	**270**
Togo	169	49	216
Gambia	171	49	326
Benin	173	57	270
Senegal	174	58	441
Côte d'Ivoire	175	63	270

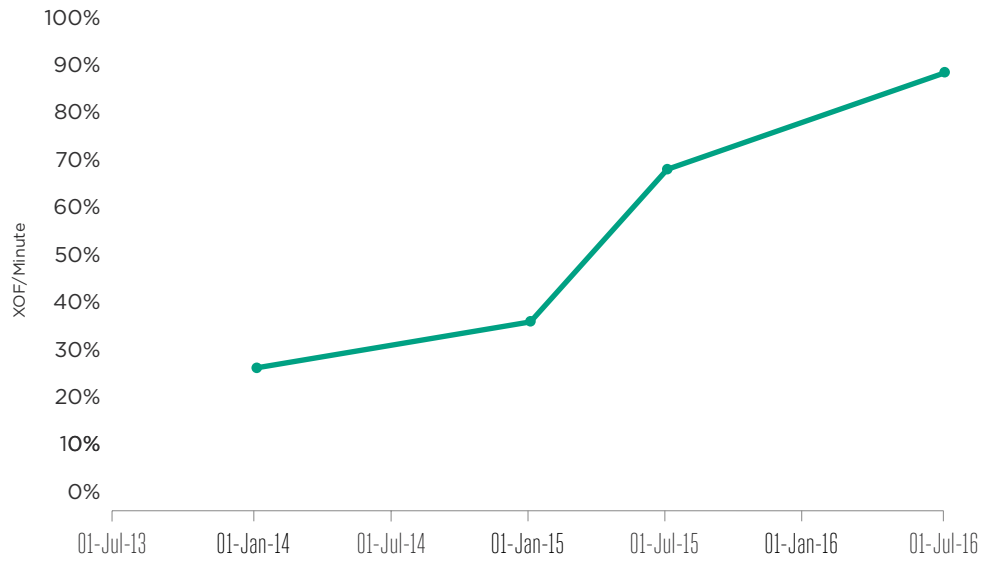
Source: World Bank Group (doingbusiness.org)

150. For more details, see: GSMA/Deloitte. 'Taxation on the mobile sector - Principles, best practice and options for reform'. (Forthcoming).
151. World Bank Group (doingbusiness.org)

Mobile operators face several sector specific taxes and regulatory fees in addition to general taxation, contributing to greater tax complexity. Aside from the number of taxes, a tax system may render business decisions more complex when it is frequently subject to change. Operators raised concerns about frequent increases in mobile specific tax rates, such as the TATTIE.

Figure 14

Changes in the TATTIE between July 2013 and July 2016



Source: Deloitte analysis based on operator data

There is evidence that mobile services can support a reduction in tax complexity, with potential benefits in terms of increased compliance. Promoting the development of the mobile sector may help to realise such benefits.

Transparency may also be affected by taxes and regulatory fees levied on operator revenue. Compared to standard sales taxes collected from consumers on behalf of the government, taxes and regulatory fees imposed directly on operators' revenue may mean that operators pass these taxes through to consumers in a non-transparent way, as they cannot itemise the taxes in prices or receipts.[152]

Mobile sector growth may support the principles of simplicity and transparency. The spread of mobile money services offers the opportunity to introduce mobile tax payments for individuals and businesses, which may reduce the costs of tax compliance.[153] Compliance may improve due to the reduced need for interaction with tax officials, which might entail perceived risks of corruption or harassment.[154] Institutions such as the World Bank[155] and the International Growth Centre[156] recognise the potential of digitalisation in this area, while the European Bank for Reconstruction and Development argues that *"cash is the most important enabler of the shadow economy"*, whereas mobile payment systems may make participating in the shadow economy more difficult, boosting transparency and reducing fraud.[157]

A number of African countries already enable citizens to use mobile money to pay their taxes including Kenya, Rwanda, Tanzania, Mauritius, Uganda and Cameroon.[158]

152. For more details, see: GSMA/Deloitte. 'Taxation on the mobile sector - Principles, best practice and options for reform' (Forthcoming).
153. Tanzania Economic Update, World Bank, 2015
154. Taxing the Informal Economy, Joshi et al, 2014
155. Digital Dividends, World Bank, 2016
156. Improving Tax Compliance in Developing Economies, International Growth Centre, 2012
157. Mobile Money Services Study, European Bank for Reconstruction and Development, January 2013
158. GSMA. (2014) '2014 State of the Industry: Mobile Financial Services for the Unbanked'; and Biztech Africa (2014). 'MTN, Orange, Cameroon govt launch Mobile Tax service'.

CASE STUDY: MOBILE INCOME TAX PAYMENTS IN MAURITIUS

In March 2014 the Mauritius Revenue Authority together with the State Bank of Mauritius enabled income tax payments via mobile for Orange Money customers. For the E-Filing season, over 123,000 returns have been received electronically (using mobile devices or online) compared to 10,000 manually submitted income tax forms.

Source: GSMA (2014). 'Paying taxes through mobile money: Initial insights into P2G and B2G payments'

CASE STUDY: MOBILE MONEY TAX PAYMENTS IN TANZANIA

In August 2013, The Tanzania Revenue Authority enabled tax payments over mobile money for property taxes and personal income taxes. Within one year of the introduction of this service, 15% of the tax base was making payments via mobile money including payers with no history of paying taxes.

Source: GSMA (2014). 'Paying taxes through mobile money: Initial insights into P2G and B2G payments'

EQUITY OF TAXATION

Equity suggests that those who are better off could bear higher taxes than those who are worse off. An equitable tax system is desirable not only in reducing poverty and improving fairness but also because it may encourage compliance. The IMF believes that *"[…] a perception of unequal treatment can jeopardize wider willingness to comply".*[159]

Any taxes on mobile services are likely to be regressive[160], as mobile ownership and usage costs tend to represent a higher proportion of income for lower-income subscribers. The use of sector specific taxes further adds to this effect. Some of these taxes, such as the fixed component of the TURTEL, are flat-rate taxes that are particularly regressive as they represent a higher proportion of income for the poorest consumers.

While limited data is available on the fiscal contribution of other sectors of the economy, the extensive use of mobile sector specific taxes and regulatory fees suggests that the treatment of different economic sectors may not be equitable. Moreover, services that compete with mobile services are not necessarily subject to the same level of taxation. For example, Over-The-Top (OTT) operators compete with mobile operators as they provide similar services, but potentially without establishing the same geographic ties to the country that mobile operators have, facing limited taxation. Taxation on international incoming calls may create further competitive distortions between OTT services and international calls made over mobile networks. A greater reliance on broad-based general taxation in place of sector specific taxation and exemptions may improve the overall equity of the tax system.

159. IMF. (2015). 'Current challenges in revenue mobilisation: improving tax compliance'.
160. A regressive tax takes a larger proportion of income from low-income earners than high-income earners. Any flat-rate tax that remains constant regardless of income levels is regressive.

Reforming mobile taxation has the potential to align infrastructure investment and mobile access with the ICT objectives laid out in the Programme de Renaissance II

3. Impacts of tax reforms on affordability, investment and economic growth

The government's *Renaissance II* programme includes a number of ambitious targets that are particularly relevant when considering tax reform on the mobile sector: [161]

- Achieving 100% mobile coverage and 70% penetration by 2021.
- Becoming a regional leader for new technologies in francophone West Africa.
- Improving the regulatory and institutional framework for the sector to stimulate an inclusive and competitive digital economy.
- Encourage the development of mobile based services for delivering healthcare and improving communication.

The current tax treatment of the sector may be hindering progress towards these goals. This section discusses how mobile taxation could impact affordability and investment, and considers potential options for tax reform, aimed at increasing mobile penetration whilst protecting the government's fiscal position.

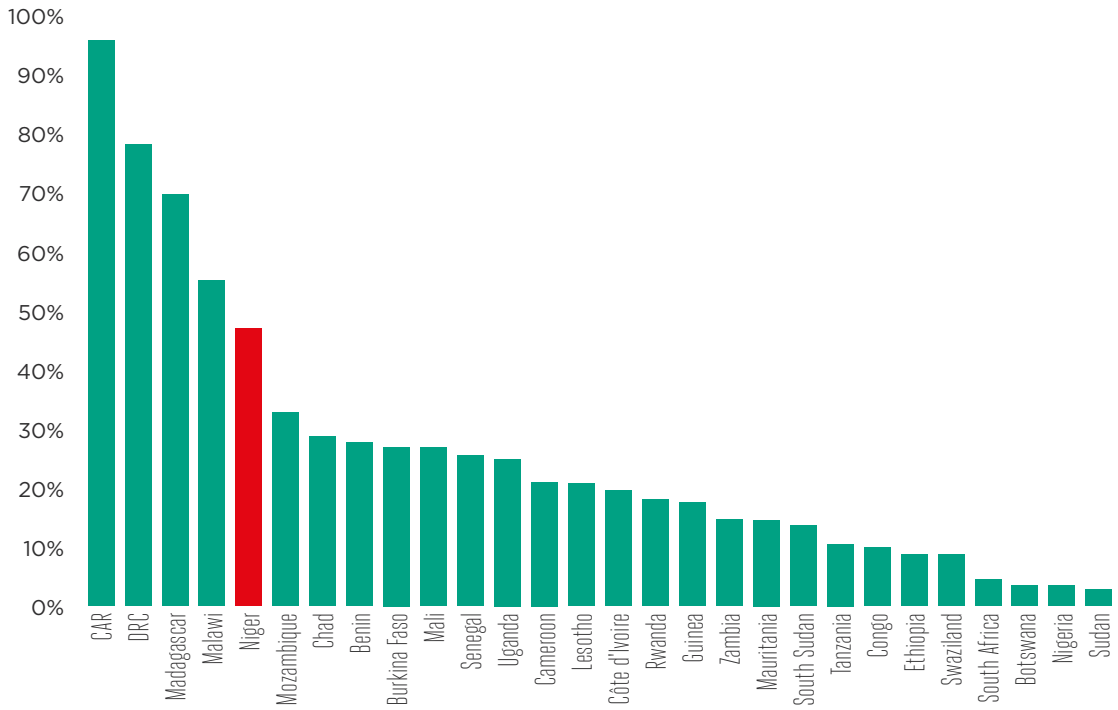
3.1 Tax reform could improve affordability of mobile services in Niger

Mobile services are currently unaffordable for many Nigeriens. For the average citizen, the representative monthly cost of voice and SMS usage is equal to 47% of average monthly income.[162] Mobile broadband are over twice as costly as basic 2G services and therefore likely to be unaffordable for the vast majority of Niger's population.[163]

161. Parti Nigérien pour la Démocratie et le socialisme - PNDS-TARAYYA. (2016) Programme de Campagne 'Renaissance II'.
162. Deloitte analysis based on ITU (2015). 'Measuring the Internet Society'. The reference basket is comprised of 30 outgoing calls per month and 100 SMS messages and World Bank database (2016).
163. Representative costs of voice/SMS and mobile broadband based on ITU (2015): 'Measuring the internet society'

Figure 15

Monthly mobile-cellular cost as a share of average monthly GNI, for selected African countries, 2014



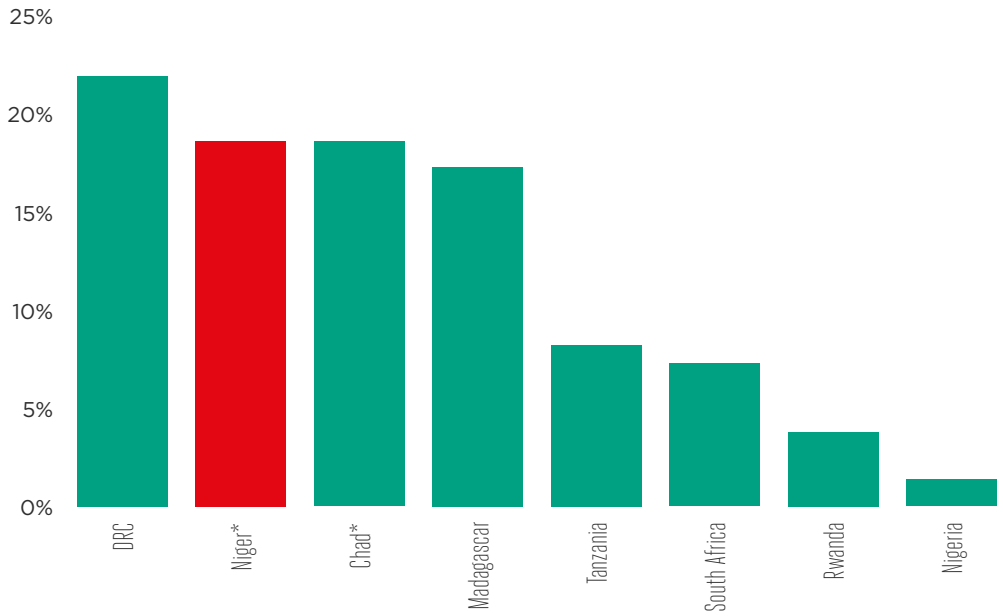
Source: Deloitte analysis based on ITU (2015): 'Measuring the internet society' and World Bank data

Affordability may be a particular concern for those at the bottom of the pyramid. For the poorest 20% of the population, the estimated cost of voice and SMS services amounts to 96% of average monthly income. This figure does not include the cost of purchasing a handset; for example, a basic mobile phone might cost around US$ 20 (XOF 13,000), which represents over 40 days' income for the poorest 20% of the population.

By potentially affecting prices, taxes and regulatory fees on mobile services may add to the affordability barrier and lower the consumption of such services. In 2015, average tax and regulatory fee payments by the mobile sector per subscriber represented over a fifth of income for the poorest 20% of consumers. This is high compared to most other African countries for which data is available.

Figure 16

Tax and regulatory fee payments per subscriber as a share of average GNI for those in the bottom 20% income group, for selected African countries for which data is available, 2014 and 2015



*Source: Deloitte analysis based on GSMA Intelligence, mobile operator data and World Bank data. *Indicates 2015 data*

Reductions in consumer taxes in particular have the potential to improve consumer access to mobile connectivity. For example:

- Affordability of mobile ownership could be improved by reducing the activation charges in relation to the TURTEL tax of XOF 250 (US$ 0.40) on new SIM cards, or the customs duty of 10% on imported handsets, would have the potential to lower the barrier to accessing mobile services by making mobile phone ownership more affordable.
- Affordability of mobile usages could be improved by lowering the variable component of the TURTEL of 3% which has the potential to enable consumers to make more extensive use of valuable mobile services. In 2015, payments of this tax totalled to over XOF 4 million (US$ 6,400).

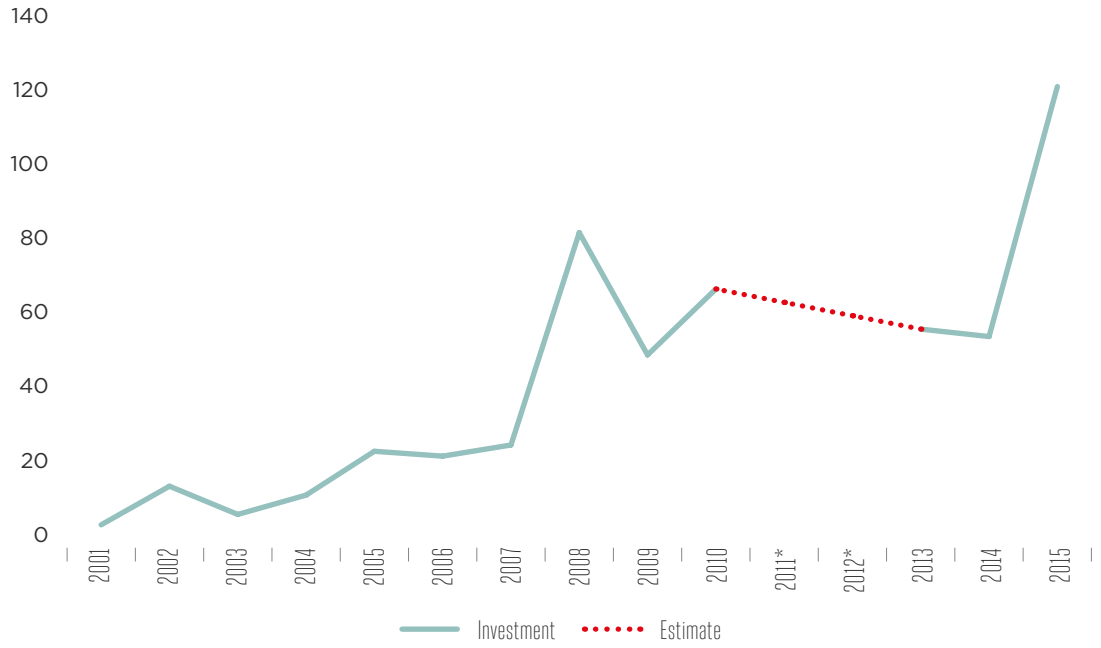
3.2 Tax reform could stimulate mobile sector investment and FDI in Niger

The mobile sector is characterised by significant upfront investment in spectrum acquisition, equipment purchase, network rollout and points of sale. With a predominantly rural population and relatively few commercial centres the costs involved in extending and upgrading mobile networks are likely to be substantial.

Despite this challenging environment, mobile operators are estimated to have invested a total of over XOF 600 billion (US$ 96 million) between 2001 and 2015, based on government and regulator analysis.[164] Over that period, this amount represents close to half of the revenue realised by the mobile industry.[165]

Figure 17

Investment by mobile operators between 2001 and 2015, XOF billion



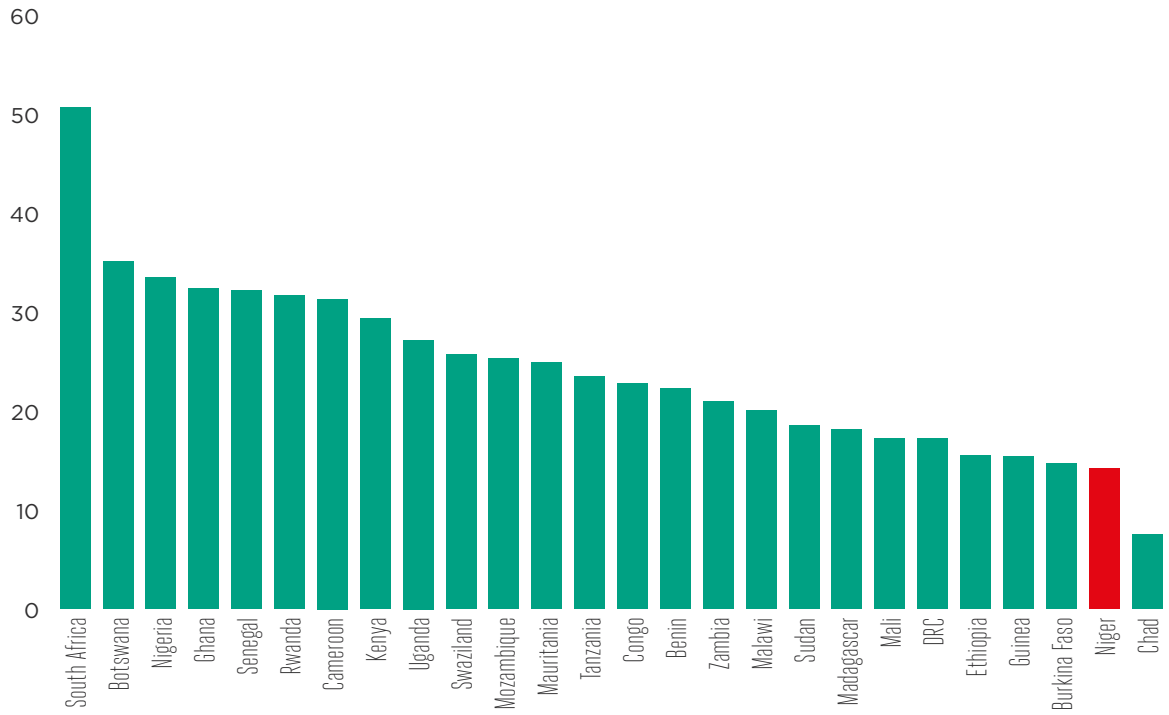
*Source: Deloitte analysis based on: Ministère de la Communication et des Nouvelles Technologies de l'Information (2012). 'Document de Politique Sectorielle des Télécommunications et des Technologies de l'Information et de la Communication'; ARTP (2014). 'Rapport Annuel 2014'; and ARTP (2015). 'Rapport Annuel 2015'. *Indicates years for which data is unavailable*

Despite the mobile sector's investment efforts, mobile infrastructure remains relatively underdeveloped. The GSMA Mobile Connectivity Index compares 134 countries and places Niger second to last in terms of infrastructure, taking into account network coverage, network performance indicators (such as mobile download speeds), other enabling infrastructure (such as access to electricity) and spectrum use.

164. Deloitte analysis based on: Ministère de la Communication et des Nouvelles Technologies de l'Information (2012). 'Document de Politique Sectorielle des Télécommunications et des Technologies de l'Information et de la Communication'; ARTP (2014). 'Rapport Annuel 2014'; and ARTP (2015). 'Rapport Annuel 2015'.
165. GSMA Intelligence.

Figure 18

Infrastructure score in the GSMA Mobile Connectivity Index for selected African countries for which data is available, 2016



Source: GSMA Mobile Connectivity Index 2016

To meet the government's objective of 100% coverage, major network investment may be required. As Niger's main operators are subsidiaries of multinational companies, their investment decisions may depend on the relative attractiveness of the business environment in different countries. An IMF report has identified a need for countries in the West African Economic and Monetary Union to "Promote economic diversification and private sector led-growth: scale-up investment on key infrastructure [...]", including by addressing fiscal and administrative challenges faced by businesses.[166]

FOREIGN DIRECT INVESTMENT (FDI) IN THE MOBILE SECTOR

Various studies demonstrate the importance of FDI in supporting economic and social progress in developing countries. A recent academic study finds that FDI has a positive effect on long-term economic growth in SSA countries.[167]

The OECD has stated that:

"Given the appropriate host-country policies and a basic level of development, a preponderance of studies shows that FDI triggers technology spillovers, assists human capital formation, contributes to international trade integration, helps create a more competitive business environment and enhances enterprise development. All of these contribute to higher economic growth, which is the most potent tool for alleviating poverty in developing countries."[168]

FDI in recent years has been strongly affected by investment projects in the mining and oil sector.[169] While the available data on Niger's FDI inflows is limited, the fact that the mobile sector accounted for 5% of GDP in 2015[170] and predominantly consists of multinational companies may indicate that the mobile sector is also among those sectors contributing substantially to FDI. Increased investment from the telecom sector could help drive FDI higher and support Niger's development.

166. IMF (2016). 'IMF country report No. 16/96'.
167. Barbi, F. and da Costa Jr. C. (2016). 'Does FDI matter for Sustainable Growth in Sub Saharan Africa? Evidence from a Heterogeneous Panel'.
168. OECD. (2002). 'Foreign Direct Investment for development. Maximising benefits, minimising costs'.
169. IMF (2016). 'IMF Country report No. 16/247'
170. Deloitte analysis based on GSMA Intelligence and IMF (2016). 'IMF Country report No. 16/247'

Investment by the telecom sector may be particularly important because of the potential benefit that improved telecom networks may have on FDI in other sectors. A well-developed mobile infrastructure may enhance ease of doing business and attract foreign investors. For example, one study finds that good infrastructure promotes FDI in Africa,[171] while another finds a positive relationship between mobile penetration and FDI in developing countries.[172]

3.3 Impacts of specific tax reforms

To estimate the quantitative impacts of specific reforms, an economic model of Niger's economy and mobile sector was constructed, using sector specific data from the GSMA and mobile operators in Niger, together with macroeconomic data from the IMF and the World Bank. This allows the model to represent both the mobile sector and its gross impacts on the economy as a whole. This approach also enables comparison between a base case that uses current projections for the sector and the reform scenarios.[173]

The modelling involves several steps and assumptions, which are discussed in detail in the methodology Appendix, and summarised here:

1. The model first computes the impact on prices. The level of taxation and regulatory fees applied to the mobile sector are reflected in the retail prices operators charge for using their services. Therefore, a change in taxation or regulatory fees will lead to a change in the retail price of mobile services. A pass-through rate represents the percentage of the tax and regulatory fee payments that is reflected in the retail price of mobile services.

2. The amount that is not passed through to prices can either be reinvested into the network or retained as profit for the operators. The amount that is reinvested into the network can be used to either build new sites or upgrade sites to mobile broadband.

3. The model then computes the impact of the price change on demand. The price of mobile services determines the demand and therefore the aggregate consumption of mobile services. The price elasticity of demand describes the responsiveness of demand to a change in the price; defined as the percentage change in demand resulting from a given percentage change in price

4. Changes in the level of consumption of mobile services lead to a new level of revenue generated by operators, which changes the level of taxes and regulatory fee payments and labour demand accordingly.

5. These changes to the mobile sector lead to direct impacts on value-added and employment and, through spillover effects, on the wider economy, in particular on real GDP, tax revenue, employment and investment.

6. An elasticity determines the impact of a change in mobile penetration on GDP growth. Multipliers allow changes in mobile sector employment to affect the wider labour force in Niger. Productivity is calculated using the Total Factor Productivity impact.

171. Asiedu, Elizabeth. (2006). 'Foreign direct investment in Africa: The role of natural resources, market size, government policy, institutions and political instability.' *The World Economy.*
172. Lydon, Reamonn, and Mark Williams. (2005). 'Communications networks and foreign direct investment in developing countries.' *Communications & Strategies.*
173. Other potential impacts on the sector that may arise from current reform programmes are not explicitly modelled but may have been considered in projections by the GSMA or third party sources and would therefore be taken into account in the base case. The policy reform scenarios were estimated separately and their interactions are not considered.

3.3.1 Removing the TATTIE

The TATTIE of XOF 88 (US$ 0.14) per minute is sector specific and has been increased three times in less than three years. It may have a strong influence on the price of incoming international calls; a recent GSMA/Deloitte study has found that the introduction of taxes on international incoming traffic increased international termination charges by an average of 97% in ten African countries.[174]

The same study finds that:

- While the direct price impact affects foreign users, there is evidence of reciprocation by other countries who increased their charges for termination of calls originating in countries that impose a tax on incoming international calls.[175] This may mean that prices for outgoing international calls rise domestically.

- Imposing the tax may increase incentives for illegal traffic routing, taking away revenue from operators and governments, while reducing quality of service for consumers. It may also be regressive, as wealthier users may be able to switch to OTT services such as Skype in response to higher international call prices.

- The tax may increase the costs of doing business, with negative economic consequences for international trade, foreign investment and global competitiveness.

A study by the OECD also finds that call volumes have *"dramatically decreased"* after the introduction of a tax on incoming international calls.[176] The OECD raises concerns on the wider economic impact of reduced international telecommunications traffic through the positive impact that it may have on trade, development of a services industry and the overall competitiveness of the region. This suggests that the long run costs may be significantly larger than the short run costs.

Table 5

Impacts of the tax on incoming international calls in selected African countries

Country	Period	Estimated lost minutes	Estimated lost corporate tax (US$)*
Benin	Feb 2011 to Sep 2013	147 million	1.0 million
Democratic Republic of Congo	Jun 2013 to Mar 2014	90 million	2.6 million
Gabon	Aug 2011 to Mar 2014	161 million	4.2 million
Ghana	Aug 2011 to Mar 2014	679 million	3.2 million
Tanzania	Aug 2011 to Mar 2014	110 million	2.7 million
Uganda	Aug 2011 to Mar 2014	9 million	0.9 million
Total	**Jun 2010 to Mar 2014**	**1,195 million**	**14.6 million**

Source: GSMA/Deloitte (2014). 'Surtaxes on International Incoming Traffic in Africa'.
**Includes lost corporate tax from reduced mobile operator revenue + lost corporate tax from businesses trading with other countries that have a tax on incoming international calls.*

174. GSMA/Deloitte (2014). 'Surtaxes on International Incoming Traffic in Africa'.
175. Based on mobile operator responses in GSMA/Deloitte (2014). 'Surtaxes on International Incoming Traffic in Africa'.
176. International Traffic Termination, OECD Digital Economy Papers No. 238

Another recent OECD analysis of African countries has found that increases in taxes on incoming international calls may be ineffective in increasing the total revenue received from these taxes, due to the reduction in incoming call volumes.[177] Therefore, increases in these taxes may be ineffective in increasing the revenue raised. Moreover, extensive traffic monitoring is often carried out by an external body (as in Niger), which typically receives a significant share of the proceeds from the tax. A recent study by Deloitte/GSMA finds that in six out of ten African countries for which data was available, the government retained only around 50% of the revenue raised from taxes on incoming international calls.[178]

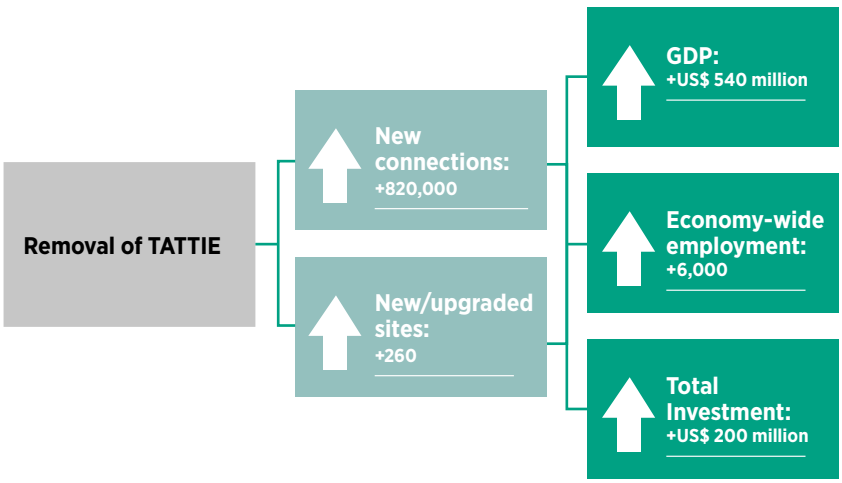
Based on 2015 data, eliminating the TATTIE would equate to a tax payment reduction of around US$ 28.6 million (XOF 16.9 billion)[179], which represents 2.5% of government tax revenue in 2015 and almost 20% of the mobile sector's tax and regulatory fee contribution.[180] Because this constitutes a relatively large payment for mobile operators, a removal of this tax has the potential to create significant benefits to the wider economy.

Assuming that 80% of the savings are passed through to consumers and 60% of the rest of tax savings are invested, this reform could have the following impacts:

- **New connections:** price reductions have the potential to generate an additional 820,000 connections over the five year period to 2021. This amount equates to almost 12% of the total volume of connections in 2016.[181] Of the new connections, 140,000 could use mobile broadband.
- **Increase in economic growth:** The increase in mobile ownership and usage has the potential to increase GDP by a total of US$ 540 million (XOF 340 billion) over the five years to 2021. This would add almost 2% to the country's GDP in 2021.
- **Additional investment:** Increased resources for investment have the potential to create around 260 new or upgraded base stations by 2021. In the wider economy, total investment could increase by US$ 200 million (XOF 120 billion) over the five years to 2021.
- **Job generation:** increased investment in the mobile sector has the potential to increase employment in the sector by 2,500 jobs, and by 3,500 employees in the wider economy.

Figure 19

Estimated cumulative economic impact of removal of the TATTIE, 2017-2021



Source: Deloitte analysis using GSMA, World Bank and operators' data. Figures are rounded.

177. OECD Working Party on Communication Infrastructures and Services Policy. (2015). 'International traffic termination'
178. GSMA/Deloitte (2014). 'Surtaxes on International Incoming Traffic in Africa'. p. 14.
179. Deloitte analysis of operator data.
180. Deloitte analysis based on Niger GDP and tax revenue data in IMF (2016). 'IMF Country report No. 16/247'.
181. Based on GSMA Intelligence data for Q2 2016.

3.3.2 Reducing the variable component of the TURTEL

The variable component of the TURTEL (3% of revenue) represents a larger share of total tax and fee payments by mobile operators than the fixed component (XOF 250 (US$ 0.40) per SIM card). This section focuses on the variable component and the fixed component is discussed separately in Section 3.3.4.

The variable component of the TURTEL, levied on revenue earned from mobile usage, is another example of sector specific taxation. If passed through to consumers, it may further increase the prices of mobile services already subject to general taxes, such as VAT, which are high compared to other African countries.

Payments of the variable component of the TURTEL totalled almost US$ 7 million (XOF 4.3 billion) or US$ 1.40 (XOF 860) per subscriber in 2015.[182] Given that the poorest consumers tend to be particularly price sensitive, even small changes in prices may create positive effects on take-up and usage. Reducing or eliminating the taxes could help to minimise distortions on mobile usage and promote a more equitable tax system.

International experience of tax reforms suggests that eliminating taxes on the usage of mobile services has the potential to drive higher mobile penetration and usage. For example, Uruguay abolished a tax on airtime and saw penetration more than double and average usage more than treble over the following years. Ecuador abolished a tax on mobile usage; mobile penetration increased from 70% to over 110% and usage per user more than doubled between 2008 and 2011.[183] Conversely, increases in such taxes may have a dampening effect on penetration growth.

Case study: Tax increases in Senegal[184]

In October 2010, Senegal increased a tax charged on telecom services (RUTEL), similar in nature to the TURTEL, from 2% to 5% on revenue. While other developments may have affected the mobile sector, market penetration showed slower growth following this tax change, and growth fell once another tax (CODETE) was increased. Subsequently, when another sector specific tax (rural telephony tax) was removed in 2012, the growth rate of penetration rose from 5% to 19% within a year.[185]

In recognition of the challenging fiscal outlook for Niger, as an illustrative example, impacts are estimated for a 50% reduction in the variable component of the TURTEL, rather than a complete removal of the tax. Based on 2015 data, this change equates to a tax payment reduction of around US$ 3.5 million (XOF 2.1 billion)[186], which represents 0.3% of government tax revenue and 2.4% of the mobile sector's tax and regulatory fee contribution.[187]

Assuming that 90% of the savings are passed through to consumers and 60% of the rest of the savings are invested, this reform could have the following impacts:

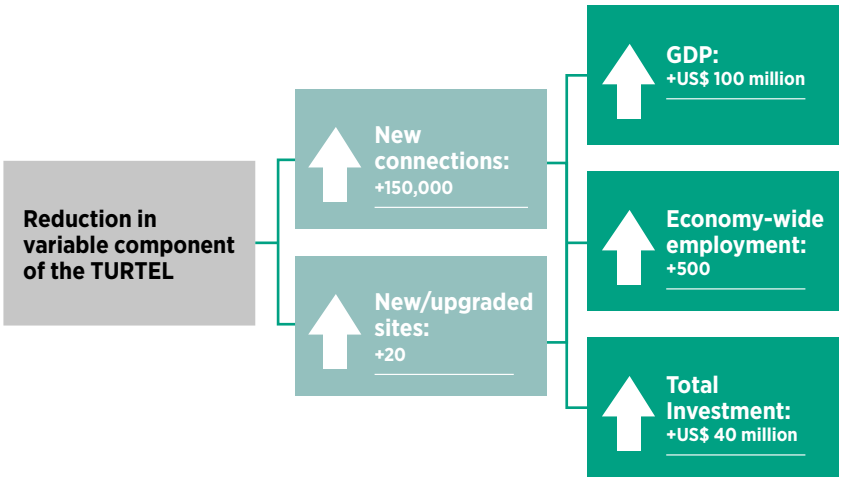
- **New connections:** price reductions have the potential to generate an additional 150,000 connections over the five year period to 2021. This amount equates to over 2% of the total volume of connections in 2016.[188] Of the new connections, 30,000 could use mobile broadband.
- **Increase in economic growth:** The increase in mobile ownership and usage has the potential to increase GDP by a total of US$ 100 million (XOF 60 billion) over the five years to 2021, adding 0.3% to GDP in 2021.

182. Deloitte analysis of operator data and GSMA Intelligence.
183. GSMA/Deloitte, 2012, 'Mobile telephony and taxation in Latin America'. Other developments in these countries may have affected the mobile sector at the same time as the tax changes.
184. GSMA/Deloitte. 'Taxation on the mobile sector - Principles, best practice and options for reform.' (Forthcoming); and GSMA/Deloitte (2011). 'Global Mobile Tax Review 2011'.
185. Deloitte analysis of GSMA Intelligence data, mobile penetration (unique subscribers).
186. Deloitte analysis of operator data.
187. Deloitte analysis based on Niger GDP and tax revenue data in IMF (2016). 'IMF Country report No. 16/247'.
188. Based on GSMA Intelligence data for Q2 2016.

- **Additional investment:** Increased resources for investment has the potential to create around 20 new or upgraded base stations by 2021. In the wider economy, total investment could increase by US$ 40 million (XOF 20 billion) over the five years to 2021.
- **Job generation:** increased investment in the mobile sector has the potential to increase employment in the sector by 200 jobs, and by 300 employees in the wider economy.

Figure 20

Estimated cumulative economic impact of reduction in the TURTEL, 2017-2021



Source: Deloitte analysis using GSMA, World Bank and operators' data. Figures are rounded.

3.3.3 Reducing regulatory fees

The various regulatory fees are sector specific, increasing the financial contribution of the mobile sector relative to other sectors. Moreover, these fees are levied on operator gross revenue rather than profitability, which can create a number of inefficiencies, including discouraging investment (see section 2.4 for more detail). The fact that regulatory fees are based on revenue before interconnection charges effectively creates a higher fee payments. This is because income from interconnection charges is not offset by equivalent interconnection payments to other operators. Other countries in the region such as Senegal or Chad exclude interconnection charges from operator revenue.[189]

189. GSMA/Deloitte (forthcoming). Digital inclusion and mobile sector taxation in Chad' and operator data.

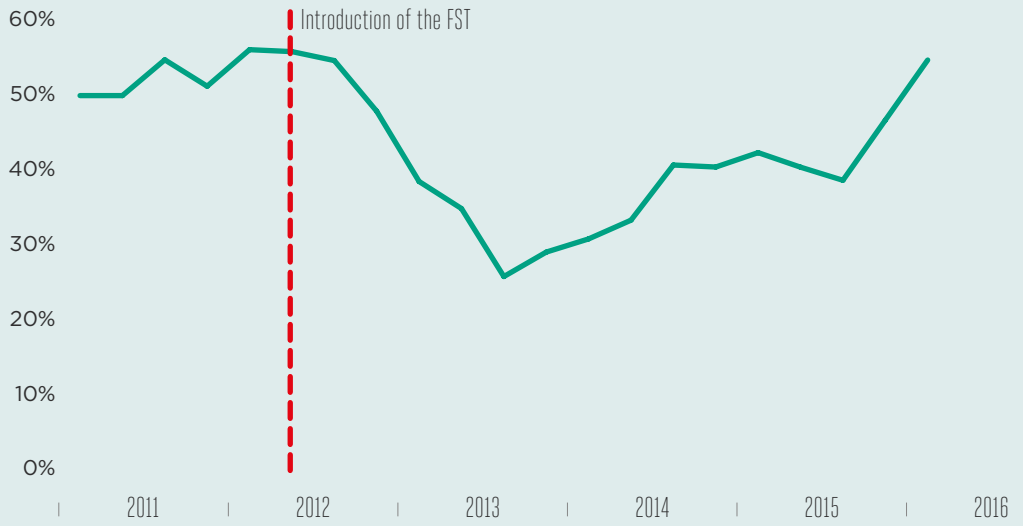
Case study: Introduction of sector specific regulatory fees in Cameroon[190]

In Cameroon a sector specific fee on operators' revenue of 3% (FST) was introduced in June 2012, which operators pay in addition to a variety of other taxes and fees.

While other developments in the country may have affected the market, evidence from GSMA Intelligence shows that the annual growth rate of unique subscriber penetration fell by 50% in the year following the introduction of the FST. Market penetration, measured by total subscribers also dropped by 0.4% over the same period.

Figure 21

Annual growth of unique mobile internet subscriber penetration in Cameroon between 2011 and 2016



Source: GSMA/Deloitte, Taxation on the mobile sector - Principles, best practice and options for reform, (Forthcoming)

A reduction in regulatory fee rates and rationalisation of the overall structure of fees could help create a more favourable environment for investment as well as reducing prices for consumers. As part of this process, reforming the fees so that they apply to revenue net of interconnection costs would be in line with international best practice.

Given that there are several types of regulatory fees imposed on operators, various possible reforms may be possible to rationalise the fee system and reduce the overall level of fees imposed. As an illustrative example, impacts are estimated for a reduction in the regulatory licence fee rate from 2% to 1% which would reduce the cumulative rate of regulatory fees form 6.5% to 5.5%.

Based on 2015 data, this change equates to a tax payment reduction of around US$ 3.3 million (XOF 2.0 billion),[191] which represents 0.3% of government tax revenue and 2.2% of the mobile sector's tax and fee contribution.[192]

Assuming that 80% of the savings are passed through to consumers and 60% of the rest of the savings are invested, this reform could have the following impacts:

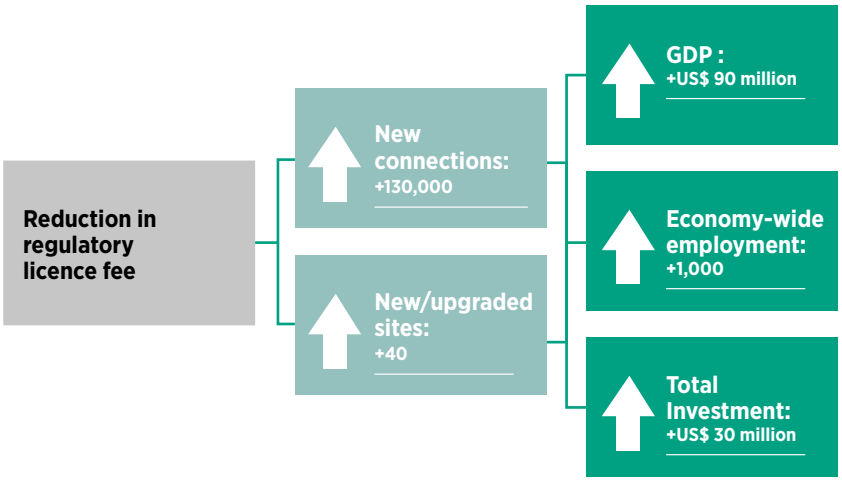
- **New connections:** price reductions have the potential to generate an additional 130,000 connections over the five year period to 2021. This amount equates to almost 2% of the total volume of connections in 2016.[193] Of the new connections, 20,000 could use mobile broadband.

190. GSMA/Deloitte. 'Taxation on the mobile sector - Principles, best practice and options for reform.' (Forthcoming).
191. Deloitte analysis of operator data.
192. Deloitte analysis based on Niger GDP and tax revenue data in IMF (2016). 'IMF Country report No. 16/247'.
193. Based on GSMA Intelligence data for Q2 2016.

- **Increase in economic growth:** The increase in mobile ownership and usage has the potential to increase GDP by a total of US$ 90 million (XOF 50 billion) over the five years to 2021, adding 0.3% to GDP in 2021.
- **Additional investment:** Increased resources for investment has the potential to create around 40 new or upgraded base stations by 2021. In the wider economy, total investment could increase by US$ 30 million (XOF 20 billion) over the five years to 2021.
- **Job generation:** increased investment in the mobile sector has the potential to increase employment in the sector by 400 jobs, and by 600 employees in the wider economy.

Figure 22

Estimated cumulative economic impact of reduction in the regulatory licence fee, 2017-2021



Source: Deloitte analysis using GSMA, World Bank and operators' data. Figures are rounded.

Moreover, the base of this regulatory fee could be amended to cover only revenue after interconnection charges to align more closely with other countries in the region.

3.3.4 Other options for mobile sector tax reform

The three tax changes above illustrate the potential economic gains from reforming three particular taxes and regulatory fees in line with best practice principles. Other options are available that may generate similar positive impacts

Reduction or removal of upfront taxes on mobile handsets

Given the low income levels in Niger, the purchase of any mobile handset may be a prohibitively high expense for many Nigeriens, while the price of smartphones in particular may exclude the majority of the population from accessing the internet. Tax reforms aimed at reducing the price of handsets have the potential to drive mobile penetration and internet usage, unlocking social and economic benefits. Several African countries have implemented or are considering such reforms.

One approach may be to reduce or eliminate the VAT on mobile handsets. Kenya, Rwanda and Senegal have all exempted mobile handsets from VAT. The experience from these countries suggests that such reforms have the potential to drive mobile penetration and benefit the economy as a whole.

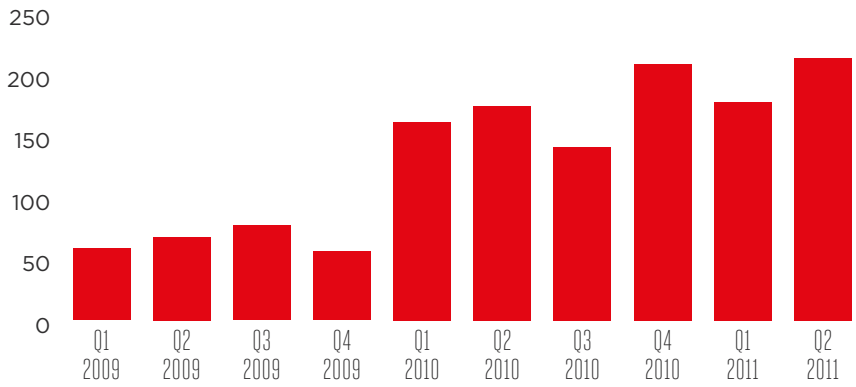
Case study: VAT exceptions on handsets in Kenya[194]

In 2009, the Kenyan government exempted mobile handsets from the 16% VAT rate. In the three years following, the VAT reduction coincided with a 200% increase in handsets sales, outpacing growth elsewhere in Africa. This increase contributed to an increase in penetration from 50% to 70%, seven percentage points above the average across African countries.

Over the same period, the contribution of mobile telephony to the Kenyan economy grew by nearly 250%, while mobile-related employment increased by 67%.

Figure 23

Number of handsets sold by the largest mobile operator in Kenya, Q1 2009 to Q2 2011, (thousands)



Source: GSMA/Deloitte (2015). 'Digital inclusion and mobile sector taxation 2015'

194. GSMA/Deloitte (2015).' Digital inclusion and mobile sector taxation, 2015'; and GSMA/Deloitte, 2011, 'Mobile telephony and taxation in Kenya'.

An alternative approach may be to reduce or remove customs duties on mobile handsets. For example, Ghana appears set to reduce customs duty on mobile phones by half, as well as exempting these from VAT.[195] Mobile phone imports are also exempt from customs duty in Senegal.[196]

The above countries have seen stronger growth in mobile penetration than Niger and have all exceeded 50% mobile penetration (unique subscribers) by 2016. Niger's mobile penetration lags behind at 24%.[197]

Removal of the TURTEL tax on SIM cards

The fixed component of the TURTEL, a tax of XOF 250 (US$ 0.40) levied on new SIM cards, is sector-specific and may increase the upfront costs of mobile ownership. Applying this tax as a flat rate is regressive, as its amount represents a higher proportion of income for the poorest consumers. Reducing or eliminating the tax has the potential to drive penetration further by lowering the barrier to mobile ownership.

Reduction or removal of taxes on network equipment

Customs duties on imported network equipment may contribute to raising the costs of expanding coverage, which is currently estimated at around 80% nationally.[198] Mobile operators paid almost US$ 4 million (XOF 2.4 billion) in the UEMOA External Tariff for network equipment.

For example, in Togo network equipment is exempt from customs duty[199]. Similarly in Côte d'Ivoire, customs duty rates on equipment are reduced relative to other goods and services.[200]

Changes to the Universal Service Fund

Operators currently contribute 4% of revenue to the USF, which represented 9% of the sector's total tax and regulatory fee payments.[201] The application of this fee to gross revenue differs from other countries in the region, which levy similar fees on revenue net of interconnection costs.

USF funds can play a role in delivering investment in network expansion and improvement in rural areas, where the commercial incentives for investment may be limited. However, USFs may not always be the most efficient way of promoting investment. A study by GSMA has found that USFs typically have large volumes of unused funds[202] and another study by the ITU has found that less than 40% of USFs are enabled to fund broadband deployment.[203]

There may be a case for reducing the USF contribution in order to make more resources available to operators for investment in network expansion and further rollout of 3G and 4G services. In general, the reliance on USFs may be reduced as networks evolve.

195. IT Web Africa (2015). 'Ghana slashes tariff on imported phones by 50%'. Retrieved from: http://www.itwebafrica.com/mobile/352-ghana/236954-ghana-slashes-tariff-on-imported-phones-by-50
196. PwC (2016). Worldwide Tax Summaries.
197. GSMA Intelligence. Other developments may have affected the mobile sector in these countries as well as the tax change.
198. GSMA Intelligence
199. IBFD (2016). 'Togo – Corporate Taxation'.
200. IBFD (2014). 'Ivory Coast – Corporate Taxation'.
201. Deloitte analysis based on operator data.
202. GSMA (2013). 'Survey of Universal Service Funds, GSMA'.
203. ITU (2013). 'Universal Service Fund and digital inclusion for all'.

3.4 Options for rebalancing taxation revenue

The mobile industry recognises the importance of the current revenue that Niger's government obtains from taxes on the mobile sector. In the medium term, tax reductions on the mobile sector are likely to have a positive impact on wider tax revenue for the government, due to the benefits from increased mobile usage and increased investment across the economy.

In the short term, the tax changes in each of the three scenarios create a tax revenue shortfall. The government may consider alternative ways to cover the shortfall. Relatively marginal changes to general taxation, such as VAT or corporation taxes, may be sufficient to cover the shortfall from reductions in distortionary sector specific taxation.

The size of tax revenue shortfalls is small relative to revenue from general taxation, especially for reductions in the TURTEL and the regulatory licence fee

The tax revenue shortfall from reductions in taxes and regulatory fees on the mobile sector would be relatively limited compared to total tax revenue. Based on tax revenue data published by the Institut National de la Statistique and the IMF for 2015, the tax revenue shortfall from each proposed tax reform option is estimated below relative to total tax revenue.

Table 6

Tax revenue shortfall in each scenario relative to total tax revenue in 2015

Tax change	Tax revenue shortfall relative to total tax revenue
Removal of the TATTIE	2.47%
Reduction in the TURTEL	0.30%
Reduction of regulatory licence fee	0.29%

Source: Institut National de la Statistique, IMF; operator data; Deloitte analysis.

Small changes in general taxation may be sufficient to cover tax revenue shortfalls

The largest estimated tax revenue shortfall in the short-term arises from the removal of the TATTIE, while the shortfall in the other proposed tax reforms is around 0.3%. This however should be weighed against the potential for significant economic and social benefits of removing the TATTIE. Additionally, it is not known whether the government retains the full revenue out of this tax.

Given that the tax shortfall from two of the proposed tax reforms is below 0.5% of total tax revenue, and if the government does not retain all the revenue earned on the TATTIE, a small increase in general tax rates may be sufficient to cover the shortfall in the short term. Similarly, a small increase in the breadth of general tax bases may be sufficient to cover the shortfall.

Incomes from VAT make up around 33% of total tax revenue.[204] Estimates of the VAT rate (currently 19%) required to make up the tax revenue shortfall in each scenario are provided in the table below.

Table 7

Indicative estimates of VAT rate required to cover tax revenue shortfall

Tax change	Estimated VAT rate required
Removal of the TATTIE	20.43%
Reduction in the TURTEL by 50%	19.17%
Reduction of regulatory licence fee by 50%	19.17%

Source: Institut National de la Statistique; IMF; operator data; Deloitte analysis

The estimations do not take into account the impacts that these increase may have on the wider economy[205]: they however illustrate the marginal impact of mobile sector specific taxes on general taxation. The indicative tax rate increases shown above can also act as an indication of potential changes to any other general taxes such as corporation taxes that generate a significant proportion of total tax revenue. For the removal of the TATTIE a smaller increase may be sufficient if the government currently makes payments to the third party monitoring body.

The above estimates are intended to give perspective on the scale of general tax changes potentially required to cover tax revenue shortfalls; it is acknowledged that in practice it may not be feasible to set VAT rates using decimals. It may be possible to use other taxes or a combination of taxes, such as direct taxes, in a similar way to cover the revenue shortfall from each scenario. Estimations for other possible tax changes cannot be provided due to the lack of data on tax revenue from different types of taxes.

204. INS Niger (2015). 'Comptes Economiques de la Nation'.
205. The representative general tax rate increases are estimated through a static analysis and subject to the following stringent assumptions. For these estimated increases in general taxation to be able to recover the sector specific taxation revenue, it is assumed that the increases in general taxation do not have any impacts on the economy's consumption, incomes, pre-tax profit and investment. Increases in general taxation could have direct impacts on the tax revenue raised from that specific tax but also indirect impacts on the revenue collected from other general taxes. For example, a rise in the income tax could directly cover the lost tax revenue but then reduced expenditure could reduce VAT and corporate tax revenue. As such, increases in general taxation may need to be higher than estimated. A macro-economic model of the Pakistani economy would be required to estimate these effects. For a methodology on estimating the effect of fiscal policy of short term economic output, see IMF (2014) 'A Simple Method to Compute Fiscal Multipliers'. For tax specific evidence, see Djankov (2014) on corporate taxes and investment, or Feldstein (1986) on income tax rate and taxable income or the OECD (2014) on the distributional impact of consumptions taxes.

4. Reforming taxation on the mobile sector in Niger

While taxation from the mobile sector remains critical to continue financing public, especially in light of a recent slowdown in economic activity due to security concerns and resource price shocks, the current tax system applies several mobile sector specific taxes and regulatory fees that may be obstructing growth of the mobile sector. Some of these taxes have been introduced or increased in recent years.

Using mobile phones is unaffordable for many Nigeriens, and despite continuous investment by mobile operators, the country's mobile infrastructure is underdeveloped relative to other countries. Sector specific taxes and regulatory fees on mobile operators and consumers – in particular the TATTIE, the TURTEL and various regulatory fees – are likely to compound the problem of affordability and limit further investment in infrastructure. The distortions created by such taxes may mean that millions of Nigeriens remain unconnected.

Reforming mobile taxation could help to align infrastructure investment, mobile access and coverage with the ICT objectives laid out in the Renaissance II programme. Based on the best practice principles and on evidence from a series of studies that have examined mobile taxation in numerous countries worldwide, a number of potential areas for tax reform could be considered by the Nigerien government:

- Sector specific taxes and regulatory fees could be substituted with reforms in line with the principle, suggested for example by international organisations such as the World Bank[206], that low rates on wider tax bases are to be preferred to higher taxes on narrow bases. The government could seek to remove the TATTIE or lower the variable component of the TURTEL to align taxes on the mobile sector more closely to the taxation of standard goods and services.

- Harmonising and simplifying the tax framework on the industry could reduce the negative impacts of taxation. For example, the current set of regulatory fees and payments could be rationalised into a simpler structure, with rates set so as to cover the necessary regulatory costs without excessively distorting prices and investment.

- Taxation could be designed in a way that extends connectivity to those that remain unconnected. The fixed component of the TURTEL and taxes on handsets could be lowered to reduce the affordability barrier for consumers purchasing a mobile handset for the first time.

206. Bird and Zolt (2003). 'Introduction to Tax Policy Design and Development'.

A phased reduction of mobile specific taxes would offer the government the opportunity to benefit from the economic contribution from mobile whilst controlling the fiscal impact in the short term. Increased mobile usage, and higher internet usage in the longer term, could benefit society as a whole, promoting development across economic sectors and helping to promote infrastructure investment as set out in recommendations provided by the IMF.

As the sector develops further, it is also important that the government does not apply sector specific taxation, over and above general taxes, to innovative mobile services that generate economic and social benefits. Mobile money, for example, has already been successfully used to distribute cash in urban areas of Niger and could give many more Nigeriens the opportunity to access financial services for the first time. The government would risk reducing the growth of such services if sector specific taxation were imposed.

5 Appendix: Methodology

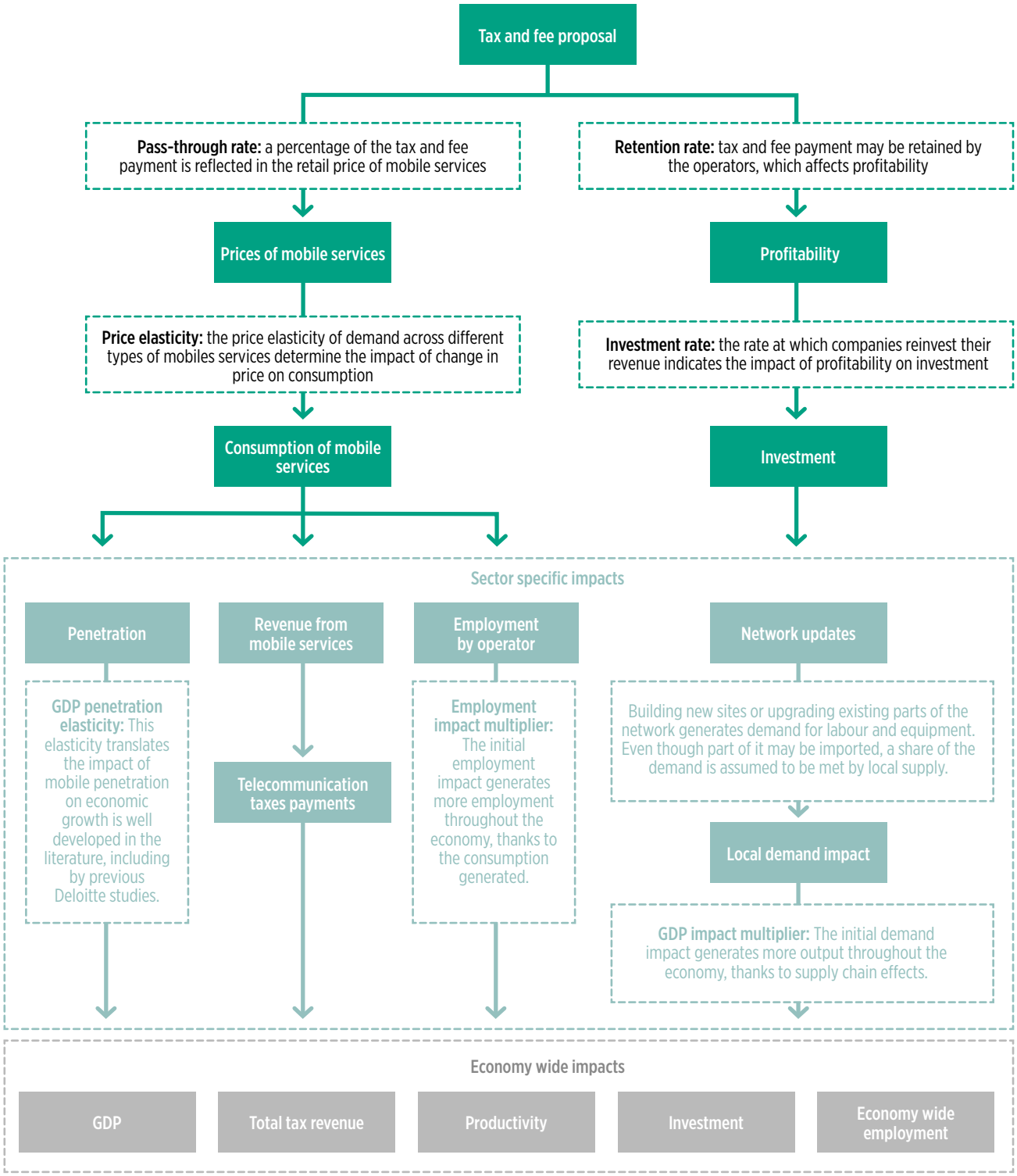
A.1 Estimation of the economic impact of a tax change

An economic model was created to describe the impacts that taxation on the mobile sector has on the sector itself and the macro-economy of Niger. This model estimates forecasts for the impacts of more than 25 sector specific and macroeconomic variables up to 2021, which can be driven either by removing or changing current taxes and regulatory fees or by the introduction of a new tax or regulatory fee.

Firstly, a base case scenario is developed for the mobile sector and economy, where taxes and regulatory fees remain at their current rate throughout the period to 2021. Then, a simulation of alternative tax policy scenarios quantifies the economic impact of reformed mobile sector taxation. It is assumed that the tax policy change is implemented as of tax year 2017 and the model estimates the effects up to 2021. The impacts of each policy are estimated independently and their interaction is not considered.

Figure 24

Schematics for modelling the economic impacts of mobile taxation changes



Source: Deloitte analysis

Modelling the impact of changes to mobile taxation on the telecom market in Niger

As illustrated in Figure 24, the model evaluates the demand and supply effect of the change in mobile taxation on the telecom market. On the demand side, a tax or regulatory fee reduction may be partly passed through to consumers as lower prices. Savings can also, on the supply side, be partly reinvested to expand the network or upgrade current sites to newer technologies.

Data collection

The inputs for the model have been provided by operators in Niger and the GSMA as well as publicly available statistics from the World Bank and the IMF. These include forecasts for future years. The outputs are derived based on estimates of the elasticity of demand for mobile services from a number of developing markets, while the impacts of mobile and broadband penetration on GDP have been derived from econometric studies of similar developing markets.

Demand side

The tax or regulatory fee change may affect the price of mobile services. This depends on the extent to which the tax reduction is passed on to consumers, modelled by a pass-through rate, which determines the percentage of the tax and regulatory fee payments that is reflected in the retail price of mobile services. All assumptions in the model are described in more detail in the section below.

Changes to the price of mobile services affect their consumption. In order to estimate this, assumptions are made on the price elasticity of demand,[207] which measures how much demand for mobile services will change in response to a price change.

Changes in prices and consumption alter the amount of revenue generated from mobile services. Increased demand generates additional employment opportunities in the sector, and increases mobile technologies' penetration in the country.

These sector impacts lead to economy-wide effects, which are estimated through assumptions that describe the impact of the mobile sector on the wider economy. These effects include the impact on GDP, calculated through a multiplier that links mobile and 3G penetration rates to economic growth, and the effect on employment, calculated through a multiplier, which estimates the number of jobs created across the economy for every job created within the telecommunications sector. The proliferation of mobile services is captured by an increase in productivity, quantified through the change in Total Factor Productivity (TFP).

As a result of additional GDP growth from reformed taxation on mobile, the potential short-term loss of tax revenue from the mobile industry may be offset by tax revenue from more broad-based consumer and operator taxes.

Supply side

The model also considers instances in which some or all of the tax/fee savings are not passed through to consumers but reinvested in extending or upgrading mobile networks in the country. Investment resulting from tax/fee savings is determined using a reinvestment rate assumption. Using data, informed by discussions with mobile operators, on the construction cost of a new site and on costs to upgrade existing sites, the model estimates the number of additional sites and upgrades that the reform may translate into by 2021.

A significant proportion of the cost of network investment relates to the cost of network equipment, much of which is imported into Niger. However, some of this additional investment is domestic value added, for example local labour. This additional value added can then have wider economic impacts, which is calculated using a GDP multiplier that captures the knock on economic effects of the incremental economic activity generated as a result of the additional investment. These economic impacts may also translate into job creation. Due to the temporary nature of construction work, the jobs creations in the model are assumed to be non-cumulative.

207. An elasticity describes the quantitative impact of a variable on another variable; the usual notation is that a 1% increase in a variable will lead to an x% change in another variable.

A.2 Key assumptions

The assumptions underlying the model have been developed on the basis of a review of academic literature and previous studies in this area. These are discussed in more detail below.

Pass-through rates

Changes in taxes and regulatory fees paid by mobile operators and consumers may be completely or partly passed-through to the end-consumer prices. The level of pass-through of taxes and regulatory fees to final prices typically depends on numerous market factors: for example, it may depend on the development of the market, the price elasticity of demand, on the scope for price reduction, as well as on operators' commercial strategies. As such, it is expected that each operator will determine how to pass through any tax/fee savings in different ways. Academic literature has found a considerable variability in pass-through rates, which may be negligible, close to 100% or even above 100% in certain instances.[208] Having considered this evidence, as well as a number of market-specific conditions in Niger, the following illustrative assumptions on pass-through rates have been employed: a pass-through rate of 90% is assumed for taxes that fall directly on retail prices or relate to consumer usage, such as the TURTEL. For taxes or regulatory fees falling on operators, it is assumed that the pass through rate is 80%.

Price elasticity of demand

A change in the price of mobile services may lead to a change in the consumption of these services, both in terms of ownership and usage. Consumption changes depend on the price elasticity of demand, that is, the responsiveness of consumers to price changes.

The assumptions regarding elasticity of demand are based on a review of studies conducted in a number of developing markets on the elasticity rates observed. Based on evidence from the empirical literature,[209] the elasticity of demand for mobile usage is assumed to be -1.49. The elasticity of demand for mobile ownership is assumed to be -1.30. The finding that demand is more elastic for those that already own mobile devices is supported by a number of studies within the field.[210]

Reinvestment rate[211]

The literature highlights that a company's cash flow is a strong predictor of its investment; the strength of this response is stronger in economies in which firms have less access to financial markets.[212] To illustrate the potential for new investment through the tax reduction, the reinvestment rate is assumed to be 60% of the value not passed through to consumers. This illustrative assumption was based on a review of market characteristics in Niger and on a review of academic papers discussing pass through rates from tax changes.[213]

Part of the investment effort is spent on network coverage expansion, and the rest is spent on network upgrade; the shares were determined through discussions with the operators and reflect the fact that Niger's mobile market is currently still dominated by basic 2G services.

Based on a review of cost benchmarks in the literature and discussions with local operators on the cost of installing sites, the cost of a new site is assumed to be US$ 170,000 and the cost of network upgrades for mobile broadband is US$ 50,000.[214] This takes into account differences in the cost of rural sites and other non-site costs that are necessary for each site.

208. IMF, 2015, 'Estimating VAT Pass Through'
209. IAn estimate of price elasticity of demand for Niger was not available. The assumed value is based on a recent study of African and Middle-Eastern countries (Hakim and Neaime (2014. 'The demand elasticity of mobile telephones in the Middle East and North Africa'). The values are adjusted to account for Niger's country-specific characteristics, such as the particularly low levels of income and low mobile penetration, which may be indicative of higher price sensitivity.
210. ISee, for example: Gruber and Koutroupis, 2010, Mobile telecommunications and the impact on economic development; Wheatley, J. J., 1998, Price elasticities for telecommunication services with reference to developing countries; GSMA, 2005, Tax and the digital divide: How new approaches to mobile taxation can connect the unconnected. London: GSMA
211. IThe definition of reinvestment rate used in this context differs from that used in the finance context, where it designates the interest payments which can be earned when money is reinvestment out of a fixed income investment to another. In this report reinvestment rate is the proportion of the tax change that is invested.
212. IGilchrist and Himmelberg (1995); 'Evidence on the role of cash flow for investment'
213. For example, an empirical study of investment by the telecom sector in the United States found that the reinvestment rate from a reduction in tax may be as high as 100% and may even exceed 100% if a country operating across states redirects investment funds towards those states with lower taxes. A similar incentive effect may exist when mobile operators operate across several countries. See Katz (2012). 'Assessment of the economic impact of taxation on communications investment in the United States'.
214. Deloitte analysis on operators' data, APC. "Unlocking broadband for all", Ericson (2012) "Preventing a Growing Mobile Network from Becoming a CAPEX/OPEX Drain" and FCC (2010) "A broadband network cost model", Pereira and Ferreira, 2012, "Infrastructure sharing as an opportunity to promote competition in local access networks", Analysis Mason, 2011, "The momentum behind LTE worldwide".

Employment and GDP multiplier

The employment multiplier is used to estimate the effect of a change in employment in the sector on total employment in the economy. The magnitude depends on the economic characteristics of the sector, such as the degree of interconnection across the supply chain and the openness of the economy. Based on the characteristics of Niger's mobile sector and the general economy the employment multiplier is assumed to be 2.2.[215] Based on the characteristic of this multiplier, for every additional job created within the mobile sector, an additional 1.2 jobs are generated in Niger's wider economy.

The GDP multiplier is used to estimate the wider economic impacts of the additional network investment. Based on the structure of Niger's economy and how telecommunications services are used, this is estimated to be 1.49.[216] This means that for every additional US$ 1 of expenditure in the telecommunications sector, GDP increases by US$ 1.49.

Market penetration Impact

There is substantial evidence in the literature on the impact of mobile penetration on GDP growth. Analysis conducted by the GSMA on the impact of mobile and 3G penetration on GDP growth estimated that a 1% increase in market penetration leads to an increase in GDP growth of 0.28 percentage points.[217] In terms of the impact of Internet penetration, it is assumed that a 1% increase in Internet penetration increases the GDP growth rate by 0.077 percentage points.[218] This model does not consider switching between 2G and 3G services and so these impacts are treated separately.[219]

Total Factor Productivity Impact

The impact on TFP is calculated based on the change in GDP, employment and investment. TFP is a measure of economic productivity that accounts for changes in output over and above those expected as a result of increased employment and investment. It is defined as follows:

$$TFP = \frac{GDP}{Capital^{\alpha} Labour^{\beta}}$$

where it will be assumed that α = 0.3 and ß=0.7.[220]

A.3 Scenario estimations

The tables below report the estimated cumulative impacts of the tax changes simulated in this report on a number of macroeconomic and industry variables, compared against the base case scenario in the specified year, where there is no change in policy; and on the assumption that the change in policy is implemented in tax year 2017.

215. This estimate is based on GSMA (2015). 'The Mobile Economy (Sub-Saharan Africa)'.
216. Few estimates are available for developing countries. The value of 1.49 is estimated by the OECD for the country with GDP per capita closest to Niger's (India) among countries for which estimates are available.
217. 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-economic-growth.pdf
218. 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
219. That is, given that it is not known whether a new 3G subscriber may previously have been a mobile user, this is treated as an increase in Internet penetration only, not as an increase in mobile and Internet penetration.
220. Bassanini A and Scarpetta S, 2001, "The Driving Forces of Economic Growth: Panel Data Evidence for the OECD countries"

Table 8

Annual impacts of removing the TATTIE on mobile usage on selected macroeconomic and industry variables

Criterion	2017	2018	2019	2020	2021
Macroeconomic impacts					
Incremental GDP	US$ 21 million	US$ 65 million	US$ 117 million	US$ 150 million	US$ 189 million
Additional employment	2,700	3,650	4,450	5,250	6,100
Labour productivity,% increment	0.16%	0.51%	0.85%	1.03%	1.21%
Investment	US$ 9 million	US$ 27 million	US$ 44 million	US$ 55 million	US$ 63 million
Sector specific impacts					
Incremental connections: total (broadband)	340,000 (20,000)	620,000 (40,000)	690,000 (60,000)	750,000 (100,000)	820,000 (140,000)
Incremental unique subscribers: total (broadband)	220,000 (15,000)	380,000 (25,000)	420,000 (35,000)	440,000 (60,000)	470,000 (80,000)
Increase in mobile penetration total, by connections	1.58%	2.75%	2.94%	3.08%	3.22%
Cumulative number of new sites (sites upgrades)	22 (19)	48 (40)	75 (64)	106 (90)	139 (118)

Source: Deloitte analysis of GSMA, World Bank and operators' data

Table 9

Annual impacts of reducing the variable component of the TURTEL on selected macroeconomic and industry variables

Criterion	2017	2018	2019	2020	2021
Macroeconomic impacts					
Incremental GDP	US$ 4 million	US$ 12 millions	US$ 21 millions	US$ 27 millions	US$ 34 millions
Additional employment	250	350	400	500	550
Labour productivity,% increment	0.16%	0.51%	0.85%	1.03%	1.21%
Investment	US$ 2 million	US$ 5 million	US$ 8 million	US$ 10 million	US$ 11 million
Sector specific impacts					
Incremental connections: total (broadband)	60 000 (0)	120 000 (10 000)	130 000 (10 000)	140 000 (20 000)	150 000 (30 000)
Incremental unique subscribers: total (broadband)	40 000 (0)	70 000 (5 000)	80 000 (5 000)	80 000 (10 000)	90 000 (15 000)
Increase in mobile penetration total, by connections	0.30%	0.52%	0.55%	0.58%	0.61%
Cumulative number of new sites (site upgrades)	2 (2)	4 (3)	6 (5)	9 (8)	12 (10)

Source: Deloitte analysis of GSMA, World Bank and operators' data

Table 10

Annual impacts of reducing the regulatory licence fee on selected macroeconomic and industry variables

Criterion	2017	2018	2019	2020	2021
Macroeconomic impacts					
Incremental GDP	US$ 3 million	US$ 10 million	US$ 18 million	US$ 24 million	US$ 30 million
Additional employment	400	550	700	800	950
Labour productivity,% increment	0.03%	0.08%	0.13%	0.16%	0.19%
Investment	US$ 1 million	US$ 4 million	US$ 7 million	US$ 9 million	US$ 10 million
Sector specific impacts					
Incremental connections: total (broadband)	50 000 (0)	100 000 (10 000)	110 000 (10 000)	120 000 (20 000)	130 000 (20 000)
Incremental unique subscribers: total (broadband)	30 000 (0)	60 000 (5 000)	70 000 (5 000)	70 000 (10 000)	80 000 (15 000)
Increase in mobile penetration total, by connections	0.25%	0.44%	0.46%	0.49%	0.51%
Cumulative number of new sites (sites upgrades)	4 (3)	8 (6)	12 (10)	17 (14)	22 (19)

Source: Deloitte analysis of GSMA, World Bank and operators' data

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