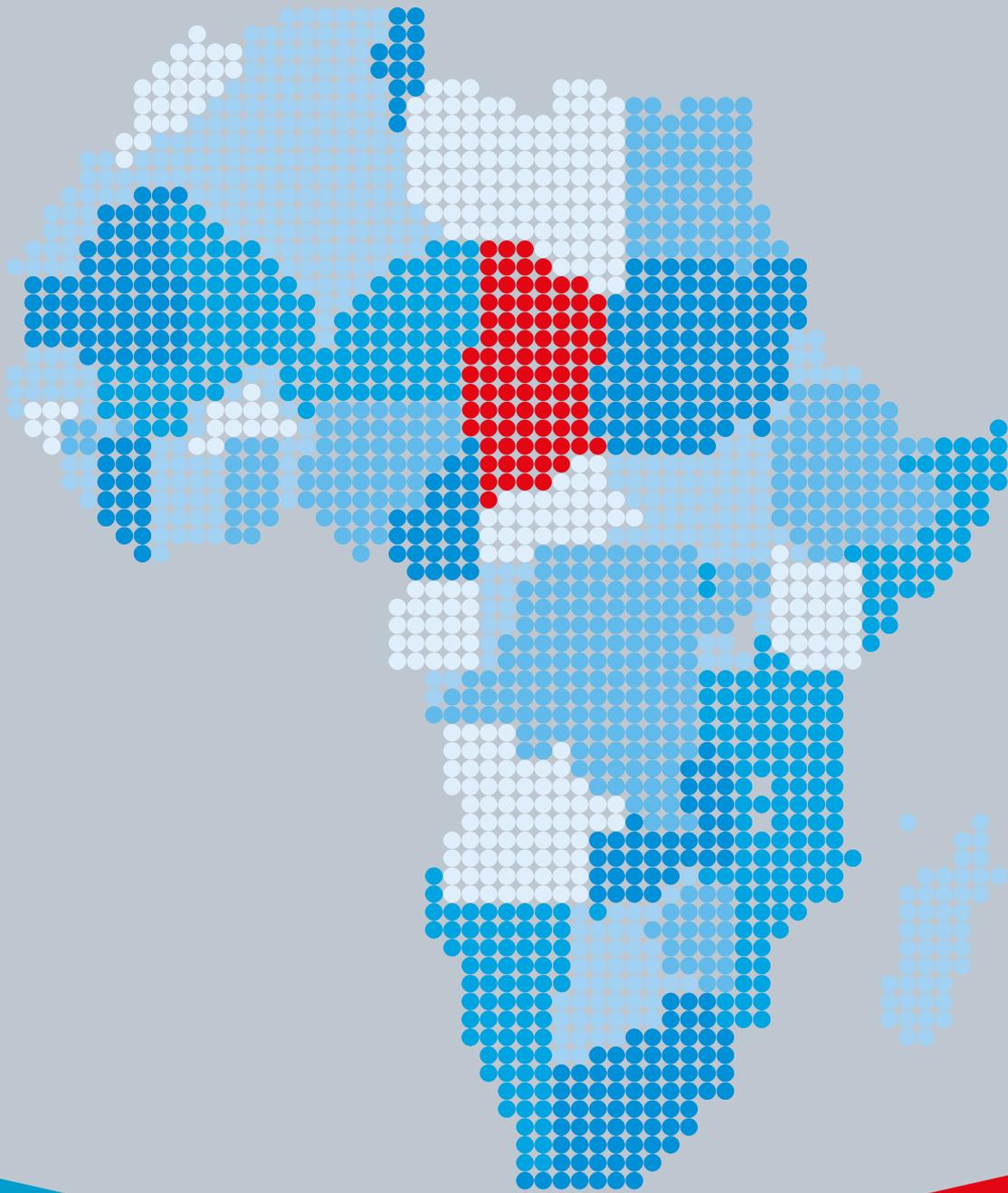




Digital inclusion and mobile sector taxation in Chad





About the GSMA

The GSMA represents the interests of mobile operators worldwide, uniting nearly 800 operators with almost 300 companies in the broader mobile ecosystem, including handset and device makers, software companies, equipment providers and internet companies, as well as organisations in adjacent industry sectors. The GSMA also produces industry-leading events such as Mobile World Congress, Mobile World Congress Shanghai, Mobile World Congress Americas and the Mobile 360 Series of conferences.

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Connected
Society

The Connected Society Programme works with the mobile industry and key stakeholders to improve network coverage, affordability, digital skills and locally relevant content, in pursuit of the wider adoption of the mobile internet.

For more information please contact us at connectedsociety@gsma.com

CONTENTS

IMPORTANT NOTICE FROM DELOITTE	2
EXECUTIVE SUMMARY	3
1 THE MOBILE INDUSTRY IN CHAD	9
2 TAXATION ON THE MOBILE SECTOR	17
3 IMPACTS OF TAX REFORMS ON AFFORDABILITY, INVESTMENT AND ECONOMIC GROWTH	29
4 REFORMING TAXATION ON THE MOBILE SECTOR IN CHAD	42
APPENDIX: METHODOLOGY	44



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Executive Summary

More than two thirds of Chadians remain unconnected to mobile services

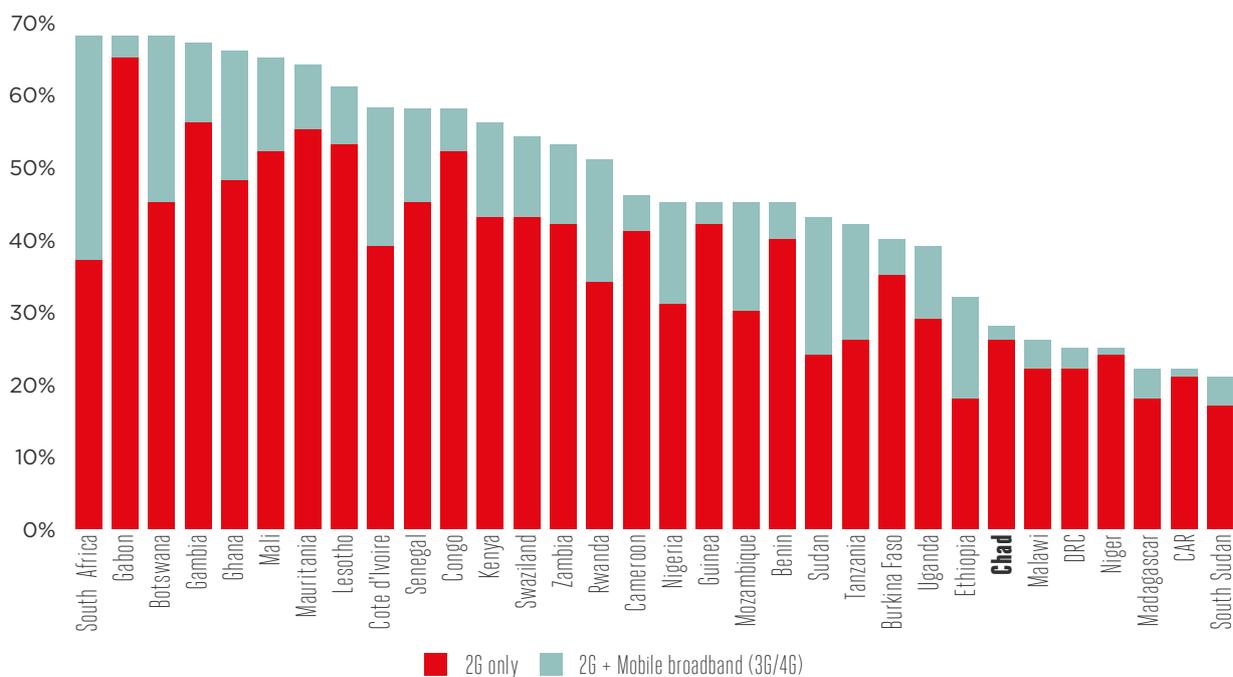
The Republic of Chad is amongst the countries with the lowest income levels in the world, with a Gross Domestic Product (GDP) per capita of US\$ 776 or CFA Franc (XAF) 458,000 in 2015¹ and 38% of the population living below the poverty line in 2011.² The country's economy is affected by the recent fall in global oil prices and ongoing regional security concerns.

Against this challenging background, the mobile sector can be seen as a success story. Despite over 78% of

Chadians living in rural areas,³ the country's two leading operators have each brought 2G coverage to 86% of the population.⁴ Mobile penetration has grown from 140,000 unique subscribers in 2006 to over four million in 2016.⁵ However, over eight million Chadians remain unconnected and mobile penetration lags behind many other African countries. Mobile broadband networks are still in their infancy, with 3G penetration only around 2%,⁶ and internet usage is the lowest among countries with comparable GDP per capita.⁷

Figure 1

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



Source: Deloitte analysis based on GSMA Intelligence (2016)

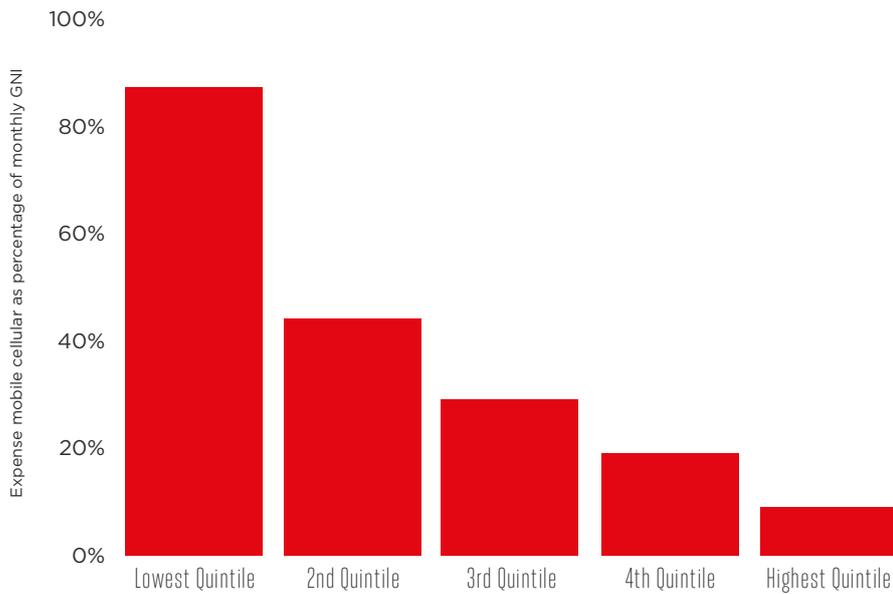
1. World Bank database (2016).
 2. World Bank database (2016). 2011, Purchasing Power Parity.
 3. World Bank database (2016).
 4. ARCEP (2015). 'Rapport Annuel'.
 5. Based on GSMA Intelligence (2016). For reference, the regulator reports over 5.4 million connections and 3.2 million unique subscribers in 2015 based on ARCEP (2015). 'Rapport Annuel'. The number of unique subscribers is different from the total number of connections as a unique user can have multiple connections. For consistency, the analysis in this report uses the unique subscriber figures provided by GSMA Intelligence, which estimated the number of unique subscribers based on the number of active SIM cards.
 6. GSMA Intelligence, unique subscribers, mobile internet (3G+4G).
 7. Based on ITU statistics for 2016

Affordability of mobile services is a key barrier to increasing penetration and usage. The typical cost of voice and SMS usage represented 21% of average monthly Gross National Income (GNI) in 2014, compared to an average of 14% in Least Developed

Countries (LDCs).⁸ High costs may be a particular issue for the poorest in Chad's society, for whom costs correspond to 87% of monthly income, not including the cost of handset purchase.

Figure 2

Mobile cellular bundle cost as a proportion of the average monthly income in Chad, 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

Given the modest uptake of mobile services and the low levels of economic development in Chad, expanding mobile penetration and usage could be a significant opportunity to achieve a number of socio-economic benefits:

- Increased mobile connectivity can contribute to economic growth and social welfare by facilitating communication and information flows, improving the ease of doing business, enhancing productivity and promoting access to education, healthcare and financial services.⁹
- Mobile broadband may deliver economic benefits over and above those generated by basic mobile telephony.¹⁰ Given the low levels of fixed internet

usage in Chad and its dispersed population, mobile broadband can represent the most effective way to connect Chadians to the internet.

- Mobile based applications have already given many Chadians access to essential life-changing services and many more people could benefit. For example, in 2014 5.8% of adults in Chad used mobile money platforms to pay bills or to transfer money.¹¹ Mobile money has been a key to delivering humanitarian assistance in rural areas.¹²

8. 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).
 9. See 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.
 10. See for example: ITU (2012). 'Impact of broadband on the economy'; Qiang et al. (2009); and LECG (2009). 'Economic Impact of Broadband: An empirical study'.
 11. World Bank (2016). 'Global Findex'. Based on survey data (excludes around 20% of population due to remoteness and security situation).
 12. Millicom (2016). 'Millicom signs the Humanitarian Connectivity Charter'. Retrieved from: <http://www.millicom.com/media/millicom-news-features/gsm-connectivity-charter/>. Note that Airtel also signed this Charter.

Higher taxes and fees on mobile services compared to other goods and services risk limiting mobile connectivity

In addition to general taxation, mobile consumers and operators in Chad are subject to 13 taxes and fees that are specific to the sector; this is higher than in a number of other African countries including Tanzania and the Democratic Republic of Congo, with nine and five sector specific taxes and fees respectively.¹³ Some of these taxes and fees have been introduced or increased in recent years in conjunction with a fall in oil-related revenues. These sector specific taxes and fees are set in ways that do not appear to align with a set of recognised principles for taxation best practice, for example:

- A SIM activation tax of UD\$ 1.6 (XAF 1000) applies to each new SIM card. This type of activation charge is rare both internationally and when compared to neighbouring countries. It is a regressive tax,¹⁴ representing around 2.5 times the daily income for the poorest 20% of the population, and contributes to raise the cost of owning and using mobile services. A 1% sector specific tax on SIM and scratch card revenues adds to this. Based on a representative cost of a SIM card before tax of XAF 500,¹⁵ taxes on SIM cards make up over two thirds of the final SIM card cost faced by consumers.
- Excise duties on each day of mobile usage (RAV)¹⁶ and on each mobile call made (FNDS)¹⁷ are levied on top of general taxation, such as Value Added Tax (VAT). A

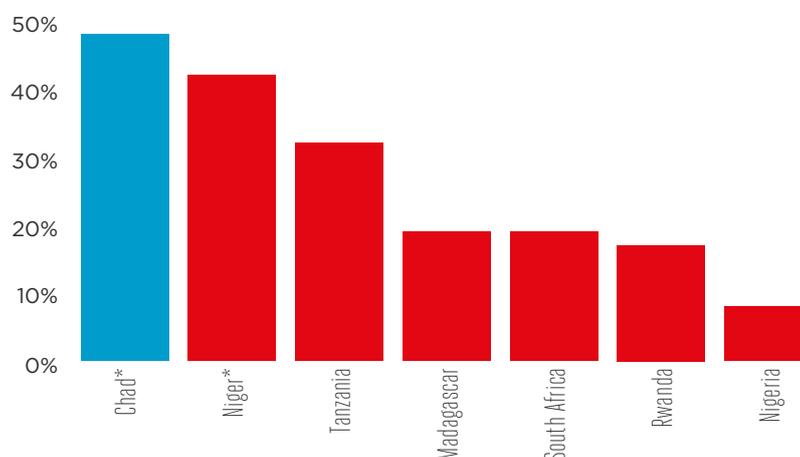
subscriber making two calls per day would be subject to annual sector specific excise duties of almost US\$ 9 (XAF 5,300), which is equivalent to 3.6% of annual income for the lowest 20% of earners. By taxing mobile usage more than other standard services, these taxes may discourage consumption of mobile services.

- In addition to spectrum, numbering and other administrative fees, mobile operators pay a range of regulatory taxes and fees to the regulator and other agencies. The combined rate of these fees increased from 4% in 2014 to 7% of revenues in 2016, which is higher than in other countries in the region. These fees are levied on revenues instead of profits, thus creating negative incentives for investment, whilst the rapid increase has contributed to market uncertainty. Fees levied on each base station installed¹⁸ create additional negative incentives for network expansion.
- Mobile operators pay a tax on incoming international calls which has resulted in estimated total payments of around US\$ 11 million (XAF 6.5 billion) in 2015.¹⁹

Overall, mobile operators in Chad are estimated to have paid around US\$ 143 million (XAF 85 billion) in taxes and fees in 2015, representing approximately 48% of market revenues.²⁰ This is a larger share than in other African countries for which data is available.

Figure 3

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



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

13. GSMA/Deloitte (2015). 'Digital inclusion and mobile sector taxation in Tanzania'; and GSMA/Deloitte (2015). 'Digital inclusion and mobile sector taxation in the Democratic Republic of the Congo'.
 14. 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.
 15. Operator data.
 16. *Redevance Audiovisuelle*, (audio-visual tax).
 17. *Fond National de Développement de Sport* (National Fund for the Development of Sport).
 18. This refers to the 'towers tax' (*taxe sur les pylônes*).
 19. Deloitte analysis based on operator data.
 20. Deloitte analysis based on operator data and GSMA Intelligence.

Rebalancing sector specific taxes and 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 in Chad, especially in light of recent revenues shortfalls from oil related activities and the size of the informal economy. However, the current treatment of the mobile sector may be limiting growth in mobile connectivity.

As part of its negotiations in relation to the extension of credit, the International Monetary Fund (IMF) noted “[...] the importance of expanding the non-oil revenue base, reducing tax exemptions, and strengthening tax and customs administrations”.²¹

In line with recommendations from the IMF,²² by transitioning to a taxation structure that relies more on general taxation rather than sector specific taxes and fees, the government could potentially improve affordability of mobile services and stimulate investment.

Reducing the excise duties on mobile usage has the potential to reduce the cost of mobile services for consumers, attracting new subscribers

As an illustrative example, a reduction of 50% of the RAV tax from XAF 10 per call to XAF 5 per call, and of the FNDS tax from XAF 1 per day to XAF 0.5 per day, equates to a tax payment reduction of around US\$ 5.7 million (XAF 3.4 billion) in 2015, which represents 0.5% of government tax revenues and 4% of the mobile sector’s tax and regulatory fee contribution.²³

Based on an analysis which examines the impact of this tax reform on mobile penetration and economic growth, price reductions have the potential to generate an **additional 330,000 connections** over the four year period to 2021, of which 80,000 could be mobile broadband connections. The increase in mobile ownership and usage has the potential to **increase GDP by a total of US\$ 370 million (XAF 220 billion)** over the four years to 2021. This amount is equal to 5% of Chad’s GDP in 2015.²⁴ Increased resources for investment can potentially result in an **additional 30 new or upgraded mobile sites** by 2021.

Reducing the tax on incoming international traffic has the potential to lead to price reductions for consumers and reduced incentives for illegal traffic routing

As an illustrative example, if the tax on incoming international calls were reduced from XAF 50 per minute to XAF 25 per minute, this would equate to a tax payment reduction of around US\$ 5.3 million (XAF 3.1 billion) in 2015, which represents 0.5% of government tax revenues and 4% of the mobile sector’s tax and regulatory fee contribution.²⁵

Based on an analysis which examines the impact of this tax reform on mobile penetration and economic growth, price reductions have the potential to generate an **additional 270,000 connections** over the four year period to 2021, including 70,000 using mobile broadband. Increased investment in the mobile sector has the potential to **increase employment in the sector and the wider economy by 700 jobs**. Increased resources for investment can potentially result in an **additional 50 new or upgraded mobile sites** by 2021.

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

Regulatory fees have increased recently, with new fees introduced. As an illustrative example, if the ARCEP administration fee were reduced from 3.5% to 1% this which would move the combined rate of regulatory fees close to the pre-2014 level. The change would save operators around US\$ 7.1 million (XAF 4.2 billion) based on 2015 data,²⁶ which represents 0.6% of government tax revenues and 5% of the mobile sector’s tax and regulatory fee contribution.²⁷

Based on an analysis which examines the impact of this tax reform on mobile penetration and economic growth, price reductions have the potential to generate an **additional 340,000 connections** over the four year period to 2021, around a quarter of which could use mobile broadband (80,000). The increase in mobile ownership and usage has the potential to **increase GDP by a total of US\$ 390 million (XAF 240 billion)** over the four years to 2021.

21. IMF (2015). ‘IMF Country Report No.16/274’.

22. Moolj and Keen (2014). ‘Taxing Principles’.

23. Deloitte analysis of operator data and IMF data. Throughout this report, unless stated otherwise, government tax revenues include government revenues from oil and other tax revenues, but exclude grants.

24. Based on Chad GDP data in International Monetary Fund, World Economic Outlook Database, retrieved October 2016.

25. Deloitte analysis of operator data, and IMF data.

26. Deloitte analysis of operator data.

27. Deloitte analysis of operator data, and IMF data.

This amount is equal to over 5% of Chad's GDP in 2015.²⁸ Increased resources for investment can potentially result in an **additional 60 new or upgraded mobile sites** by 2021.

Reduction or removal of the SIM card activation tax has the potential to drive penetration further by lowering the barrier to mobile ownership

The introduction of the SIM card tax in January 2013 coincided with a marked drop in the growth rate of mobile connections, which became negative in the first quarter of 2013 following a previous growth rate of over 5%.²⁹ A removal of this tax and of the recently increased 1% sales tax on SIM and scratch cards has the potential to reduce the cost of taking up a mobile subscription for the unconnected and spur penetration.

Marginal increases in general taxation may be sufficient to cover tax revenues shortfalls

In the medium term, tax and regulatory fee reductions on the mobile sector have the potential to increase wider tax revenues 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 revenues shortfall from removing sector specific taxes. International organisations such as the World Bank suggest general taxes on wider bases are to be preferred to taxes on narrow bases, such as sector specific taxes. Marginally

increasing general taxes across all sectors of the economy could allow the government to collect equivalent tax revenues in a simpler and more efficient way.

In Chad there is limited public information regarding total revenues collected from different taxes.³⁰ Based on illustrative assumptions about the total revenues generated from VAT, a modest increase in general VAT (currently 18%) may be sufficient to cover a shortfall in government tax revenues resulting from reductions in mobile sector specific taxes and fees.³¹

Table 1

Indicative estimates of VAT rate required to cover tax revenues shortfall, under different tax reform scenarios

	If VAT revenues are 35% of total non-oil tax revenues	If VAT revenues are 50% of total non-oil tax revenues	If VAT revenues are 65% of total non-oil tax revenues
Reducing excise duties (RAV and FNDS) by 50%	18.41%	18.29%	18.22%
Reducing the tax on incoming international calls by 50%	18.39%	18.27%	18.21%
Reducing the ARCEP administrative fee from 3.5% to 1%	18.52%	18.36%	18.28%

Source: IMF; operator data; Deloitte analysis

28. Based on Chad GDP data in International Monetary Fund, World Economic Outlook Database, retrieved October 2016.

29. While other developments may have affected the sector at the same time, this provides indicative evidence of the negative effects of the tax on mobile penetration.

30. Mobile operators note that fiscal accountability is a key tax governance challenge.

31. The representative tax rate increases in the table are estimated through a static analysis and subject to a number of stringent assumptions, discussed in section 3.4.



Mobile services are key to economic development and social inclusion

1. The mobile industry in Chad

The Republic of Chad is amongst the countries with the lowest income levels in the world, with GDP per capita of US\$ 776 (XAF 458,000) in 2015.³² As a consequence of low oil prices and security concerns, GDP growth slowed from 6.9% in 2014 to 1.8% in 2015; the economy is forecast to contract by 0.4% in 2016.³³ Proceeds from oil extraction account for around 20% of total GDP in Chad³⁴, leaving the economy exposed to market price fluctuation. Reducing the country's reliance on oil rents has been identified as a policy priority by the Chadian government and the IMF.³⁵

The mobile sector is a key contributor to Chad's economy. In 2015, mobile services generated market revenues of US\$ 300 million (XAF 117 billion), which corresponded to 2.7% of Chadian GDP.³⁶ Three operators, Airtel (Bharti Airtel), Tigo (Millicom) and Sotel serve the country. The two largest, Airtel and Tigo, account for more than 96% of the market.³⁷ By 2015 each of the two largest operators had brought coverage to 85% of Chad's population, which is predominantly located in rural areas.³⁸

The government has presented long-term economic objectives in its 'Vision 2030' strategy, which identifies the need to promote diversified, competitive economic growth and to strengthen infrastructure.³⁹ Chad lacks basic infrastructure in many regions, particularly road and energy infrastructure.⁴⁰ The country's most recent national development plan aims to further the 'Vision 2030' agenda, including by improving access to Information and Communications Technology (ICT).⁴¹

This report examines the role of tax policy in stimulating mobile uptake, digital inclusion, infrastructure investment, employment and broader economic growth.

- The remainder of this section analyses the state of mobile uptake and digital inclusion in Chad and its capacity to drive economic and social development.
- Section 2 sets out the taxes levied on mobile consumers and operators and their implications for affordability of mobile services and investment incentives. The section also compares Chadian mobile taxes and fees to best practice principles and policies of other jurisdictions.
- Section 3 analyses how potential mobile tax and regulatory fee reforms could affect affordability and investment, as well as the wider economy.
- Section 4 concludes, discussing options for tax reform.

32. World Bank data.

33. World Bank (2016). 'Global Economic Prospects'.

34. World Bank data.

35. IMF (2016). 'IMF Country Report 16/274'.

36. Deloitte analysis based on GSMA Intelligence (2016) and World Bank data.

37. GSMA Intelligence (2016).

38. ARCEP (2015). 'Rapport Annuel'.

39. Ministère du Plan et de la Prospective (2016). 'Vision 2030'. Retrieved from: <http://www.plan-td.org/w3/index.php/general/69-vision-2030>.

40. African Development Bank (2009). 'Country Strategy Paper 2010-2014'.

41. Ministère de l'Économie, du Plan et de la Coopération Internationale (2014). 'Plan National du Développement 2013-2015'. Retrieved from: <http://mepci.webtchad.com/plan-d-developpement.html>.

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

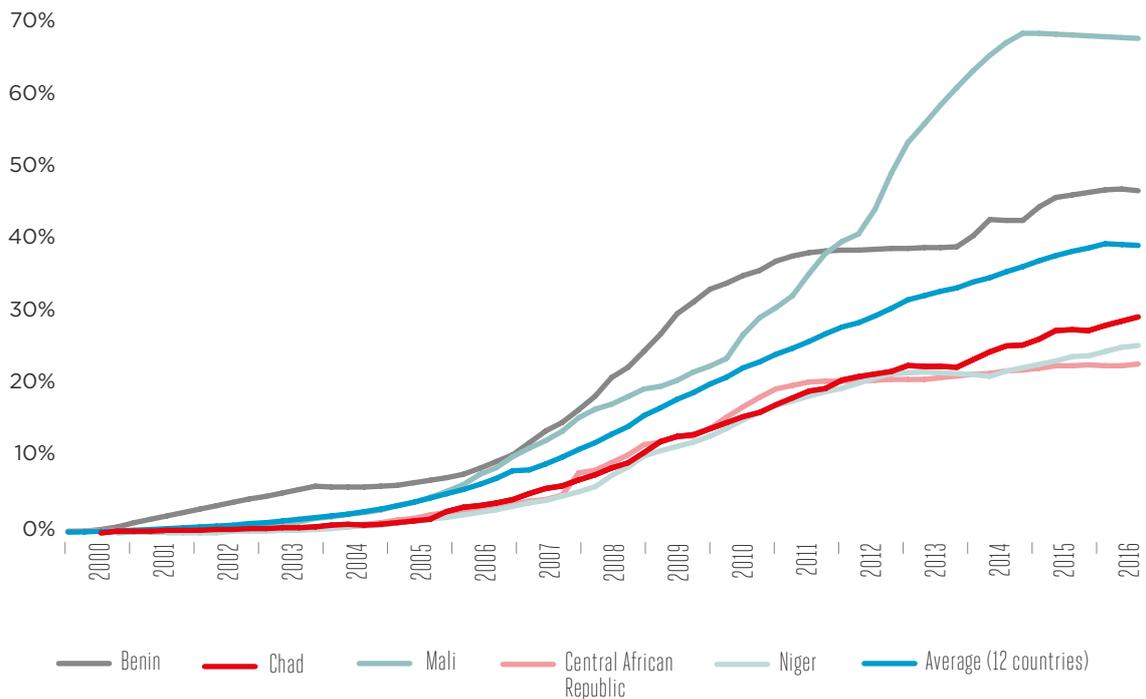
Mobile networks bring connectivity to the country's geographically dispersed population. As of 2015, 78% of Chad's population live in rural areas⁴² and less than 1% have access to fixed line telephony.⁴³

Mobile penetration has grown from 4% in 2006 to 28% in 2016⁴⁴ and there are now 3.7 million more Chadians

with access to mobile telephony than ten years ago. However, more than 70% of the population are still unconnected and unable to access the benefits of basic mobile services. Despite the increase in mobile subscriptions, Chad has experienced relatively slow growth in mobile penetration when compared to other African countries.⁴⁵

Figure 4

Mobile penetration (unique subscribers) in selected African countries over time



Source: GSMA Intelligence (2016). Niger, Mali, Benin and CAR are the four countries with comparable GDP per capita levels and geographic locations. Average based on Benin, Burkina Faso, Central African Republic, Chad, Democratic Republic of Congo, Mali, Niger, Nigeria, Rwanda, South Sudan, Sudan and Tanzania.

42. World Bank data.
43. ITU Statistics (2016).

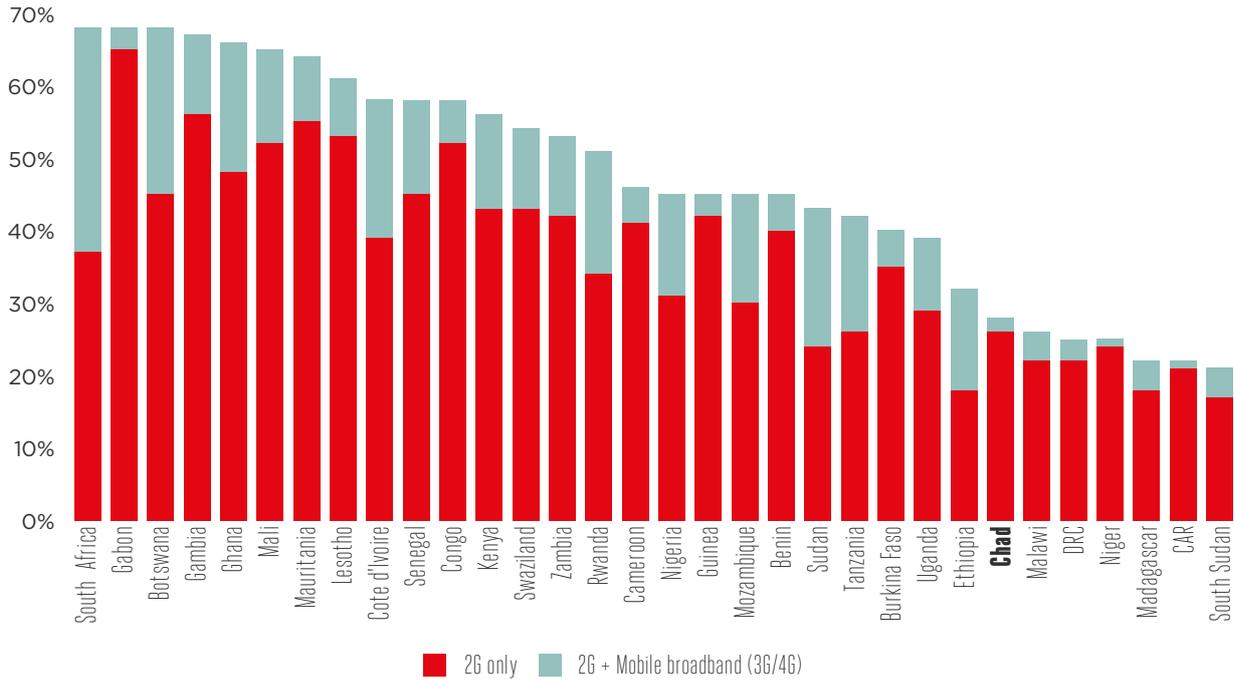
44. GSMA Intelligence, mobile penetration, unique subscribers. For reference, the regulator ARCEP reports penetration of 40.6% in 2015 based on total connections and 24.3% based on unique subscribers. Subscribers may have multiple SIM cards (i.e. connections) and therefore, the numbers may differ.

45. Where possible Chad 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.

The vast majority of the over four million mobile subscribers in Chad use 2G services and mobile broadband penetration is among the lowest in the world, at 2% in 2016.⁴⁶

Figure 5

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



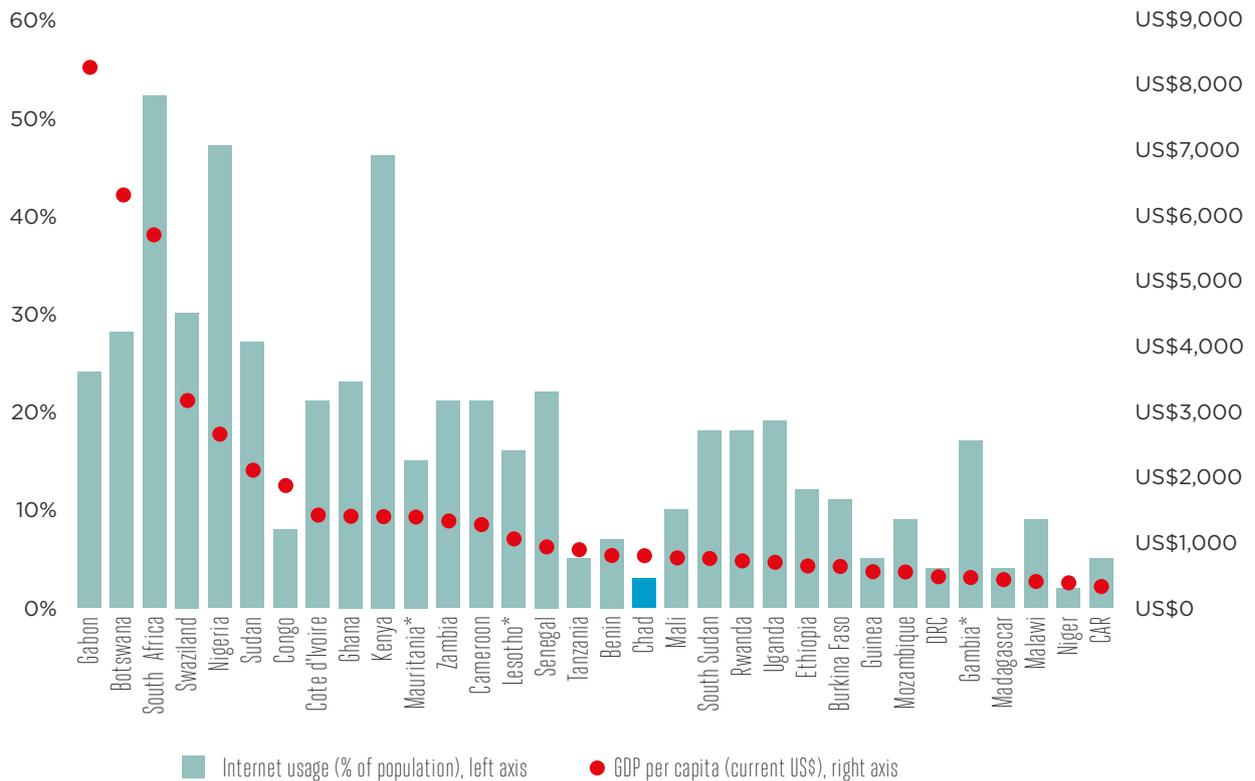
Source: Deloitte analysis based on GSMA Intelligence (2016)

46. GSMA Intelligence, unique subscribers, mobile internet (3G+4G).

The limited fixed infrastructure and relatively low uptake of mobile broadband in Chad is reflected in overall internet usage, which was less than 3% of the population in 2015. This is lower than in other African countries with similar GDP per capita.

Figure 6

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



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

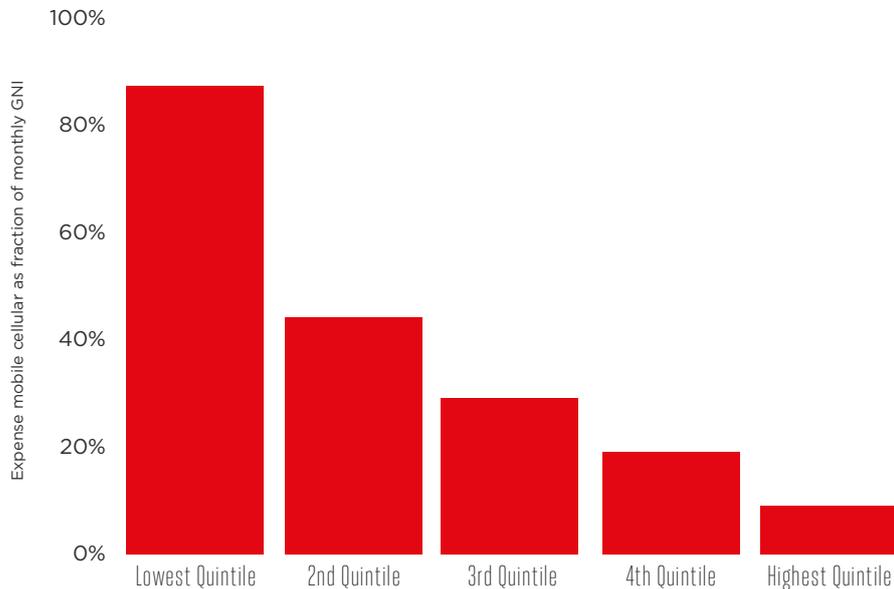
Low rates of mobile and internet usage may exist when many citizens are unable to afford mobile services. Data from the International Telecommunication Union (ITU) suggests that the cost of mobile services in Chad is relatively high as a proportion of income. The typical cost of voice and SMS usage corresponded to 21% of

average monthly GNI in 2014, compared to an average of 14% in LDCs and 6% in developing countries.⁴⁷ For the lowest 20% of earners, the cost of a mobile subscription represents 87% of monthly income, not including device costs or mobile broadband costs.

47. Deloitte analysis based on 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.

Figure 7

Mobile cellular bundle cost as a proportion of the average monthly income in Chad, 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

Limited coverage may be a further barrier to digital inclusion. In 2015, 15% of the population was not yet covered by mobile signals from each of the two largest operators,⁴⁸ while mobile broadband coverage remains below 20% in 2016, which is significantly lower than

in countries with similar levels of income – such as Mali and Benin with over 35%.⁴⁹ Further investment in infrastructure could expand mobile and broadband networks across the country.

1.2 Mobile services are key to economic development and social inclusion

Chad has one of the lowest GDP per capita levels in the world and 38% of its population were living under the US\$ 1.90 a day poverty line in 2011.⁵⁰ In countries with low levels of economic and social development, such as Chad, increased use of mobile services is widely recognised as a driver of social inclusion and economic growth.⁵¹

Increased mobile service provision in Chad 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.⁵² A recent GSMA/Deloitte study found that the uptake of mobile can support all SDGs.⁵³ In particular, in LDCs such as Chad, mobile uptake may impact the following SDGs:

- **Eradicating poverty (SDG 1):** 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.

48. ARCEP (2015). 'Rapport Annuel'.

49. GSMA Intelligence (2016), population coverage.

50. World Bank data, 2011, Purchasing Power Parity.

51. 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*.

52. 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.

53. GSMA (2016). 'Mobile Industry Impact Report: Sustainable Development Goals'.

- **Zero hunger (SDG 2):** Mobile uptake in agricultural communities can increase access to markets and information that can increase productivity.
- **Industry, innovation and infrastructure (SDG 9):** 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):** 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 uptake of mobile devices and services.

MOBILE SERVICES PROMOTE DIGITAL, SOCIAL AND FINANCIAL INCLUSION

Increased digital access promotes inclusive development by enabling distance health care and education, and improving information access across sectors of the economy.⁵⁴ This is particularly relevant for the large proportion of Chad's population living in rural areas.

According to Chad's national development plan, ICT may increase productivity in the public and private sector as well as in rural areas through remote learning and health care solutions (mHealth).⁵⁵ Furthermore, agriculture – Chad's biggest industry, with value added amounting to 52% of GDP in 2015 – has been identified in a World Bank study as a sector that may benefit greatly from innovative mobile applications.⁵⁶ The SSA region has seen a large increase in the development and use of mobile phone-based applications.

mAgriculture: An example of how information access through mobile may yield tangible benefits is the Paaréa financial service, accessible using mobile phones. This service allows Chad's distant livestock trading communities to pool funds, save and receive external funding from sponsors such as non-governmental organisations, giving group members

the opportunity to pay for the drilling of new wells or repair existing wells.⁵⁷ Another example is Kenya's Agricultural Commodity Exchange (KACE), a mobile-powered exchange for goods such as maize and beans, which is reported to have increased incomes for 75% of farmers.⁵⁸ Other mobile agriculture initiatives in Africa have improved the efficiency of supply chains by improving access to agricultural inputs and reducing transaction times and costs of delivery.⁵⁹

Mobile money: Services such as Tigo Cash and Airtel Money can contribute to greater financial inclusion in the country, providing access to credit and general banking services. Mobile money services were introduced in 2012. By 2014, 5.8% of adults in Chad used their phone to pay bills or to transfer money.⁶⁰ GSMA research finds that mobile money operates successfully in rural areas that lack basic infrastructure.⁶¹ These services can be particularly useful for distributing aid funds. Chad's operators have recently collaborated with humanitarian organisations to distribute emergency funds to regions affected by droughts.⁶² Mobile market penetration may thus enable more Chadians to benefit from access to financial services, remittances and emergency funding.

mHealth: Transformative mHealth technologies in African countries can also facilitate the delivery of basic health services, especially to populations living in rural areas. 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 2014.⁶³

MOBILE SERVICES PROMOTE LONG-RUN ECONOMIC GROWTH

Mobile services contribute to economic growth, employment and productivity. The GSMA estimated that in 2013, mobile operators and their associated ecosystems made a direct contribution of US\$ 75 billion (XAF 37 trillion) or 5.4% of the total GDP in SSA; employed nearly 2.4 million people; and supported the development of a number of tech hubs, labs, incubators and accelerators.⁶⁴

54. Ministère de l'Economie, du Plan et de la Coopération Internationale (2014). 'Plan National du Développement 2013-2015'. Retrieved from: <http://mepci.webtchad.com/plan-d-developpement.html>.

55. Ministère de l'Economie, du Plan et de la Coopération Internationale (2014). 'Plan National du Développement 2013-2015'. Retrieved from: <http://mepci.webtchad.com/plan-d-developpement.html>.

56. World Bank data; Qiang, Kuek, Dymond and Esselaar (2012). 'Mobile Applications for Agriculture and Rural Development'. *World Bank ICT Sector Unit*.

57. GSMA (2015). '2015 Mobile Insurance, Savings & Credit Report'.

58. Qiang, Kuek, Dymond and Esselaar (2012). 'Mobile Applications for Agriculture and Rural Development'. *World Bank ICT Sector Unit*; Andrianaivo & Kpodar (2011). 'ICT, Financial Inclusion and Growth: Evidence from African Countries'. IMF Working Paper 11/73.

59. Qiang, Kuek, Dymond and Esselaar (2012). 'Mobile Applications for Agriculture and Rural Development'. *World Bank ICT Sector Unit*.

60. World Bank (2016). 'Global Findex'. Based on survey data (excludes around 20% of population due to remoteness and security situation).

61. GSMA (2015). Spotlight on Rural Supply: 'Critical factors to create successful mobile money agents'.

62. Millicom (2016). 'Millicom signs the Humanitarian Connectivity Charter'. Retrieved from: <http://www.millicom.com/media/millicom-news-features/gsma-connectivity-charter/>; Airtel has also signed this Charter.

63. GSMA (2014). 'Snapshot: Grameen Foundation's "Mobile Midwife" Service in Nigeria - How to generate and use consumer insights to localise mHealth content'.

64. GSMA (2014). 'Sub-Saharan Africa 2014'.

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 grow as mobile penetration becomes more widespread; the overall ease of doing business improves as more people are connected by mobile networks.

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.⁶⁵
- 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.⁶⁶
- 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 Chad a 10% increase in mobile penetration may increase TFP by 4.2 percentage points.
- Mobile broadband may deliver economic benefits over and above those generated by basic mobile telephony.⁶⁷ A World Bank study has found that in developing economies such as Chad a 10% increase in broadband subscriber penetration⁶⁸ could accelerate economic growth by 1.38%.⁶⁹ Evidence from the literature on the impact of broadband on productivity suggests that every 10% increase in broadband penetration increases productivity by 1%.⁷⁰

65. 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., Rosotto, C.M. (2009). 'Economic Impacts of Broadband'. *Information and Communications for Development 2009: Extending Reach and Increasing Impact*.

66. Onakoya, BOA, et al. (2012). 'Investment in Telecommunications. Infrastructure and Economic Growth in Nigeria: A Multivariate Approach'. *Research Journal of Business Management and Accounting*.

67. ITU (2012). 'Impact of broadband on the economy'.

68. 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'.

69. Qiang et al.(2009)

70. LECG (2009). 'Economic impact of Broadband: An empirical study'.



Higher taxes and fees on mobile services compared to other goods and services risk limiting mobile connectivity

2. Taxation on the mobile sector

Mobile services in Chad are subject to a broad range of taxes and fees, some of which are specific to the mobile sector. In total, over 25 distinct taxes and fees on mobile operators have been identified, of which 13 are sector specific.⁷¹ The number of sector specific taxes and fees is higher than in a number of other African countries, including Tanzania or the Democratic Republic of Congo with nine and five such sector specific taxes and fees respectively.⁷² 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 the nature of the tax. Some taxes 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 in Chad are subject to taxes and charges applied to mobile devices, SIM cards and mobile usage. These taxes are likely to affect the

prices ultimately paid by consumers and may have a particularly strong effect on the poorest users.

71. Deloitte analysis based on operator data.

72. GSMA/Deloitte (2015). 'Digital inclusion and mobile sector taxation in Tanzania'; and GSMA/Deloitte (2015). 'Digital inclusion and mobile sector taxation in the Democratic Republic of the Congo'.

Figure 8

Key consumer taxes on mobile services, 2016

PAYMENT BASE		TYPE	RATE
Handsets and other devices		Custom duty on imported devices	30%
		VAT	18%
Services	Activation	★ SIM activation fee	XAF 1,000 per SIM
		★ Sales tax on SIM & scratch cards	1% per card
		VAT	18%
	Usage (Calls, SMS, & mobile broadband)	VAT	18%
		★ RAV (Excise duty)	XAF 10 per day of usage
		★ FNDS (Excise duty)	XAF 1 per call
		★ Tax on post-paid invoices	10% of billed activity

★ Mobile specific

Source: Deloitte analysis based on operator data and World Trade Organization (2013). 'Trade Policy Review'.

TAXES ON HANDSETS AND OTHER DEVICES

Consumers purchasing a handset device are affected by the following taxes:

- A standard VAT rate of 18% is applied to all devices sold domestically, including imports.⁷³
- Any device that is imported from outside the Central African Economic and Monetary Community (CEMAC) region⁷⁴ is subject to customs duty at a rate of 30%, which is the highest bracket for customs duties.⁷⁵

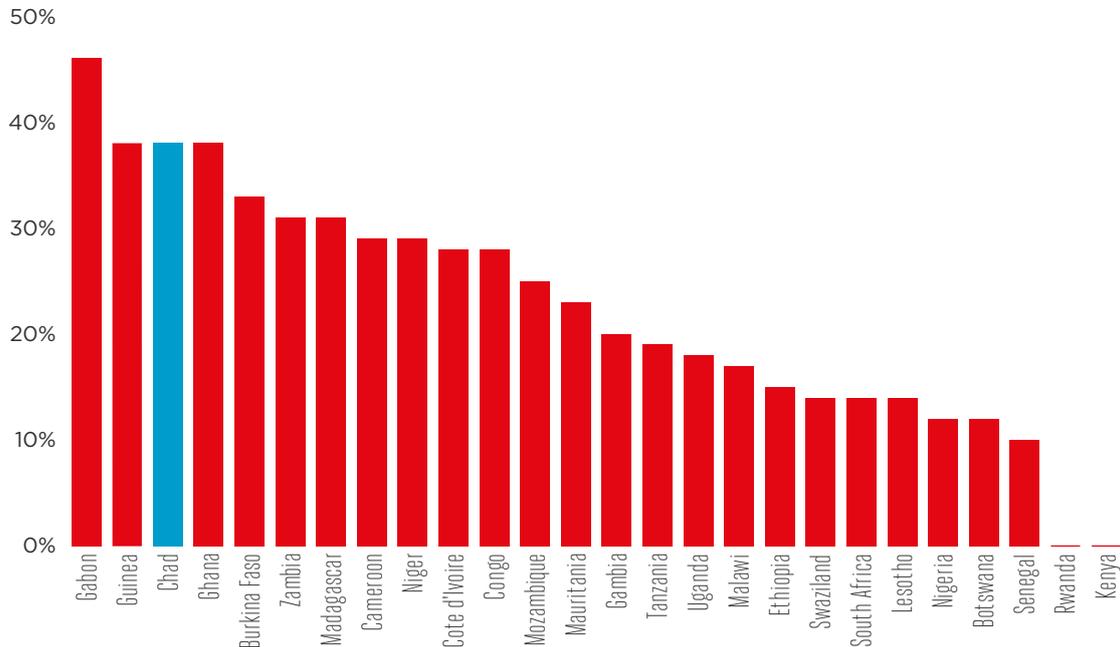
Taxes on mobile devices may increase the upfront costs of accessing mobile services. Based on 2014 data, handset taxes are estimated to make up 38% of the final cost of handsets, which is high compared to other African countries.⁷⁶

73. Deloitte (2015). 'International tax, Chad Highlights 2015'.
 74. The CEMAC region consist of the following members: Angola, Burundi, Cameroon, Central African Republic, Chad, Republic of Congo, Democratic Republic of Congo, Equatorial Guinea, Gabon, São Tomé and Príncipe and Rwanda.
 75. World Trade Organization (2013). 'Trade Policy Review. Annex for Chad'. Brackets for customs duties range from 5% to 30%.
 76. GSMA/Deloitte (2015). 'Digital inclusion and mobile sector taxation 2015'.



Figure 9

Handset taxes as a proportion of handset costs in selected African countries for which data is available, 2014



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

ACTIVATION AND CONNECTION CHARGES

For each new user, activation charges are levied in addition to the handset taxes described above:

- A SIM activation tax of XAF 1,000 (US\$ 1.6) to each new SIM card. 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 2014.⁷⁷
- In addition to standard VAT of 18% a sector specific 1% sales tax is levied on each SIM card sold. The 1% sales tax also applies to top-up scratch cards and was increased from 0.5% at the beginning of 2016.⁷⁸

These charges may further increase the barriers to accessing mobile services. For example, the SIM activation tax alone represents around 8% of monthly income for the poorest 20% of the population.⁷⁹

TAXES ON MOBILE USAGE

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

- A standard VAT rate of 18% is applied on all calls, SMS and mobile broadband usage.
- The audio-visual tax, *Redevance Audiovisuelle* (RAV) of of XAF 10 (US\$ 0.02) is charged for every day of mobile usage once a billable activity is undertaken.
- The National Fund for the Development of Sport, *Fond National de Développement de Sport* (FNDS) tax of XAF 1 per call applies.
- For post-pay subscribers, a 10% tax on post-paid invoices is applied on the value of all billed activity. Only 1% of mobile connections in Chad were post-paid in 2015, but this share may increase as the market develops.⁸⁰

Excise duties such as the RAV and FNDS are specific to the mobile sector and could increase the prices consumers pay for mobile services, which may prevent more extensive usage. Together with the upfront costs of gaining access to mobile services, usage charges could create further pressure on affordability.

77. GSMA/Deloitte (2015). 'Digital inclusion and mobile sector taxation 2015'. p. 14.

78. Operator data.

79. Deloitte analysis based on World Bank data.

80. Deloitte analysis based on GSMA Intelligence.

2.2 Taxes and regulatory fees on mobile operators

Operator taxes and fees constituted around two thirds of the overall payments by the mobile industry in 2015.⁸¹ The figure below summarises the taxes and fees faced by mobile operators and indicates those that are specific to mobile operators.⁸²

Figure 10

Key operator taxes, regulatory fees and other payments to regulators

PAYMENT BASE		TYPE	RATE
Network Equipment		Customs duty	10% - 30%
		★ Towers tax	10% on annualised capital value during asset life
Profits		Corporation tax	35% (at least 1.5% of turnover)
Salaries		Payroll tax	20% on salary
Withholding taxes (WHT)		WHT on dividends and foreign supplies	25%
		WHT on rent and commissions	20%
Real estate		Nation building tax	8% - 10% on rental value
International traffic		★ Tax on incoming international calls	XAF 50 per minute
Regulatory fees and other payments to regulators	Numbering	★ Numbering fee	XAF 165 per number
	Spectrum	★ One off spectrum license	License specific fees
		★ Spectrum royalty fees	Based on bandwidth size and number of base stations
	Revenues	★ ARCEP administration fee	3.5% on gross revenue
		★ Universal Service Fund	2.5% on gross revenue
		★ R&D fund	1% on gross revenue

★ Mobile specific

Source: Deloitte analysis based on operator data and Deloitte (2016). 'Corporation Tax Rates 2016'.

TAXES ON NETWORK EQUIPMENT

Operators pay taxes on the value of imported network equipment as well as specific taxes levied on their network infrastructure:

- Customs duty rates vary depending on the nature of the imported good. The rates can reach 28% for radio equipment such as antennas or software and 30% for battery equipment.⁸³ Operators noted the application of the highest customs duty bracket to batteries is particularly significant given the power shortage issues in Chad.
- Mobile towers are subject to an additional charge (*taxe sur les pylônes*) which is based on 10% of the annualised capital value during the asset's life.⁸⁴

CORPORATION TAX

Profits of mobile operators generated in Chad are subject to a general corporation tax. The corporation tax rate is 35%, down from 40% in the fiscal year 2014/15, as long as the implied tax payment is larger than 1.5% on turnover. Otherwise, the minimum tax on turnover applies.⁸⁵ Operators therefore remain liable for corporation tax even in the case of negative profit, unlike in many other countries.

TAXES ON INCOMING INTERNATIONAL CALLS

A fixed tariff on incoming international calls is set at EUR 0.36 (XAF 67) per minute. Of this, 0.10 EUR (XAF 66) per minute forms part of a revenue sharing agreement between ADETIC and the operators, who can retain a minority share of EUR 0.04 (XAF 26) to cover their expenses.⁸⁶

On top of the fixed tariff, a tax of XAF 50 per minute is imposed on international inbound calls. In 2015, payments of this tax from operators totalled an estimated XAF 6.5 billion.⁸⁷

Operators report that VAT is levied on proceeds from incoming internal calls, which appears inconsistent with the relevant ITU regulations of which the Republic of Chad is a signatory.⁸⁸

REGULATORY FEES

Mobile operators pay several regulatory fees levied on revenues each year, some of which have increased in recent years:

- The *Frais de Gestion Administrative* (FGA) are administration fees paid to the regulator, ARCEP, and amount to 3.5% of operator revenues. This fee was increased from 3% in 2014.
- A Universal Service Fund (USF) fee of 2.5% on revenues is paid to the ICT development agency, *Agence de Développement des TIC* (ADETIC). This contribution was introduced in 2014.
- A further fee amounting to 1% of gross revenues is paid to ADETIC for the development of research and training in telecoms and ICT.

The combined rate of these fees increased from 4% in 2014 to 7% in 2016,⁸⁹ a 75% increase.

In addition, mobile operators are subject to the following fees payable to the regulator:

- A spectrum royalty fee calculated based on, among others, the number of frequency bands allocated and the number of base stations owned by each operator.⁹⁰
- For each standard mobile phone number, a numbering fee of XAF 165 is charged.⁹¹

SPECTRUM LICENCE COSTS

Finally, one-off spectrum acquisitions and licence renewals entail further costs for operators. These occur infrequently, when new spectrum is released to the market or existing licences expire. In 2014, one new license has been awarded together with one license being renewed.⁹²

83. Operator data and CROSET (2016). 'Téléphonie mobile au Tchad: Un marché en plein boom malgré des prix élevés et une qualité médiocre des services'.

84. Operator data.

85. Deloitte (2016). 'Corporation Tax Rates 2016'.

86. République de Tchad (2013). 'Décret no. 050 - portant gestion exclusive de la passerelle internationale par la Société des Télécommunications du Tchad (SOTEL TCHAD)'; and 'Protocole d'accord pour la gestion du Trafic International (2016)'.
87. Deloitte analysis based on operator data. For more detail on this type of tax see: GSMA/Deloitte. (2011). 'Mobile Taxation: Surtaxes on international incoming traffic'.

88. ITU (1989). 'Final acts of the World Administrative Telegraph and Telephone Conference'.

89. Operator data.

90. République de Tchad (2015). 'Décret no. 2372/PR/PM/MPNTIC/2015'.

91. Operator data. This amount increases to XAF 1,500,000 (US\$ 2,590) for shorter, commercial numbers.

92. TeleGeography (2014). 'Airtel receives Chad's first 3G licence'. Retrieved from: <https://www.telegeography.com/products/commsupdate/articles/2014/04/14/airtel-receives-chads-first-3g-licence/>; operator data. Details on fees paid are not made public by Chad's authorities and operator figures are not reported for reasons of confidentiality.

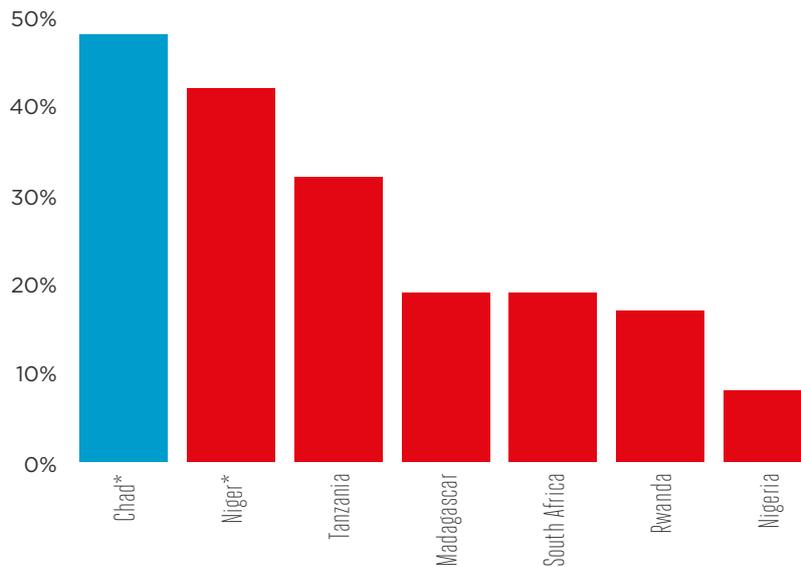
2.3 The tax and regulatory fee contribution of the mobile sector

Increases in mobile tax and regulatory fee rates, together with revenue falls in the oil sector, have raised the mobile sector's share of total tax revenues of the Chadian government in recent years.⁹³

The mobile sector as a whole paid around US\$ 143 million (XAF 85 billion) in taxes and regulatory fees in 2015, which represents approximately 48% of sector revenues.⁹⁴ Data available from 2014 and 2015 indicates that the mobile sector's contribution relative to market revenues is higher than other countries in the region, such as Rwanda, Nigeria, Niger and Tanzania.

Figure 11

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



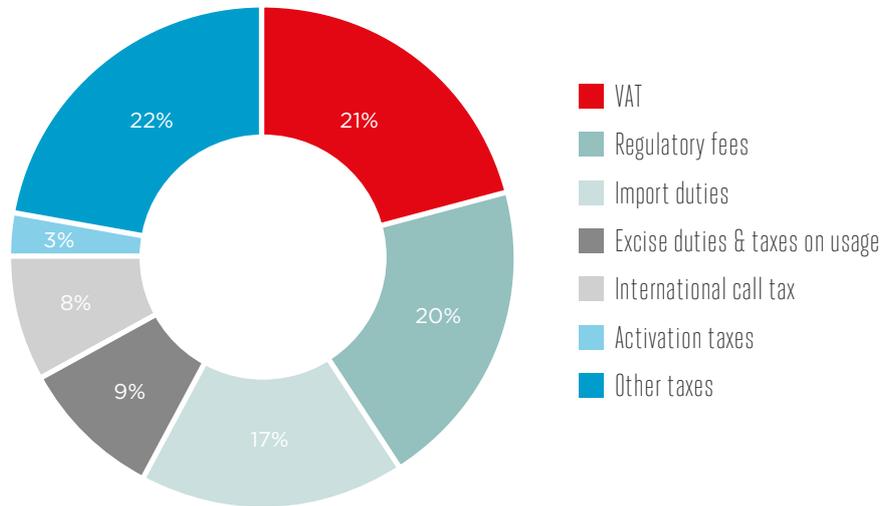
Source: Deloitte analysis based on operator data, GSMA Intelligence. *Indicates values for 2015.

Mobile-specific taxes and fees, such as the regulatory fees, the international calls tax and excise duties on mobile usage, account for more than one third of the total payments made by the mobile industry.

93. Based on operator data for 2015 and 2014 and World Bank data this share increased to 4.7% in 2015, up from 3.4% in 2014.
 94. Deloitte analysis based on operator data and GSMA Intelligence.

Figure 12

Share of total payments by mobile operators by type of tax and fee in Chad excluding corporation tax, 2015



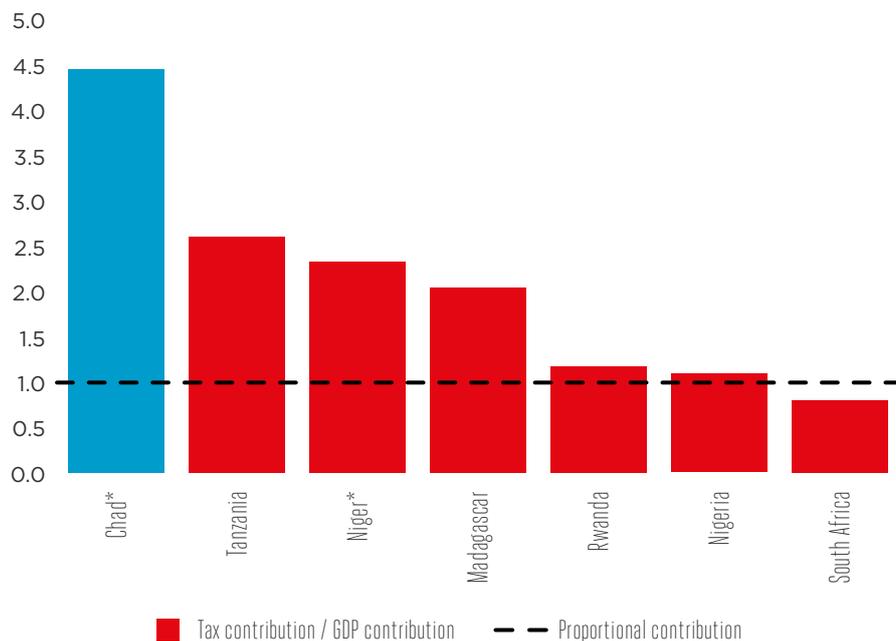
Source: Operator data. Corporation tax is excluded for confidentiality reasons. Other taxes include: Payroll taxes, nation building tax, tower tax, and other small taxes

As a consequence of sector specific taxes and regulatory fees levied on top of general taxes, the mobile sector makes a large financial contribution relative to its economic footprint. The mobile sector’s contribution to government tax revenues, including all tax and fee payments, is over

four times its share of GDP.⁹⁵ A value greater than 1 indicates that the sector over-contributes to tax revenues, relative to the size of the sector in the economy. That is, despite only accounting for less than 3% of GDP, the sector contributed 12% of total government tax revenues in 2015.⁹⁶

Figure 13

Ratio of the tax and fee share to the GDP share of mobile in selected African countries for which data is available, 2014 and 2015



Source: Deloitte analysis based on GSMA Intelligence and mobile operator data. *Indicates values for 2015

95. Deloitte analysis based on GSMA Intelligence, mobile operator data for 2015 and IMF (2016). ‘Chad – 2016 Article IV consultation’.
 96. Deloitte analysis based on GSMA Intelligence, mobile operator data for 2015 and IMF (2016). ‘Chad – 2016 Article IV consultation’. Government tax revenues include government revenues from oil and other tax revenues, but exclude grants.

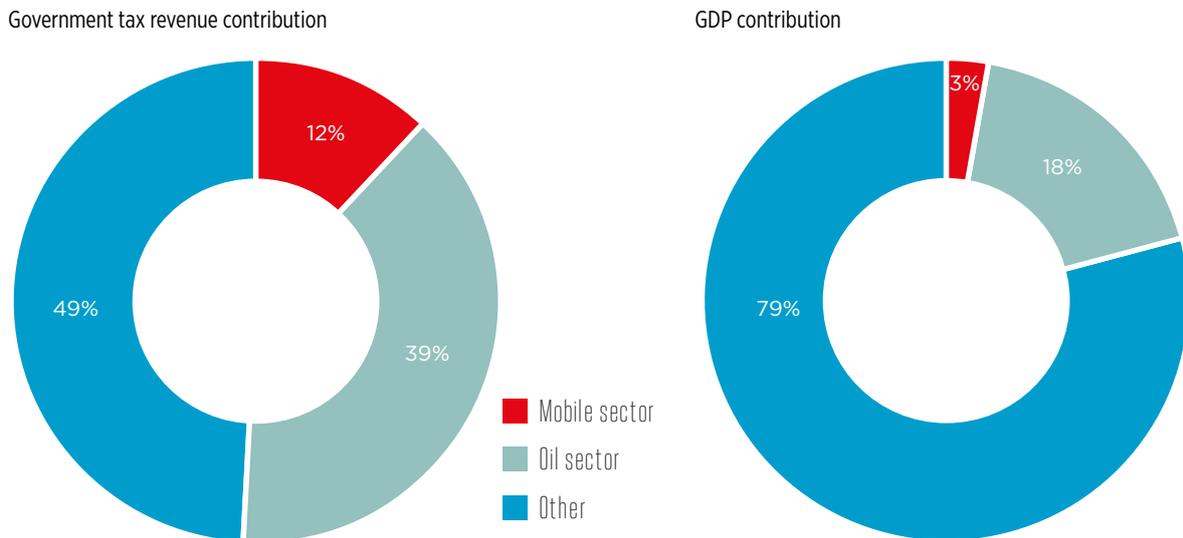
2.4 Best practice in taxation policy and mobile sector taxation in Chad

The establishment of an effective taxation policy in Chad has to consider numerous practical challenges including the presence of a large informal sector and limited institutional capabilities. It is estimated that informal activity could account for 40% of Chad's GDP.⁹⁷ The costs of applying taxation to small firms in the

informal sector may be high relative to the potential revenues earned. In Chad, tax collection appears to rely on a relatively narrow tax base; a crucial source of tax revenues is the oil sector, while the mobile sector also makes a significant contribution.

Figure 14

Government tax revenue and GDP breakdown, 2015



Source: Deloitte analysis based on operator data, World Bank data and IMF (2016). 'IMF Country Report No.16/274'. Government tax revenues include revenues from oil and other tax revenues but exclude grants. The mobile sector contribution includes all tax and regulatory fee payments.

Excessive reliance on the oil sector entails risks for Chad's public finances. International organisations have recognised the importance of broadening the tax base across other sectors. The African Development Bank's Public Finance Reform Support Programme (PARFIP) has stated a development objective of "[...] broadening of the tax base in order to improve the contribution of the non-oil productive sector to fiscal revenue mobilization".⁹⁸ The IMF also recognises that the Chadian tax system requires reform in order to be more closely aligned with best practice principles: "[...] Directors noted the importance of expanding the non-oil revenue

base, reducing tax exemptions, and strengthening tax and customs administrations".⁹⁹

Tax reform efforts should be guided by established principles on the design of effective tax systems, as provided by international organisations such as the World Bank¹⁰⁰, the IMF¹⁰¹, the ITU¹⁰² and the Organisation for Economic Co-operation and Development (OECD).¹⁰³ 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.¹⁰⁴

97. Schneider (2012). 'The Shadow Economy and Work in the Shadow: What Do We (Not) Know?'. IZA Discussion Paper Series.
 98. African Development Bank (2015). 'Chad Public Finance Reform Support Programme (PARFIP)'. Retrieved from <https://www.gtai.de/GTAI/Content/DE/Trade/Fachdaten/PRO/2016/01/Anlagen/PRO201601155000.pdf?v=1>.
 99. IMF (2015). 'IMF Country Report No.16/274'.
 100. Bird and Zolt (2003). 'Introduction to Tax Policy Design and Development'.
 101. Moolij and Keen (2014). 'Taxing Principles'.
 102. ITU (2013). 'Taxing telecommunication/ICT services: an overview'.
 103. OECD (2014). 'Fundamental principles of taxation', in Addressing the Tax Challenges of the Digital Economy. OECD Publishing.
 104. For more details, see GSMA/Deloitte, Taxation on the mobile sector - Principles, best practice and options for reform, forthcoming

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 Chad. The principles support specific steps for implementing effective taxation in practice:¹⁰⁵

- 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.

Figure 15

Best practice principles of taxation



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

The tax structure applied to the mobile sector in Chad is an example of high tax collection from a relatively narrow base, and appears inconsistent with best practice in taxation, particularly with regard to efficiency, equity and simplicity.

105. Course on Practical Issues of Tax Policy in Developing Countries, World Bank, April 28-May 1, 2003 and OECD, 2014, 'Fundamental principles of taxation'

EFFICIENCY OF TAXATION

An efficient tax system minimises economic distortions while raising the required revenues. Efficiency can be attained by taxes that:

- Are broad based.
- Incentivise competition and investment.
- Account for sector and product externalities.

In Chad there are several sector specific taxes and fees levied on top of general taxes, which may distort consumer and business decisions. Taxes such as excise duties on mobile usage distort relative prices and do

not take into account the positive effects the sector has on economic and social development (see section 1.2). The use of these taxes and fees may impede the realisation of benefits by discouraging mobile use and impeding investment in mobile infrastructure.

Best practice suggests that regulatory fees should have the purpose of covering the cost of the regulator. However, the comparatively high combined rate of 7% across regulatory fees levied on operator revenues, and the availability of alternative revenue sources for ARCEP;¹⁰⁶ suggests that this may also act as a means of revenue generation, which is not economically efficient. The combined rate of 7% is higher than in other African countries.

Table 2

Selected examples of regulatory fees levied on revenue in African countries for which data is available, 2015.

Country	Tax type	Tax rate
Nigeria	Annual operating levy (including USF)	2.5%
Niger	Regulatory fees, USF and R&D fund	6.5%
DRC	Regulatory revenues fee	2.0%
Tanzania	Local service levy, USF, and license fee	1.4%
Ghana	Investment fund and license fee	2%

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.

While the fiscal contribution of the mobile sector is important, applying general taxation to broader bases may be more effective at raising revenues and minimising distortions. Evidence from academic literature suggests that general indirect taxation remains the most viable option in the short term,¹⁰⁷ even in the presence of an informal sector.¹⁰⁸ Increased mobile sector growth may also help to bring other sectors into the formal economy. Mobile money and digitalisation of payments may enhance transparency and make it more difficult to participate in the shadow economy.¹⁰⁹ The introduction of mobile tax payments may reduce the costs of compliance¹¹⁰ and appears to have been successful in countries such as Tanzania.¹¹¹

SIMPLICITY AND ENFORCEABILITY

Complexity of taxes may discourage tax compliance and weaken investment incentives. The tax environment in Chad appears relatively complex due to the large number of general taxes faced by businesses, as well as the widespread use of sector specific taxation and exemptions.¹¹² The IMF advises that "[...] fiscal space will need to be created by expanding the non-oil tax base through a rationalization of exemptions."

As a result of tax complexity, the World Bank and PwC's Paying Taxes study has found that the time required to comply is very high both internationally and relative to its regional neighbours. This finding is reflected in the overall ranking of the Paying Taxes index, in which Chad occupies last place. Reducing complexity may be important in order to lower the costs of compliance, expand the formal economy and improve the investment climate.

106. Republique du Tchad (2014). Loi No. 013/PR/2014. 'Portant Regulation des Communications Electroniques et des Activites Postales'.
 107. Ehtisham et al (2012). 'Tax Reforms in the Presence of Informality in Developing Countries'
 108. Kaplow (2004). 'On the undesirability of commodity taxation even when income taxation is not optimal'.
 109. European Bank for Reconstruction and Development. 'Mobile Money Services Study'. World Bank. (2016). 'Digital Dividends' International Growth Centre. (2012). 'Improving Tax Compliance in Developing Economies.'
 110. Joshi et al. (2014). 'Taxing the Informal Economy'
 111. <http://www.gsma.com/mobileforddevelopment/programme/mobile-money/paying-taxes-through-mobile-money-initial-insights-into-p2g-and-b2g-payments>
 112. IFZ. 'Tchad'. Retrieved from on <http://www.ifz.net/pages-facteurs-production/tchad>.

Table 3

Paying Taxes Index ranking for selected African countries, 2016

Country	Paying taxes rank	Time to comply (hours)
Chad	186	732
Central African Republic	185	483
Nigeria	181	908
Benin	179	270
DRC	173	346
Niger	156	270
Burkina Faso	153	270
Tanzania	150	179
Mali	149	270
Sudan	140	180
South Sudan	104	210
Rwanda	48	109

Source: World Bank Group (doingbusiness.org)

The mobile sector is subject to a particularly large number of taxes and fees. Tax complexity increases when taxes are frequently subject to change. Operators raised concerns about frequent increases

in mobile-specific tax and regulatory fee rates, as well as disputes with authorities that may add to the complexity and uncertainty of the tax environment.

Table 4

Recent changes to taxes and regulatory fees on the mobile sector in Chad

	Tax or fee	Previous rate	New rate	Year of change
Consumers	SIM activation tax	n/a	XAF 1,000	2013
	Sales tax on SIM and scratch cards	0.5%	1%	2016
	International termination tax	n/a	XAF 50/minute	2014
Operators	ARCEP administration fee	3%	3.5%	2014
	USF contribution	n/a	2.5%	2014

Source: Deloitte analysis based on operator data and GSMA/Deloitte (2015), 'Digital inclusion and mobile sector taxation 2015' and Tchadinfos.com (2013).

Apart from increasing the complexity of the tax system, mobile specific taxes could also impact enforceability. For example, the tax on incoming international calls of XAF 50 per minute could incentivise the substitution of VoIP calls or calls routed via illegal SIM boxes, which prevents the government from raising revenues from the calls.

EQUITY OF TAXATION

Equity suggests that those who are better off could bear relatively more 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”.¹¹³

Any taxes on mobile services are likely to be regressive,¹¹⁴ 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 are flat-rate taxes, which are particularly regressive as they represent a higher proportion of income for poorer people. Chad has relatively high income inequality – across 145 countries it is ranked 49th in the World on the Gini coefficient measure on inequality. Inequitable taxation may add to enduring inequality across society.

The extensive use of mobile sector specific taxes and fees, together with widespread exemptions in other areas of economic activity, suggests that the treatment of different economic sectors may not be equitable. While limited data is available on the fiscal contribution of other non-oil sectors of the economy, a greater reliance on broad-based general taxation in place of sector specific taxation and exemptions may improve the overall fairness of the tax system, potentially enhancing tax morale and compliance.



113. IMF. (2015). 'Current challenges in revenue mobilisation: improving tax compliance'.
 114. IA regressive tax takes a larger proportion of income from low-income earners than high-income earners.

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

The mobile sector is an important enabler for economic and social development in Chad. However, the current tax treatment of the sector may be hindering progress. 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 has the potential to improve affordability of mobile services on Chad

Although mobile network coverage reaches at least 86% of the population¹¹⁵, uptake of mobile services is low compared to other African countries. The cost of mobile services is likely to be a key barrier preventing the majority of Chad's population from taking up

a mobile subscription. For the average Chadian it is estimated that the cost of voice and SMS usage amounts to 29% of income, not including the cost of purchasing a mobile phone.¹¹⁶

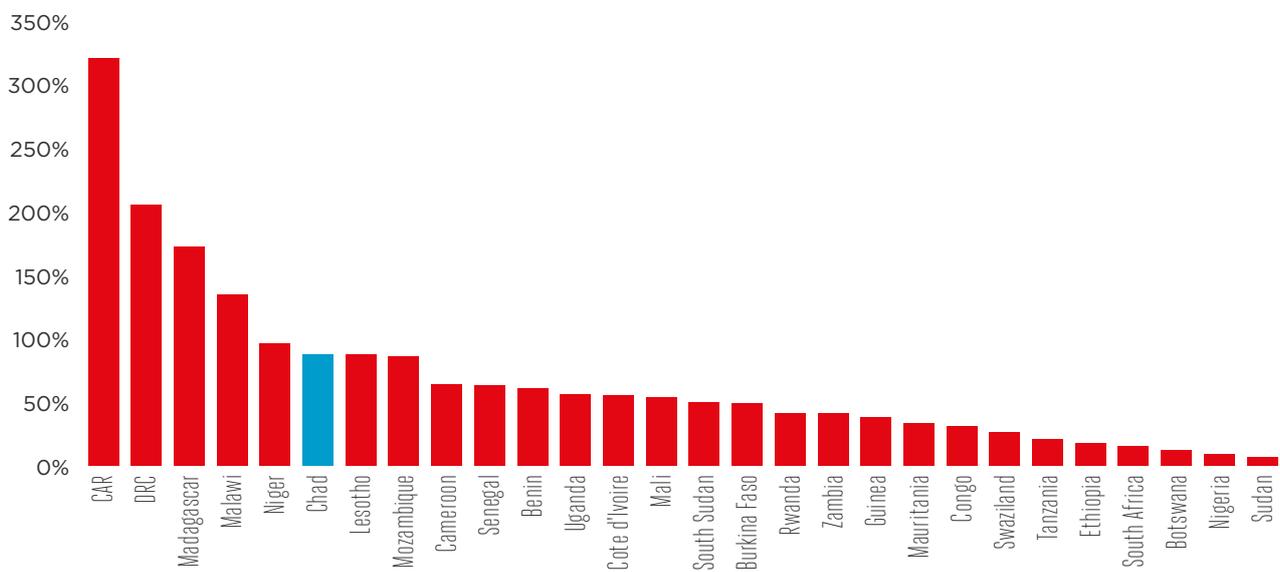
¹¹⁵ ARCEP (2015), 'Rapport Annuel'. Coverage of two operators, actual coverage could be higher if the operators' coverage has complementarities.
¹¹⁶ Deloitte analysis based on ITU (2015): 'Measuring the internet society' and World Bank data.

Affordability may be a problem particularly 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 87% of average monthly income. This figure does not include the cost of purchasing a handset; for

example, a basic mobile phone might cost around XAF 12,000, which represents over 8% of annual income of the poorest 20% of the population. Chad's poorer citizens may be unable to afford mobile services on top of their spending on essential items.

Figure 16

Mobile-cellular cost as a share of monthly GNI for those in the bottom 20% income group, for selected African countries, 2014



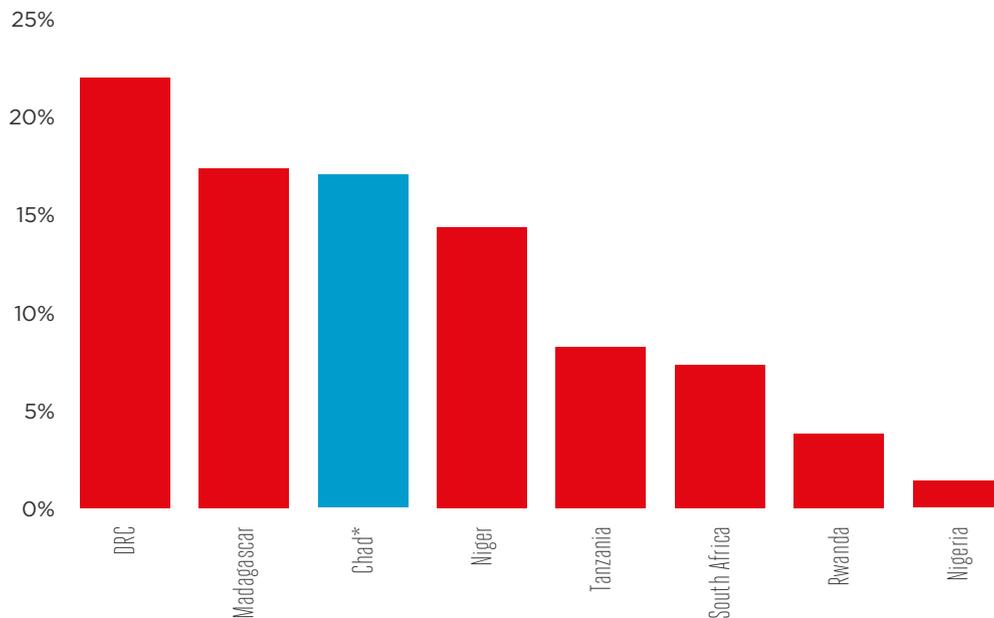
Source: Deloitte analysis based on ITU (2015): 'Measuring the internet society' and World Bank data

Similarly, lack of affordability is likely to be a major reason for relatively low rates of broadband usage. In Chad, even for the highest 20% of earners the typical cost of a mobile broadband package represents 9% of monthly income,¹¹⁷ higher than the 5% threshold set by the United Nations Broadband Commission. The price of 3G and 4G-capable handsets is also likely to represent a substantial expenditure.

Taxes and regulatory fees may increase the barrier to mobile ownership and usage if they lead to price increases. In 2015, Chad's operators made tax and regulatory fee payments equal to XAF 22,000 per subscriber, which represents around 4% of average annual income for Chadians.¹¹⁸ Taxes and regulatory fees per subscriber amount to almost 20% of the annual income of the poorest consumers, which is higher compared to other African countries such as Rwanda, Nigeria and Tanzania.

Figure 17

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



Source: Deloitte analysis based on GSMA Intelligence, mobile operator data for 2014 and World Bank data. * Indicates values for 2015

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

- Reducing the SIM activation charge of XAF 1,000 or the customs duty of 30% on imported mobile devices has the potential to lower the barrier to accessing mobile services.
- Lowering the excise duties on usage of XAF 10 per call and XAF 1 per day has the potential to enable consumers to make more extensive use of valuable mobile services. Payments of these taxes totalled over US\$ 11 million (XAF 6.5 billion) or US\$ 3 (XAF 1,780) per subscriber in 2015.¹¹⁹

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

118. Deloitte analysis based on GSMA Intelligence, mobile operator data for 2014 and World Bank data.

119. Deloitte analysis based on operator data and GSMA intelligence, 2015.

3.2 Tax reform has the potential to stimulate mobile sector investment and Foreign Direct Investment (FDI) in Chad

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,¹²⁰ the costs involved in extending and upgrading mobile networks in Chad are likely to be substantial.

International studies indicate that Chad’s mobile infrastructure is markedly underdeveloped compared to other countries:

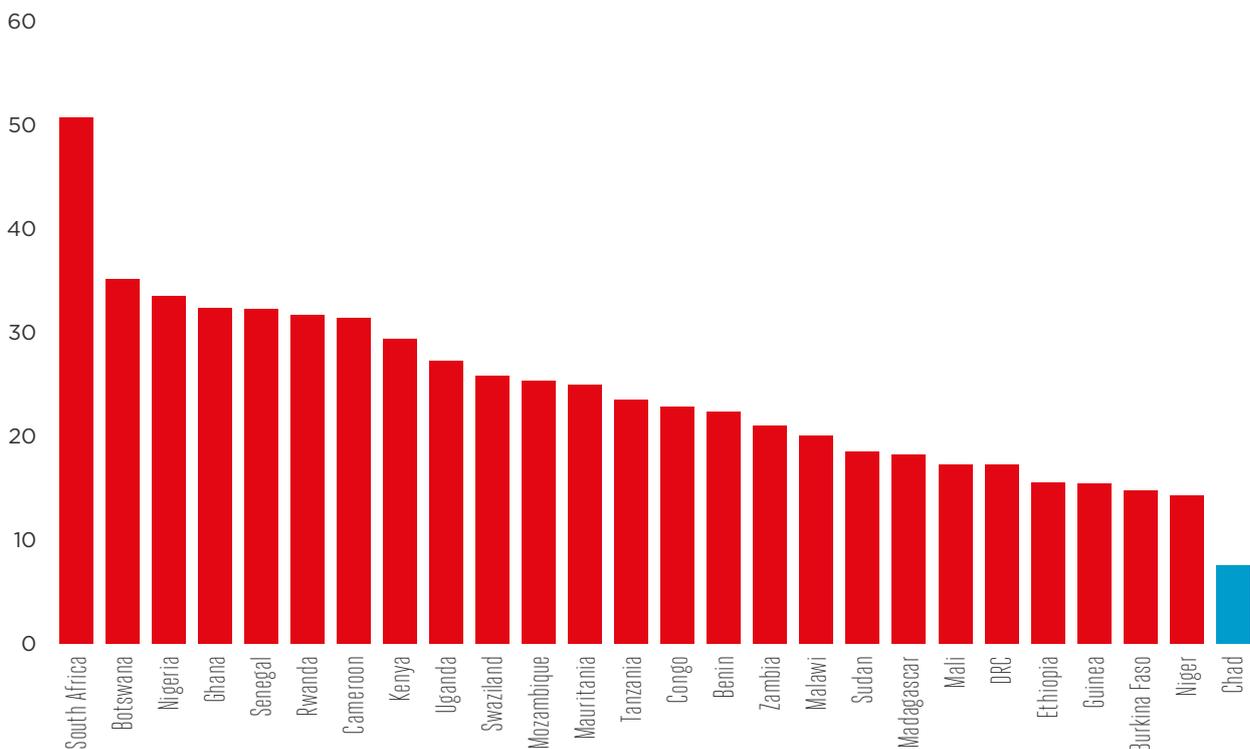
- The GSMA Mobile Connectivity Index compares 134 countries and places Chad last in terms of infrastructure, taking into account network coverage,

network performance indicators (such as mobile download speeds), other enabling infrastructure (such as access to electricity) and spectrum use.¹²¹

- According to the World Economic Forum’s Networked Readiness Index, Chad’s utilisation of information and communication technologies to drive development and competitiveness is limited. The country was ranked last among 143 economies in 2015, on a measure of infrastructure and digital content that takes into account coverage, bandwidth, electricity production and internet server security.¹²²

Figure 18

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



Source: GSMA Mobile Connectivity Index 2016

120. GSMA/altai consulting (2015). 'Spotlight on Rural Supply: Critical factors to create successful mobile money agents'.

121. GSMA Intelligence (2016). 'Mobile Connectivity Index: Methodology'.

122. World Economic Forum (2016). 'The Global Information Technology Report 2016'.

As Chad's main operators are subsidiaries of multinational companies, their investment decisions may depend on the relative attractiveness of the business environment in different countries. The World Bank has identified a need for Chad to improve the environment for private sector investment, including by addressing fiscal and administrative challenges faced by businesses.¹²³

The level of taxation directly affects mobile operators' financial ability to invest, but tax complexity and uncertainty may also affect investment incentives.

- With a large number of frequently changed taxes, returns on investments are more uncertain and investment may be deterred, especially where significant upfront investments may need to be recovered over a long time period, as in the mobile sector.
- Fees on revenues rather than profits (such as the ARCEP administration fee) may discourage investment and innovation, as these fees require the same payment from an operator regardless of whether it retains its profit or sacrifices it to invest in new infrastructure and services.
- The spectrum royalty fee¹²⁴ increases with number of base stations that are operated and therefore increases the operators' cost for expanding their mobile network coverage. This incentive structure may distort the cost-benefit considerations of installing new sites.

Operator taxes and fees are likely to affect the financial resources available for investment as they are less likely to be passed through to consumers. Reducing and rationalising these taxes and fees has the potential to increase investment.

THE TELECOM SECTOR AND FDI

Various studies demonstrate the importance of FDI in supporting economic and social progress in developing countries. Academic research has broadly found a positive relationship between FDI and growth in developing countries;¹²⁵ in Chad it is estimated that over the period of 1980-2010 FDI inflows in Chad increased economic growth by 28% overall.¹²⁶

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.”¹²⁷

While the available data on Chad's FDI inflows is limited, it appears likely that the mobile sector is among those sectors contributing substantially to FDI, given that the sector accounts for almost 3% GDP in 2015 and predominantly consists of multinational companies. Net FDI inflows in Chad reached 5.5% of GDP in 2015, the highest level since 2004,¹²⁸ yet Chad still has the lowest investment stock in SSA.¹²⁹ Increased investment from the telecom sector could help drive FDI higher and support Chad's development.

Promoting investment in the telecom sector specifically may also be 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,¹³⁰ while another finds a positive relationship between mobile penetration and FDI in developing countries.¹³¹

123. World Bank (2015). 'Country Partnership Framework for the Republic of Chad for the Period FY16-20'. *International Development Association, International Finance Corporation and Multilateral Investment Guarantee Agency*.

124. This term is used to refer to the fee described in Decret No. 2372, *Portant détermination et fixation des frais et montants des redevances sur communications électroniques*.

125. Waheed, (2004). 'Foreign capital inflows and economic growth of developing countries: a critical survey of selected empirical studies'. *Journal of Economic Cooperation*.

Hansen, Henrik, and John Rand. (2006). 'On the causal links between FDI and growth in developing countries'. *The World Economy*.

126. Ongo Nkoa, B. 'Foreign Direct Investment and Economic Growth: The Experience of CEMAC Countries'. *Journal of Finance & Economics*.

127. OECD. (2002). 'Foreign Direct Investment for development. Maximising benefits, minimising costs'.

128. World Bank data.

129. See for example: IMF (2016). 'Chad selected issues'.

130. Asiedu, Elizabeth. (2006). 'Foreign direct investment in Africa: The role of natural resources, market size, government policy, institutions and political instability'. *The World Economy*.

131. Lydon, Reamonn, and Mark Williams. (2005). 'Communications networks and foreign direct investment in developing countries'. *Communications & Strategies*.

3.3 Impacts of specific tax and regulatory fee reforms

To estimate the quantitative impacts of specific reforms, an economic model of Chad's economy and mobile sector was constructed, using sector specific data from the GSMA and mobile operators in Chad, 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.¹³²

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.

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 Chad. Productivity is calculated using the Total Factor Productivity impact.

3.3.1 Reducing excise duties on usage

The excise duties on daily usage (RAV) and on each call made (FNDS) are sector specific. If passed through to consumers, they may further increase the prices of mobile services already subject to general taxes, such as VAT.

The use of flat rates means that the RAV and FNDS may particularly discourage the poorest citizens from using mobile phones. A subscriber making two calls per day would be subject to annual RAV and FNDS duties of almost US\$ 9 (XAF 5,300), which is equivalent to around 3.6% of annual income for the lowest 20% of earners.

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 excise duties 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

¹³² 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.

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 2011.¹³³

In recognition of the challenging fiscal outlook for Chad, as an illustrative example, impacts are estimated for a 50% reduction in the RAV and FNDS rates, rather than a complete removal of the taxes. Based on 2015 data, this change equates to a tax payment reduction of around US\$ 5.7 million (XAF 3.4 billion),¹³⁴ which represents 0.5% of government tax revenues and 4% of the mobile sector’s tax and regulatory fee contribution.¹³⁵

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:

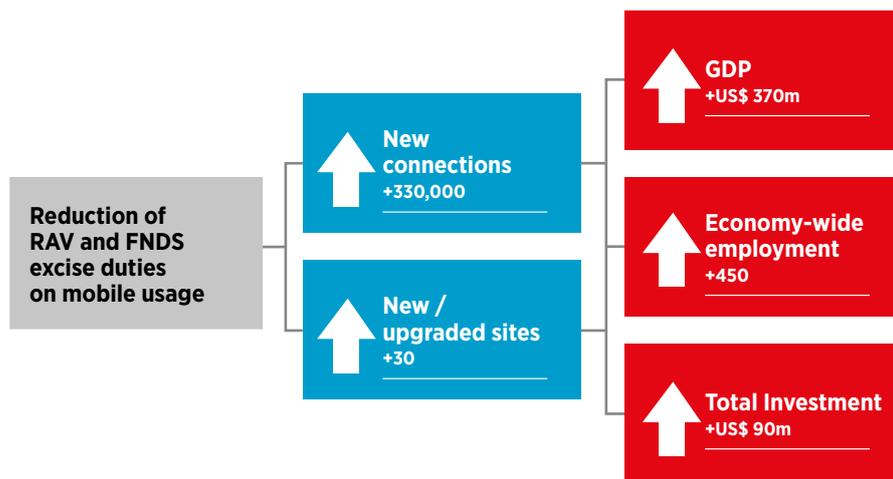
- **New connections:** Price reductions have the potential to generate an additional 330,000 connections over the five year period to 2021.

This amount equates to 5% of the total volume of connections in 2016.¹³⁶ Of the new connections, 80,000 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\$ 370 million (XAF 220 billion) over the five years to 2021. This amount is equal to 3% of Chad’s GDP in 2015.¹³⁷
- **Additional investment:** Increased resources for investment has the potential to create an additional 30 new or upgraded base stations by 2021. In the wider economy, total investment could increase by US\$ 90 million (XAF 50 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 250 employees in the wider economy.

Figure 19

Estimated cumulative economic impact of reduction in RAV and FNDS excise duties on mobile usage, 2017-2021



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

133. 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.
 134. Deloitte analysis of operator data.
 135. Deloitte analysis of operator data and IMF data.
 136. Based on GSMA Intelligence data for Q2 2016.
 137. Based on Chad GDP data in International Monetary Fund, World Economic Outlook Database, retrieved October 2016.

3.3.2 Reducing the tax on incoming international calls

The tax on international incoming calls is another example of sector specific taxation. It may have a strong influence on the price of incoming international calls; a previous GSMA/Deloitte study has found that the introduction of taxes on international incoming traffic increased prices by between 50% and 111% in four African countries.¹³⁸

The same study finds that:

- Higher prices have caused a reduction in incoming call volumes.
- Imposing the tax may increase incentives for illegal traffic routing, taking away revenues from operators and governments, while reducing quality of service for consumers.
- The tax may increase the costs of doing business, with negative economic consequences for international trade, foreign investment and global competitiveness.

A recent OECD analysis of African countries has found that increases in incoming international call charges may not increase the total revenues received from these charges, due to the reduction in incoming call volumes.¹³⁹ The OECD analysis suggests that reductions in these charges may have only a limited impact on the revenues raised. In the medium- to long-term the tax could be phased out in order to maximise economic benefits for Chad. However, in recognition of the challenging fiscal outlook, as an illustrative example, impacts are estimated for a 50% reduction in the tax rate. Based on 2015 data, this change equates to a tax payment reduction of around US\$ 5.3 million (XAF 3.1 billion)¹⁴⁰, which represents 0.5% of government tax revenues and 4% of the mobile sector's tax and regulatory fee contribution.¹⁴¹

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 270,000 connections over the five year period to 2021. This amount equates to over 4% of the total volume of connections in 2016.¹⁴² Of the new connections, 70,000 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\$ 310 million (XAF 190 billion) over the five years to 2021. This amount is equal to 3% of Chad's GDP in 2015.¹⁴³
- **Additional investment:** Increased resources for investment has the potential to create an additional 50 new or upgraded base stations by 2021. In the wider economy, total investment could increase by US\$ 80 million (XAF 50 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 300 jobs, and by 400 employees in the wider economy.

138. GSMA/Deloitte. (2011). 'Mobile Taxation: Surtaxes on international incoming traffic'.

139. OECD Working Party on Communication Infrastructures and Services Policy. (2015). 'International traffic termination'

140. Deloitte analysis of operator data.

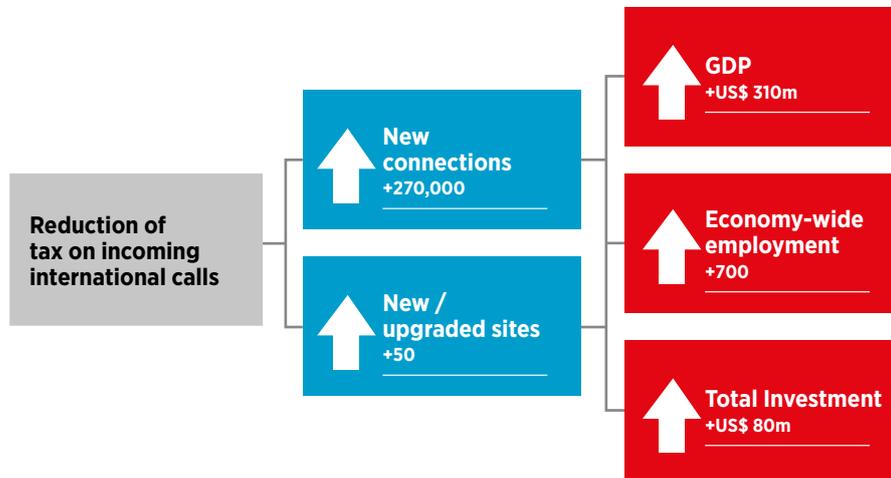
141. Deloitte analysis of operator data, and IMF data.

142. Based on GSMA Intelligence data for Q2 2016.

143. Based on Chad GDP data in International Monetary Fund, World Economic Outlook Database, retrieved October 2016.

Figure 20

Estimated cumulative economic impact of reduction in tax on incoming international calls, 2017-2021



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

3.3.3 Reducing regulatory fees

Regulatory fees levied on mobile operator revenues have risen markedly since 2014. These fees are sector specific, increasing the financial contribution of the mobile sector relative to other sectors. The number of different fees and changes in these over time also adds to complexity. A reduction in 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.

International experience suggests that reducing taxes and fees on operator revenues could drive faster growth in penetration, both due to price reductions and network expansion. For example, in Senegal, a tax levied at a rate of 3% of revenues was removed and the growth rate of mobile penetration rose from around 5% to a peak of 20% over the following year.¹⁴⁴

Given that there are several types of regulatory fees imposed on operators, various possible reforms may be possible to rationalise the regulatory fee system

and reduce the overall level of fees imposed. As an illustrative example, impacts are estimated for a reduction in the ARCEP administrative fee rate from 3.5% to 1% which would reduce the cumulative rate of regulatory fees from 7% to 4.5%, close the pre-2014 levels. Based on 2015 data, this change equates to a tax payment reduction of around US\$ 7.1 million (XAF 4.2 billion),¹⁴⁵ which represents 0.6% of government tax revenues and 5% of the mobile sector's tax and regulatory fee contribution.¹⁴⁶

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 340,000 connections over the five year period to 2021. This amount equates to around 5% of the total volume of connections in 2016.¹⁴⁷ Of the new connections, 80,000 could use mobile broadband.

144. GSMA/Deloitte, 'Taxes and fees on the mobile sector, Principles, best practice and options for reform', Forthcoming. Other developments may have affected the mobile sector at the same time as the tax change.

145. Deloitte analysis of operator data.

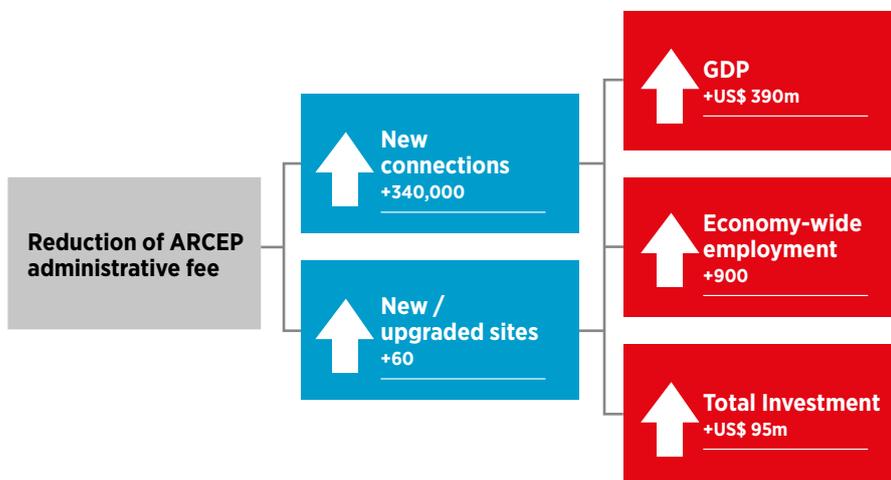
146. Deloitte analysis of operator data, and IMF data.

147. 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\$ 390 million (XAF 240 billion) over the five years to 2021. This amount is equal to over 4% of Chad’s GDP in 2015.¹⁴⁸
- Additional investment:** Increased resources for investment has the potential to create an additional 60 new or upgraded base stations by 2021. In the wider economy, total investment could increase by US\$ 95 million (XAF 65 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 500 employees in the wider economy.

Figure 21

Estimated cumulative economic impact of reduction in ARCEP administrative fee, 2017-2021



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

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 THE SIM CARD ACTIVATION TAX

Based on a representative cost of a SIM card before tax of XAF 500,¹⁴⁹ taxes on SIM cards make up over two thirds of the final SIM card cost to consumers. The tax on SIM cards of XAF 1,000 is sector specific and likely to

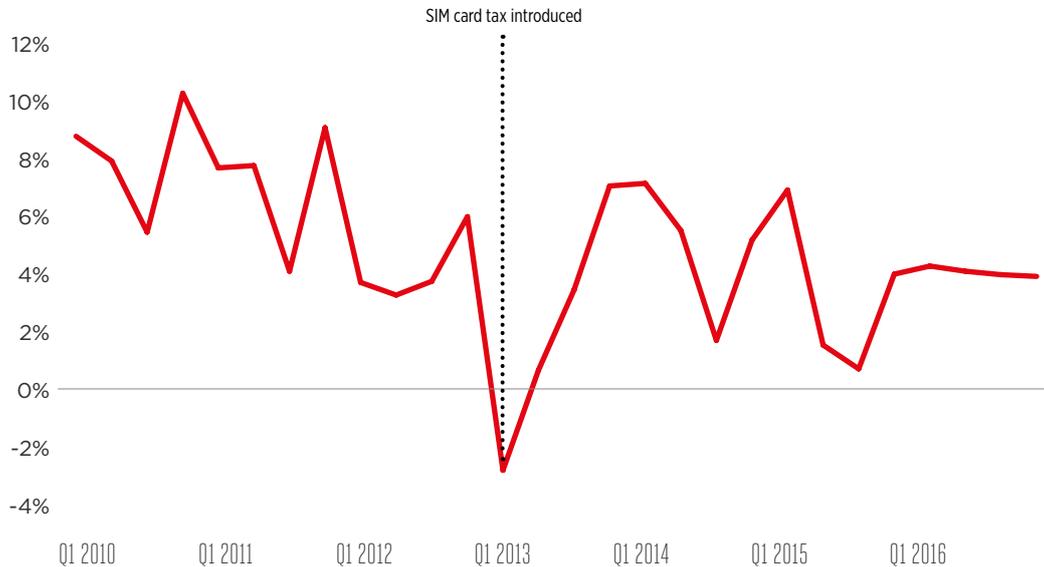
increase the upfront costs of mobile ownership. Applying this tax as a flat rate is particularly regressive, as its amount represents a higher proportion of income for the poorest consumers. Reducing or eliminating the tax has the potential to drive penetration further by lowering the barrier to mobile ownership.

Though other developments may have affected the sector, the introduction of the SIM card tax in January 2013 coincided with a marked drop in the growth rate of mobile connections, which became negative in the first quarter of 2013 from a previous growth rate of over 5%.

148. Based on Chad GDP data in International Monetary Fund, World Economic Outlook Database, retrieved October 2016.
 149. Operator data.

Figure 22

Quarterly growth rate of connections in Chad, 2010-2016



Source: GSMA Intelligence. Data excludes cellular M2M connections

A reduction in the sales tax on SIM cards (and top-up scratch cards) of 1% to the previous level of 0.5% before 2016 has similar potential to lower the cost of mobile services and increase affordability and usage.

REDUCTION OR REMOVAL OF TAXES ON MOBILE HANDSETS

Given the low income levels in Chad, the purchase of any mobile handset may be a prohibitive expense for many Chadians, while the price of smartphones in particular may exclude large portions of the populations 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.

One approach may be to reduce or eliminate the VAT on mobile handsets. Countries such as Rwanda and Senegal have exempted mobile handsets from VAT. International

experience suggests that such reforms have the potential to drive mobile penetration and benefit the economy as a whole. In Kenya, for example, the VAT exemption in 2009 led to a 200% increase in handset sales over the following three years, outpacing growth elsewhere in Africa.¹⁵⁰ Over the same period, the contribution of mobile telephony to the Kenyan economy grew by nearly 250%, while mobile-related employment increased by 67%.¹⁵¹

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.¹⁵² Mobile phone imports are also exempt from customs duty in Senegal.¹⁵³

The above countries have seen stronger growth in mobile penetration than Chad and have all exceeded 50% mobile penetration (unique subscribers) by 2016,¹⁵⁴ compared to 28% in Chad.¹⁵⁵

150. GSMA, 2012, 'Taxation of mobile telecoms: Sector-specific taxes on consumption and international traffic'.

151. GSMA/Deloitte, 2011, 'Mobile telephony and taxation in Kenya'.

152. 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>

153. PwC (2016), Worldwide Tax Summaries.

154. GSMA Intelligence. Other developments may have affected the mobile sector in these countries as well as the tax change.

155. GSMA Intelligence, mobile penetration, unique subscribers. For reference, the regulator ARCEP reports penetration of 40.6% in 2015 based on total connections and 24.3% based on unique subscribers. Subscribers may have multiple SIM cards (i.e. connections) and therefore, the numbers may differ.

3.4 Options for rebalancing taxation revenues

The mobile industry recognises the importance of the current revenues that Chad’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 revenues for the government, due to the benefits from increased mobile usage and increased investment across the economy. As a result, the government has the potential to recover the tax revenues shortfall in the medium term.

In the short term, the tax changes in each of the three scenarios create a tax revenues shortfall. The government may consider alternative ways to cover the shortfall.

Marginal changes to general taxation, such as VAT or corporation tax, may be sufficient to cover the shortfall from reductions in distortionary sector specific taxation.

THE SIZE OF TAX REVENUES SHORTFALLS IS SMALL RELATIVE TO REVENUES FROM GENERAL TAXATION

The tax revenues shortfall from reductions in taxes on the mobile sector would be small compared to total non-oil tax revenues. Based on tax revenues data published by the IMF for 2015, the tax revenues shortfall from each proposed tax reform option is estimated below relative to total non-oil tax revenues.

Table 5

Tax revenues shortfall in each scenario relative to total non-oil tax revenues in 2015

Tax change	Tax revenues shortfall relative to total non-oil tax revenues
Reduction of excise duties on mobile usage (RAV and FNDS)	0.80%
Reduction of tax on incoming international calls	0.75%
Reduction in ARCEP administrative fee	0.80%

Source: IMF; operator data; Deloitte analysis

SMALL CHANGES IN GENERAL TAXATION MAY BE SUFFICIENT TO COVER TAX REVENUES SHORTFALLS

Given that the tax shortfall from each proposed tax reform is below 1% of total non-oil tax revenues, a small increase in general tax rates – for example VAT – may be sufficient to cover the shortfall. Similarly, a small increase in the breadth of general tax bases may be sufficient to cover the shortfall.

There is limited visibility of tax revenues from specific types of tax in Chad.¹⁵⁶ Estimates of the VAT rate (currently 18%) that may make up the tax revenues shortfall are provided, based on illustrative assumptions about the total revenues generated from VAT.

156. Mobile operators note that fiscal accountability is a key tax governance challenge.

Table 6

Indicative estimates of VAT rate required to cover tax revenues shortfall, under different tax reform scenarios

	If VAT revenues are 35% of total non-oil tax revenues	If VAT revenues are 50% of total non-oil tax revenues	If VAT revenues are 65% of total non-oil tax revenues
Reduction of excise duties on mobile usage (RAV and FNDS)	18.41%	18.29%	18.22%
Reducing the tax on incoming international calls by 50%	18.39%	18.27%	18.21%
Reducing the ARCEP administrative fee from 3.5% to 1%	18.52%	18.36%	18.28%

Source: IMF; operator data; Deloitte analysis

The estimations do not take into account the impacts that these increase may have on the wider economy;¹⁵⁷ however, they 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 that generate a significant proportion of total tax revenues.

Aside from changes in the VAT rate, other options may be available. The indicative tax rate increases shown above can act as an indication of potential changes to other general taxes (e.g. corporation tax).

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.

157. 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 revenues raised from that specific tax but also indirect impacts on the revenues collected from other general taxes. For example, a rise in the income tax could directly cover the lost tax revenues 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 Chadian 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 consumption taxes.

4. Reforming taxation on the mobile sector in Chad

While taxation from the mobile sector remains critical to continue financing public expenditure in Chad, especially in light of recent revenues shortfalls from oil-related activities, the current tax system applies several mobile sector specific taxes and fees that may be obstructing growth of the mobile sector. Some of these taxes and fees have been introduced or increased in recent years.

Using mobile phones is unaffordable for many Chadians, while the country's mobile infrastructure is underdeveloped and internet usage is low relative to other countries. Sector specific taxes and fees on mobile operators and consumers – in particular the excise duties on mobile usage, the surcharge on incoming international calls, the SIM card activation tax 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 Chadians remain unconnected.

Reforming mobile taxation has the potential to align infrastructure investment and mobile access with the ICT objectives laid out in the 'Vision 2030' strategy. 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:

- Sector specific taxes and fees could be substituted with reforms in line with the principle, suggested for example by international organisations such as the World Bank¹⁵⁸, that low rates on wider tax bases are to be preferred to higher taxes on narrow bases. The government could seek to reduce the excise duties on daily usage (RAV) and on each call made (FNDS) or lower the surcharge on incoming international call

volumes to align consumer taxes on mobile usage 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 array of regulatory fees and payments could be rationalised into a simpler structure, with rates set 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. Fixed SIM activation charges or handset customs duties could be lowered, which has the potential to reduce the affordability barrier for consumers purchasing a mobile handset for the first time.

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 reduce Chad's dependency on oil revenues as recommended 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, could give many Chadians 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.

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



Reforming mobile taxation has the potential to align infrastructure investment and mobile access with the ICT objectives laid out in the 'Vision 2030' strategy.

Appendix: Methodology

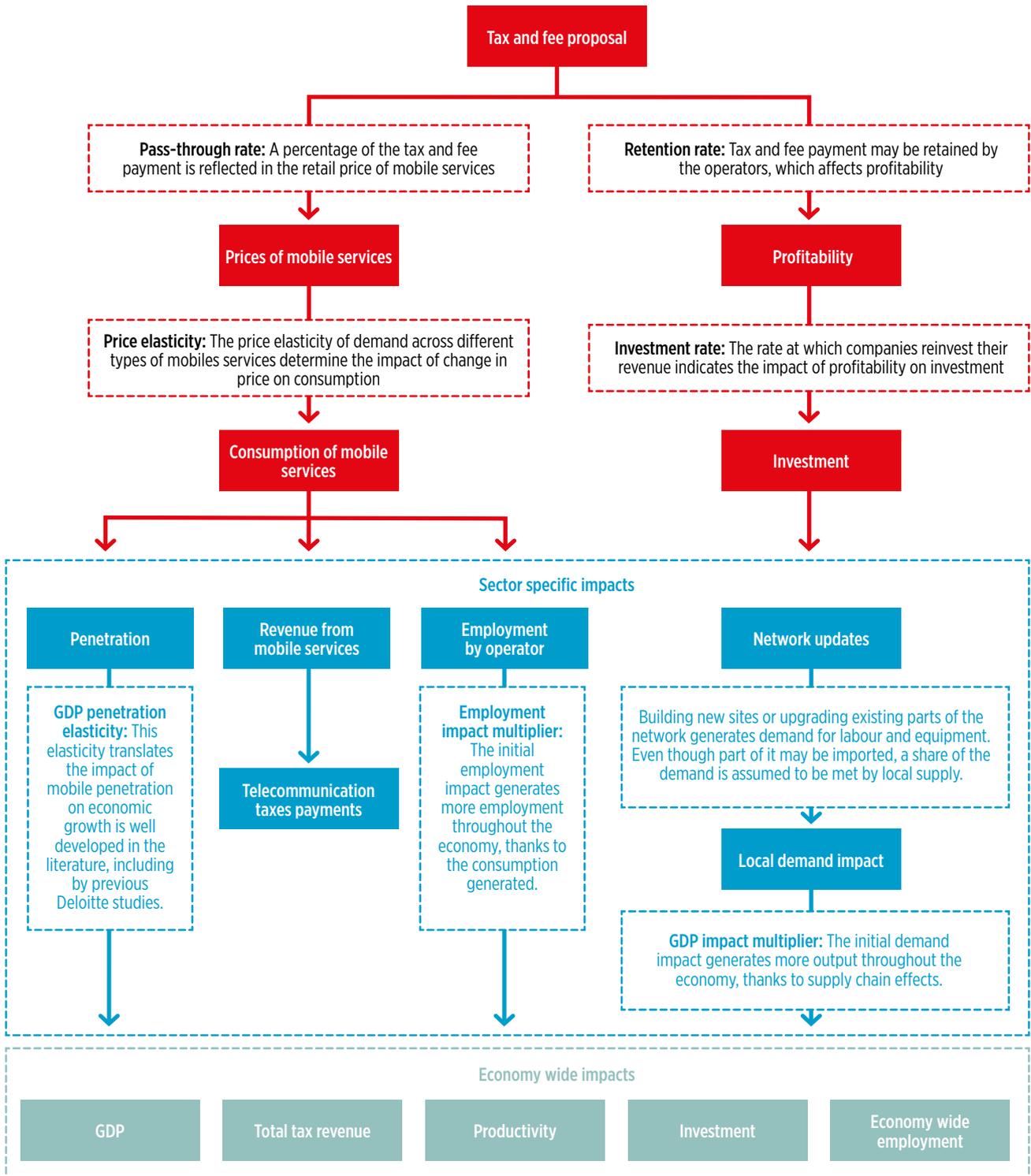
A.1 Estimation of the economic impact of a tax change

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 Chad. 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 the 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 23

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 Chad

As illustrated in Figure 23, 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 Chad 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,¹⁵⁹ 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 revenues 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 revenues from the mobile industry may be offset by tax revenues 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 Chad. 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.

159. 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.¹⁶⁰ Having considered this evidence, as well as a number of market-specific conditions in Chad – including evidence that affordability is a key barrier preventing many consumers from accessing mobile services – 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, such as the excise duties on days of usage and on calls made. For taxes or regulatory fees on operator revenue, 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 and taking into account Chad's relatively low levels of income and mobile penetration,¹⁶¹ 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.¹⁶²

Reinvestment rate¹⁶³

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.¹⁶⁴ 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 Chad, on operator data and on a review of the existing evidence internationally.¹⁶⁵

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 Chad'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 (XAF 100 million) and the cost of network upgrades for mobile broadband is US\$ 50,000 (XAF 30 million).¹⁶⁶ This takes into account differences in the cost of rural sites and other non-site costs that are necessary for each site.

160. IMF, 2015, 'Estimating VAT Pass Through'

161. An estimate of price elasticity of demand for Chad 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 Chad's country-specific characteristics, such as the particularly low levels of income and low mobile penetration, which may be indicative of higher price sensitivity.

162. See, 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

163. The 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 reinvested out of a fixed income investment to another. In this report reinvestment rate is the proportion of the tax change that is invested.

164. Gilchrist and Himmelberg (1995); 'Evidence on the role of cash flow for investment'

165. 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'.

166. Deloitte analysis on operators' data, APC (2012). '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 Chad's mobile sector and the general economy, it is assumed that for every additional job created within the mobile sector an additional 1.2 jobs are generated in Chad's wider economy.¹⁶⁷

The GDP multiplier is used to estimate the wider economic impacts of the additional network investment. Based on the structure of Chad's economy and how telecommunications services are used, this is estimated to be 1.49.¹⁶⁸ 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.¹⁶⁹ 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.¹⁷⁰ This model does not consider switching between 2G and 3G services and so these impacts are treated separately.¹⁷¹

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 $\alpha = 0.3$ and $\beta = 0.7$.¹⁷²

167. This estimate is based on GSMA (2015). 'The Mobile Economy (Sub-Saharan Africa)'.

168. 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 Chad's (India) among countries for which estimates are available.

169. 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>

170. 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

171. 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.

172. Bassanini A and Scarpetta S (2001). 'The Driving Forces of Economic Growth: Panel Data Evidence for the OECD countries'

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.

Table 7

Annual impacts of reducing the RAV and FNDS excise duties on mobile usage on selected macroeconomic and industry variables

Criterion	2017	2018	2019	2020	2021
Macroeconomic impacts					
<i>Incremental GDP</i>	US\$ 18 million	US\$ 48 million	US\$ 84 million	US\$ 101 million	US\$ 118 million
<i>Additional employment</i>	150	250	300	400	450
<i>Labour productivity, % increment</i>	0.11%	0.29%	0.46%	0.53%	0.61%
<i>Investment</i>	US\$ 4 million	US\$ 13 million	US\$ 20 million	US\$ 24 million	US\$ 29 million
Sector-specific impacts					
<i>Incremental connections: total (broadband)</i>	130,000 (10,000)	230,000 (30,000)	260,000 (40,000)	290,000 (60,000)	330,000 (80,000)
<i>Incremental unique subscribers: total (broadband)</i>	70,000 (5,000)	120,000 (15,000)	130,000 (20,000)	140,000 (30,000)	160,000 (40,000)
<i>Increase in mobile penetration total, by connections</i>	0.86%	1.51%	1.65%	1.78%	1.93%
<i>Cumulative number of new sites (site upgrades)</i>	2 (2)	5 (4)	8 (6)	11 (9)	14 (12)

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

Table 8

Annual impacts of reducing the tax on incoming international calls on selected macroeconomic and industry variables

Criterion	2017	2018	2019	2020	2021
Macroeconomic impacts					
<i>Incremental GDP</i>	US\$ 15 million	US\$ 40 million	US\$ 70 million	US\$ 85 million	US\$ 99 million
<i>Additional employment</i>	250	400	500	600	700
<i>Labour productivity, % increment</i>	0.11%	0.29%	0.46%	0.53%	0.61%
<i>Investment</i>	US\$ 4 million	US\$ 11 million	US\$ 17 million	US\$ 20 million	US\$ 24 million
Sector-specific impacts					
<i>Incremental connections: total (broadband)</i>	110,000 (10,000)	190,000 (20,000)	220,000 (30,000)	240,000 (50,000)	270,000 (70,000)
<i>Incremental unique subscribers: total (broadband)</i>	30,000 (5,000)	60,000 (10,000)	60,000 (10,000)	70,000 (10,000)	70,000 (20,000)
<i>Increase in mobile penetration total, by connections</i>	0.71%	1.25%	1.37%	1.48%	1.61%
<i>Cumulative number of new sites (site upgrades)</i>	4 (3)	9 (8)	14 (12)	20 (17)	27 (23)

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

Table 9

Annual impacts of reducing the ARCEP administrative fee on selected macroeconomic and industry variables

Criterion	2017	2018	2019	2020	2021
Macroeconomic impacts					
<i>Incremental GDP</i>	US\$ 19 million	US\$ 51 million	US\$ 88 million	US\$ 107 million	US\$ 125 million
<i>Additional employment</i>	350	500	600	750	900
<i>Labour productivity, % increment</i>	0.11%	0.30%	0.48%	0.56%	0.64%
<i>Investment</i>	US\$ 5 million	US\$ 13 million	US\$ 21 million	US\$ 25 million	US\$ 31 million
Sector-specific impacts					
<i>Incremental connections: total (broadband)</i>	130,000 (10,000)	240,000 (30,000)	270,000 (40,000)	310,000 (60,000)	340,000 (80,000)
<i>Incremental unique subscribers: total (broadband)</i>	70,000 (5,000)	120,000 (15,000)	130,000 (20,000)	150,000 (30,000)	160,000 (40,000)
<i>Increase in mobile penetration total, by connections</i>	0.90%	1.57%	1.72%	1.86%	2.01%
<i>Cumulative number of new sites (site upgrades)</i>	5 (4)	11 (9)	18 (15)	25 (22)	34 (29)

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



Notes



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