

Reforming mobile sector taxation in Guinea:

Unlocking socio-economic gains from mobile connectivity









The GSMA represents the interests of mobile operators worldwide, uniting nearly 800 operators with more than 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.

For more information, please visit the GSMA corporate website at www.gsma.com

Follow the GSMA on Twitter: @GSMA

Report published March 2018

EY | Assurance | Tax | Transactions | Advisory

About EY

EY is a global leader in assurance, tax, transaction and advisory services. The insights and quality services we deliver help build trust and confidence in the capital markets and in economies the world over. We develop outstanding leaders who team to deliver on our promises to all of our stakeholders. In so doing, we play a critical role in building a better working world for our people, for our clients and for our communities.

EY refers to the global organization, and may refer to one or more, of the member firms of Ernst & Young Global Limited, each of which is a separate legal entity. Ernst & Young Global Limited, a UK company limited by guarantee, does not provide services to clients. For more information about our organization, please visit ey.com

Disclaimer

This report (Report) was prepared by Ernst & Young LLP for the GSM Association using information provided by the GSM Association and data from publicly available sources.

Ernst & Young LLP does not accept or assume any responsibility in respect of the Report to any readers of the Report (Third Parties), other than GSM Association. To the fullest extent permitted by law, Ernst & Young LLP will accept no liability in respect of the Report to any Third Parties. Should any Third Parties choose to rely on the Report, then they do so at their own risk.

Ernst & Young LLP has not been instructed by its client, GSM Association, to respond to queries or requests for information from any Third Party and Ernst & Young LLP shall not respond to such queries or requests for information. Further, Ernst & Young LLP is not instructed by GSM Association to update the Report for subsequent events or additional work (if any) performed by Ernst & Young LLP. Accordingly, without prejudice to the generality of the foregoing, Ernst & Young LLP accepts no responsibility to any Third Party to update the Report for such matters.

Ernst & Young LLP reserves all rights in the Report.

Contents

Executive summary			5
1.	The Gu	linean economy, the role of mobile and opportunities for growth	8
	1.1	Macroeconomic overview	8
	1.2	Fiscal overview	10
	1.3	Demographic overview	12
	1.4	Mobile market in Guinea	14
	1.5	Affordability of smartphones and mobile services in Guinea	19
	1.6	The socio-economic contribution of the mobile sector	22
2.	Mobile sector taxation in Guinea		26
	2.1	Overview of mobile taxation in Guinea	26
	2.2	Tax contribution of the mobile sector	30
	2.3	Tax burden in comparison to other sectors	35
3.	Designing a more efficient tax policy framework for the mobile sector in Guinea		
	3.1	Considerations for a more efficient tax system in developing countries	36
	3.2	Outlook of the tax environment in Guinea	38
	3.3	An assessment of mobile sector taxation in Guinea	39
	3.4	Options for tax policy reform in Guinea's mobile sector	40
4.	. Economic impacts of tax reform on the mobile sector in Guinea		42
	4.1	Recommended options for tax reform	42
	4.2	Approach to assessing the quantitative impacts of tax reform on the mobile	
		market and the wider economy	42
	4.3	Eliminating excise duty (TCT) on bonus calls	44
	4.4	Eliminating the surtax on international incoming traffic (SIIT)	46
	4.5	Reducing annual backhaul spectrum fees (redevance FH) by 80%	47
5.	Conclu	sion: Reforming mobile sector taxation in Guinea	50
Ap	pendix	A Methodology	52
Ap	pendix	B Scenario estimations	62

GSMA



Executive summary

Mobile telephone services are playing an increasingly important role in supporting economic growth and social inclusion in the developing world. Improved affordability and penetration for mobile services enhances digital connectivity by expanding internet and broadband access, which in turn facilitate the reduction of barriers for trade, commerce, communication, service delivery and human development. Examples of these benefits are seen in the form of financial inclusion via mobile payment platforms, digitally enabled local entrepreneurship, innovative health and education delivery systems and growing numbers of e-government initiatives.

Supportive regulatory conditions should seek to provide the mobile industry with the support it needs in order to thrive and maximise the opportunities available to consumers, businesses and governments. Within this, taxation is an important factor, with the need to achieve an appropriate balance between revenue generation, economic growth and social development.

In order to assess the potential benefits of a more efficient tax structure in the mobile sector, one which focuses on increasing mobile affordability and unlocking digital inclusion, the GSMA¹ has commissioned EY to undertake a study of the economic impact of potential tax reforms on the Guinean mobile sector.

This report analyses developments in the mobile sector and its tax treatment in Guinea, sets out potential options for tax policy reform, and estimates the impacts of these policy options on: the mobile sector, the wider economy and the Government's fiscal position.

The Guinean mobile market is expanding rapidly, but the lack of affordability for mobile ownership limits its potential growth.

In Guinea, the mobile industry is playing an increasingly important role in driving economic growth and digital inclusion across the country. The number of mobile subscribers has grown from 1.3 million in 2007 to 6.0 million in 2017 (46.5% unique subscriber penetration), an average annual growth rate of 17%. Total mobile sector revenues were \$472 million in 2017;² equivalent to over 6.4% of Guinean GDP.³

This rapid growth has been facilitated by investment in the sector by Guinea's mobile operators. However, there remains a significant difference between the extent of 2G population coverage (86%), and that of 3G (60%), suggesting that continued investment is required to improve mobile connectivity, particularly in rural and disadvantaged areas.^{4,5} Government initiatives, such as the planned National Backbone Network in Guinea,⁶ have been supportive in encouraging increased investment in the sector, but there remain a number of challenges that act as barriers to further mobile sector growth.

In particular, the lack of affordability of mobile ownership in Guinea is a significant barrier. For example, individuals in the bottom 20% of the income distribution spend approximately 10.9% of their monthly income on mobile ownership (500MB consumption basket). The more data-intensive consumption baskets represent even more of an affordability challenge. For example, the cost of a medium consumption basket (1GB of data, 250 minutes and 100 SMS) is higher than the total monthly income of individuals in the bottom 20% of the income distribution, and is therefore significantly above the "1 for 2" (1GB of data costing less than 2% of monthly income) affordability target adopted by the United Nations.⁷

1. GSMA, <u>https://www.gsma.com/mea/</u>.

2. GSMA Intelligence database

5. 4G has yet to be launched in Guinea.

Alliance for Affordable Internet, 2017, "2017 Affordability Report, <u>http://a4ai.org/affordability-report/report/2015/#redefine_%E2%80%9Caffordability%E2%80%9D_with_income_and_gender_inequalities_in_mind.</u>

^{3.} GSMA Intelligence database and companies' annual accounts data.

^{4.} GSMA Intelligence database

^{6.} Backbone National à Fibre Optique de Guinée.

Taxes on the mobile sector are disproportionately high compared to levels in other African countries.

In 2017, the total tax contribution of the mobile sector is estimated at \$278 million,⁸ accounting for 20% of Guinea's total tax revenues.⁹ Tax and fee payments from the sector, as a share of total tax revenues, were roughly three times greater than the sector's revenue as a share of GDP.¹⁰ The total tax contribution of the mobile sector is also equivalent to 54% of the sector's total market revenue. This is relatively high compared with other countries in Africa, including Nigeria (9%), Morocco (11%), South Africa (20%), Rwanda (21%), Senegal (22%) and Egypt (23%).

Through policy reform, the Government of Guinea has the opportunity to simplify and rebalance mobile sector taxation, supporting the growth of the economy and leading to increased digital and financial inclusion.

The Guinean economy experienced a downturn between 2014 and 2015,¹¹ but has since recovered, with real GDP growing by 6.2% in 2017, the tenth highest rate in Africa. However, a number of challenges remain, and significant structural reform and infrastructure development is required over the medium term to sustain further growth.

The Guinean economy remains heavily reliant on the mining sector, and hence is vulnerable to fluctuations in global commodity prices. In response, the Government, via its Economic and Social Development Plan 2016–2020 (PNDES), is targeting increased economic diversification.¹²

The mobile sector has the potential to contribute to this policy goal, and generate significant socioeconomic benefits to Guinea, such as enhancing literacy rates, which are among the lowest in the world.¹³ Further, increased levels of 3G penetration will provide Guineans with improved access to the internet, as just 9.8% of individuals reported using the internet in 2016.¹⁴

To unlock these benefits, the Guinean Government should seek to enhance the business environment for mobile operators. This includes delivering the necessary ICT infrastructure to support mobile, as set out in the National ICT Plan (2016–2020),¹⁵ and the exploration of tax reforms, which could increase the affordability of mobile technology for consumers.

Tax reform in the sector would lead to considerable growth in mobile penetration, promoting greater investment and affordability in the sector. The growth in the sector would also increase GDP and taxation revenue for government in the medium-term.

To promote further growth in the sector and the wider economy, three options for tax reform have been identified. These reforms would lead to a growth in penetration, increased technology migration to smartphones and 3G connections, and would increase GDP and taxation revenue in the medium-term:

- Eliminating excise duty (TCT) on bonus calls: The elimination of the excise duty (taxe sur la consommation téléphonique – TCT) on bonus calls,¹⁶ which is currently levied at 1 GNF per second, will lower the cost of providing free calls for mobile operators. This should lead to an increase in the supply of these bonus calls and ultimately lower the effective price faced by subscribers. This in turn should increase usage and connectivity across Guinea. The reform would lead to the following benefits:
 - Mobile penetration would increase by 663,000 unique subscribers (4.3%) by 2023, equivalent to 1.3 million new connections, and mobile data usage would grow by 11.9%. This would increase sector revenues by \$44 million (6.9%); and
 - GDP would grow by \$57 million (0.9%), and annual tax receipts by over \$13 million (0.5%), a cumulative fiscal gain of over \$41 million over five years.
- Eliminating the surtax on international incoming traffic (SIIT): The elimination of the \$0.12 surtax on international incoming traffic (SIIT)¹⁷ should lead to an increase in the volume of international incoming calls to Guinea, enhancing connectivity for both businesses and consumers. It will also alleviate the significant

^{8.} Source: EY Analysis and operator data.

^{9.} The net tax revenue of the calendar year 2017 was GNF 12,633,643 million (\$1,414 million). Source: Guinea, Ministry of Economy and Finance.

^{10.} EY estimated 2017 market revenue based on operator data for 2016.

^{11.} The downturn in the Guinean economy was primarily a consequence of the Ebola outbreak, which claimed 2,544 lives and had a heavy toll on economic activity in the region.

^{12.} Government of Guinea, 2016–2020 Economic and Social Development Plan – <u>http://www.gouvernement.gov.gn/index.php/bulletin</u>.

According to the World Bank, the literacy rate is 46% for Guinea's youth population and 32% for adults.
 World Bank Databank. Internet usage statistics include fixed and mobile internet services.

To no bains balabains. Internet usage statistics include lixed and mobile internet services.
 Government of Guinea (2016) National ICT Plan 2016-2020 – <u>https://smartafrica.org/IMG/pdf/srategie_tic_finale_v.6_28_juillet_2016.pdf.</u>

^{6.} Borus calls refers to voice traffic which is not charged to the customer. Under the current tax scheme. operators are charged 1GNF per second for these calls.

^{17.} The SIIT takes the form of an imposed fixed price that operators must charge for international inbound termination. Currently, the international termination rate is \$0.28 per minute, with \$0.12 of surtax accruing to government.

costs and resources which are devoted to the policing of illegal gateways. The reform would lead to the following benefits:

- International incoming traffic will increase by 263 million minutes in 2023. This would increase sector revenues by \$114 million (17.7%), allowing for significant re-investment in the sector, totalling approximately \$6 million per annum. Mobile penetration would increase by 927,000 unique subscribers (6.0%) by 2023, equivalent to 1.8 million new connections.
- GDP would grow by \$89 million (1.4%), and annual tax receipts by over \$8 million (0.3%), a cumulative fiscal gain of over \$16 million over five years.
- Reducing annual backhaul spectrum fees (redevance FH) by 80%: The proposed 80% reduction in annual backhaul spectrum fees payable by Guinean mobile operators would align annual backhaul spectrum fees with the average levels observed in Africa.¹⁸ It would promote an enhanced investment environment in the Guinean mobile sector, leading to the following benefits:

- Mobile penetration would increase by 220,000 unique subscribers (1.4%) by 2023, equivalent to 423,000 new connections. This would increase sector revenues by \$14 million (2.1%) and mobile sector investment would increase by \$0.6 million per annum.
- GDP would grow by \$22 million (0.3%), and annual tax receipts by over \$2 million (0.1%), a cumulative fiscal gain of over \$5 million over five years.

The growth in the sector, under all scenarios, would also lead to wider societal benefits, through increasing access to mobile data and broadband, particularly among lower income rural communities, as more than 50% of new subscribers come from low-income groups in all scenarios.

The boost to mobile penetration would lead to growth in productivity across the economy, and hence an increase in GDP, household incomes, employment and investment.

Moreover, all reforms are shown to be self-financing in terms of their impact on government revenues in the medium term, and will generate positive tax revenues before the completion of the Economic and Social Development Plan 2016–2020.



18. In Sub-Saharan Africa, spectrum fees represent 0.74% of mobile operators' revenue on average (based on a selection of 11 countries in 2016, for which data is available). In Guinea, spectrum fees represent on average 3.9% of mobile operators' revenue. Therefore, in order to align the level of spectrum fees in Guinea to the average level of Sub-Saharan Africa, we propose a reduction of 80% of the current level of spectrum fees.

1. The Guinean economy, the role of mobile and opportunities for growth

1.1 Macroeconomic overview

Guinea's economy is recovering from the recent Ebola epidemic and commodity price shocks, and will require structural reform in order to achieve the Government's medium term goals.

The Guinean economy grew rapidly in 2017, achieving a growth rate of 6.2%, with gross domestic product (GDP) standing at approximately \$7.3 billion.¹⁹ This is the tenth fastest growth rate in Africa, and demonstrates Guinea's strong recovery from a downturn in 2014 and 2015. During this period, GDP increased at an average rate of just 0.2%, primarily as a consequence of an outbreak of Ebola, which claimed 2,544 lives²⁰ and had a heavy toll on economic activity in the region.

The recent growth in the Guinean economy has been supported by increases in mining production, stronger domestic demand and favourable export conditions. On the supply side, higher electricity provision from the Kaleta hydroelectric dam, and the recent execution of construction contracts (worth an estimated 15% of GDP) have boosted economic activity.²¹ Furthermore, production of bauxite,²² Guinea's top export product, is estimated to have increased by over 8.8% in 2016.²³ On the demand side, a weaker Guinean Franc (GNF) supported an estimated 6.3% real increase in exports (by value) during 2017.²⁴ Private consumption, which fell by over 5% in 2015, is predicted to have returned to pre-2014 levels in 2017.²⁵

Inward foreign direct investment (FDI) has grown significantly since 2014. Annual FDI flows are estimated to have increased by 84% between 2016 and 2017, reaching approximately \$458.6 million.²⁶ This represents 48% of total investment in Guinea, and is a considerable increase from 2014 levels, when FDI was just over \$3 million.²⁷

However, while the signs of recovery are strong, several challenges remain for the Guinean economy. As shown in Figure 1, GDP per capita was \$626 in 2016, significantly below the regional average.

^{19.} Oxford Economics database

International Monetary Fund, Guinea: 2016 Article IV Consultation – Press Release; Staff Report; and Statement by the Executive Director for Guinea – http://www.imf.org/en/Publications/CR/Issues/2016/12/31/Guinea-2016-Article-IV-Consultation-Press-Release-Staff-Report-and-Statement-by-the-44152.

ibid. Bauxite, an aluminium ore, is the world's main source of aluminium.

Datate, an administrative, is the workd's main source of administration.
 United States Geological Survey - <u>https://minerals.usgs.gov/minerals/pubs/commodity/bauxite/mcs-2017-bauxi.pdf</u>.

^{24.} Oxford Economics database

^{25.} *ibid*.

^{26.} Oxford Economics database. Of this investment, a large proportion is directed towards the mining sector (IMF, 2016).

^{27.} *ibid.*

Figure 1



GDP per capita in selected African countries, 2016

Source: Oxford Economics database

Continued economic growth will need to be supported by improvements in infrastructure, specifically in relation to energy and transport, which have been identified by the IMF as key barriers to economic activity.²⁸ As of 2014, just 4% of Guineans in rural areas had access to electricity, compared to 68.5% among Guinea's urban population.²⁹ This creates a barrier to economic activity in rural areas, particularly for the mobile sector as it creates challenges for both network rollout and mobile phone ownership. Guinea was ranked 135th out of 138 countries in the Enabling Trade Index,³⁰ with particularly low scores for the availability and quality of transport infrastructure (137th), and the availability and use of ICTs (136th).³¹ In addition to infrastructure challenges, limited diversification in the Guinean economy exposes the country to significant external market risks. Together, gold and aluminium products (including bauxite) make up over 76% of Guinea's exports by value. The mining sector accounts for a significant share of the Guinean economy,³² with mineral rents³³ equivalent to 9.5% of Guinean GDP in 2015.³⁴ As shown in Figure 2, this proportion is significantly higher than the Sub-Saharan Africa average, which exposes Guinea to the type of commodity price shocks experienced in 2014 and 2015.³⁵

31. Information and Communication Technologies

34. World Bank Databank

^{28.} International Monetary Fund, Guinea: 2016 Article IV Consultation – Press Release; Staff Report; and Statement by the Executive Director for Guinea – http://www.imf.org/en/Publications/CR/Issues/2016/12/31/Guinea-2016-Article-IV-Consultation-Press-Release-Staff-Report-and-Statement-by-the-44152.

^{29.} World Bank Databank

^{30.} World Economic Forum, The Global Enabling Trade Report 2014: http://www3.weforum.org/docs/WEF_GlobalEnablingTrade_Report_2014.pdf.

^{32.} On average, the mining sector contributed to 20% of Guinean GDP between 2010 and 2014. Ministry of Mines and Geology, 2014.

^{33.} Mineral rents are the difference between the value of production for a stock of minerals at world prices and their total costs of production. Minerals included in the calculation are tin, gold, lead, zinc, iron, copper, nickel, silver, bauxite and phosphate.

^{35.} Between 2013 and 2015, the price of aluminium (\$/mt) fell by approximately 10%, while gold prices (\$/troy oz.) decreased by approximately 18% - World Bank Databank.

Figure 2



Mineral rents (% of GDP), for selected African countries, 2015

Source: World Bank Databank

Economic diversification was highlighted as a priority for structural reform by the International Monetary Fund (IMF) in 2016,³⁶ and prioritised within the Government's Economic and Social Development Plan 2016–2020 (PNDES).

In particular, the PNDES sets out the Government's plan to promote conditions for the development of the digital economy, and *"to make ICT an engine of economic and social development in Guinea"*.³⁷ Further objectives for the ICT sector are set out in

the National ICT Plan (2016–2020), which include the deployment of a national fibre-optic network and the completion of other essential electronic communications infrastructure.³⁸ The National ICT Plan (2016–2020) also sets out the Guinean Government's aim of adopting a financing policy that is favourable to the digital economy. Through efficient taxation in the mobile sector, these objectives should be achievable by 2020, allowing for enhanced productivity across the economy and an improvement in the digital literacy of the population.

1.2 Fiscal overview

Guinea's fiscal situation is improving, but considerable fiscal space will be required to finance investment needs.

The fiscal position of the Guinean Government has improved in recent years, with the fiscal deficit reducing substantially from an 8.1% deficit in 2015 to just 1.4% in 2016. Government revenue, excluding grants, increased to 15% of GDP in 2016, compared to 13.7% in 2015,³⁹ while government expenditure was down by approximately 12.9% for the year.⁴⁰ Efforts to increase taxation revenues are underway in Guinea, which focus on refining taxpayer identification, improving data collection and gaining a tighter control of the commercial tax base.⁴¹ In addition, the PNDES aims to simplify the Guinean tax system, in an effort to boost the business environment and improve tax compliance.

A breakdown of tax revenues in 2016 is provided in Figure 3, and shows that taxes on the mobile sector accounted for approximately 20% of total tax

International Monetary Fund, Guinea: 2016 Article IV Consultation – Press Release; Staff Report; and Statement by the Executive Director for Guinea – <u>http://www.imf.org/en/Publications/CR/Issues/2016/12/31/Guinea-2016-Article-IV-Consultation-Press-Release-Staff-Report-and-Statement-by-the-44152.</u>
 ibid.

- 39. World Bank, Guinea Overview.
- 40. Oxford Economics database

^{38.} Government of Guinea (2016) National ICT Plan 2016-2020 - https://smartafrica.org/IMG/pdf/srategie_tic_finale_v.6_28_juillet_2016.pdf.

^{41.} International Monetary Fund, Guinea: 2016 Article IV Consultation – Press Release; Staff Report; and Statement by the Executive Director for Guinea – http://www.imf.org/en/Publications/CR/Issues/2016/12/31/Guinea-2016-Article-IV-Consultation-Press-Release-Staff-Report-and-Statement-by-the-44152.

revenue for the Government, while the mining sector represented approximately 17% of the total. Taxes on other goods and services (e.g. VAT and excise duties) accounted for 35% of total tax revenue, while taxes on international trade (e.g. customs duties) and direct taxes (e.g. personal income taxes) outside of the mobile and mining sectors accounted for 20% and 8% respectively. This highlights the distortive nature of the taxation system facing mobile operators and consumers; the mobile sector accounts for a larger share of tax revenue than the mining sector despite mobile revenues (6.4%) accounting for a smaller proportion of GDP than mineral rents (9.5%).

Figure 3



Composition of tax revenue, Guinea, 2016

Source: International Monetary Fund, EY analysis of operator's data

Government expenditure in Guinea is estimated at approximately \$1.5 billion in 2017, equivalent to 20.9% of GDP,⁴² while gross government debt is expected to decrease from approximately 55.8% of GDP in 2016 to 43.1% in 2018.⁴³

Nevertheless, the World Bank and IMF have placed Guinea at a moderate risk of debt distress, which may worsen if spending proposals do not have the desired impact on economic growth.⁴⁴ It is therefore important that the Guinean Government focuses its activities on the most economically productive sectors. As such, tax policy should take into account the distortive impacts of taxation on certain sectors (e.g. mobile) which have the potential to generate significant additional economic activity and tax revenues in the short-tomedium term.

42. Oxford Economics database

^{43.} Oxford Economics database

1.3 Demographic overview

Rapid population growth and increasing rates of urbanisation pose a challenge to infrastructure and services in Guinea.

Figure 4 provides a demographic overview of Guinea. Guinea's population stands at approximately

12.4 million, and increased at an average annual rate of 2.3% between 2006 and 2016.⁴⁵ This has been largely driven by an improvement in life expectancy, which has risen from 53 years in 2005 to over 59 years in 2015.

Figure 4

Overview of Guinean demographics



Source: Oxford Economics database, World Bank Databank, EY analysis

45. World Bank Databank

A relatively high proportion of the population (62%) live in rural areas. As shown in Figure 5, this has declined steadily from around 90% in the 1960s, due to the increasing urbanisation of the country. This poses a challenge to the Government to ensure that sufficient investment is made in infrastructure to meet the growing demand for energy, transport and communication services.

Figure 5

Rural population (% of total population), 1960-2016



Source: World Development Indicators, World Bank Databank

The average electrification rate in Guinea is just 27.7%, ^{46,47} but this masks significant variation in electrification between rural and urban areas: in 2014, just 4.0% of Guineans in rural areas had access to electricity, compared to 68.5% among Guinea's urban population.⁴⁸ In addition to limited access to electricity, the percentage of the population who are internet users⁴⁹ is relatively low in Guinea (9.8%) when compared to regional peers. As shown in Figure 6, this is roughly 10 percentage points lower than the regional average.

Figure 6

Individuals using the internet (% of population) in selected African countries, 2016



Source: World Development Indicators, World Bank Databank

Increasing access to electricity and internet services should therefore be considered as policy priorities for the Guinean Government, and can be enabled through further development of the mobile sector. The Government's commitment to developing infrastructure in Guinea, and specifically to promote conditions for a digital economy, represents an opportunity to increase mobile connectivity in Guinea. By providing a tax environment which is conducive to private and foreign investment in the sector, the Government can help to improve internet access for Guinea's majority rural population, thereby bridging the digital divide.

1.4 Mobile market in Guinea

The Guinean mobile market is rapidly expanding, yet over half of the population remain unconnected to mobile services in 2017.

The mobile market in Guinea has grown rapidly over the past decade, with the number of subscribers increasing by 4.7 million between 2007 and 2017. However, as demonstrated in Figure 7, which provides an overview of the Guinean mobile market, a significant opportunity exists to develop the sector (e.g. the relatively low level of 3G penetration and smartphone usage), and in achieving the vision set out in the Government's economic and social development plan (PNDES) 2016–2020.

^{46.} World Bank Databank

^{47.} The electrification rate is defined as the proportion of the total population with access to electricity.

^{48.} World Bank Databank

^{49.} Internet users are individuals who have used the internet (from any location, and through any technology, i.e. fixed or mobile) in the last three months.

GSMA

Figure 7

Guinean mobile market in figures⁵⁰

Ļ	Guinean mobile operators generated \$0.5 bn in revenue in 2017, equivalent to over 6.4% of Guinean GDP.
(((<u>A</u>)))	Ninth largest mobile market in West Africa by revenue.
<u></u>	11.4 million connections at Q4 2017 Equivalent to 88.4% total subscriber penetration 2022 forecast: 14.2 million, at a 5-year CAGR of 4.5%.
Ð	6.0 million unique subscribers at Q4 2017 Equivalent to 46.5% unique subscriber penetration 2022 forecast: 7.3 million, at a 5-year CAGR of 4.2%.
BREAKD	OOWN OF TOTAL CONNECTIONS
.	17% 3G penetration* (connections) at Q4 2017 2022 forecast: 74% (3G and 4G), 5-year CAGR of 34%. *There were no 4G connections at Q4 2017
-	28% smartphone penetration at Q4 2017 2022 forecast: 55%, at a 5-year CAGR of 14%.
?	99% prepaid connections compared to total in Q4 2017 2022 forecast: 98%, at a 5-year CAGR of -0.3%.

Source: GSMA Intelligence, EY analysis

50. Compound annual growth rate (CAGR) is the mean annual growth rate for the period.

As demonstrated in Figure 8, unique subscriber penetration has grown rapidly over the past decade, with 46.5% of the population connected at the end

of 2017 (equivalent to 88.4% penetration in total connections).⁵¹ However, the rate of growth has slowed since 2014.

Figure 8

Unique mobile subscriber penetration in Guinea, 2007-2017



Source: GSMA Intelligence database

Despite this rapid growth, there is still considerable room for expansion, as over half of the population remains unconnected to mobile services. As shown in Figure 9, Guinea ranks below a number of regional peers when it comes to unique subscriber penetration. Access to mobile data services is lower again, with just 14.4% of individuals having access to mobile internet. This relatively low penetration reflects both limited 3G network coverage and the lack of affordability for more advanced mobile technologies (smartphones and 3G services).

^{51.} There is an important difference between the number of mobile connections—the metric traditionally used by the industry to measure market size and penetration—and the term 'unique mobile subscribers'. The latter refers to a single individual that has subscribed to a mobile service and that person can hold multiple mobile connections (i.e. SIM cards).

Figure 9



Mobile penetration (unique subscribers, all and with mobile internet) in selected African countries, 2017

Source: GSMA Intelligence database

Figure 10



Market penetration rate (total connections), by technology

Source: GSMA Intelligence database

Monthly average revenue per user (ARPU) is relatively low in Guinea, compared to other mobile markets in West Africa (see Figure 11), at an estimated \$6.87 in Q4 2017. This low ARPU is largely driven by the low-income per capita and limited penetration of 3G services.

Figure 11





Source: GSMA Intelligence database

1.5 Affordability of smartphones and mobile services in Guinea

The lack of affordability of mobile services and handsets is a key barrier to mobile connectivity in Guinea, and limits the benefits that the sector can bring.

Lack of affordability can represent a significant barrier to connectivity, particularly for those at the bottom of the economic pyramid. GSMA analysis highlights that countries with a relatively high cost of mobile ownership (including both device and airtime/data) as a share of income per capita⁵³ typically have lower penetration rates.⁵⁴ A lack of affordability has been cited by up to 80% of people in developing countries as the primary barrier to mobile access and usage.⁵⁵

A basic measure of affordability of mobile services is the proportion of monthly income which is spent on mobile services and devices. The GSMA developed such a measure by estimating the total cost of mobile ownership (TCMO), a tool that enables affordability assessments across a range of countries, income groups and consumption baskets. It allows the identification of the elements affecting the affordability of mobile services and devices.⁵⁶ In Guinea, in addition to usage and device costs, low access to electricity in rural areas can mean that subscribers incur additional time and cash costs for charging phones. This is particularly a barrier to the adoption of smartphones, which tend to have shorter battery life. Figure 12 shows the TCMO as a proportion of monthly income for the two lowest income quintiles in Guinea, compared to the entire population. For a low consumption basket (500MB of data), those in the lowest two quintiles spend approximately 8.3% of their monthly income on mobile ownership, which increases to 10.9% for those in the lowest quintile. This is significantly above the 5% affordability threshold adopted by the United Nations Broadband Commission.⁵⁷

More modern, data-intensive consumption baskets represent a greater affordability challenge. For example, the cost of a medium basket (1GB of data, 250 minutes and 100 SMS) is higher than the total monthly income of individuals in the bottom 20% of the income distribution, and will therefore have to reduce significantly to meet the UN's 2025 "1 for 2"⁵⁸ affordability target.⁵⁹

Given the increased importance of data in both economic and social settings, the lack of affordability of mobile ownership in Guinea represents a significant barrier to mobile connectivity, and could prevent data usage converging to levels seen in more developed economies.

53. Defined as Gross National Income (GNI) per capita.

56. TCMO consists of the cost of a handset, activation and usage costs. It is typically calculated as a cost per month, and assumes a life expectancy of a device of 36 months for medium and low-income countries, and 24 months for high and very high-income countries.

58. '1 for 2' refers to 1GB of data costing less than 2% of monthly income.

^{54.} GSMA, 2016, "Digital inclusion and mobile sector taxation 2016", https://www.gsma.com/mobilefordevelopment/wp-content/uploads/2016/07/Digital-Inclusion-and-Mobile-Sector-Taxation-2016.pdf.

^{55.} GSMA, 2015, Connected Women, "Bridging the gender gap: mobile access and usage in low- and middle-income countries".

^{57.} UN Broadband Commission (2017). ICT expenditure reflects mobile broadband prices, prepaid handset-based 500 MB. For further information: http://broadbandcommission.org/Documents/ITU_discussion-paper_Davos2017.pdf.

Alliance for Affordable Internet, 2017, "2017 Affordability Report", <u>http://a4ai.org/affordability-report/2015/#redefine_%E2%80%9Caffordability%E2%80%9D_with_income_and_gender_inequalities_in_mind.</u>

Figure 12



TCMO as a proportion of monthly income in Guinea, 2016

Source: GSMA Intelligence database, Tarifica

The lack of affordability of mobile services in Guinea is exacerbated by the high levels of taxation on usage and devices. As shown in Figure 13, taxes on the usage of mobile services represent a higher share of tariff costs (30%) than in any other country in West Africa.



Usage taxes as a proportion of tariff costs (500MB data basket), 2016



Source: GSMA Intelligence database, Tarifica

Similarly, Figure 14 demonstrates that taxes represent a high proportion (40%) of device costs when compared to other countries in West Africa.

Taxes on devices can, in particular, increase the initial barrier to ownership, and hence act as a brake on increased mobile adoption.

Figure 14

Consumer taxes as a proportion of device costs, 2016



Source: GSMA Intelligence database, Tarifica

1.6 The socio-economic contribution of the mobile sector

Mobile operators directly contribute to the Guinean economy, with total revenues of \$472 million in 2017.

Total mobile sector revenues were \$472 million in 2017,⁶⁰ equivalent to over 6.4% of Guinean GDP.⁶¹ However, the benefits to the economy go beyond the direct impact of the sector: the mobile operators support a much wider mobile ecosystem, including mobile applications and mobile content developers, mobile infrastructure providers, mobile distribution and retail companies and mobile device manufacturers. These companies create further economic activity in Guinea by buying products and services from the firms in their supply chain (indirect effects) and by generating employee income which leads to increased consumer spending, generating demand in consumer goods markets (induced effects).

Mobile connectivity promotes productivity improvements in the economy.

Greater access to mobile services has transformed economies, accelerating economic growth and development in countries worldwide. The effects of mobile connectivity on an economy are largely delivered through its impact on productivity. Improvements in mobile connectivity can improve communication and trade within an economy, while also making a country more attractive for foreign investment. In addition, added connectivity can boost tourism, and allow firms to access a broader pool of labour.⁶²

The benefits of mobile connectivity—and how it translates to the wider economy—have been widely studied. For example, a literature review by the International Telecommunication Union (ITU) finds that a 10% increase in mobile broadband penetration leads to a 0.25% to 1.38% increase in GDP.⁶³ Further, a number of studies have shown a strong relationship between mobile penetration and productivity: these show that a 10% increase in mobile penetration increases productivity by between 1.0% and 1.3%.⁶⁴

Mobile networks promote digital inclusion and can bridge the digital divide.

Where fixed broadband coverage is low (as is the case in Guinea, where just 0.009% of the population

have fixed subscriptions),⁶⁵ mobile networks are central to promoting digital inclusion due to the lower cost of network rollout. Mobile services can enhance digital inclusion in the economy by ensuring equal opportunity and access to information. For example, the large rural communities in Guinea, representing 62% of the population, can gain greater access to the knowledge and digital economy.

Mobile technology also removes other barriers to accessing to broadband services, including the need for a permanent address, affordability of ownership of a PC or laptop and access to a bank account. As of 2016, just 9.8% of Guinean households were internet users,⁶⁶ while the number of internet servers per million people is lower in Guinea (0.2) than in any neighbouring country (e.g. 5.4 in Côte d'Ivoire, 1.7 in Guinea-Bissau). Increased rollout of mobile broadband services will therefore be key to addressing the low level of access to internet services, particularly given the limited fixed broadband network.

Mobile phones have proven to be a significant transformational technology, allowing access to innovative mobile applications and services.

Mobile technology has the ability to enable more efficient delivery of public services and to improve access to healthcare and education services for underserved and remote populations. Its portability, traceability and affordable computing power means mobile technology is well positioned to deliver wide ranging and highly personalisable services to large numbers of people.

Mobile money can expand access to financial services, providing low-income individuals with a secure, accessible and convenient method to manage their finances.

Mobile money services have the power to transform financial systems and promote a move away from cash-based economies. They provide affordable financial services to low-income subscribers and enable safety, security and convenience for financial transactions for those without access to traditional financial services.

^{60.} GSMA Intelligence database

^{61.} GDP level based on Oxford Economics database

^{62.} Oxford Economics, 2013, "The Economic Value of International Connectivity"

^{63.} ITU, 2012, "The Impact of Broadband on the Economy: Research to Date and Policy Issues".

^{64.} LECG, 2009, "Exploring the Relationship Between Broadband and Economic Growth" and Waverman et al., 2009, "Economic Impact of Broadband: An Empirical Study".

^{65.} World Development Indicators, World Bank Databank

^{66.} *ibid.*

In 2014, just 6% of Guineans reported having an account at a financial institution. While for those in the bottom 40% of the income distribution, the rate of traditional financial inclusion was just 2%.⁶⁷ There is therefore a strong opportunity to promote financial inclusion in Guinea through the use of mobile money services. The number of mobile money subscribers increased from 4.2 million in 2010 to 10.7 million in 2015, and is likely to rise further as mobile adoption increases.

In 2014, the Guinean Government adopted a National Strategy for Financial Inclusion (Stratégie Nationale d'Inclusion Financière, SNIFI), which focuses on improving the regulatory framework, data collection and consumer literacy in the financial sector. The strategy emphasises actions to enhance access to financial services, especially for the poor, and seeks to include mobile operators as part of the solution.

CASE STUDY P2G vehicle tax payments

In March 2017, following a request from the Guinean tax authorities, Orange Money launched an application that allows vehicle owners to make their annual vehicle tax payment via mobile money in exchange for a sticker (sold at an Orange store) that matches the vehicle type to the vehicle ID.

The person-to-government (P2G) payment system provided the Government with an opportunity to increase its tax collection rate, which was approximately 1% before intervention. For users, the system enabled the use of mobile money account funds to make payment at any time or anywhere.

Orange Money customers also save on transportation costs, which they previously incurred when they would travel to Conakry to get their stickers. According to Orange, this new service has seen the number of new mobile money users increase by 70,000, in addition to a 12% increase in the overall active customer base. The Government also benefits through daily reporting via the Orange Money system on the number of stickers that have been purchased, what category and from which Orange shop. There are several advantages to electronic payments over cash payments, including increasing the transparency of transactions and hence reducing the size of the informal economy. Cash transactions are often unregistered, and facilitate the shadow economy, and the evasion of tax payments. The promotion of electronic payments, including mobile money transactions, could reduce the level of uncollected taxes from the shadow economy to the benefit of the Guinean Government's fiscal position.⁶⁸

Mobile health

Mobile health (m-Health) applications can improve health systems through reducing the cost of service delivery, providing distribution channels for public health information, streamlining health administration and data management, and even aiding real-time supply chain management.⁶⁹ In a number of countries, including Guinea, mobile healthcare has already been shown to be effective for contacting rural patients who cannot reach urban tertiary care centres, and for enabling video-based consultations using mobile broadband, thereby making healthcare accessible to this underserved population.⁷⁰

The introduction of m-Health technologies during the Ebola epidemic (see case study next page) enabled authorities to use real-time data to support coordination and intervention efforts in 2014 and 2015. In the event of future outbreaks of communicable diseases, mobile technology has the potential to help synchronise and coordinate intervention efforts.

^{67.} World Bank Databank

^{68.} EY, 2016, "Reducing the Shadow Economy through Electronic Payments".

^{69.} University of Cambridge, 2011, "Mobile Communications for Medical Care".

^{70.} PWC "Emerging mHealth: Paths for Growth".

CASE STUDY m-Health in the fight against Ebola⁷¹

Following the outbreak of the Ebola epidemic in December 2013, challenges in retrieving timely and accurate data contributed to the complexity in controlling the epidemic. A series of interventions were required in order to stop transmission and control the outbreak,⁷² all of which required careful coordination and management. In this setting, the availability of real-time health data would be indispensable for guiding strategy, coordinating interventions and troubleshooting problems.

In 2014, a mobile application, CommCare, was chosen to support the implementation of the Government Response Plan against the Ebola Virus Disease. The innovative system, developed by the Earth Institute at Columbia University (USA) and the United Nations Population Fund (UNFPA), allowed for real-time identification of individuals who had not been visited and also allowed for greater staff accountability through timestamps and collection of GPS points.

The m-Health tool, which was used by 210 contact tracers in Guinea's five prefectures as of April 2015, demonstrated the potential to improve access to surveillance data using mobile technology from difficult-to-reach communities in the event of future outbreaks.

m-Health services also have the potential to support continued improvements in health outcomes in Guinea. Maternal mortality has decreased from 1,040 per 100,000 live births in 1990 to 679 in 2015, while mortality rates among the under-fives have decreased from 235 per 1,000 live births in 1990 to 89 in 2016.⁷³

Mobile connectivity can form part of the solution to achieving further gains in the healthcare sector, and can be used in health education, disease prevention, disease treatment, health care and health support applications. Mobile services can also be used to overcome traditional barriers⁷⁴ to accessing essential information and services, such as geographic isolation, gender disparities⁷⁵ and social stigmas.⁷⁶

Mobile learning

Mobile learning (m-Learning) has the ability to reduce inequalities in educational systems by widening access to learning materials, improving literacy and reducing drop-out rates. Guinea has made significant improvements in providing access to education in recent years, with net enrolment rates in primary education increasing from 62% to 76% between 2004 and 2014. However, the enrolment rate in secondary education remains low at 32% in 2014, while literacy rates are also low at 46% and 32% for Guinea's youth and adult populations respectively.

Guinea's literacy rates are among the lowest in the world, and represent a barrier to increased economic diversification and employment opportunities from foreign investment. Mobile phone technology has been shown as a potential enabler of higher literacy in emerging economies, by teaching individuals to read and providing access to reading materials.⁷⁷

CASE STUDY Digital schools in Guinea⁷⁸

As of January 2017, the Orange Digital Schools programme has been rolled out in 30 schools in Guinea, providing over 7,000 students with access to educational content via digital kits which include tablets, servers, video projectors and screens.

The 30 schools taking part in the programme sponsored by Orange Guinea employees—are in Conakry, Maritime Guinea, Middle Guinea, Upper Guinea and Forested Guinea. The initiative provides teaching staff and pupils with access to a library containing over 45,000 e-books, covering mathematics, science and French exercises at the touch of a fingertip.

75. T.A. Gurman, S.E. Rubin and A.A. Roes, 2012, "Effectiveness of mHealth Behavior Change Communication Interventions in Developing Countries: A Systematic Review of the Literature", in *Journal of Health Communication: International Perspectives*, 17 (1).

77. World Bank, 2014, "What we are learning about reading on mobile phones and devices in developing countries".

^{71.} J.A. Sacks, E. Zehe, C. Redick et al., 2015, "Introduction of Mobile Health Tools to Support Ebola Surveillance and Contact Tracing in Guinea. Global Health: Science and Practice", 3(4), 646-659. http://doi.org/10.9745/GHSP-D-15-00207.

^{72.} These included community engagement, identification of contacts, contact monitoring for symptoms, rapid lab confirmation of cases, isolation and treatment of new cases; and safe and dignified burials.

^{73.} World Development Indicators, World Bank Databank.

^{74.} N. McKee, J.T. Bertrand and A. Becker-Benton, 2004, Strategic communication in the HIV/AIDS epidemic, in Sage Publications (New Delhi ; Thousand Oaks, Calif).

^{76.} J.G. Khan, J.S. Yang and J.S. Khan, 2010, "Mobile' health needs and opportunities in developing countries", US National Library of Medicine National Institutes of Health, in *Health Affairs*, (2), pp. 254-261.

^{78.} Orange Guinea, Corporate Social responsibility - https://www.orange.com/en/Group/Orange-in-the-world/countries/Welcome-to-Orange-Guinea-Conakry/Guinee-Conakry/CSR.

GEMA

Gender equality

Mobile can empower women in developing countries, making them more connected, safer and increasing their access to information. Mobile provides women with access to services and lifeenhancing opportunities, such as health information and guidance, financial services and employment opportunities, often for the first time.⁷⁹

Guinea ranks 122nd out of 144 countries in the Global Gender Gap Index.⁸⁰ In particular, it scores poorly for educational attainment (142nd), although it scores relatively well (29th) for economic participation and opportunity.⁸¹ By enhancing opportunities to learn and develop human capital, increased mobile connectivity in Guinea can help to continue to address gender inequality.



79. GSMA Connected Women, 2015, "Bridging the gender gap: Mobile access and usage in low- and middle-income countries".

80. World Economic Forum, Global Gender Gap Index 2016. 81. World Economic Forum, Global Gender Gap Index 2016.

2. Mobile sector taxation in Guinea

Guinea's tax and regulatory system is complex, and the tax burden of the mobile market is high in comparison to other countries and sectors.

2.1 Overview of mobile taxation in Guinea⁸²

2.1.1 **Taxation on mobile consumers**

Table 1 below outlines the different taxes that apply to consumers of mobile products.

Table 1

Key taxes on mobile consumers, 2016

Central taxes	
Customs duty	10% - 20%
Value-added tax (VAT)	18%
Excise duty on telephone consumption (<i>taxe sur la consommation téléphonique</i> or "TCT")	GNF 1 (per second of usage)
Surtax on international incoming traffic (SIIT)	\$0.12 (per minute of usage)

Customs duty

Customs duty is due on handsets and SIM (subscriber's identity module) cards at 10% and 20% respectively. Furthermore, base stations and network equipment are subject to custom duties at 10%.

Value-added tax

Telecommunications are subject to the standard rate of value-added tax (VAT) in Guinea of 18%, as are handsets, SIM cards and scratch cards.

Excise duty on telephone consumption (TCT)

Excise duty on telephone consumption (TCT) is due from companies and enterprises. It is a consumption tax which is not deductible for corporation tax purposes. The tax is charged on all telephone calls, including international and national calls whether made using a fixed line or a mobile phone, roaming and interconnection services. It also applies on mobile text and mobile data, as per the rates included in Table 2.

^{82.} This section is based on IBFD's information, EY 2017 Worldwide Corporate Tax Guide, the Guinea Ministry of Economy and Finance, the Guinea Ministry of Budget, the Guinea Regulatory Authority for Posts and Telecommunications (ARPT), and operator data.

CC 140

Table 2

TCT rates, 2016

тс	T rates
Calls (including bonus calls)	GNF 1 per second of communication
SMS	GNF 10 per connection
Internet	5% on the price of the internet pass

Surtax on international incoming traffic (SIIT)

Guinea imposes an international termination charge of \$0.28 per minute on calls that are received from overseas. This takes the form of a fixed price that operators must charge for international inbound termination including two elements:

- The international charge to cover the local carrier's costs and profits; and
- The surtax (sensu stricto) which includes the compensation for the body in charge of monitoring the international traffic, and a share for the government.

Table 3

International termination rate breakdown, 201683

Share	Rate per minute (\$ cents)
Telecommunications regulator (ARPT) (to fund anti-fraud programmes)	3.5
Service fees for the technical body in charge of supplying, managing and operating the system	7
Fund for the connection of Guinea via submarine cable, optic fibre and broadband for the democratisation of telecommunications	1.5
Total surtax	12
Wholesale rate (operators)	16
Total international termination rate	28

^{83.} Arrête Conjoint No1135/MCNTI/MEF/SGG. Autorité de Régulation des Postes et Télécommunications (ARPT). Under Article 3, the entire \$0.28 per minute is considered SIIT. However, for the purposes of this report, we differentiate between the international charge and the surtax (sensu stricto).

2.1.2 **Taxation on mobile operators**

Table 4

Key taxes on mobile operators, 2016

Central taxes		
Corporation tax	35%	
Personal income tax (on wages)	40% (top rate)	
Payroll tax	6%	
Social security	4-6%	
Professional training contribution	1.5%	
Stamp duty	1%	
Tax on access to telecommunications network - TARTEL	3%	
Minimum lump sum tax		
Withholding tax on the purchase of local goods and services 10		

Corporation tax

Resident companies are subject to taxation on income derived from Guinea. The corporation tax rate in Guinea is 35%, which is reduced to 30% for mining companies.⁸⁴

On top of this, Guinea applies a minimum lump sum tax that is payable by all companies at the rate of 3% on annual revenue. For medium-sized enterprises, the amount due under this tax is between GNF 15 million⁸⁵ and GNF 45 million. For large enterprises, the tax due is between GNF 45 million and GNF 60 million. The tax can be used as a tax credit against a company's corporate income tax liability, but only the amount over GNF 6 million for large companies and GNF 3 million for all other companies.

2.1.3 Other taxes

- **Personal income tax.** All resident individuals are liable to income tax on their worldwide income. The rate of tax depends on the income the individual earns, with the top rate of income tax being 40%.
- **Payroll Tax.** Companies have to pay a tax of 6% on the value of their employees' aggregated salaries,

wages and similar payments, including fringe benefits.

- Social security. Companies have to make social security contributions on aggregated wages and salaries, including fringe benefits of employees. The rate varies from 4% to 6% depending on what coverage the employee receives.
- **Professional training contribution.** The professional training contribution is due at a rate of 1.5% on the aggregated value of employees' wages and salaries. A company is only liable if it has more than 10 employees.
- **Stamp duty.** Stamp duty is due at a rate of 1% of the nominal value of the commercial note upon its exchange and is also due on imports of new vehicles valued between GNF 500 and GNF 1,000.
- Tax on access to telecommunications network. The tax applies to companies holding a telecommunications network operating licence that provides access to the telecommunications networks. The tax applies at the rate of 5% on the net turnover derived by the company.

If the taxable income is less than GNF 1,000m then no tax will be imposed.
 Exchange rate is USD to GNF 8,929.

CC 140

 Withholding flat tax on import and purchase of goods and services. A tax of 10% is levied on local purchases of goods and services made by public establishments, mining companies, telephone companies, banks, insurance companies, microfinance institutions, oil companies and semipublic companies.

2.1.4 **Regulatory fees on mobile operators**

Mobile operators are subject to a number of different regulatory fees which must be paid in order to supply telecommunications services. The details of these regulatory fees can be seen in Table 5 below.

Table 5

Key regulatory fees on mobile operators, 2016⁸⁶

Regulatory fees			
Universal service fund	1.5% of net annual revenue		
Research and development fund	1% of net annual revenue		
Control fee on telecommunications stations	Between GNF 100,000 (\$11) and GNF 1,800,000 (\$202) per station		
GSM 900 and DCS 1800 fees on demand study for mobile phone networks	GNF 14,000,000 (\$1,568)		
GSM 900 and DCS 1800 application fees for mobile phone networks	GNF 350,000,000 (\$39,198)		
GSM 900 and DCS 1800 spectrum fee for mobile phone networks	GNF 70,000,000 (\$7,840) per duplex channel		
Spectrum application fee for backhaul	GNF 2,000,000 (\$224)		
Spectrum initial fee for backhaul	GNF 50,000,000 (\$5,600)		
Spectrum annual fees for backhaul* (redevance faisceaux hertziens (FH))	The fee depend on the number of Mbps. It varies between GNF 14,000,000 (\$1,568) and GNF 84,000,000 (\$9,408)		
AMRC ⁸⁷ licence application fee	GNF 5,000,000 (\$560)		
AMRC licence fee	GNF 200,000,000 (\$22,399)		
AMRC annual licence fee	GNF 100,000,000 (\$11,199)		
WiMAX licence application fee	GNF 5,000,000 (\$560)		
WiMAX licence fee	GNF 200,000,000 (\$22,399)		
WiMAX annual licence fee	GNF 300,000,000 (\$33,598)		
WiMAX annual frequency operation fee	GNF 50,000,000 (\$5,600) per MHz		
VSAT licence fee	GNF 100,000,000 (\$11,199)		
VSAT annual operation fee	GNF 50,000,000 (\$5,600)		
National interconnection fee ⁸⁸	GNF 30 per minute		
Numeration application fee	GNF 200,000 (\$22)		
Numeration licence fee	GNF 3,800,000 (\$426) (not applicable to long numbers)		
Numeration annual fee	GNF 15,000,000 (\$1,680) on two digit numbers GNF 13,000,000 (\$1,456) on three digit numbers GNF 10,000,000 (\$1,120) on four digit numbers GNF 750 (\$0.08) by PQ for long numbers		

* The economic impact analysis "Reducting annual backhaul spectrum fees (redevance FH) by 80%", described under section 4.5, focuses on this tax only.

^{86.} Exchange rate is US to GNF 8,929. Application fees (including demand study) and licence fees are one-off payments. Renewal fees are paid annually.

^{87.} Accès multiple par répartition en fréquence or Frequency Division Multiple Access, in English.

Arrêté N A/2017/2162/MPTEN/SGG relatif à la redevance d'interconnexion des opérateurs de télécommunications en république de Guinée, et portant modification de l'arrêté A/2010/1654/MTNTI/SGG du 10 mai 2010 relatif à la redevance d'interconnexion.

2.2 Tax contribution of the mobile sector

The total tax contribution of the mobile sector is equivalent to 54% of the mobile sector's total market revenue. In 2017, the total tax contribution is estimated at \$278 million,⁸⁹ accounting for 20% of the total tax revenues of Guinea.⁹⁰ Consumers pay 43% of the total taxes, while operators pay the remaining 57%. As shown in Figure 15, this total tax burden as a percentage of mobile revenue (54%) is the highest among a sample of African countries, including Nigeria (9%), Morocco (11%), South Africa (20%), Rwanda (21%), Senegal (22%) and Egypt (23%).

Figure 15



Operator versus consumer taxes (as a share of total mobile revenue)

Source: GSMA Intelligence, EY Analysis and operator's data

The mobile sector made a large contribution in taxes and fees relative to its economic footprint in 2017. While revenues from the mobile sector only accounted for around 6% of Guinea's GDP,⁹¹ the sector's tax and fee payments accounted for around 20%⁹² of government total tax revenue. Tax and fee payments from the sector, as a share of total tax revenues, were 3.3 times greater than the sector's revenue as a share of GDP.

Figure 16 shows this distribution of the total tax payments made by operators in Guinea in comparison

to other African countries. In Guinea, consumerspecific taxes are the largest source of tax payments (39%), followed by VAT (18%) and corporation tax (10%). Annual spectrum fees and regulatory fees are the next largest (6% and 5% respectively) followed by import duties (5%), with other taxes⁹³ (16%) making up the rest.

In this regard, it is noted that consumer-specific taxes in Guinea (39%) constitute a greater portion of the tax revenue than in any other country in Africa. Guinea also has one of the highest proportion of revenues

^{89.} Source: EY Analysis and operator data.

^{90.} The tax revenue of the calendar year 2017 was GNF 12,633,643 million (\$1,414 million). Source: Guinea, Ministry of Economy and Finance. Tax revenue for 2017 from the mobile sector has been estimated based on operator's data.

^{91. 2016} GDP was estimated at \$8,200m, which has been forecasted to grow at 4.441% in 2017. Source: World Bank.

^{92.} EY estimated 2017 market revenue based on operator's data for 2016.

^{93.} This includes all other tax payments made by operators in Guinea in 2016, which are not covered by a specific category (e.g. Personal Income Tax, Social Security Contributions, Personal Tax).

GEMA

made up by annual spectrum fees (6%), which is higher than in many other African countries such as Algeria (5%), Cameroon (3%) and Ghana (2%). Regulatory fees in Guinea (5%) also make up a higher share than they do in South Africa (2%).

Guinea also has one of the highest shares of revenue made up by corporation tax (10%), which is greater

Figure 16

than Madagascar (8%), Tanzania (7%) and Morocco (2%). Import duties as a share of revenues are also higher than in many countries such as Niger (4%), Senegal (4%), South Africa (3%), Tunisia (3%), Rwanda (2%), Tanzania (1%), Egypt (1%) and Morocco (1%). VAT as a share of revenue (18%) is also higher than in Ghana (17%).



Source: GSMA Intelligence, EY Analysis and operator data

General taxes are equivalent to around 25% of total mobile sector revenue. This is higher than the share in Tunisia (20%), South Africa (19%), Kenya (18%), Tanzania (16%), Ghana (16%), Egypt (14%) and Senegal (12%) as shown in Figure 17. Mobile-specific taxes represent the largest share of mobile sector revenues compared to any other African country in the sample at 29%. The next highest is Tunisia (23%), followed by Niger (18%), Chad (18%), Tanzania (15%), Ghana (14%) and Senegal (10%).

Figure 17



General taxes and fees versus mobile sector-specific taxes and fees (as percentage of mobile sector revenue)

Source: GSMA Intelligence, EY Analysis and operator data

Following the liberalisation of global telecommunications markets over the last two decades, there has been a trend of declining rates for incoming international termination. However, a number of countries outside the OECD area, especially in Africa, continue to apply a government-mandated standard termination charge for incoming international traffic.⁹⁴ As mentioned above, Guinea imposes a \$0.28 surtax on international incoming traffic, of which \$0.12 goes to government. Table 6 below shows the reduction in international traffic which has been experienced in certain countries following the introduction or increase of this surtax.

Table 6

Traffic reduction as a consequence of SIIT, selected countries⁹⁵

Country	Termination rate before the increase	Termination rate after the increase	Increase in retail tariffs	International incoming traffic reduction (period)
El Salvador	N/A ⁹⁶	\$0.04 (2008)	N/A ⁹⁷	53% (2008-2011)
Ghana	\$0.11 - \$ 0.13	\$0.19 (2010)	46% - 73%	48% (2009-2011)
Rwanda	\$0.09	\$0.22 (2012)	144%	30% (Q3 2012-Q2 2013)
Tanzania	N/A ⁹⁸	\$0.25 (2012)	126%	26% (Q2 2012-Q2 2013)
Pakistan	\$0.02	\$0.088 (2012)	340%	26% (2012-2013)
Guinea	\$0.16	\$0.34 (2009)	116% (Q12009-Q12010)	N/A ⁹⁹

94. OECD, 2015, "Working party on communication infrastructures and services policy", International Traffic Termination. pp.4-5.

- 95. OECD, 2015, "Working party on communication infrastructures and services policy", International Traffic Termination, p. 29.
- 96. Data not available.
- 97. Data not available.
- 98. Data not available.
- 99. Data not available.

GGMA

As demonstrated in Table 6, retail tariffs for international services increased by 116% as a result of raising the surtax of \$0.34 per minute on all international incoming traffic in 2009. Similar increases in the retail tariff have also caused a significant reduction in the amount of incoming international traffic in other African countries. For example, in Rwanda a 144% increase in SIIT resulted in a 30% reduction in international traffic and in Ghana a 46% to 73% increase in tariffs, resulted in a 48% decline in international incoming traffic. In Guinea, there has been an overall decrease in international traffic between 2012 and 2016, as shown in Figure 18.



International traffic in Guinea, 2012-2016



Source: ARPT, Annual Observatory 2016

Finally, annual fees for backhaul spectrum amount to approximately 5% of total tax payments for the mobile industry. The spectrum fees are an important source of revenue, exceeding the levels seen in other

Figure 19

Annual backhaul spectrum fees as percentage of mobile market revenue

countries. As shown in Figure 19, the level of backhaul

spectrum fee payments in Guinea (3.9%), as a share

of the total market revenue, surpasses the level seen

in most countries in Africa for which data is available.



Source: GSMA Intelligence and operator data



CC 140

2.3 Tax burden in comparison to other sectors

Consumption taxes in the Guinean mobile sector consist of VAT, excise duty on communications (TCT) and the surtax on international incoming traffic (SIIT). Not all goods have to bear the same tax burden. Mobile services are subject to VAT at the standard rate of 18%, while other goods, including educational and financial services, are exempt from VAT. Furthermore, despite its positive externalities, the mobile sector is also made subject to excise duties, along with other products and services such as alcohol and gambling. Table 7 summarises the VAT rates, customs duties and other consumption taxes applying to different sectors.

Table 7

Key tax rates in Guinea, 2016

VAT (standard rate)	18%
VAT (exempt)	 Certain food products including, rice, flour, bread, palm oil and fish Medical services Educational services Financial services
Excise taxes	 Specific tax on consumption of alcoholic beverages of GNF 1,500 - 1,000 per cl of fluid 15% tax is applied to the consumption of various gambling activities Various financial services are subject to taxes ranging from 5% to 20%

Source: 2017 EY Worldwide Corporate Tax Guide, IBFD, Guinea Ministry of Economy and Finance, World Bank Doing Business

3. Designing a more efficient tax policy framework for the mobile sector in Guinea

Governments have to raise tax revenues to fund the provision of public goods and services. However, if the tax system is not designed properly, this could lead to unintended consequences for both the government and the taxpayers in terms of the incidence of the tax burden, distributional effects, efficiency and costs of collection.

In order to prevent such unintended consequences, it is important to follow certain principles of tax policy design which have been consistently developed by international organisations such as the International Monetary Fund (IMF), the Organisation for Economic Cooperation and Development (OECD), the United Nations (UN) and the World Bank. $^{\rm 100}$ These principles include:

- Taxation should be as broad-based as possible;
- Specific taxes should be limited and be based on a clear rationale of externalities;
- The tax system should be equitable;
- The tax system should not discourage investment;
- The tax system should be simple; and
- Taxes should be easy to collect.

By applying these principles, this section identifies three policy options that could enhance the tax environment in Guinea.

3.1 Considerations for a more efficient tax system in developing countries

As laid out in Figure 20, the tax system is likely to have wider impacts in terms of:

- Price. Tax rises can lead to price changes and therefore to changes in demand for mobile services.
- **Tax revenue.** A change in the design or rate of tax will have an impact on tax revenues, which may be positive or negative depending on the precise change and how it is implemented.
- **Productivity.** To the extent that tax changes broaden or narrow access to mobile technologies, they deliver or impede productivity gains across the economy.

Indirectly, the taxation of the mobile sector will also impact information flows, access to markets, business processes and innovation. This will ultimately affect the economic growth and development of a country.

100. IMF, OECD, UN and World Bank, 2011, "Supporting the Development of More Effective Tax Systems. A Report to the G-20 Development Working Group".


Factors shaping tax policy choices



In order to make sure these impacts are positive, there are key factors which will generally need to be taken into account by any tax policy on the mobile sector.¹⁰¹ These include:

- Distributional characteristics. The design of a tax can impact different cohorts of taxpayers in different ways, such as those in different income deciles.
- Economic incidence. Who bears the tax will depend on the market structure, the demand elasticity and the scope for tax cuts to be absorbed in prices. This incidence will, in turn, determine where in the economy and at what stages in the supply chain the impact of the tax is felt.
- Efficiency. Taxes have the capacity to distort decision making by increasing costs of production and distribution. The efficiency of a tax can be assessed against the extent to which unwarranted and unintended distortions are avoided.
- **Cost of collection.** The complexity of a tax and its conformity with existing models and procedures have a direct impact on the cost of collection (administrative burden) and the costs of compliance to the taxpayers.

101. There are a number of theoretical studies around the taxation of mobile services, including: ITU, June 2013, "Taxing Telecommunication/ICT Services: An Overview".

These key tax considerations should be appropriately balanced by applying the following principles:

- Broad-based taxes with single and low rates, minimising the use of exemptions, should be favoured over specific taxes. This should allow the maximisation of revenue with minimal distortions to the consumption and provision of mobile services.
- Specific taxes must be highly selective, narrowly targeting a few goods mainly on the grounds that their consumption entails negative externalities on society. Therefore, mobile phones and services should not be included in a list of goods and services singled out for exceptionally harsh tax treatment.¹⁰²
- Mobile operators and consumers should be treated equally to other people in equal circumstances in an equal way ("horizontal equity"). In addition, the tax system should also preserve "vertical

equity"¹⁰³ by avoiding the imposition of regressive taxes which affect more heavily consumers of mobile services in the lower income groups.¹⁰⁴

- Taxes should not undermine the affordability of mobile services, as excessive taxation can increase the cost of handsets and mobile services.¹⁰⁵
- A stable and transparent tax system in line with international standards is a strategy that would deliver sustained investment.¹⁰⁶
- Tax rules should be clear and no more complex than needed to achieve the policy aim, facilitating mobile businesses and consumers to make optimal decisions and respond to intended policy incentives.¹⁰⁷
- The collection of taxes should be as efficient as possible, i.e. low tax administration costs and minimal evasion and avoidance costs.¹⁰⁸

3.2 Outlook of the tax environment in Guinea

There is significant scope for improvement in making Guinea a more business friendly environment. In the World Bank ease of doing business report,¹⁰⁹ Guinea is ranked 153 out of 190 countries and 26 out of 48 Sub-Saharan Africa countries.

Furthermore, the tax regime in Guinea is regarded as particularly difficult for businesses. The World Bank's ease of doing business report places Guinea 182 out of 190 global countries, and 42 out of 48 Sub-Saharan Africa countries when it comes to the ease of paying taxes. The number of tax payments, the time spent to prepare, file and pay taxes, the total tax and contribution rate, and the post-filing time, make Guinea's system extremely complex and represent a large administrative burden for companies, acting as a barrier to future investment. This suggests that a more friendly business environment is necessary to attract more investment. The mobile sector in Guinea has great scope to grow given it is ranked 29 out of 38 African countries in the ITU's ICT Development Index and 166 out of 176 countries globally.¹¹⁰ Improving the business and tax environment is key to taking advantage of this potential growth.

ITU, June 2013, "Taxing Telecommunication/ICT Services: An Overview"
ITU, June 2013, "Taxing Telecommunication/ICT Services: An Overview"

^{104.} Richard M Bird and Eric M Zolt, "Introduction to Tax Policy Design and Development", (Practical Issues of Tax Policy in Developing Countries, World Bank, 2003).

^{105.} V. Tanzi and H. Zee, March 2001.

^{106.} V. Tanzi and H. Zee, March 2001.

^{107.} IMF, OECD, UN and World Bank, July 2016, "Enhancing the Effectiveness of External Support in Building Tax Capacity in Developing Countries. Prepared for Submission to G20 Finance Ministers".

^{108.} Revenue Mobilization in Developing Countries (March 2011) Prepared by the Fiscal Affairs Department. Approved by Carlo Cottarelli, IMF.

^{109.} World Bank, 2017, "Doing business, measuring business regulations".

^{110.} ICT Development Index, 2017, http://www.itu.int/net4/ITU-D/idi/2017/index.html#idi2017economycard-tab&GIN.

3.3 An assessment of mobile sector taxation in Guinea

An assessment of the current mobile tax regime in Guinea against the four tax considerations and principles elaborated in section 3.1, identifies the following characteristics:

- The current tax system has a high incidence of both mobile operators and consumers. Despite the positive externalities of the sector, mobile services are subject to a high level of specific taxation (for example, TCT and SIIT). As a result, the tax revenue from the mobile sector is 59% of the overall revenue of the industry. As mentioned above, mobile services have positive impacts for the wider economy in terms of connectivity and digital inclusion. Therefore, it is not clear why they should be penalised with specific taxes alongside products with negative externalities (such as alcohol and tobacco).
- Taxes undermine the affordability of mobile services and are likely to have a negative impact on the distribution of income. As a result of the point mentioned above, consumers of mobile services face a high tax burden. 43% of total tax payments of the sector comes from consumers, which amounts to 23% as a share of the mobile market revenue. As a consequence, mobile services are more expensive than they could be in Guinea. This may hinder connectivity and digital inclusion for the most disadvantaged in Guinea.
- The tax system is not efficient and discourages investment. Mobile companies are more heavily taxed than other sectors in Guinea. For example,

despite the positive externalities generated by the industry, mobile operators are subject to extra taxes on their corporate income, such as the tax on access to the telecommunications network. The resulting reduced profits send signals to the market that the provision of mobile services and production of mobile technology is not a profitable investment, and this is likely to stifle investment in the industry.

• The regulatory and tax system for mobile is not simple and increases the cost of collecting taxes. The tax regime in Guinea is regarded as particularly difficult for businesses. The World Bank's ease of doing business report places Guinea 182 out of 190 global countries, and 42 out of 48 Sub-Saharan Africa countries when it comes to the ease of paying taxes. The number of tax payments, the time spent to prepare, file and pay taxes, the total tax and contribution rate, and the post filing time, makes Guinea's system extremely complex and represents a large administrative burden for companies, acting as a barrier to future investment.

As shown in Table 8 below, although in Guinea the number of tax payments is just below the average for Sub-Saharan Africa, the time to calculate and pay those taxes in Guinea is much higher than in the rest of Sub-Saharan Africa, 400 hours and 280.8 hours respectively. Furthermore, the effective tax rate is also higher than in the rest of Sub-Saharan Africa at 61.4% compared to 46.8%. Guinea also falls far behind the rest of Sub-Saharan Africa when it comes to complying with post-filing procedures.

Table 8

Guinea tax index, 2017

Indicator	Guinea	Sub-Saharan Africa	OECD high-income countries	Overall best performer
Tax payments (number per year)	33	37.2	10.9	3 (Hong Kong)
Time (hours per year)	400	280.8	160.7	55 (Luxembourg)
Total tax and contribution (% of profit)	61.4	46.8	40.1	18.47 (32 economies)
Post-filing index (0-100)	12.77	54.39	83.45	99.38 (Estonia)

Source: World Bank, Doing Business 2017.

3.4 Options for tax policy reform in Guinea's mobile sector

Based on this analysis, we have identified three options for reform in line with the considerations and principles of taxation elaborated above:

- Option 1 Removal of the excise duty on telephone consumption (TCT)
- Option 2 Removal of the Surtax on International Incoming Traffic (SIIT)
- Option 3 Reduction of the annual backhaul spectrum fees (redevance FH) by 80%

These proposals will likely reduce the tax burden on consumers, increasing the affordability of mobile services in Guinea. Subsequently, there will be increased demand for these services and the products associated with them, such as mobile phones. As a result, the productivity of Guinea is expected to increase thanks to better connectivity, leading to greater digital inclusion. Furthermore, increased demand will lead to greater investment in the provision of mobile services and production of associated goods.

3.4.1 Eliminating excise duty (TCT) on bonus calls

The TCT is an excise duty tax charged to consumers on the price of services at the following rates: calls – GNF 1 per second; SMS – GNF 10 per connection, data – 5% of internet pass price. The value of free bonus calls are also subject to the TCT, although this does not directly generate revenue for operators.^{III} The TCT represents an additional burden to the customer and operators, thereby limiting the benefits associated with mobile consumption.

The rationale for change

 Mobile services should not be subject to special taxes. Generally excise taxes are imposed to reduce the consumption of goods with negative costs associated with it, such as alcohol and tobacco products. However, the consumption of mobile services is likely to have positive impacts and therefore, they should not be taxed on the same basis. Hence, removing the TCT would increase the benefits associated with mobile consumption, such as connectivity, digital and financial inclusion.

- The TCT is one of the main consumer taxes that contribute to the large tax burden the industry faces. As shown in section 2.2, Guinea has high consumer taxes that are specific to the mobile sector and represent a large burden. Consumer taxes are equivalent to 23% of the total revenue made by telecommunications operators; similarly, mobile-specific taxes constitute 29%. This makes telephone use more expensive, especially for those on lower income.
- The full elimination of the TCT would further increase the affordability of mobile services. Reducing the tax burden will translate into lower prices, especially benefiting the low-income population, and thereby making the tax system less regressive.
- The TCT should not be applied on bonus calls. These are gifted to consumers by operators as a thank you for customer loyalty and the cost of providing them are entirely borne by operators. Taxing the consumption of these calls effectively increases further the cost of supplying them and reduces businesses incentives to do so.¹¹² Removing the TCT on bonus calls will decrease the cost of supplying them and lead to more of them being offered, increasing consumption of mobile calls and the benefits associated with it.

3.4.2 Eliminating the Surtax on International Incoming Traffic (SIIT)

Guinea imposes a surtax of \$0.12 per minute on calls that are received from overseas. The SIIT is imposed as a fixed price that operators must charge for international inbound termination. This discourages people to make phone calls to Guinea, thereby disincentivising further the connectivity of the country with the world.

The rationale for change

 International calls should not be subject to special taxes. Generally excise taxes are imposed to reduce the consumption of goods whose consumption has negative costs associated with it, such as the consumption of alcohol and tobacco products. The consumption of telecommunications services, such

^{111.} For the purposes of section 4, only the removal of the TCT on bonus calls will be modelled. However, the full elimination of the TCT is expected to lead to greater benefits, as explained in this subsection.

^{112.} The taxation of free services is also problematic from a practical point of view. Given no consideration is paid for them, the tax base is not clear. This could lead to increasing tax uncertainty.

as international phone calls, however, does not have negative costs associated with it. Instead the effects of consumption, such as connecting people from different countries to Guinea more easily, are likely to have positive impacts and could, for example, facilitate foreign direct investment, as well as regional and international business opportunities.

- Removing the SIIT would increase the amount of time spent by callers from abroad calling into Guinea. Hence, the benefits associated with its increased connectivity will also be greater for the domestic population of Guinea, who ultimately see themselves affected by a reduced number of international calls, for example, from family and friends working or studying abroad.
- The SIIT leads to high monitoring costs to detect fraud. GSM gateways or SIM-boxes can be used to bypass international termination rates. Network operators and authorities actively search for anomalous behaviour in calling patterns to find illegal gateways. The result is a "cat and mouse" game between enforcement authorities, mobile operators, and suppliers of anti-fraud services on the one side and manufacturers of gateways and parties offering to terminate clandestine international traffic on the other.¹¹³ The removal of SIIT would alleviate the significant costs and resources, which are devoted by both operators and authorities, to the policing of these illegal gateways; instead, such resources could be spent, for example, on improving the telecommunications infrastructure or promoting the universal access of broadband.

3.4.3 Reducing annual backhaul spectrum fees (redevance FH) by 80%

Guinea imposes a large number of regulatory fees on telecommunications operators, as set out in Table 5 in section 2.1.4, including annual spectrum fees for both access spectrum and backhaul spectrum. This increases the costs for the operators, and ultimately, this undermines the affordability of mobile services.

In Sub-Saharan Africa, the annual spectrum fees represent, on average, 0.74% of mobile operators' revenue.¹¹⁴ This is 20% of the level seen in Guinea, where these fees represent 3.9% of mobile operators' revenue on average.

In order to align the level of spectrum fees in Guinea to the average level of Sub-Saharan Africa, such fees could be reduced by 80%. This would bring these fees closer to an optimal level to avoid distortions in the allocation of the spectrum, with positive effects for the mobile sector (e.g. more affordable services) and for the wider economy (e.g. more investment and rural coverage).

The rationale for change

- The objective of annual spectrum fees in many countries is to cover the costs of spectrum management. These fees should not be used as a mean of raising additional revenue. The primary objective should be to allow the efficient allocation of spectrum among operators to maximise the longterm benefit to society.
- High spectrum fees reduce funds available for investment into mobile networks that are necessary to enhance quality and coverage.
- The level of backhaul spectrum fee payments in Guinea (3.9% as a share of the total market revenue) surpasses the level seen in most countries in Africa. This is a competitive disadvantage for Guinea, in comparison to neighbouring countries seeking to attract investment into the mobile sector.
- High backhaul spectrum fees are preventing greater investment in rural areas. In urban areas, fixed network or fibre can be used to provide access to network coverage, while rural areas rely on backhaul spectrum to provide coverage. High fees on backhaul limit the deployment of coverage in rural areas, hampering economic growth in these areas. This does not support the National ICT Plan 2016–2020¹¹⁵ to develop the rural economy through mobile services and e-agriculture, and will worsen the demographic issues discussed in section 1.3.
- Reducing the level of spectrum fees will ultimately translate into better quality and more affordable services for the consumer. For any resource, including radio spectrum, the primary economic objective is to maximise the net benefits to society that can be generated from that resource. To do so, the spectrum should be efficiently allocated among its users. Therefore, excessive fees should be avoided as they can lead to an inefficient allocation of spectrum.

Section 4 presents detailed economic modelling to show the impacts delivered by these options.¹¹⁶

^{113.} OECD, 2015, "Working party on communication infrastructures and services policy". International Traffic Termination, p. 16.

^{114.} Based on a selection of 11 countries for which data is available in 2016.

^{115.} Government of Guinea (2016) National ICT Plan 2016-2020. Objective 4.

^{116.} While a combination of these tax reforms can potentiate the economic benefits for Guinea, the economic assessment will consider the options as separate 'scenarios' where each tax is reformed and compared to a status quo scenario with no change in taxation.

4. Economic impacts of tax reform on the mobile sector in Guinea

4.1 Recommended options for tax reform

Based on the framework and analysis outlined in the previous section, the following three options for tax reform have been assessed quantitatively by modelling their impacts on the mobile sector and the wider economy:

- The elimination of excise duty (taxe sur la consommation téléphonique – TCT) on bonus calls,¹¹⁷ which is currently levied at 1 GNF per second. This will result in lower prices and hence should lead to increased usage of relevant services.
- The elimination of the surtax on international incoming traffic (SIIT), which is currently levied at \$0.12 per minute. This will result in lower prices for international termination, and should lead to an

increase in the volume of incoming calls.

3. Reducing annual backhaul spectrum fees (redevance FH) charged to operators by 80%. A significant portion of this reduction will be passed through to subscribers in the form of lower prices, and it will also incentivise additional investment in the sector, as operators reinvest a share of the increased profits.

These options for tax reform have been modelled separately in order to isolate the effects of each option on the mobile sector and the wider economy. Alternative scenarios and combinations of these reforms are also possible.¹¹⁸

4.2 Approach to assessing the quantitative impacts of tax reform on the mobile market and the wider economy

The potential quantitative impacts of each of the tax reform options have been analysed using a set of modelling tools representing both the Guinean mobile sector and the Guinean economy as a whole. The assessment considers the options as separate 'scenarios', where each tax is reformed and compared to a status quo scenario with no change in taxation, although it is acknowledged that a combination of these tax reforms can have beneficial economic impacts for Guinea.

A model of the Guinean mobile sector has been created to calculate changes in the mobile sector resulting from each of the tax policy scenarios. This includes the change in subscribers, usage, technology, revenues, profits, reinvestment and expanded capacity in the sector.

The wider economic impacts of each tax policy scenario are assessed via a 'Computable General Equilibrium' (CGE) model, namely the standard

 ^{&#}x27;Bonus calls' refers to voice traffic which is not charged to the customer. Under the current tax scheme, operators are charged 1 GNF per second for these calls.
The economic impacts of each option for tax reform have been modelled separately, and therefore cannot be simply aggregated to determine the benefits of combined reductions in various taxes.

GGMA

version of the Global Trade Analysis Project (GTAP) model and its associated dataset.¹⁹ The GTAP model is contributed to, and widely used, by government agencies, international institutions, the private sector and academia to model policy changes within countries and cross-border effects of trade policies. Some examples include the World Bank, the World Trade Organization (WTO), the Directorate General

for Trade of the European Commission, the Asian Development Bank, the Organisation for Economic Co-operation and Development (OECD) and the United Nations Economic Commission for Africa.¹²⁰

A schematic of the modelling approach used in this study is shown in Figure 21 below.¹²¹

Figure 21



^{119.} Global Trade Analysis Project (<u>https://www.gtap.agecon.purdue.edu/</u>).

^{120.} GTAP Consortium (https://www.gtap.agecon.purdue.edu/about/consortium.asp).

^{121.} Please see Appendix A for more detail on the methodology approach used in this study to construct the scenario forecasts.

4.3 Eliminating excise duty (TCT) on bonus calls

The elimination of the TCT on bonus calls, which is currently levied at 1 GNF per second, would reduce consumer prices and therefore improve the affordability of mobile services. The proposed elimination of the excise duty on bonus calls would translate into an effective reduction in the price of all mobile services by 4.4%, the majority of which would be passed through to subscribers.¹²²

This price decrease would benefit both households and business subscribers. For household subscribers, the tax reform would lead to an increase in real disposable incomes, and will improve the affordability of mobile services. As shown in Section 1.5, this is particularly relevant for Guinea, as the cost of mobile ownership represents a significant share of monthly income, particularly for those at the bottom of the income pyramid. Absent behavioural effects, this tax reform would reduce the cost of a 500MB data basket, for the poorest 20% of the population, from 10.9% of monthly income to 10.6%. For business subscribers, the reduction in excise duty would reduce input costs for all sectors that use mobile, increasing demand and freeing up resources which can be invested elsewhere.

This tax scenario would have the following impacts compared to a "baseline" scenario¹²³ of no change in current levels of taxation:

- New connections: an additional 663,000 unique subscribers, or 1.3 million mobile connections by 2023. This is equivalent to an increase of around 4.3% in unique subscriber penetration (8.2% in total connections). Of these new connections, 98% would be prepay and approximately 55% would be classified as low income.
- Mobile market revenue: total mobile sector revenue would increase by \$44 million (6.9%) by 2023. This would be driven by additional revenues from the increased number of connections, and higher overall usage, which offset the reduction in pricing from the tax reform.
- Technology migration: the reduction in the price of data would lead to the migration of around 697,000 additional 2G connections to mobile broadbandenabled services. This significant increase in

technology migration is facilitated by increased investment in 3G coverage by mobile operators, resulting from the reinvestment of increased profits.

- Usage: the reduction in the price of mobile services would lead to an 11.9% increase in total data usage compared to the baseline, while usage of voice and message services would increase by 11.7% and 11.8% respectively. Among low-income customers, data usage per connection would increase by an estimated 54MB per month.
- Additional investment by operators: there would be additional investment of over \$6 million per annum as a result of the increased revenue from the tax reform (equivalent to 60 new 3G base stations, or 240 upgrades from 2G to 3G stations, per year).
- **Productivity gain:** the increase in unique subscriber penetration of 4.3% would lead to a 0.8% gain in productivity across the economy, leading in turn to further increases in output, incomes and expenditure.
- **GDP increase:** total GDP would increase by \$57 million (0.88%) by 2023 compared to the baseline, as the price and productivity effects lead to a chain reaction of expansion across the economy.
- Employment increase: as a result of the increased economic activity in the economy, employment would increase by approximately 4,200 jobs (0.08%).
- Wider investment in the economy: as a result of the decrease in intermediate costs for businesses that use mobile, additional resources are made available for investment across the economy. By 2023, this scenario would lead to an annual increase in investment of \$14 million.
- Benefits to other sectors: as a result of the increased level of economic activity, all of the sectors within the economy will increase their level of output. Output in the trade sector rises the most (1.7%), while communications (1.5%), and business services (1.3%) also make relatively strong gains.

^{122.} The pass-through rate is endogenously generated from the GTAP model, and reflects the visibility of the tax, and the level of price competition in the Guinean communications sector. 123. Please see Appendix A for more detail on the modelling assumptions used in this study and see Appendix B for detailed estimated impacts.

GSMA

• Tax revenue impact: this scenario would have an initial net cost to the Guinean Exchequer of \$4 million in 2019. However, the subsequent expansion of the mobile sector, and significant growth in the wider economy, mean that, by year 2 both the annual impact and cumulative impact are positive. The gain in tax revenue is approximately \$13 million per annum by 2023.

The summary of the sector-specific and economic impacts in 2023 is shown in Figure 22.

Figure 22

Annual impacts of eliminating excise duty (TCT) on bonus calls, 2023¹²⁴



Source: EY analysis

124. Please see Appendix B for further detail on the results of this analysis, including annual impacts between 2019 and 2023.

4.4 Eliminating the surtax on international incoming traffic (SIIT)

The elimination of the SIIT, which is currently levied at \$0.12 per minute, would translate into an effective reduction in the price of international incoming calls of 42.3%. This price reduction would stimulate an increase in the volume of international incoming calls, generating additional revenue for operators which can be invested in the Guinean mobile market in the form of new base stations or upgrades.¹²⁵

By extending the reach of mobile to individuals in rural and low-income areas, this added investment in the mobile sector will allow greater mobile connectivity in Guinea, stimulating enhanced usage of 2G and 3G services in the market. This will have a positive effect on the productivity of the Guinean businesses, as mobile enhances the efficiency of communication and trade across the economy. The elimination of the SIIT will also have a significant social impact, bringing Guinean families closer together and strengthening the ties between Guinean expatriates, domestic households and businesses.

The elimination of the SIIT will also help to improve Guinea's business environment, with Guinea currently ranked 135th out of 138 countries in the Enabling Trade Index.¹²⁶ For businesses trading with Guinea, the cost of communication will be reduced, which may also improve the attractiveness of Guinea as a destination for foreign direct investment.¹²⁷

This tax scenario would have the following impacts compared to a "baseline" scenario¹²⁸ of no change in current levels of taxation:

- International incoming traffic: As a result of lower prices for non-domestic callers, there will be an additional 263 million minutes of international incoming traffic by 2023.
- New connections: an additional 927,000 unique subscribers, or 1.8 million mobile connections by 2023. This is equivalent to an increase of around 6.0% in unique subscriber penetration (11.5% in total connections). Of these new connections, 99% would be prepay and approximately 55% would be classified as low-income.
- Mobile market revenue: total mobile sector revenue would increase by \$114 million (17.7%) by 2023. This would be driven by the significant

growth in revenues from international traffic, and the incremental mobile penetration and usage levels generated from reinvestment.

- Additional investment by operators: there would be additional annual investment of over \$6 million as a result of the increased revenue from the tax reform (equivalent to 60 new 3G base stations, or 240 upgrades from 2G to 3G stations, per year).
- Usage: the technology migration enabled by investment in the sector would lead to a 10.6% increase in total data usage compared to the baseline, while usage of voice and message services would also both increase by approximately 11.1%. Among low-income customers, data usage per connection would increase by an estimated 51MB per month.
- **Productivity gain:** the increase in unique subscriber penetration of 6.0% would lead to a 1.1% gain in productivity across the economy, leading in turn to further increases in output, incomes and expenditure.
- **GDP increase:** total GDP would increase by \$89 million (1.4%) by 2023 as the price and productivity effects lead to a chain reaction of expansion across the economy.
- Employment increase: as a result of the increased economic activity in the economy, employment would increase by approximately 13,200 (0.24%) by 2023.
- Wider investment in the economy: as a result of the increased level of output in the mobile sector, additional resources are made available for investment across the economy. By 2023, this scenario would lead to an annual gain in investment of \$24 million.
- Tax revenue impact: this scenario would have an initial net cost to the Guinean Exchequer of \$13 million in 2019. However, the subsequent expansion of the mobile sector, and significant growth in the wider economy, mean that, by year 2 both the annual impact and cumulative impact are positive. The gain in tax revenue is approximately \$8 million per annum by 2023.

The summary of the sector-specific and economic impacts in 2023 is shown in Figure 23.

46

^{125.} A base station, as defined by the International Telecommunication Union (ITU), is a land station in the land mobile service.

^{126.} World Economic Forum, "The Global Enabling Trade Report" 2014, http://www3.weforum.org/docs/WEF_GlobalEnablingTrade_Report_2014.pdf.

^{127.} The impact on foreign direct investment has not been specifically modelled under this scenario.

^{128.} Please see Appendix A for more detail on the modelling approach and assumptions.

GEMA

Figure 23

Annual impacts of eliminating the surtax on international incoming traffic (SIIT), 2023¹²⁹



Source: EY analysis

4.5 Reducing annual backhaul spectrum fees (redevance FH) by 80%

In this scenario, the annual backhaul spectrum fees charged to mobile operators in Guinea are reduced by 80%. The impact of this reform would be similar to a reduction of the taxation burden on the sector and would align annual backhaul spectrum fees in Guinea with the average levels observed in Africa,¹³⁰ thereby promoting an enhanced investment environment.

In general, the extent to which taxes ultimately fall on mobile operators or consumers depends on the type of tax and market conditions. Some taxes and regulatory fees may be absorbed by operators in the form of lower profits, while others may be passed through to consumers through higher prices, or there may be a combination of the two. The reduction in annual backhaul spectrum fees will lead to a direct saving for operators, a portion of which is passed through to subscribers in the form of a 2.6% price reduction.¹³¹ The remainder of the tax saving to mobile operators will be allocated to profits or reinvested in the sector in order to upgrade and/or build new base stations. This will facilitate significant technology migration, as consumers increasingly adopt newgeneration services.

^{129.} Please see Appendix B for further detail on the results of this analysis, including annual impacts between 2019 and 2023.

^{130.} In Sub-Saharan Africa, annual backhaul spectrum fees represent 0.74% of mobile operators' revenue on average (based on a selection of 11 countries in 2016, for which data is available). In Guinea, annual backhaul spectrum fees represent on average 3.9% of mobile operators' revenue. Therefore, in order to align the level of annual backhaul spectrum fees in Guinea to the average level of Sub-Saharan Africa, we propose a reduction of 80% of the current level of annual backhaul spectrum fees.

^{131.} A pass-through rate of 94% is derived from the GTAP model in this scenario. The remaining 4% is therefore available for reinvestment.

This scenario would have the following impacts compared to the baseline scenario:

- New connections: an additional 220,000 unique subscribers, or 423,000 mobile connections by 2023. This is equivalent to an increase of around 1.4% in unique subscriber penetration (2.7% in total connections). Of these new connections, 97% would be prepay and approximately 55% would be classified as low income.
- Mobile market revenue: total mobile sector revenue would increase by \$14 million per annum (2.1%) by 2023. This would be driven by additional revenues from the increased number of connections, and higher overall usage, which offset the reduction in pricing from the tax reform.
- Usage: the reduction in the price of mobile services would lead to a 5.0% increase in total data usage compared to the baseline, while usage of voice and message services would increase by approximately 4.7% and 4.8% respectively. Among low-income customers, data usage per connection would increase by an estimated 53MB per month.
- Additional investment by operators: there would be additional annual investment of over \$0.6 million as a result of the increased revenue from the tax reform (equivalent to 6 new 3G base stations, or 24 upgrades from 2G to 3G stations, per year).
- **Productivity gain:** the increase in unique subscriber penetration of 1.4% would lead to a 0.3% gain in productivity across the economy, leading in turn to further increases in output, incomes and expenditure.
- **GDP increase:** total GDP would increase by \$22 million (0.3%) compared to the baseline, as the price and productivity effects lead to a chain reaction of expansion across the economy.

- Employment increase: as a result of the increased economic activity in the economy, employment would increase by approximately 3,800 jobs (0.07%).
- Wider investment in the economy: as a result of the decrease in intermediate costs for businesses that use mobile, additional resources are made available for investment across the economy. By 2023, this scenario would lead to an annual gain in investment of \$9 million.
- Benefits to other sectors: as a result of the increased level of economic activity, the majority of sectors within the economy (11 out of 12) will increase their level of output. Output in the communications sector rises the most (1.4%), while trade (1.1%) and financial services (0.5%) also make relatively strong gains.
- Tax revenue impact: this scenario would have an initial net cost to the Guinea Exchequer of \$4 million in 2019. However, the subsequent expansion of the mobile sector, and significant growth in the wider economy, mean that by year 2 both the annual impact and cumulative impact are positive. The gain in tax revenue is about \$2 million per annum by 2023.

The summary of the sector-specific and economic impacts in 2023 is shown in Figure 24.

Figure 24

Annual impacts of reducing annual backhaul spectrum fees by 80%, 2023¹³²



Source: EY analysis

132. Please see Appendix B for further detail on the results of this analysis, including annual impacts between 2019 and 2023.

5. Conclusion: Reforming mobile sector taxation in Guinea

The mobile industry has the potential to play an increasingly important role in achieving the objectives set out in the Guinean Government's economic and social development plan (PNDES) 2016–2020, by becoming an engine for economic and social growth in both urban and rural Guinea.

The sector has grown rapidly over the past decade, with over 4.7 million new individuals becoming connected to mobile services between 2007 and 2017. However, with unique subscriber penetration of just 46.5%, there is still significant scope to further develop the sector. A lack of affordability for basic consumption baskets in Guinea limits the potential growth in mobile adoption, particularly among rural and low-income individuals. Furthermore, the low affordability of internet-enabled mobile services and handsets in Guinea, and the challenging economics of providing network in rural areas (due to low population density and low electrification rates) act as significant barriers to mobile connectivity, and could prevent data usage converging to levels seen in more developed economies.

By promoting investment, reducing the cost of mobile ownership and incentivising usage, the tax reforms outlined in this paper will help to connect individuals, particularly those in low-income groups, to mobile services. Reforming taxation applied on the mobile sector towards a more balanced and efficient structure has the potential to provide significant economic benefits and increase government tax revenue before the Government's Economic and Social Development Plan (PNDES) 2016–2020 deadline.

A summary of the impacts is provided in Table 9.

Table 9

Summary of socio-economic benefits of the proposed tax reforms by 2023

Indicator	Eliminating excise duty (TCT) on bonus calls	Eliminating the surtax on international incoming traffic (SIIT)	Reducing the annual backhaul spectrum fees (redevance FH) charged to operators by 80%
New unique subscribers	663,000	927,000	220,000
Sector revenue	+\$44m	+\$114m	+\$14m
GDP increase	+\$57m	+\$89m	+\$22m
Wider investment	+\$14m	+\$24m	+\$9m
Annual gain in tax revenue	+\$13m	+\$8m	+\$2m

The policy options for reform outlined in this report achieve a number of key objectives for the mobile sector, and wider Guinean economy. This includes increasing the affordability of mobile products and services, reducing the tax burden on operators and consumers, and as a result, increasing the productivity of the country. Furthermore, these tax reforms will be aligned with the principles of taxation which have been developed by the IMF, World Bank, OECD and UN, by:

- Reducing the level of specific taxation;
- Favouring the use of broad-based forms of taxation, such as VAT;
- Making the tax system more equitable, recognising the positive externalities of mobile services; and¹³³

These reforms will be self-sustainable in terms of revenue, and, at the same time, they will make the tax regime more attractive for investment in the mobile sector.



133. An externality is a consequence of an economic activity experienced by unrelated third parties; it can be either positive or negative.

Appendix A Methodology

This Appendix sets out the methodology applied in this study to calculate the potential economic impacts of tax policy scenarios. As described in Section 4, the economic modelling is undertaken in two stages using two models:

- A model of the Guinean mobile sector, the 'telecoms market model' has been created to calculate changes in the mobile sector resulting from each of the tax policy scenarios. This includes the change in subscribers, usage, technology, revenues, profits, reinvestment and expanded capacity in the sector; and
- The wider economic impacts of each tax policy scenario are assessed via a Computable General Equilibrium (CGE) model, namely the standard version of the Global Trade Analysis Project (GTAP) model and its associated dataset.

Mobile sector modelling

Design of the telecoms market model

The telecoms market model covers the period 2017–2023, and uses data from local mobile operators and the GSMA Intelligence database. For modelling the scenarios, it has been assumed that the first phase of tax changes becomes

Figure 25

effective in 2018. The telecoms market model then calculates separate forecasts for each tax policy scenario. The difference between the scenario forecasts and the baseline is effectively the additional impact resulting from the tax policy reform.¹³⁴

A schematic of this model is presented in Figure 25 below.

Overview of mobile sector modelling approach



Source: EY analysis

134. The baseline forecast is the counterfactual scenario for which results are compared against. It is based on operators forecasts of the market over the period 2017-2023.

As illustrated in Figure 25, the telecoms market model captures the impact on consumer demand and operators' profits and investment as a consequence of a mobile taxation reform. The model allows for the estimation of the additional connections, technology migration and mobile penetration generated across different usage profiles (categorised by low, medium and high-income groups), and across 2G, 3G and 4G services.

Mobile market impacts

For consumers, a reduction in the tax rate leads to a decrease in the effective price of mobile services or handsets. The relationship between the size of the tax reduction and the related decrease in prices is dependent on the level of "pass-through".¹³⁵ The resulting reduction in the effective price of mobile services is modelled to have the following impacts:

- An increase in usage per connection, as lower prices lead to increased demand for services;
- An increase in the number of connections, as lower prices reduce the relative cost of mobile ownership which attracts new subscribers; and
- Additional technology migration, as lower prices for smartphones and/or cheaper data services accelerates the migration of existing subscribers from 2G services to 3G/4G services.

For operators, the proportion of the tax reduction that is not passed through in the form of lower prices would either be retained as increased profit or reinvested. The decision between these two options depends on an assumption made on the reinvestment rate.¹³⁶ The following effects of additional investment are estimated using the telecoms market model:

- An increase in the number of subscribers, as the investment enables the building of new mobile sites and, hence, increased network coverage; and
- Additional technology migration, as the investment enables upgrade of 2G sites to 3G/4G and, therefore, existing subscribers have the opportunity to upgrade from 2G to 3G/4G services.

Key outputs

The key outputs of the telecoms market model include changes to the baseline forecast (based

on the GSMA Intelligence forecast) in respect of:

- the number of connections;
- the number of unique subscribers;
- mobile market penetration;
- total market revenue; and
- sector taxation receipts.

For connections and subscribers, the model specifies market segments by usage profile (high, medium and low), technology (2G, 3G and 4G) and payment type (prepay and postpay). Therefore, the telecoms market model has been run for a total of 18 categories of subscribers.

Macroeconomic modelling

Macroeconomic modelling approach

The macroeconomic model builds upon the mobile sector analysis to estimate how lower taxes and prices feed through to the wider economy. This takes into account forward and backward linkages in the supply chain (i.e. supply chain for mobile service providers, and where mobile services are used in other sectors of the economy), the interaction between expanding businesses and a rise in household incomes and employment, and an assumed productivity gain across the economy as mobile penetration rises. This model gives an estimate of the dynamic impact on total tax receipts, allowing for all these indirect effects to work through the economy.

The macroeconomic impacts are modelled in two stages:

- The impact of the tax change on the sector itself and the interaction with the wider economy; and
- A boost to economy-wide productivity resulting from the increase in penetration.

The impact of the mobile sector on the wider economy starts from its supply chain linkages. In particular, telecommunications is an important input to businesses right across the Guinean economy. As lower taxes and consequent lower prices are passed on, many businesses will benefit and be able to expand their own outputs. Businesses that supply the mobile sector will also benefit from its expansion (see Figure 26).

^{135.} The percentage of the tax/fee change which is passed through to subscribers in the form of lower prices. This is calculated based on the relative slope of the supply and demand curves for mobile services.

^{136.} The percentage of the tax/fee change not passed through to subscribers which is reinvested by operators.

Figure 26

Supply chain linkages



Source: EY analysis

The wider interactions in the economy lead to a virtuous circle of economic expansion:

- The forward and backward linkages from the mobile sector lead to expansion in a number of related sectors, and this in turn creates more expenditure circulating in the economy;
- The mobile communications sector will see increased investment, as it is now relatively more profitable than in the baseline;
- Overall household incomes will expand, leading to more spending in the wider economy and an increase in aggregate savings to fund investment;
- Higher real wages attract more people into the workforce, expanding employment and in turn further boosting spending in the economy;

- A larger economy requires more investment to complement the expansion in employment and to support the larger capital stock, which will see growth in construction and in sectors making investment goods; and
- The economy is modelled to be constrained by available resources (workers, capital), so some sectors must contract to make way for the expanding sectors.

These linkage and interaction effects will be reinforced by an increase in productivity in the Guinean economy, due to the rise in penetration of the mobile sector. This in turn leads to a further expansion in output, incomes and expenditure in the economy.

The CGE model

CGE models reproduce the structure of the whole economy by mapping all existing economic transactions among diverse economic agents (e.g. households, firms). They are large-scale numerical models that simulate the core economic interactions in the economy, and replicate the circular flow of the economy (see Figure 27). They are based on the economic theory of general equilibrium; i.e. that

Figure 27



Source: Adapted from Burfisher, Mary (2011) Introduction to Computable General Equilibrium Models

Central in CGE modelling is the choice of closure rules. This relates to the specification of endogenous (those determined by the model) and exogenous (those determined externally). In the standard GTAP model prices, quantities of all non-endowment commodities (e.g. produced and traded commodities) and regional incomes are endogenous variables, while policy variables, technical change variables and population are exogenous to the model.¹³⁷ This standard closure is amendable with a wide range of alternative options available depending on modelling assumptions adopted.

supply and demand for goods, services and factors of production in the economy must be balanced.

Economic relationships in CGE models are based on

theory and empirical evidence from the academic

literature. The prices of goods, services and factors

of production adjust until all markets clear, that

is, until they are simultaneously in equilibrium.

^{137.} Hertel, T.W. ed., 1997, Global Trade Analysis: Modelling and Applications, Cambridge University Press.

Scenario modelling

The CGE model is used to conduct a number of tax policy simulations and, hence, assess the impacts of detailed policy scenarios on the wider economy. The approach is as follows:

- First, the effective tax on communication services (which includes mobile services) is calculated;¹³⁸
- Second, GTAP model parameters (e.g. ownprice and cross-price elasticities) and closure rules (e.g. related to employment assumptions)

are adjusted to ensure better alignment with the mobile telecoms market and broader characteristics of a specific economy;

- Third, simulation scenarios are run that account for the direct effect of taxes and tariffs on prices and a productivity improvement from any increase in mobile penetration (see Figure 28); and
- Finally, simulations are performed estimating the new equilibrium following the policy shocks introduced.

Figure 28

Overview of macroeconomic modelling approach



^{138.} All taxes affecting the production and consumption of mobile services and mobile phones in Guinea (e.g. turnover, excise, VAT) are combined to estimate the effective (compound) tax rates on final and intermediate consumption of goods and services.

The impact of changes in tax policy on pricing

Mobile taxation policy changes may be fully or partially passed through to consumer prices for mobile goods and services. The extent of passthrough depends on specific market factors (e.g. the extent of competition in the specific market) and is likely to vary by sector and country.

In this study, the extent to which tax changes are passed onto consumers is derived from the macroeconomic modelling in GTAP and specifically for Guinea. The GTAP model calculates the communication sector-specific short-to-mediumrun change in relative prices of intermediate and final goods after a change in taxation. This calculation is based on relationships derived for Guinea that are incorporated in the GTAP model, and which are based on input-output tables from national statistics and other empirical data on the Guinean economy. In the GTAP model, tax reform scenarios are modelled as a percentage change in the overall taxation burden on consumption and/or production in the sector.

Therefore, the change in price in any country is determined by the specific market conditions in the communications sector and the relationships in the wider economy of that country, as these are reflected in the underlying data (demand and supply flows) and parameters (elasticities and other estimated coefficients) of the economy under analysis. Specifically, the extent of pass-through is determined by the assumed elasticity of both demand and supply in the market.¹³⁹ The elasticity of supply depends on the competitive environment and degree of market power within the industry, and reflects the profitability, input costs and usage of natural resources in production. The elasticity of demand is determined by consumer preferences, and will vary depending on the underlying behavioural relationships in the Guinean economy.

Table 10 provides the pass-through rates derived in the GTAP model for each scenario.

Table 10

Pass-through rates for modelled scenarios

Indicator	Eliminating excise duty (TCT) on bonus calls	Eliminating the surtax on international incoming traffic (SIIT)	Reducing the annual backhaul spectrum fees (redevance FH) charged to operators by 80%	
Pass-through rate	73.8%	99% (for non-domestic customers)	94.0%	

In scenario 1, the mobile operators pass approximately 74% of the tax savings on to subscribers by reducing the prices of mobile services. The level of the pass-through rate reflects the underlying market structure and is determined by the underlying price and income elasticities of supply and demand.

In scenario 2, the mobile operators pass almost the full tax saving to non-domestic customers. This leads to an increase in the volume of incoming international calls and hence increases the revenue that operators in Guinea receive from incoming international traffic. In scenario 3, as the GTAP model assumes a competitive market, a tax change which directly reduces the cost of production is almost entirely passed on to consumers (94% passed through in the model). Though the consumer demand assumptions are the same as within the other scenarios, the reduction in this distortive tax allows the operators to improve their cost structures and therefore to significantly reduce their prices. This is a different type of tax compared to scenario 1, where the tax change leads to a change in the gap between what consumers pay and what producers receive without direct structural changes to the business models of companies.

^{139.} For instance, if we assume that supply is perfectly elastic, then consumers will absorb the full tax reduction in the form of lower prices.

Key assumptions for Guinea

The assumptions underlying the mobile sector and macroeconomic modelling for this study are based on an extensive literature review and are presented in more detail below.

Price elasticity of demand

The impact of price changes on the consumption of mobile services are captured via estimates of the price elasticity of demand (PED), which measures the change in quantity demanded following a change in price.

A literature review has been conducted (covering 30 studies), as a basis for establishing a set of assumptions on the PED.

For the purposes of this study, we define four sets of PEDs:

- Mobile usage elasticities which relate to the change in usage per connection following a change in price;
- Mobile ownership elasticities which relate to the change in the number of connections following a change in the price of services and handsets;
- Technology migration elasticities which relate to the migration from 2G to 3G/4G services following a change in the price of data, and a change in price of handsets; and
- International traffic termination elasticity, which relates to the change in usage per connection following a change in the price of international termination.

All elasticities in this study are further varied by income groups of subscribers (low, middle and high).

To establish relevant price elasticities for Guinea, we have used a set of studies pertaining to lowincome countries (Guinea is defined as a low-income economy by the World Bank).¹⁴⁰

The following price elasticities of demand have been assumed in this study:

• Usage elasticities: from -0.7 to -0.8 for voice and from -1.0 to -1.3 for data;

- Ownership elasticities: from -0.8 to -1.0 for mobile services and from -1.1 to -1.4 for handsets;
- Technology migration elasticities: from -0.2 to -0.3 for data and from -0.3 to -0.5 for handsets; and
- International traffic termination elasticity: -1.34. This is based on the OECD's (2015) empirical study on the elasticity of international termination charges.

Reinvestment rate

The exact reinvestment rate depends on a range of factors, including the cash flow of a specific company. In the modelling, it is assumed that operators reinvest 60% of the portion of the tax reduction that they retain (i.e. the proportion that is not passed onto subscribers).

The remaining 40% is retained as increased profit. This assumption is based on a review of previous studies of the economic impacts of mobile taxation reforms.¹⁴¹

Of the reinvestment amount, it is assumed that 20% of operators' investment is directed toward building new 2G sites, and 80% is directed toward upgrading 2G sites into 3G. This is based on EY's analysis of the GSMAi data, which suggests that there exists significant potential to increase 3G coverage (currently 60%), while there is also the need to extend 2G coverage (86%). The following reinvestment assumptions are made for the scenarios:

- Scenario 1: 20% is allocated to building new 2G sites, 20% is for upgrading 2G sites into 3G and the remaining 60% is assumed to be invested in network improvements.
- Scenario 2: 60% is reinvested in building new 2G sites, and 40% for upgrading 2G sites to 3G.
- Scenario 3: 20% is allocated to building new 2G sites, and 80% for upgrading 2G sites into 3G.

In order to determine the population coverage of new sites, estimates from Tanzania have been used. This is due to a lack of available local data and in recognition of the reasonably comparable demographics and mobile market characteristics between Guinea and Tanzania. These assumptions include:

World Bank (<u>https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups</u>).
See, for example, Gilchrist and Himmelberg, 1995, "Evidence on the role of cash flow for investment" and Katz, 2012, "Assessment of the economic impact of taxation on communications

investment in the United States".

- The coverage of a new 3G site at the given level of penetration is assumed to be around 8,000 people; and
- The coverage of a new 2G site is assumed to be 67% higher, based on the data received from Tanzanian mobile operators, at 13,500 people.

To determine the level of capital expenditure required to update or build new sites following reinvestment, the following assumptions have been used:

- Capital expenditure required to upgrade a 2G site to a 3G level is \$25,000 (based on the other GSMA studies); and
- Capital expenditure required to build a new 2G site is \$90,250 (based on data received from Guinean mobile operators).

Total factor productivity impact

The benefits of mobile connectivity—and how they translate to the macro economy—have been widely studied in the literature. The effects of mobile connectivity on the economy are largely delivered through their impact on productivity, one of the main measures being total factor productivity (TFP).¹⁴²

It is assumed that a 1% increase in unique subscriber penetration leads to a 0.19% increase in total factor productivity. This value is based on a review of the literature, and with reference to previous studies conducted by the GSMA. This impact has been adjusted from previous studies to account for mobile penetration and infrastructure in Guinea.¹⁴³

The shock to TFP is modelled as a change in the productivity of all primary factors (of equal proportions) in the Guinean economy. This productivity change enters as a variable into the constant elasticity of substitution (CES) value-added production function¹⁴⁴. The TFP shock works in the Guinean model as the sum of two effects:

- by reducing production costs which are passed on to consumers through lower prices, which in turn leads to higher demand and production levels (the output effect); and
- by reducing the demand for primary factors, for a given output level (productivity effect).

Timing of macroeconomic impacts

The standard GTAP model seeks to calculate differences in key economic variables between different possible states of the economy—a baseline case and a policy scenario—at a fixed point in time. This means that the standard model is a comparative static model and does not model year-by-year changes to the new equilibrium.

The CGE literature on the dynamic impacts of tax policy on a country's GDP suggests that the transition to a new equilibrium takes on average 5 to 10 years with the annual impact on GDP increasing at a diminishing rate.¹⁴⁵

Using this evidence from the literature, a transition path between the baseline case and the policy change has been derived. It is assumed that 67% of the steady state impact is felt in 2020 (the next year following the policy is implemented), 83% in 2021, 95% in 2022 and 100% in 2023 (five years after the policy implementation). The productivity effects are assumed to come into effect from 2019. The assumed path is illustrated in Figure 29.

^{142.} TFP is a measure for how efficiently an economy uses inputs during its production process.

^{143.} This value is based on previous GSMA analysis which outlines the relationship between mobile penetration rates, infrastructure and productivity.

^{144.} The factor substitution effect is zero, as the productivity of all factors changes in the same proportions

^{145.} See, for example, HMRC (2014) The Dynamic Effects of Fuel Duty Reductions; HMRC (2013) The Dynamic Effects of Corporation Tax; and Giesecke and Nhi (2009) Modelling Value-Added Tax in the Presence of Multiproduction and Differentiated Exemptions.

Figure 29



Time path for the transition to the new equilibrium

Source: EY analysis

Closure rules in the macroeconomic model

In order to account for specific labour market conditions in Guinea, a specific closure rule has been applied in GTAP in relation to employment and wages. The standard approach in CGE models is to assume that the supply of labour is fixed, and hence an increase in the demand for labour results in an increase in wages and prices, rather than employment. However, in Guinea, it can be observed that there is some significant unemployment in the skilled workforce.

Labour survey data published by the Guinea National Statistical Office suggests that Guinea faces a skilled unemployment problem among educated people with professional and university degrees (unemployment amongst those educated to professional and technical levels is 28%, while it is 35% for university graduates). Therefore, the macroeconomic modelling in GTAP allows for unemployment in the "Technicians/Associate Professional" category. This means that an expansion of demand in the economy leads to both an increase in employment and an increase in wages for skilled workers.

Mobile sector weight in the telecommunications sector

As the GTAP macroeconomic model does not identify the mobile sector as a separate industry, an off-model share of the mobile sub-sector has been calculated based on the data from the Guinea National Statistical Office and the Regulatory Body for Postal and Telecommunications Sector. Given a very low share of the fixed internet, telephony and postal services in Guinea, the share has been estimated at 99%.

International incoming traffic tax modelling

In modelling scenario 2, a number of assumptions were required in order to estimate the impact of reducing international incoming traffic tax on the mobile market:

- It is assumed that the price of domestic mobile services does not change, with only the price faced by non-domestic (i.e. foreign) subscribers changing as a consequence of the reduction in SIIT. As the pass-through rate for this scenario is close to 100%, non-domestic customers receive a price change of approximately 42.3%, from \$0.28 per minute to \$0.16 per minute. Therefore, the effect on the domestic market, in terms of connections, subscribers, and ARPUs is limited to reinvestment effects.
- In this scenario, operators are assumed to reinvest 12.3% of their additional revenue from incoming international traffic into the Guinean mobile market.¹⁴⁶ This investment is enabled by the low costs incurred by operators as a result of the increased volume of incoming traffic, in addition to the improved investment environment supported by the tax reform. It is assumed that 20% additional investment is used to build new 2G sites and 80% is directed toward upgrading sites from 2G from 2G to 3G.

^{146.} At present, the capital expenditure to revenue ratio is approximately 12.3% for Guinean mobile operators. We assume that this rate remains constant in response to additional revenue.

Appendix B Scenario estimations

This Appendix sets out the detailed estimated mobile market and economic impacts of each of the tax scenarios, compared to a baseline case of no tax reform.

Scenario 1: Eliminating excise duty (TCT) on bonus calls

This scenario models an elimination of the excise duty (taxe sur la consummation téléphonique – TCT) on bonus calls, which is currently levied at 1 GNF per second.¹⁴⁷

Table 11

Annual impact of eliminating excise duty (TCT) on bonus calls

Indicator	2019	2020	2021	2022	2023
MOBILE SECTOR IMPACTS					
Change in price of services vs baseline	-4.4%				
Incremental connections (total)	369,000	773,000	930,000	1,099,000	1,276,000
Incremental unique subscribers (total)	192,000	401,000	483,000	570,000	663,000
Incremental connections (3G and 4G)	167,000	439,000	614,000	879,000	1,198,000
of which technology migration	74,000	188,000	288,000	469,000	697,000
Incremental connections by low-income subscribers	197,000	415,000	502,000	600,000	706,000
ARPU (total) vs baseline	-3.0%	-1.6%	-1.7%	-1.7%	-1.7%
Increase in mobile penetration (connections)	2.6%	5.4%	6.3%	7.3%	8.2%
Increase in mobile penetration (unique subscribers)	1.4%	2.8%	3.3%	3.8%	4.3%
Data usage vs baseline	4.5%	9.2%	10.1%	11.0%	11.9%
Increase in market revenue (total)	-\$0.4m	\$24m	\$30m	\$37m	\$44m
Increase in market revenue (total) vs baseline	-0.1%	4.3%	5.1%	6.0%	6.9%
Additional investment	\$5m	\$5m	\$5m	\$6m	\$6m
Static tax impact ¹⁴⁸	-\$32m	-\$34m	-\$36m	-\$38m	-\$40m
Impact on mobile sector taxation	-\$27m	-\$17m	-\$16m	-\$14m	-\$12m
WIDER ECONOMIC IMPACTS ¹⁴⁹					
Full impact on communications sector taxation	-\$9m	-\$7m	-\$9m	-\$11m	-\$11m
Receipts from all other sectors	\$5m	\$16m	\$20m	\$23m	\$24m
Total tax receipts	-\$4m	\$9m	\$11m	\$12m	\$13m
Cumulative total receipts	-\$4m	\$5m	\$15m	\$28m	\$41m
Real GDP	\$4m	\$38m	\$47m	\$54m	\$57m (0.88%)
Employment		Impact estimated for 2023 only.			4,156 (0.08%)
lousehold income		Impact estimated for 2023 only.			\$79m (0.97%)
Household expenditure		Impact estimated for 2023 only.			\$75m (0.95%)
Investment		Impact estimate	ed for 2023 only.		\$14m (1.85%)

Source: EY analysis

147. The tax cut is calculated on the effective base which is the total revenue from services. The effective rate decreases from 14.7% to 8.8%.

148. This is the initial direct cost to the Exchequer, before behavioural change in the sector and the economy; overstates the true cost.

^{149.} The evidence on the time path of some of the variables to the new equilibrium is not available.

Figure 30



Connections and penetration impacts of eliminating excise duty (TCT) on bonus calls, \$m

Source: EY analysis

Figure 31





GSMA

Figure 32





Scenario 2: Eliminating the surtax on international incoming traffic (SIIT)

This scenario models the elimination of the \$0.12 surtax on international incoming traffic (SIIT).

Table 12

Annual impact of SIIT removal on selected variables

Indicator	2019	2020	2021	2022	2023
MOBILE SECTOR IMPACTS					
Change in price of international incoming traffic vs baseline	-42.3%				
Incremental connections (total)	186,000	545,000	933,000	1,347,000	1,784,000
Incremental unique subscribers (total)	97,000	283,000	484,000	699,000	927,000
Incremental connections (3G and 4G)	46,000	205,000	469,000	814,000	1,247,000
of which technology migration	46,000	205,000	469,000	814,000	1,247,000
Incremental connections by low-income subscribers	103,000	303,000	518,000	747,000	990,000
ARPU (total) vs baseline	3.1%	5.9%	5.4%	5.1%	4.8%
Increase in mobile penetration (connections)	1.3%	3.8%	6.3%	8.9%	11.5%
Increase in mobile penetration (unique subscribers)	0.7%	2.0%	3.3%	4.6%	6.0%
Data usage vs baseline	1.3%	3.7%	6.0%	8.4%	10.6%
Increase in market revenue (total)	\$25m	\$58m	\$75m	\$95m	\$114m
Increase in market revenue (total) vs baseline	4.7%	10.4%	12.7%	15.2%	17.7%
Additional investment	\$3m	\$5m	\$5m	\$5m	\$6m
Static tax impact	-\$46m	-\$49m	-\$52m	-\$56m	-\$58m
Impact on mobile sector taxation	-\$43m	-\$40m	-\$36m	-\$31m	-\$25m
Additional international incoming traffic (million minutes)	110	226	240	252	263
WIDER ECONOMIC IMPACTS					
Full impact on communications sector taxation	-\$20m	-\$16m	-\$20m	-\$22m	-\$24m
Receipts from all other sectors	\$6m	\$21m	\$26m	\$30m	\$32m
Total tax receipts	-\$13m	\$6m	\$7m	\$8m	\$8m
Cumulative total receipts	-\$13m	-\$8m	-\$1m	\$7m	\$15m
Real GDP	\$14m	\$64m	\$76m	\$85m	\$89m (1.36%)
Employment		Impact estimate	ed for 2023 only.		13,193 (0.24%)
Household income		Impact estimate	ed for 2023 only.		\$90m (1.11%)
Household expenditure		Impact estimate	ed for 2023 only.		\$86m (1.08%)
Investment		Impact estimate	ed for 2023 only.		\$24m (3.17%)

GGMA

Figure 33



Connections and penetration impacts of eliminating the surtax on international incoming traffic (SIIT)

Source: EY analysis

Figure 34

Eliminating the surtax on international incoming traffic (SIIT)-annual GDP effects compared to baseline, \$m



Scenario 3: Reducing the annual backhaul spectrum fees (redevance FH) charged to operators by 80%

This scenario models an 80% reduction in the annual backhaul spectrum fees charged to operators.

Table 13

Annual impact of reducing the annual backhaul spectrum fees (redevance FH) charged to operators by 80%

Indicator	2019	2020	2021	2022	2023
MOBILE SECTOR IMPACTS					
Change in price of services vs baseline	-2.6%				
Incremental connections (total)	160,000	337,000	364,000	393,000	423,000
Incremental unique subscribers (total)	83,000	175,000	189,000	204,000	220,000
Incremental connections (3G and 4G)	92,000	235,000	315,000	442,000	592,000
of which technology migration	37,000	87,000	123,000	200,000	297,000
Incremental connections by low-income users	84,000	179,000	193,000	212,000	234,000
ARPU (total) vs baseline	-1.7%	-0.8%	-0.8%	-0.8%	-0.8%
Increase in mobile penetration (connections)	1.1%	2.3%	2.5%	2.6%	2.7%
Increase in mobile penetration (unique subscribers)	0.6%	1.2%	1.3%	1.3%	1.4%
Data usage vs baseline	2.3%	4.6%	4.7%	4.9%	5.0%
Increase in market revenue (total)	-\$2m	\$10m	\$11m	\$12m	\$14m
Increase in market revenue (total) vs baseline	-0.4%	1.8%	1.9%	2.0%	2.1%
Additional investment	\$0.5m	\$0.5m	\$0.6m	\$0.6m	\$0.6m
Static tax impact	-\$15m	-\$16m	-\$17m	-\$17m	-\$18m
Impact on mobile sector taxation	-\$10m	-\$5m	-\$5m	-\$5m	-\$5m
WIDER ECONOMIC IMPACTS					
Full impact on communications sector taxation	-\$12m	-\$10m	-\$12m	-\$14m	-\$15m
Receipts from all other sectors	\$9m	\$11m	\$14m	\$16m	\$17m
Total tax receipts	-\$3m	\$2m	\$2m	\$2m	\$2m
Cumulative total receipts	-\$3m	-\$1m	\$1m	\$3m	\$5m
Real GDP	\$4m	\$15m	\$18m	\$21m	\$22m (0.34%)
Employment	Impact estimated for 2023 only.				3,798 (0.07%)
Household income		Impact estimated for 2023 only.			\$29m (0.36%)
Household expenditure		Impact estimated for 2023 only.			\$30m (0.37%)
Investment		Impact estimate	ed for 2023 only.		\$9m (1.17%)

Figure 35



Connections and penetration impacts of reducing the annual backhaul spectrum fees (redevance FH) charged to operators by 80%

Source: EY analysis

Figure 36

Main drivers of the market revenue change following the 80% reduction of annual backhaul spectrum fees charged to operators



Figure 37







For full report, please visit the GSMA website at www.gsma.com

GSMA HEAD OFFICE

Floor 2 The Walbrook Building 25 Walbrook London EC4N 8AF United Kingdom Tel: +44 (0)20 7356 0600 Fax: +44 (0)20 7356 0601