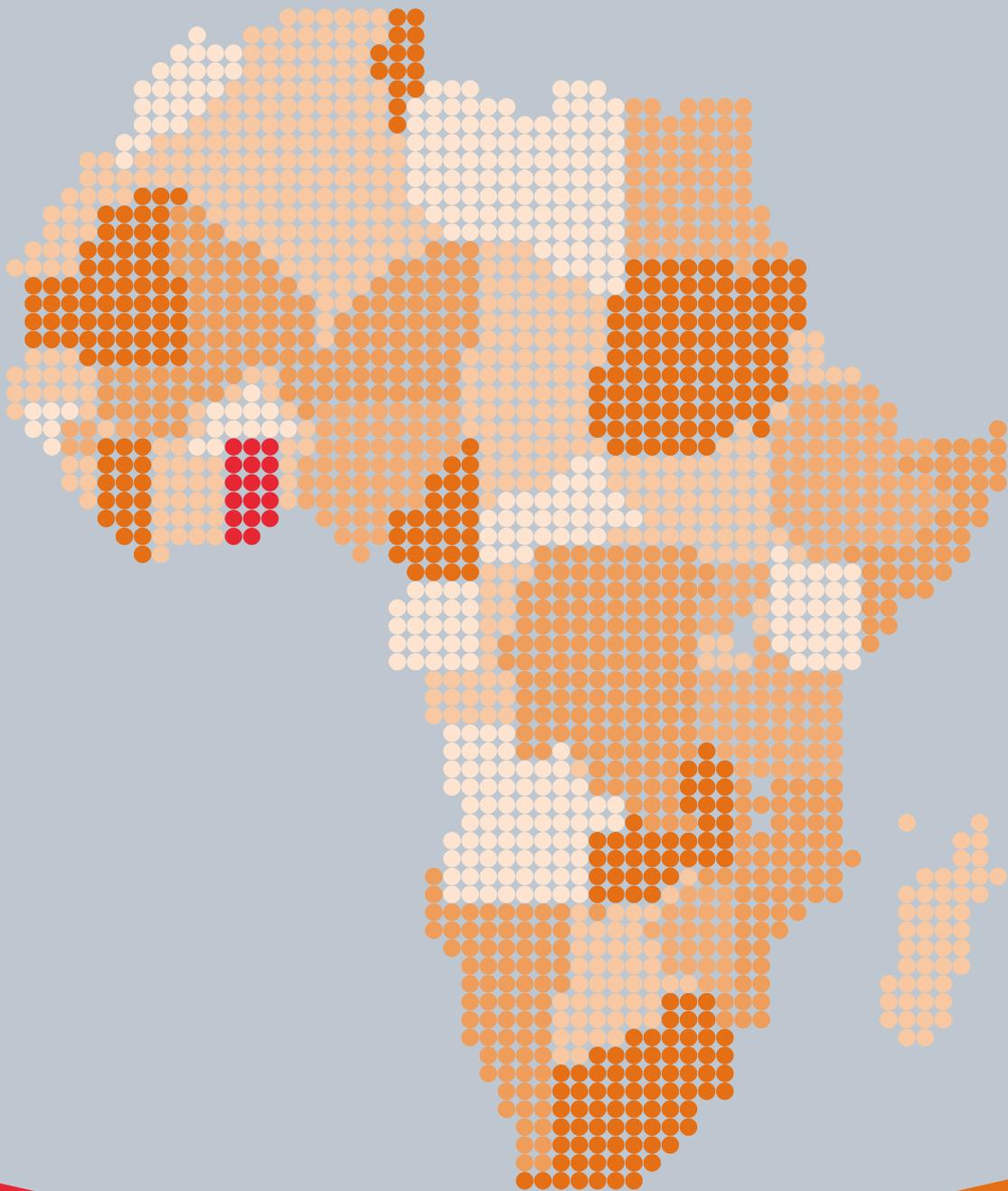




# Digital inclusion and mobile sector taxation in Ghana





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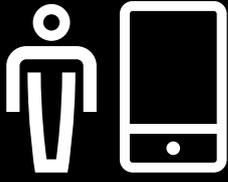
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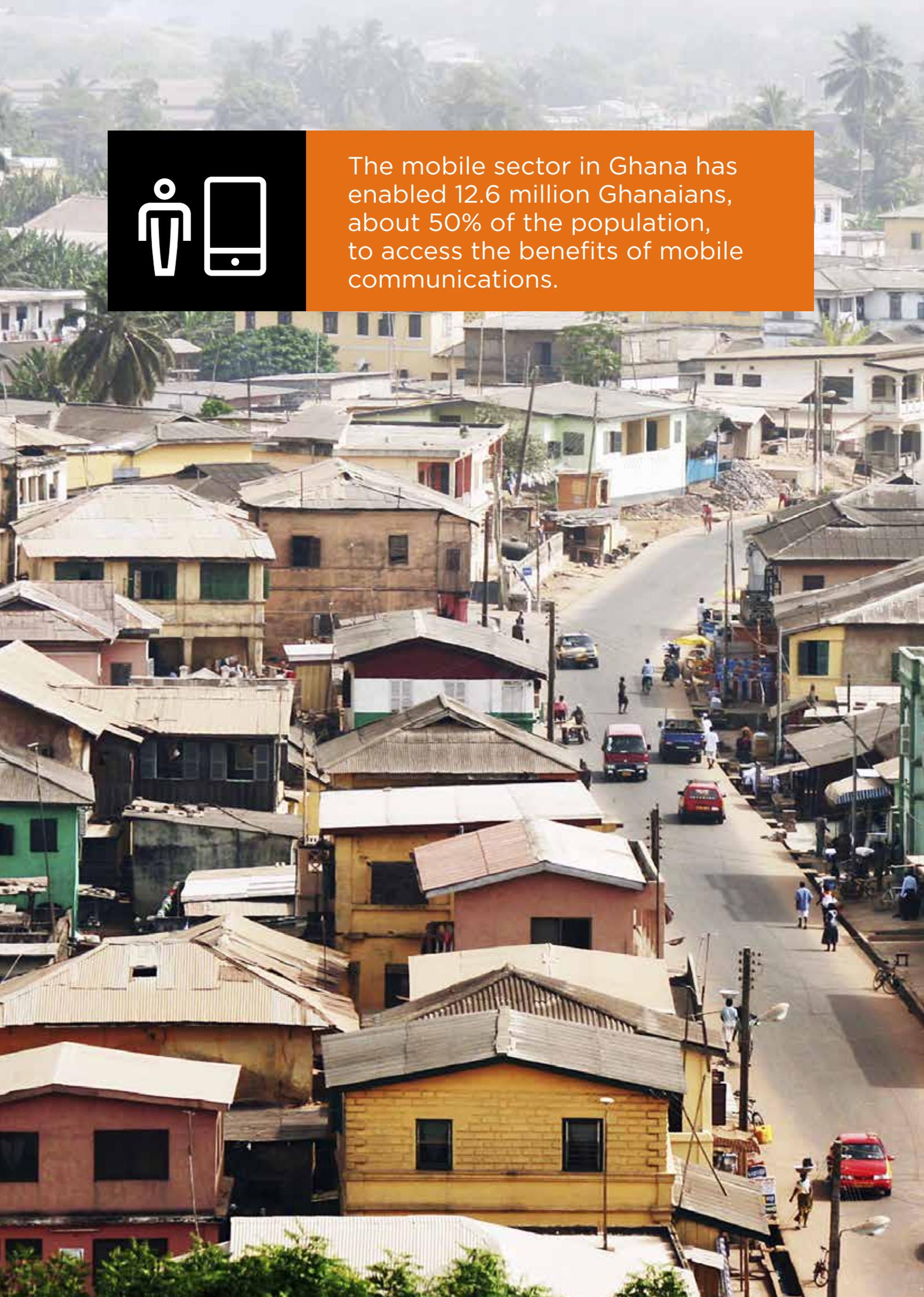
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The mobile sector in Ghana has enabled 12.6 million Ghanaians, about 50% of the population, to access the benefits of mobile communications.





# Executive Summary

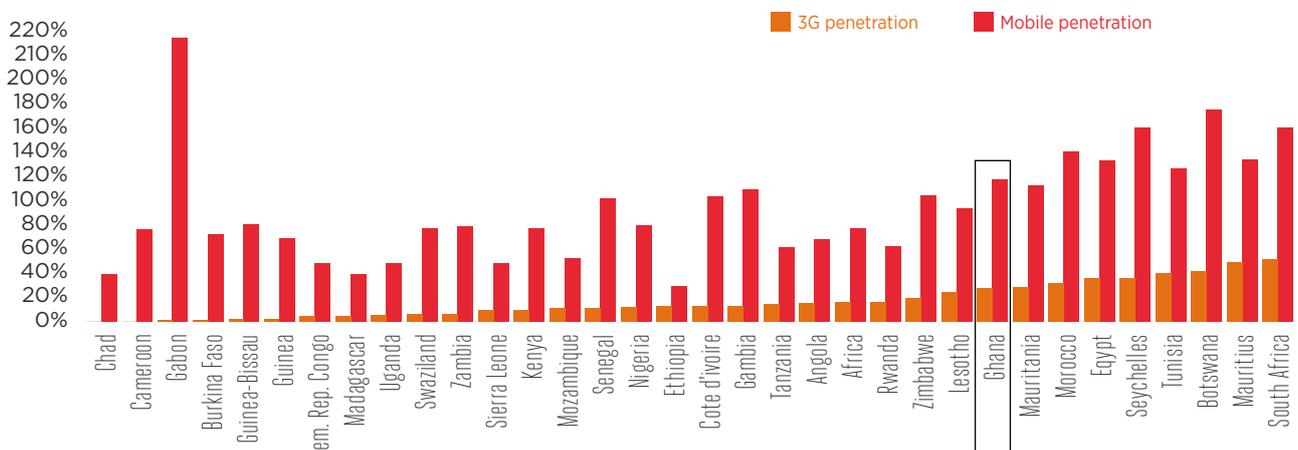
## Mobile services are bringing significant benefits to Ghana

In the last decade, the **mobile sector in Ghana has enabled 12.6 million Ghanaians, about 50% of the population, to access the benefits of mobile communications.** This increase in access is bringing wide-ranging benefits to the Ghanaian economy and society:

- Mobile and broadband services promote digital inclusion, enabling millions to benefit from the exchange of ideas and information, reduced communication costs and improved access to healthcare, education and financial services.
- By improving the availability of information and reducing transaction costs, mobile services increase productivity and enable businesses and markets to operate more efficiently. These services also support investment and innovation in the wider economy, for example in the provision of network equipment and the creation of business services and applications. Thanks to these effects, access to mobile services leads to economic growth.
- The mobile sector also contributes to Ghana’s long-run economic and fiscal stability, both through its own contribution to the economy and government revenues, and through the contribution of the associated ecosystem of industries.
- Mobile is the most cost-effective way of extending access to ICT and the internet in Ghana and is therefore fundamental to helping the government achieve its objectives of expanding ICT infrastructure and access and promoting the use of ICT in all sectors.

Ghana has been successful in expanding access to mobile services, and penetration rates exceed the regional average. However, when the number of unique subscribers is considered, half the population remains without access to mobile services, while World Bank data indicates that only about 12% of the population are regular internet users. Mobile users in Ghana have also faced quality of service issues due to network congestion. Additional investment in network infrastructure can help address these challenges.

### Mobile and 3G penetration rates



Source: GSMA Intelligence Database

Figure 1

## High levels of mobile-specific taxation risk mobile sector growth as well as Ghana's overall economic growth

Mobile is one of the more heavily taxed sectors in Ghana, and mobile operators are subject to 14 different taxes and regulatory fees, in addition to various one-off charges.

**Mobile operators pay US\$650 million in taxes each year, representing about 40% of total revenues in the sector.**

Ghanaian mobile users are subject to taxes on devices and usage, which increase the total cost of mobile ownership and create barriers to affordability.

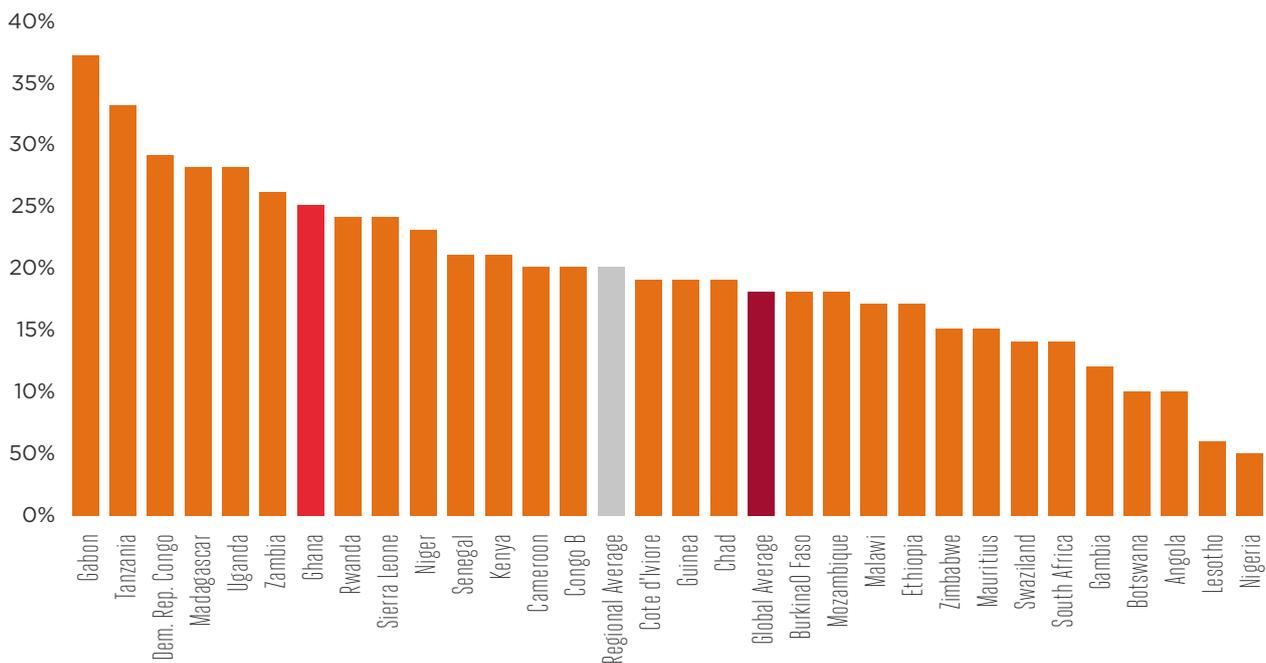
- Mobile handsets are subject to taxes of up to 37.5%, through VAT, the National Health Insurance Levy (NHIL) and customs duties, which were reintroduced in 2013. At the time of publication of this report, customs duties on smartphones were

expected to be removed in January 2015 under the budget presented by the Minister of Finance to Parliament in November 2014.

- Mobile services such as calls, SMS and data usage are subject to VAT, NHIL and an additional Communications Services Tax (CST) of 6%.
- The government has raised the possibility of an additional tax of GHS 5 (US\$1.35) on the activation of SIM cards.

As a result, **taxes account for almost a quarter of the cost of mobile ownership in Ghana, significantly above the regional average.**

### Taxation as a share of the total cost of mobile ownership



Source: GSMA/Deloitte (2011) "Global Mobile Tax Review"; data from mobile operators in Ghana 2014

Figure 2

Mobile operators are subject to a number of sector-specific taxes, in addition to corporate tax and the National Fiscal Stabilisation Levy (NFSL). Many of these taxes reduce incentives and resources for infrastructure investment; examples include licensing fees and the contribution towards the Ghana Investment Fund for Electronic Communications, each of which amounts to 1% of total revenues. Another potential barrier to investment comes from customs duties on imported network equipment; base stations, for example, are subject to import duties of 10%.

Mobile operators are also subject to additional taxes on termination and interconnection fees; a CST of 6% is applied

to the costs of interconnection, over and above the CST levied on the total cost of the call, while the Surtax on International Incoming Traffic (SIIT) fixes the price of international termination fees, with 46% of the charge going to the government.

In addition to these taxes, mobile operators pay a range of other regulatory fees and charges, including numbering fees of up to US\$0.50 per number, microwave fees charged per link, and right-of-way fees on fibre roll-out of about US\$4,000 per kilometre. This multitude of fees, charged on a variety of tax bases, makes the tax system complicated and opaque, potentially deterring investment and expansion.

## Mobile is taxed at a higher rate than many other sectors

Many of the taxes mentioned above are **specific to the mobile sector, and as a result mobile operators contributed 9.1% of Ghana's total tax revenues in 2013, while their turnover represented about 3.2% of Ghanaian GDP.** In addition to being subject to additional taxes, the mobile sector is also excluded from tax exemptions granted to various other sectors.

At 24.5% of the cost of mobile ownership, the tax burden on mobile ownership is almost as high as that on wines and spirits, where tax makes up 25% of the retail price, and tobacco, where taxes make up about 31.5% of the price. Whereas alcohol and tobacco are widely acknowledged to generate negative externalities, mobile services create positive spillovers onto other sectors and the wider economy.

Items such as educational supplies, books, newspapers, postal services and transport are exempt from VAT and the

NHIL. In contrast, mobile services are subject to additional taxation, despite playing a similar role in providing access to information and ideas, facilitating communication and enabling business transactions.

Whereas imported telecommunications network equipment is subject to customs duty (along with VAT and the NHIL), the government of Ghana has granted customs and VAT exemptions for machinery and apparatus used in other sectors such as agriculture, mining and transport.

Mobile is one of the few sectors that pays the NFSL; other industries to which the levy is applied include financial institutions and breweries, and this is expected to be extended to 2017 under the Ministry of Finance's 2015 budget<sup>1</sup>. In the case of breweries, this is because the government wants to discourage consumption of alcohol. By applying a similar tax on mobile

1. The budget speech of the budget statement and economic policy of the Government of Ghana for the 2015 financial year, <http://www.mofep.gov.gh/sites/default/files/budget/Budget-Speech-2015.pdf>



services, the government risks sending a signal that it also wants to limit take-up of these services.

While the mobile sector faces a higher level of taxation through the NFSL, sectors such as the hotel industry and some types of financial services benefit from a reduced corporate tax rate of 20%.

Many of the goods and services taxed at a higher rate are those that are recognised to create negative externalities, for example alcohol and tobacco. In contrast, mobile services can generate positive externalities through network effects and by increasing productivity and the flow of information.

## Taxes on mobile in Ghana are inefficient and limit digital inclusion and economic growth

Taxes on mobile are misaligned with many of the widely recognised principles of taxation indicated by organisations such as the International Monetary Fund.

### 1. In general, taxation should be broad based

Mobile-specific taxes such as the CST lead to inefficiently low consumption and investment in the mobile sector in Ghana.

### 2. Taxes should account for sector and product externalities

Mobile-specific taxes in Ghana fail to account for positive network effects and spillovers onto sectors such as agriculture, healthcare and education.

### 3. The tax system should be simple, understandable and enforced

Taxes such as the CST on interconnection fees have created uncertainty about their application and enforcement.

### 4. Incentives for competition and investment should be unaffected

Taxes on mobile operators' total revenues reduce incentives for investment in infrastructure and quality of service improvements.

### 5. Taxes should not be regressive

Taxes on mobile lead to a disproportionate burden on poorer Ghanaians and risk excluding them from the benefits of digital and financial inclusion.

The following taxes risk creating negative impacts on the Ghanaian economy due to their failure to align with these principles:

**THE CST** fails to account for positive externalities created by the mobile sector and increases barriers to affordability. This excludes many Ghanaians from the benefits of mobile and broadband services and reduces productivity and economic growth. This also risks damaging the government's long-run tax revenues.

**THE ENDING OF THE CUSTOMS DUTY EXEMPTION ON HANDSETS** created a barrier to mobile ownership and access to mobile services. This tax represents a greater burden for poorer consumers and risks widening the digital divide. This could have a particularly negative impact on internet access: smartphones are the most cost-effective way of extending internet access in Ghana, and while the industry has taken steps to improve affordability by introducing smartphones that cost as little as US\$50, customs duties risk creating additional barriers. Fortunately, the government has announced the removal of the customs duty on smartphones in the 2015 budget<sup>2</sup>, though this may exclude feature phones which are still the primary

means of accessing mobile services for most Ghanaians.

**CUSTOMS DUTIES ON NETWORK EQUIPMENT** disincentivise investment in infrastructure. This tax fails to take into account the fact that mobile infrastructure helps provide a public good, and that many investment projects, particularly in rural areas, may not be economically viable as a result of this tax. As a result, customs duties on network equipment may also reduce the employment and economic activity associated with site installation and civil works, leading to decreased government tax revenues.

**THE SIIT** increases the costs of trade for local and regional businesses, risks reducing remittances to local consumers and reduces Ghana's overall competitiveness.

**THE CST ON INTERCONNECTION CHARGES** increases the costs of calls between networks. Given that CST is already payable on the total cost of the call, this may amount to double taxation. The tax may also have anti-competitive implications since it increases the costs of calls between different networks.

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## By rebalancing mobile-specific taxes, the Ghanaian government can promote digital inclusion, economic growth and fiscal stability

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The mobile sector makes a significant contribution to Ghanaian government revenues and public services. However, it is important to recognise that while taxation on the mobile sector may deliver short-term benefits to the government, this comes at the cost of long-run economic growth and is ultimately counterproductive for the government. By reducing taxes on the mobile sector, the Ghanaian

government can not only increase digital and financial inclusion and economic growth, but it can also recover higher tax revenues through more efficient and broad-based taxation.

A detailed model of the Ghanaian mobile sector and its macroeconomic impacts is used to estimate the impacts on mobile penetration, GDP growth and tax revenues of

2. The budget speech of the budget statement and economic policy of the Government of Ghana for the 2015 financial year, <http://www.mofep.gov.gh/sites/default/files/budget/Budget-Speech-2015.pdf>

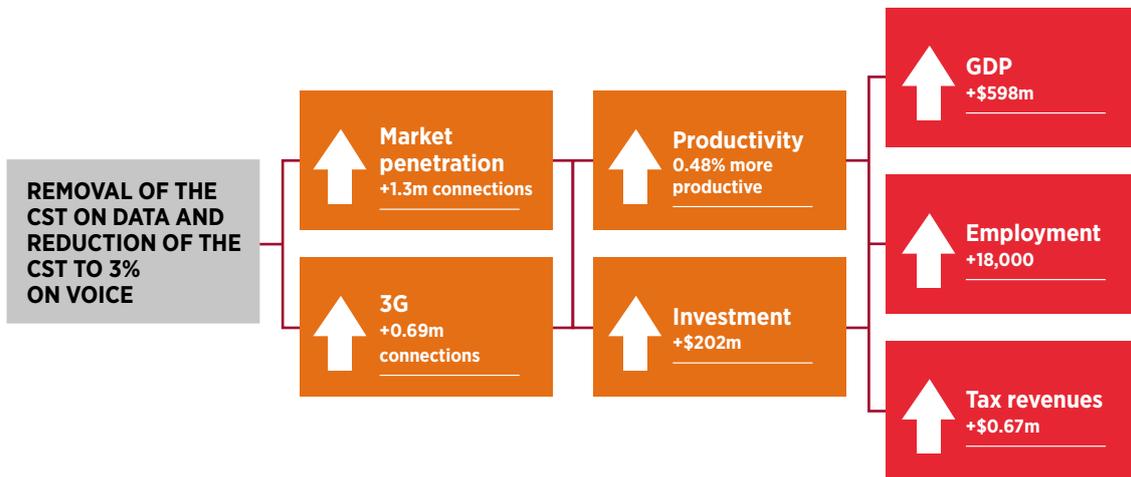
changes to taxation in Ghana. The following proposed suggestions would enable the Ghanaian government to minimise the inefficiencies associated with taxation on mobile while maintaining revenue neutrality by 2020.

**Eliminating the CST on mobile data and halving it on other services reduces barriers to mobile usage and promotes digital inclusion. In 2013, mobile operators paid over US\$100 million in CST payments; removing the CST on data and halving it on other services would reduce this payment**

**by about US\$60 million. If these savings are passed through to consumers an additional 1.3 million connections could be supported, the majority of them 3G.**

**By facilitating communication and economic activity across the economy, increased mobile penetration could increase GDP by up to US\$600 million in 2020 and increase productivity by 0.48%. Thanks to these impacts on the wider economy, tax revenues would be expected to recover to baseline levels by 2020.**

Impact of eliminating the CST on data and halving it on other services, 2020



Source: Deloitte analysis based on mobile operator data

Figure 3

**Removing customs duties of 20% on handsets and smartphones** removes a fundamental barrier to mobile access, especially for poorer consumers for whom the one-off cost of purchasing a device represents a significant share of the cost of ownership. This is expected to lead to an additional 3 million handset purchases, with 0.93 million of these being 3G-enabled devices. With the share of unique users in Ghana standing at approximately 50%, about half of these handset purchases are expected to represent new connections, while half may represent users upgrading their devices.

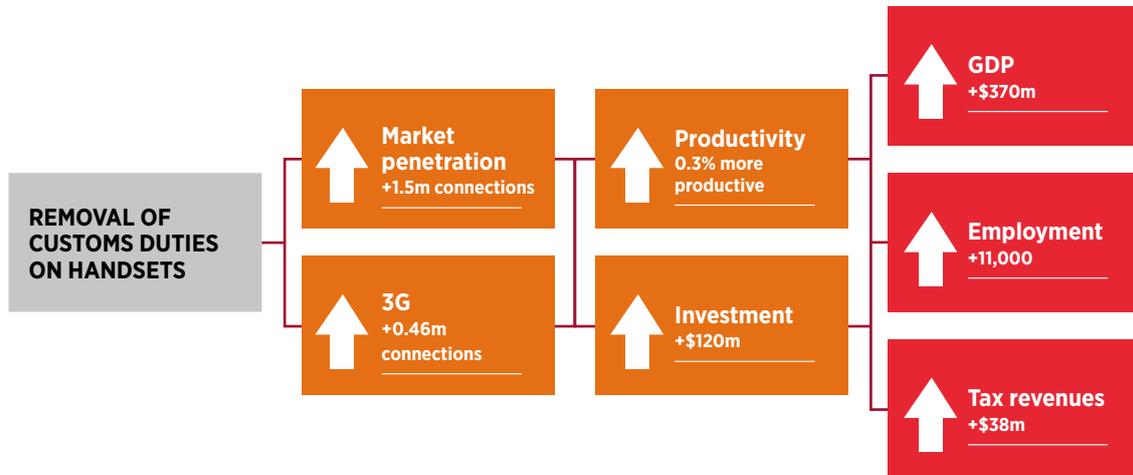
The removal of these customs duties could therefore lead to 1.5 million additional connections. This increase in mobile and

3G penetration, and hence usage, would increase productivity in Ghana by 0.3% and lead to US\$120 million in additional investment by 2020, while enabling over 11,000 new jobs. This could contribute an additional US\$370 million in annual GDP by 2020. As a result of this increase in economic growth, the government of Ghana could achieve revenue neutrality by 2016 and an additional US\$37 million in annual tax revenues by 2020. Fortunately, the Ministry of Finance has included the exemption of smartphones from customs duties in the 2015 budget<sup>3</sup>; this decision is expected to contribute toward achieving these benefits, though achievement of these full estimates requires exemption of all mobile handsets.

3. The budget speech of the budget statement and economic policy of the Government of Ghana for the 2015 financial year, <http://www.mofep.gov.gh/sites/default/files/budget/Budget-Speech-2015.pdf>



## Impacts of removing customs duties on handsets, by 2020



Source: Deloitte analysis based on mobile operator data

Figure 4

In addition to the impacts modelled above, research suggests that removing or reducing other mobile-specific taxes can promote financial inclusion, international competitiveness and infrastructure investment.

**Removing customs duties on network equipment** could reduce the cost of electronic network equipment such as base stations by 10%, increasing the economic viability of infrastructure investment in remote areas. This could have a particular impact on 3G coverage, which currently lags behind mobile coverage in Ghana.

**Removing the SIIT** can reverse the 35% fall in international incoming traffic seen after the introduction of the tax in 2010, generating up to US\$0.75 million per

year in corporate tax revenues, up to US\$1.0 million through remittances and their impact on the economy annually, and over US\$5 million in revenues from international trade. Eliminating this tax would also make Ghana more competitive and attractive to foreign investors.

**Rebalancing taxes across the economy** can help mitigate any short-run losses in tax revenue. For example, the government of Ghana could consider rebalancing taxation towards those goods and services that do not deliver positive benefits for the wider economy.

In summary, these proposals have the potential to deliver the following benefits to Ghana:



**INCREASED INTERNET ACCESS AND DIGITAL INCLUSION:**

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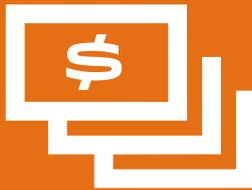
By removing barriers to affordability, reductions in the CST and the removal of custom duties can increase penetration by up to 3 million connections and increase the usage of mobile and 3G services. Through increased mobile broadband penetration, up to a million more Ghanaians can benefit from the benefits of internet access and digital inclusion.



**INCREASED PRODUCTIVITY AND ECONOMIC GROWTH:**

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Increases in mobile and broadband penetration and usage can increase productivity by up to 0.5%, generate over US\$200 million in additional investment in 2020 and increase economic growth.



**ECONOMIC AND FISCAL STABILITY:**

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Increased economic growth and GDP will expand the tax base, enabling the government of Ghana to achieve additional revenues of up to US\$37 million through more broad-based taxation. In contrast, increases to taxation on mobile are likely to be counterproductive and ultimately decrease economic growth and government revenues.



**SUPPORT THE GHANAIAN GOVERNMENT IN ITS AMBITIONS TO EXPAND ICT INFRASTRUCTURE AND INCREASE THE USE OF ICT IN ALL AREAS OF THE ECONOMY.**

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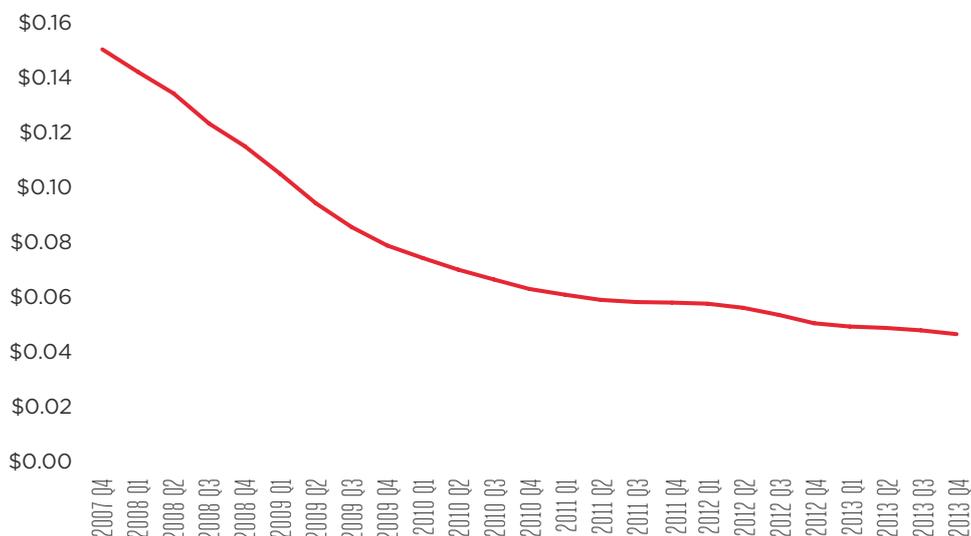
# 1 Introduction to the mobile sector in Ghana

## 1.1 Mobile services are creating wide-ranging benefits for Ghana

Since the introduction of mobile telephony communications in 1992, Ghana has become one of Africa's most developed mobile markets, with over half of the population now owning a mobile phone. With six mobile

operators, including the four market leaders MTN, Vodafone, Tigo and Airtel, the Ghanaian market has become increasingly competitive. This is reflected in the falling cost of mobile services, as shown in Figure 5 below.

Effective price per minute



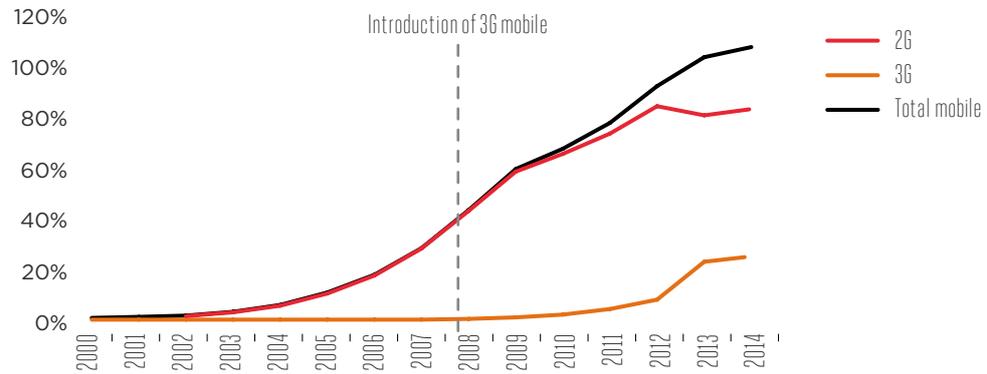
Source: GSMA Intelligence Database

Figure 5

This fall in the cost of mobile ownership has removed barriers to access, enabling millions of Ghanaians to enjoy the benefits of mobile services. In the last decade there has been rapid growth in the mobile market, with mobile penetration rates surpassing 100%

for total connections, and the penetration rate for unique subscribers reaching 50.1%. This growth in the market has been further strengthened through the introduction of 3G mobile in 2007; there are now 7.8 million 3G connections in Ghana.

## Penetration rates



Source: GSMA Intelligence Database

Figure 6

Compared to many economies in the region, Ghana is well connected to mobile networks, with mobile operators providing coverage for up to 95% of the population<sup>4</sup>, making the country well poised to reap the benefits associated with connectivity.

The positive impact of mobile is furthered by the use of 3G services that provide access to the internet, which is associated with an extensive range of benefits for both consumers and businesses in Ghana. The benefits of mobile and broadband services can be summarised into three categories:

### 1. Mobile services promote digital inclusion

**Digital inclusion refers to the principal** that the benefits of ICT should be available to all, regardless of location or socioeconomic status. Mobile services can reduce communication and transaction costs, making it less costly for Ghanaians to conduct everyday business operations and supporting the expansion of businesses and enterprises. Lower costs also enable more effective delivery of public services. In particular, mobile and broadband communication offers an effective means of bringing healthcare and education services to remote and under-served areas, through e-government initiatives and mobile applications.

### 2. Mobile services promote productivity, innovation and economic growth

By enabling businesses and government to

deliver their services faster, and at a lower cost, mobile services increase productivity across the Ghanaian economy. Mobile services can also facilitate the exchange of ideas and information, supporting the move towards a knowledge-based economy. Through wider effects on the economy, this helps to increase living standards in Ghana and improve Ghana's international competitiveness.

Mobile services also create opportunities for investment, innovation and employment in the mobile sector and other industries that form the mobile ecosystem, such as equipment providers, network engineering and maintenance industries, and related business service industries. Other opportunities enabled by mobile services include the development of mobile applications in healthcare, education and agriculture, and the creation of local content. This has an additional impact on economic growth and supports the diversification of the Ghanaian economy.

### 3. Mobile services promote long-run economic growth and fiscal stability

The mobile sector also makes an important contribution to the revenues of the Ghanaian government. This includes the direct contribution made by mobile operators, which amount to 6.1% of Ghana's total tax revenues and also the tax revenues generated by the wider ecosystem of industries supported by mobile services.

4. Budde Report "2013 Ghana - Telecoms, Mobile, Broadband and Forecasts" <http://www.budde.com.au/Research/2013-Ghana-Telecoms-Mobile-Broadband-and-Forecasts.html>

## 1.2 Mobile can support the government's ICT strategy

By supporting the liberalisation of the mobile market, the Ghanaian government has enabled growth and innovation in the sector. This has led to substantial growth in broadband access, allowing consumers and businesses to reap the extensive benefits of internet-enabled services. The government now intends to build on this foundation and bring Ghana closer to an information society which includes all Ghanaians and provides the greatest opportunity for growth<sup>5</sup>.

The National Development Planning Commission was established in 1995 to advise the President of the Republic of Ghana on development policy and strategy. Specific strategies for ICT development are advised for the purpose of Ghana's modernisation and rapid growth. The medium-term ICT policy objectives are<sup>6</sup>:

- ▶ To promote rapid development and deployment of the national ICT infrastructure.
- ▶ To strengthen the institutional and regulatory framework for managing the ICT sector.
- ▶ To promote the use of ICT in all sectors of the economy.

The Ministry of Communications has also highlighted the relationship between digital inclusion and growth<sup>7</sup> and the importance of allowing an environment that can provide access to the whole population. The Ministry has an ambitious strategy which aims to provide affordable broadband for all Ghanaians by 2020.

As part of the government's ICT policy, a Universal Service Fund (USF) was established in 2005 named the

Ghana Investment Fund for Electronic Communications (GIFEC). The main objective of this fund is to provide financial resources for the establishment of universal service and ensure access to ICT and basic telephony for rural communities in Ghana<sup>8</sup>. The funds are disbursed through a range of initiatives in schools, libraries and community centres with the aims of increasing connectivity and allowing all aspects of a community to reap its benefits.

“We should endeavour to provide high-speed internet at very affordable prices and good quality for the benefit of everybody irrespective of their location.”

*Dr. Edward Kofi Omane Boamah,  
Minister of Communications*

Provision of mobile services by mobile operators enables the Ghanaian government to achieve these goals. With limited fixed-line connections, mobile is the most affordable way to gain access to ICT and the internet and for consumers and businesses to realise the associated benefits. Mobile consumers can gain access to important information regarding their health and education, which can contribute towards increased living standards and life expectancy. Mobile also allows businesses to find more cost-effective ways to conduct their operations and creates opportunities to trade abroad.

5. National Telecommunications Policy, Republic of Ghana, Ministry of Communications, 2005.

6. An agenda for shared growth and accelerated development for a better Ghana, The coordinated programme of economic and social development policies, 2010-2016, December 2010.

7. Buddie Report "2013 Ghana - Telecoms, Mobile, Broadband and Forecasts" <http://www.buddie.com.au/Research/Ghana-Mobile-Market-Insights-Statistics-and-Forecasts.html>

8. Ghana Investment Fund for Electronic Communications [http://www.gifec.gov.gh/index.php?option=com\\_content&view=article&id=86&Itemid=53](http://www.gifec.gov.gh/index.php?option=com_content&view=article&id=86&Itemid=53)

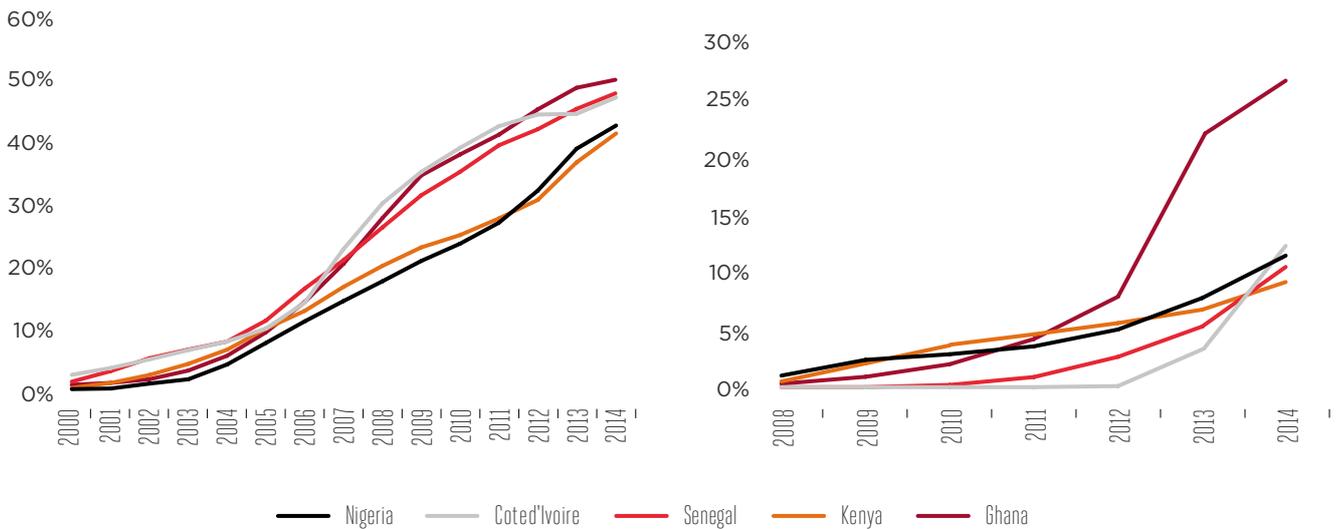
### 1.3 High taxes may limit the realisation of these benefits

Following a period of rapid expansion of mobile ownership in Ghana, annual growth rates have begun to slow down in recent years. This coincided with the introduction of the Communication Service Tax in 2008, which increased the tax burden on the mobile sector. Higher tax rates are reflected in higher consumer prices and have the potential to reduce investment, which affects coverage in rural areas and the quality of service.

In addition, World Bank data suggests that only 12% of the Ghanaian population are internet users, a figure lower than in many other African countries: in Kenya 39% of the population are internet users, in Nigeria 38% and in Senegal 20%<sup>9</sup>. With the number of 3G connections growing rapidly since its introduction in Ghana in 2007, increased mobile ownership has the ability to bridge this gap and increase access to the internet across the population.

Although Ghana has a relatively high penetration rate compared to the regional average, with total mobile penetration surpassing the 100% mark, unique subscriber penetration is currently only 51%.

Mobile penetration of unique subscribers and 3G penetration, by country



Source: GSMA Intelligence Database

Figure 7

9. World Bank World Development Indicators <http://data.worldbank.org/indicator/IT.NET.USER.P2/countries>

### 1. Affordability of services for all consumers

Affordability creates a significant barrier to accessing the benefits of mobile and 3G services in Ghana. The cost of mobile ownership in Ghana has declined over the last decade due to greater competition, while the mobile industry has taken steps to improve internet access by reducing the costs of smartphones. However, the tax burden has increased over this same period, and sector-specific taxes levied on handsets and mobile services result in increased consumer prices. As a consequence, consumers risk being excluded from the advantages mobile services bring to communities, limiting digital inclusion.

### 2. Coverage of 3G services in rural and under-served urban areas

The availability of broadband services also presents a challenge to expanding internet access. While 2G coverage is currently available to 95% of the population<sup>10</sup>, 3G networks cover about 26% of the population. Increasing pressure on mobile operators' revenues, partly as a result of taxation, means that limited funding may be available for operators for investment in the infrastructure necessary to extend their 3G network. Network coverage will suffer as a result of this barrier to investment, which risks excluding many Ghanaians from the benefits of accessing the internet via a mobile phone.

### 3. Improving the service quality of all mobile services

Mobile operators in Ghana have identified issues with the current quality of service of mobile caused by over-congested networks. This is a significant issue for the economy, as Ghanaians with access to mobile services may be unable to realise their full potential. In order to tackle this problem, additional investment to increase network capacity is required across the whole network by the mobile operators. While many are already taking steps to address this issue and have committed additional funds to infrastructure investment<sup>11</sup>, pressures on mobile operators' revenues may make this level of investment unsustainable in the longer term.

**The importance of tax revenues from the mobile sector for the government of Ghana is recognised. However, the current system of taxation on the mobile sector in Ghana risks creating inefficiencies, with short-run government revenues coming at the cost of long-run economic growth.**

This study, which is based on a model of the Ghanaian mobile sector and its macroeconomic impacts, suggests a number of options for the government to rebalance taxation on the mobile sector in a way that promotes economic growth and protects the government's tax revenue position in the long term.

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**Section 2** of this report describes in full the taxes levied on the mobile sector in Ghana and the implications of these taxes for the mobile sector and the wider economy. It also compares the taxes levied in Ghana with international benchmarks and with best practice on taxation principles as recommended by international organisations.

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**Section 3** provides effective recommendations for rebalancing taxes on the mobile sector. These policies can support the Ghana government's goal of digital inclusion, increase economic growth and protect government revenues.

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**The Appendix** describes in detail the macroeconomic model of the Ghanaian mobile sector and economy that has been used in the analysis to estimate the impacts of rebalancing mobile sector taxes. Moreover, this section presents more detailed results from each of the scenarios described within the report, whilst provides further analysis regarding the introduction of a new GHS 5 tax per SIM card activation, which has been recently been proposed by the National Identity Authority.

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10. Based on data from the GSMA Intelligence and <http://www.budde.com.au/Research/2013-Ghana-Telecoms-Mobile-Broadband-and-Forecasts.html>

11. Tigo Ghana, for example, pledged to invest US\$100,000 per day from July to October 2014 to upgrade its infrastructure; MTN has committed almost US\$100 million to network upgrades. See <http://www.telegeography.com/products/commsupdate/lists/country/ghana/>



Taxes account for almost a quarter of the cost of mobile ownership in Ghana.



# 2 Taxation on mobile in Ghana

## 2.1 Consumer taxes create barriers to affordability

Taxation on the mobile sector is significant in Ghana, which creates barriers that prevent consumers from accessing mobile services. The current tax structure in Ghana means that each component of owning and using a mobile phone is subject to taxation, resulting in higher prices:

Initially, consumers must purchase a device and SIM card, which are subject to VAT, customs duties and the National

Health Insurance Levy (NHIL)<sup>12</sup>.

Consumers then need to activate their devices, and activation is subject to VAT, Communications Service Tax (CST)<sup>13</sup> and the NHIL.

Lastly, the usage of mobile services including calls, SMS, data and airtime vouchers, are subject to the CST as well as VAT and the NHIL.

### Consumer taxes on mobile devices and services in Ghana

		TAX BASE	TAX TYPE	TAX RATE	
Taxes on consumers	Devices		VAT	15%	
			Customs Duties (and additional charges)	Up to 25%	
			National Health Insurance Levy	2.5%	
	Services	Activation, mobile broadband, airtime vouchers, calls and SMS		VAT	15%
				 Communications Service Tax	6%
				National Health Insurance Levy	2.5%

Key: Consumer taxes on devices Consumer taxes on services  Mobile-specific

Source: Deloitte analysis based on mobile operator data

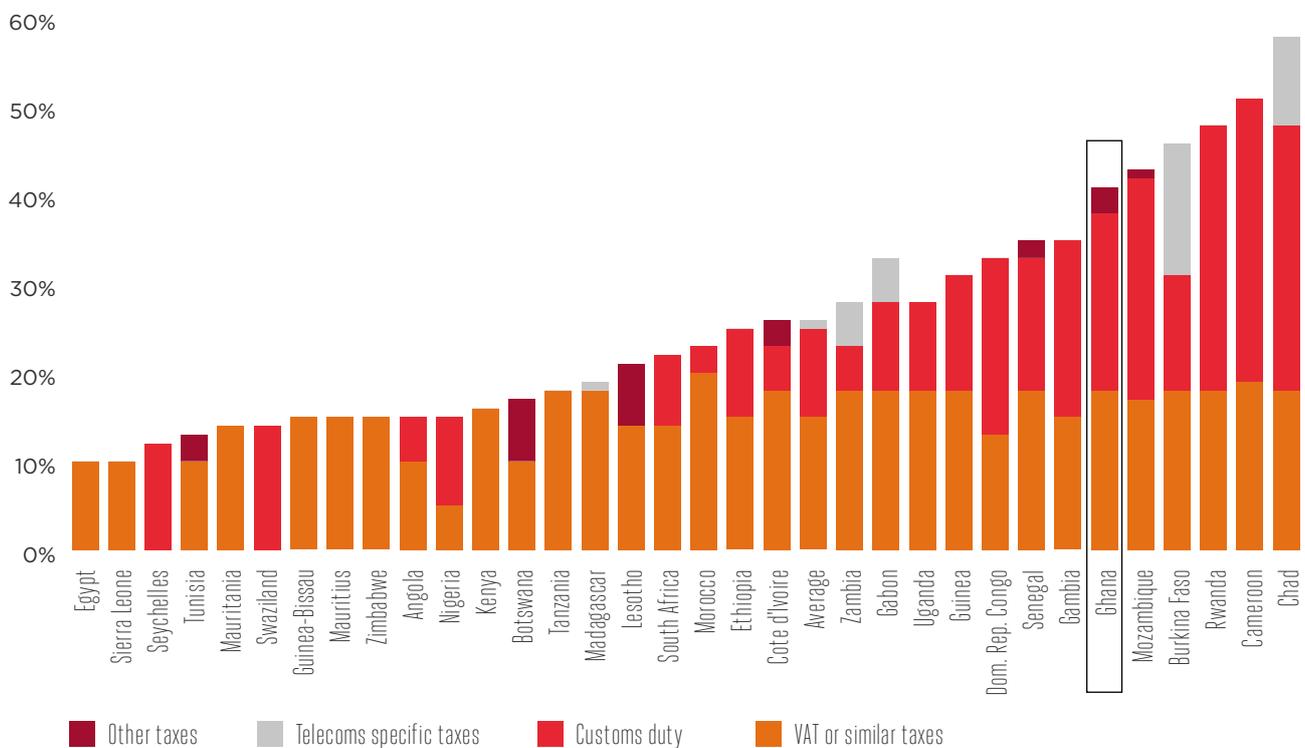
Table 1

12. The national health insurance levy is a levy on goods and services supplied in or imported into Ghana to partly finance the National Health Insurance Scheme (NHIS) – Ghana Revenue Authority  
 13. The CST is a tax levied on changes for the use of communications services that are provided by communications service operators – Ghana Revenue Authority

Handsets, smartphones and tablets imported into Ghana are subject to a 20% customs duty, which was reintroduced in 2013<sup>14</sup>; this is in addition to VAT and the NHIL. As a result of these taxes, the total level of taxation applied to devices in Ghana is 38%, almost 50% higher than the African average<sup>15</sup>. This is driven mainly by the customs duty, which is set at one of the highest rates in Africa. By reducing the affordability of devices, these taxes risk excluding many Ghanaians

from the extensive benefits of mobile and mobile broadband and risk encouraging an illegal black market for handsets, with less expensive devices entering in from neighbouring countries. The Ministry of Finance announced the exemption of smartphones from customs duties in the 2015 budget, which will improve the affordability of smartphones, though affordability of feature phones will remain an issue.

Total taxation paid on mobile devices, by country



Source: GSMA/Deloitte (2011) "Global Mobile Tax Review"; data from mobile operators in Ghana 2014

Figure 8

The tax burden on mobile usage is increased above that on other products due to the imposition of the sector-specific CST of 6%. This additional charge brings the total taxes on mobile services above the African average. Mobile-specific taxes on usage further exacerbate barriers to affordability by increasing the cost of using a mobile phone. This discourages Ghanaians from purchasing a mobile phone, hindering digital inclusion in Ghana.

14. Telegeography Report "Ghana's Parliament Approves Customs and Excise Amendment Bill" <http://www.telegeography.com/products/commsupdate/articles/2013/07/10/ghanas-parliament-approves-customs-and-ex-cise-amendment-bill/>  
 15. GSMA Mobile Taxation Survey 2011; operator data



### Taxation as a share of usage costs, by country



Source: GSMA/Deloitte (2011) "Global Mobile Tax Review"; data from mobile operators in Ghana 2014

Figure 9

## 2.2 Taxes on mobile operators reduce growth and investment in the mobile sector

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In addition to the taxes levied on consumers, the Ghanaian government also levies a number of taxes on mobile operators that are not levied on businesses in other sectors. These taxes include:

- Taxes on inputs, including customs duties on imported network equipment, airtime vouchers and SIM cards;
- Taxes on services in the form of taxes on interconnection and termination fees;
- Taxes on profits such as corporate tax and the National Fiscal Stabilisation Levy (NFSL); and
- Taxes on revenues, for example annual license fees and the Universal Service Obligation.

As well as these taxes, mobile operators are also subject to a number of regulatory fees such as gateway licenses, numbering fees and microwave fees, specific to the telecommunications sector. This multitude of taxes and fees, which are levied on a variety of bases, increases the complexity of the tax system and thereby creates additional inefficiencies in the market.

## Taxes levied on mobile operators in Ghana

		TAX BASE	TAX TYPE	TAX RATE
Taxes on operators	Imported network equipment and SIM cards		VAT	15%
			Customs Duties (and additional charges)	Up to 20%
			National Health Insurance Levy	2.5%
	Taxes	Profits	Corporation tax	25%
			National Fiscal Stabilisation Levy	5%
		Termination/ Interconnection revenues	SIIT	GH¢ 0.19
			 CST on interconnection	6%
	Annual regulatory fees	Net revenues (gross revenue - interconnection - NHIL - VAT - CST)	 Ghana Investment Fund for Electronic Communications (GIFEC)	1%
			 Variable licence fee	1%
			 International Gateway Licence	\$100k
		Fixed amounts	 Right of way fees for fibre rollout	\$4000/km on average
			 Microwave fees	Per link
			 Numbering fee	Up to \$0.50 per number

Key: Operator taxes on equipment Other operator taxes  Mobile-specific

Source: Deloitte analysis based on mobile operator data

Table 2

As seen above, mobile operators in Ghana are subject to taxes on all aspects of their operations, from sourcing the equipment necessary to develop network infrastructure, to the delivery of specific services and to their total revenues. Many of these charges are either specific to the sector, or create a disproportionate burden on the mobile sector compared to other areas of the economy.

### Customs Duties

The customs duty of up to 20% (in addition to VAT and the NHIL) on imported equipment makes it more costly for mobile operators to invest in infrastructure and so may hinder the expansion of networks in underserved areas. In some African countries, such as Tanzania, the government granted operators exemption from this tax for a given period in order to promote investment, indicating the other African governments' awareness of the negative implications of this tax on the economy.

### SIIT and CST on interconnection

Mobile operators also face additional taxes on certain services: the Surtax on International Incoming Traffic (SIIT) and the CST on interconnection. The SIIT, introduced in 2010, takes the form of a compulsory set termination rate of GHS 0.19 of which the government takes GHS 0.06, leaving operators with GHS 0.13 in revenue. The costs of the tax largely fall on the mobile operators or on international businesses and consumers, creating a barrier to international trade and the expansion of Ghanaian businesses.

The CST on interconnection is an additional charge on termination fees on calls across networks, which is set at 6%, the same rate as on mobile services.

This affects consumers and businesses by making it more costly to make/receive calls from one network to another, which risks damaging competition in the mobile market. When the CST was first introduced it was not completely transparent whether the CST also affected interconnection fees, leading to uncertainty from consumers and mobile operators. Three of the mobile operators appealed this tax, claiming that the charge of CST on interconnection amounted to double taxation<sup>16</sup>; the High Court agreed with this assessment, but the government of Ghana has since introduced legislation to clarify that the CST applies to interconnection fees<sup>17</sup>.

### Corporate tax and the National Fiscal Stabilisation Levy

Both corporate tax and the NFSL are applied to mobile operators' profits. The NFSL was first imposed in 2009 as a temporary tax over a number of months in order to raise revenue for fiscal stabilisation of the economy<sup>18</sup>. This tax has been re-imposed over a period of 18 months in 2013 and 2014<sup>19</sup> and has been extended to 2017 under the 2015 budget proposed by the Ministry of Finance<sup>20</sup>. As a result, mobile operators in Ghana are subject to a total tax of 30% on profits.

16. PWC "Ruling on Internet Services... the way forward?" <http://www.pwc.com/gh/en/assets/pdf/ghana-on-point-ruling-on-interconnect-services-july-2013.pdf>

17. PWC "On point: Communications Service Tax (Amendment) Bill" [http://www.pwc.com/en\\_GH/gh/assets/pdf/ghana-on-point-communication-service-tax-amendment-bill-july-2013.pdf](http://www.pwc.com/en_GH/gh/assets/pdf/ghana-on-point-communication-service-tax-amendment-bill-july-2013.pdf)

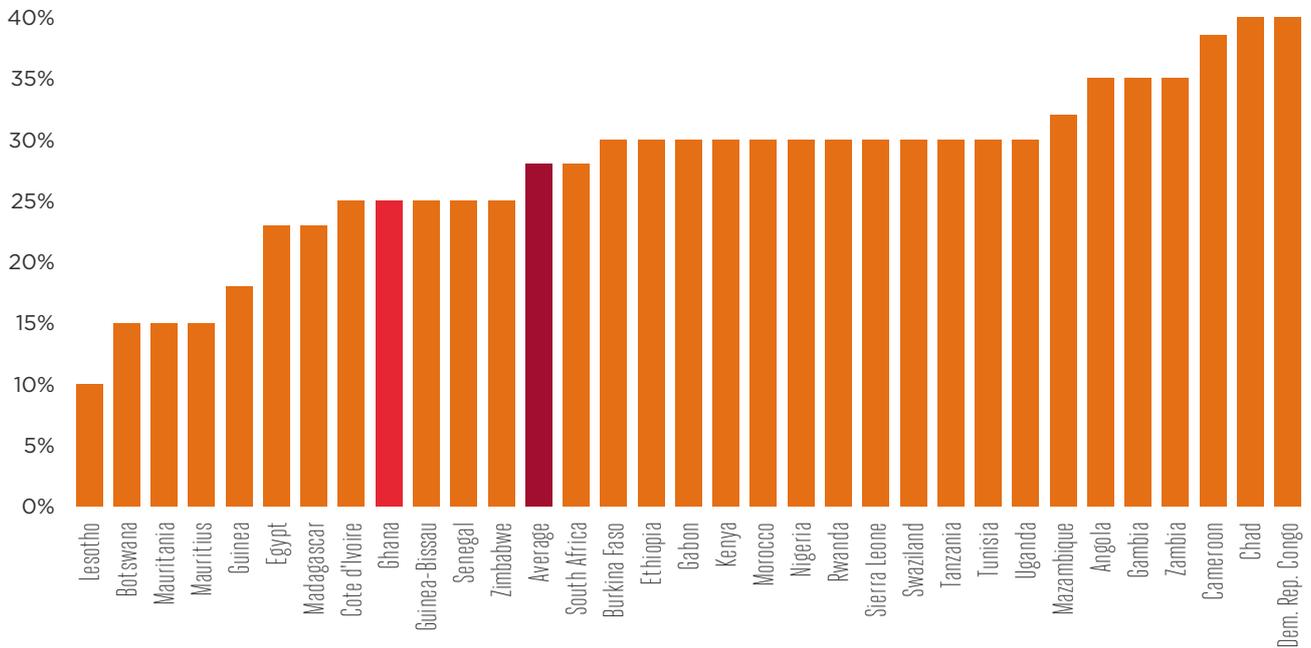
18. Parliament of Ghana, National Fiscal Stabilisation Levy Act, 2013 <http://www.parliament.gh/publications/36/562>

19. PWC "On point: Re-imposition of National Fiscal Stabilisation Levy (NFSL)" <http://www.pwc.com/gh/en/assets/pdf/ghana-on-point-nfsl-additional-taxes-and-levies-july-2013.pdf>

20. The budget speech of the budget statement and economic policy of the Government of Ghana for the 2015 financial year, <http://www.mofep.gov.gh/sites/default/files/budget/Budget-Speech-2015.pdf>



## Taxes on corporate profits, by country



Source: International Finance Corporation, World Bank Group

Figure 10

### Regulatory fees

In addition to these general taxes on profits, mobile operators are also subject to a multitude of sector-specific taxes, which may be either one-off fees or recurring annual payments. Many of these fees apply to revenues; however, there are also charges on numbering, length of fibre roll-out and microwave links.

These fees also include a contribution to the GIFEC, described in section 1.2. This fund was established in 2005 as part of the Universal Access Fund that aims to increase access to mobile telephony worldwide. While a GSMA study of similar

funds worldwide found that Ghana's fund is relatively aligned to international best practice for fund administration and development, fewer than one in eight funds worldwide were found to have succeeded in meeting their own targets, and a third had failed to dispense any funds<sup>21</sup>. Given the challenges and additional administrative and bureaucratic burdens faced by these funds, resources for infrastructure investment can generally be allocated more efficiently by the mobile operators themselves, and there is a risk that GIFEC may not be the most effective means of achieving digital inclusion.

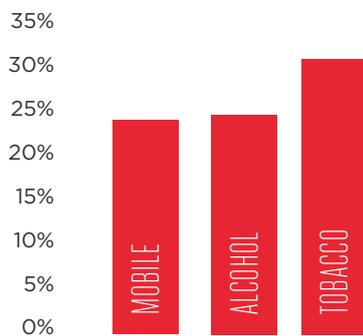
21. GSMA "Universal Service Fund Study" <http://www.gsma.com/publicpolicy/wp-content/uploads/2013/04/GSMA-USF-Main-report-final.pdf>

## 2.3 The tax burden on mobile is higher than that on many other sectors

As noted, many of the taxes levied on mobile are unique to the sector, and as a result the tax burden on mobile is higher than on many other industries. This is despite the fact that mobile and broadband services are recognised to have positive effects on the wider economy through network effects and spillovers onto other sectors.

As a result of the CST, taxes make up 24.5% of the cost of mobile ownership in Ghana. Other products subject to additional excise taxes include alcohol and tobacco: taxes make up 25% of the cost of wine and spirits<sup>22</sup>, and about 31.5% of the cost of tobacco<sup>23</sup>. However, alcohol and tobacco are recognised to have negative impacts on wider society, whereas mobile creates positive spillovers.

### Taxation as a proportion of usage costs



Source: Deloitte analysis

Figure 11

While VAT, customs duties and the NHIL are applied to most products in Ghana, there are a number of exceptions. Items exempt from VAT and the NHIL include educational supplies, books and newspapers, postal services and transport<sup>24</sup>. In contrast, not only are mobile services subject to the full rate of VAT and the NHIL, they are also subject to additional taxation through the CST. Given the role that mobile services play in providing access to information and ideas,

facilitating communication and enabling business transactions, the government could consider treating mobile and internet services in a similar manner.

Whereas imported telecommunications network equipment is subject to customs duty (along with VAT and NHIL), the government has granted customs and VAT exemptions for machinery and apparatus used in other sectors such as agriculture, mining and transport<sup>25</sup>.

Although the NFSL is not unique to the mobile sector, only a limited number of sectors are subject to this tax. Other sectors include banks, non-bank financial institutions, insurance companies and breweries, which are subject to the additional tax either because they make large profits or the government wishes to discourage consumption. Previously, mining companies were also included, but have now been excluded due to the industry's recent struggles with profitability<sup>26</sup>.

While the mobile sector faces a higher level of taxation through the NFSL, other sectors also benefit from a lower rate of corporate tax. Examples include the hotel industry, and some types of financial services, which pay corporate tax at a discounted rate of 20%<sup>27</sup>.

**As a result of these discrepancies between the treatment of the mobile sector and the treatment of other industries, the sector contributes 9.1% of total tax revenues in Ghana, while turnover in the sector represents 3.2% of GDP.**

22. World Health Organisation "Global Status Report: Alcohol Policy" [http://www.who.int/substance\\_abuse/publications/en/Alcohol%20Policy%20Report.pdf](http://www.who.int/substance_abuse/publications/en/Alcohol%20Policy%20Report.pdf)

23. The Tobacco Atlas, "Excise Duty as a percentage of cigarette price" [http://www.tobaccoatlas.org/solutions/tobacco\\_taxes/excise\\_tax/](http://www.tobaccoatlas.org/solutions/tobacco_taxes/excise_tax/)

24. Ghana Revenue Authority: [http://www.gra.gov.gh/index.php?option=com\\_content&view=article&id=44&Itemid=47](http://www.gra.gov.gh/index.php?option=com_content&view=article&id=44&Itemid=47)

25. PWC "On point: Re-imposition of National Fiscal Stabilisation Levy (NFSL)" <http://www.pwc.com/gh/en/assets/pdf/ghana-on-point-nfsl-additional-taxes-and-levies-july-2013.pdf>

26. Ghana Revenue Authority, "Implementation of the National Fiscal Stabilisation Levy Act" [http://www.gra.gov.gh/index.php?option=com\\_content&view=article&id=152:implementation-of-national-fiscal-stabilization-levy-act-862&catid=1:latest-news&Itemid=26](http://www.gra.gov.gh/index.php?option=com_content&view=article&id=152:implementation-of-national-fiscal-stabilization-levy-act-862&catid=1:latest-news&Itemid=26)

27. PWC "Charting tax trends in Ghana" [http://www.pwc.com/en\\_GH/gh/pdf/ghana-tax-guide-with-facts-and-figures.pdf](http://www.pwc.com/en_GH/gh/pdf/ghana-tax-guide-with-facts-and-figures.pdf)

## 2.4 Mobile taxes in Ghana are inefficient and inequitable

The importance of tax revenues in the development of public policies and services is well known, and it is recognised that in developing markets, the establishment of an effective tax policy has to contend with numerous practical difficulties including widespread informal activity, limited institutional capabilities and political pressure to avoid taxing special interests<sup>28</sup>. As a result of these competing issues tax policy frequently has to strike a balance between the theoretically correct response and the one that recognises the practicalities of taxation in a market<sup>29</sup>.

There are however a number of principles that are widely recognised as contributing to an effective tax system, and if applied in Ghana, these principles could not only expand the mobile sector but also lead to significant economic growth and increased tax revenues for governments. Organisations such as the IMF list the following principles:

- **In general, taxation should be broad-based:** Taxation alters incentives for production and consumption, and so economic distortions will generally be minimised where the burden of taxation is spread evenly across the economy. Mobile-specific taxes levied in Ghana are likely to lead to under-use of mobile services due to the increased tax burden on usage. This under-use reduces the financial resources available to mobile operators for investment and their expected return, leading to underinvestment in the sector.
- **Taxes should account for sector and product externalities:** The case for taxation to address negative externalities such as those arising from tobacco consumption is well recognised<sup>30</sup>. However, the same logic also applies in the case of sectors and products with positive externalities. In the case of the mobile sector, these positive externalities include network effects<sup>31</sup> and the benefits that mobile services create for other sectors of the economy.
- **The tax and regulatory system should be simple, easily understandable and enforced:** Uncertainty and lack of transparency over taxation systems and liabilities may deter investors and is also likely to increase enforcement costs for government. Introduction of new taxes such as the CST and discussion regarding a potential SIM card tax create uncertainty and deter both consumers and mobile operators from spending on mobile services.
- **Dynamic incentives should be unaffected:** Taxation should not disincentivise efficient investment or competition in the ICT sector. Taxes levied on total revenues are likely to have a particularly detrimental impact on investment since they apply to mobile operators regardless of their level of profitability. This reduces incentives for operators to spend on investment or quality of service improvements, since those that do so are taxed at the same rate as those that do not invest and report higher profits.

28. IMF (2001), 'Tax policy for developing countries'

29. Ibid.

30. An externality refers to an impact on the wider economy that is not accounted for by the consumer purchasing the good. For example, consumers of tobacco create an additional cost for others through second-hand smoke, but do not take into account this impact when choosing whether to smoke.

31. Network effects are a particular type of positive externality, which arise because the value of being a mobile user increases with the number of other users in the network. It is regarded as an externality because the individual does not take into account the positive impact on the rest of the network when making their consumption decision.

These principles are intended to minimise the inefficiencies associated with taxation and the distortive impacts that taxes may have on the wider economy. Optimal taxes are those that minimise these inefficiencies. Examples include broad-based consumption taxes such as VAT, with adjustments for the positive and negative externalities created in the wider economy; corporate taxes that are levied on profits, not revenues, and so do not distort investment decisions, are also more efficient, in particular if they account for externalities.

In addition to the principles outlined above, **it is widely accepted that taxes should be**

**equitable, and that the burden of taxation should not fall disproportionately on the poorer members of society.** Consumption taxes such as the CST are regressive since they create a higher burden relative to income for poorer consumers, creating barriers to both digital and socioeconomic inclusion.

The table below summarises how the taxes levied in Ghana align with these principles (and the extent to which these taxes are regressive and are likely to limit digital inclusion).

Alignment of taxes on the mobile sector in Ghana with these principles

Tax	Broad-based	Accounts for externalities	Simple and enforceable	Incentives for competition and investment	Equitable (not regressive)
VAT	✓	✗	✓	✓	✗
NHIL	✓	✗	✓	✓	✗
CST	✗	✗	✓	✗	✗
Customs duty on handsets	✓	✗	✗	✗	✗
GIFEC	✗	✓	✓	✗	✓
Licence fee	✗	✗	✓	✗	✓
NFSL	✗	✗	✓	✓	✓
Corporate tax	✓	✗	✓	✓	✓
Customs duty on equipment	✓	✗	✗	✗	✓
SIIT	✗	✗	✗	✗	✓
Interconnection fees	✗	✗	✗	✗	✗

Table 3

As can be seen in the table, many of the taxes levied on the mobile sector fail to align with the key principles of efficient taxation, with ramifications for the development of the sector and for the wider economy. The following taxes have been identified as particularly distortive:

### The CST reduces digital inclusion and limits the potential of mobile services:

While any tax that is levied on a specific sector will have a distortionary effect, the CST is particularly damaging since it also fails to account for the positive externalities mobile creates in the wider economy. These externalities include network effects for mobile users, and positive spillovers onto sectors such as agriculture, healthcare and education through the use of mobile applications and services.

### The customs duty on handsets reduces digital inclusion:

The customs duty on handsets raises the cost of ownership, and it can therefore lead to the exclusion of many Ghanaians from the benefits of mobile and internet access. Furthermore, it does not account for the positive externalities that mobile services create in the wider economy and is regressive, hitting poorer consumers harder. This tax may also have created some uncertainty in the market: mobile handsets were exempted from customs duty in 2008, but this exemption was ended in the Customs and Excise Amendment Bill of 2013<sup>32</sup>.

### Levying customs duty on imported equipment disincentivises investment:

This tax fails to account for the positive externalities that investment in the mobile

sector can bring. Increasing the cost of importing equipment risks making some infrastructure investments, especially those in remote areas, economically unviable and fails to take into account the fact that mobile network infrastructure may be considered a public good.

### The SIIT increases the costs of trade and limits regional development:

The SIIT is particularly distortive since it only applies to international incoming calls. It increases the costs of trade and makes it more difficult for Ghanaian businesses to expand internationally, while potentially deterring foreign firms from investing in Ghana. There are also issues with its enforcement: by having the revenues collected by a third-party the costs of administering the tax are increased and revenues are diverted away from the government<sup>33</sup>.

### The CST on interconnection is distortive and potentially anti-competitive:

Taxation on transferring calls between networks may have anti-competitive impacts as it makes calls between different networks more costly for consumers and businesses than calls between the same networks. This tax is effectively double taxation for the former case, which is inequitable and creates distortions within the sector. This puts further strains on the promotion of digital inclusion and growth in Ghana.

The inefficiencies created by these various taxes not only limit the development of the mobile sector, but also hinder economic growth and the realisation of the positive externalities created by mobile services. **As a result, the government of Ghana risks losing out on revenues that could be generated if the tax system were more efficient.**

32. Telegeography Report "Ghana's Parliament Approves Customs and Excise Amendment Bill" <http://www.telegeography.com/products/commsupdate/articles/2013/07/10/ghanas-parliament-approves-customs-and-ex-cise-amendment-bill/>

33. Deloitte/GSMA "Surtaxes on International Incoming Traffic in Africa" [http://www.gsma.com/publicpolicy/wp-content/uploads/2012/03/Surtaxes\\_on\\_International\\_Incoming\\_Traffic\\_in\\_Africa\\_FULL-REPORT\\_WEB.pdf](http://www.gsma.com/publicpolicy/wp-content/uploads/2012/03/Surtaxes_on_International_Incoming_Traffic_in_Africa_FULL-REPORT_WEB.pdf)



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# 3 Case studies: Impacts of taxation on mobile services

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A number of countries worldwide have experienced the sectoral and macroeconomic impacts resulting from a change in tax policy in the mobile sector. A range of evidence from markets is presented here, illustrating the positive impacts that a reduction in mobile sector taxation can have on penetration and government revenues; conversely, an increase in tax can potentially decrease usage and investment.

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Case study:

VAT EXEMPTIONS ON HANDSETS IN KENYA LED TO IMPROVED ECONOMIC PERFORMANCE

The cost of access has been widely recognised as a barrier to the adoption of mobile technology. In recognition of this, the Kenyan government exempted mobile handsets from VAT in 2009, which had previously been implemented at 16%<sup>34</sup>. Mobile operators and other handset dealers immediately passed this exemption directly onto consumers.

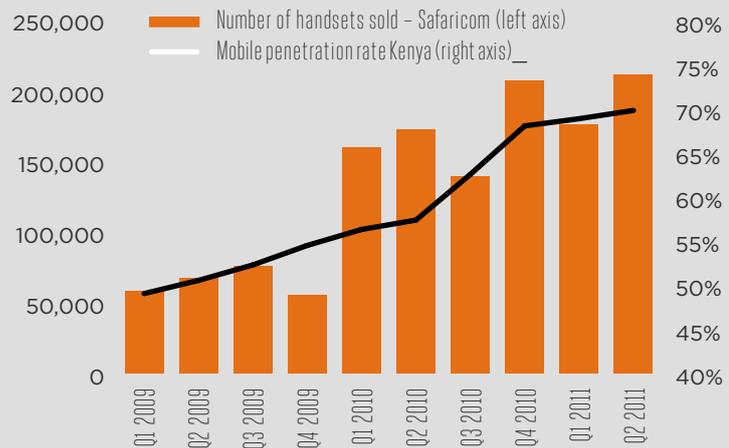
In the three years following, the VAT reduction contributed to an increase in handset sales of 200%, outpacing growth elsewhere in Africa. This increased penetration from 50% to 70%, above the 63% average across Africa<sup>35</sup>.

Over the same period, the contribution of mobile telecommunications to the Kenyan economy grew by almost 250%, while mobile-related employment increased by 67%<sup>36</sup>. Moreover, the impact of mobile telecommunications on Kenyan productivity increased by over 300% in five years<sup>37</sup>.

Consequently, more recent government proposals to re-introduce VAT across the ICT sector have caused widespread concerns around the negative impact on rural poverty, mobile penetration and economic growth<sup>38</sup>.

Combined with wider market price reductions, the VAT exemption helped to increase access to a wide range of mobile services, with mobile usage increasing by 113%. This has been recognised as improving economic growth, productivity and economic and social equality.

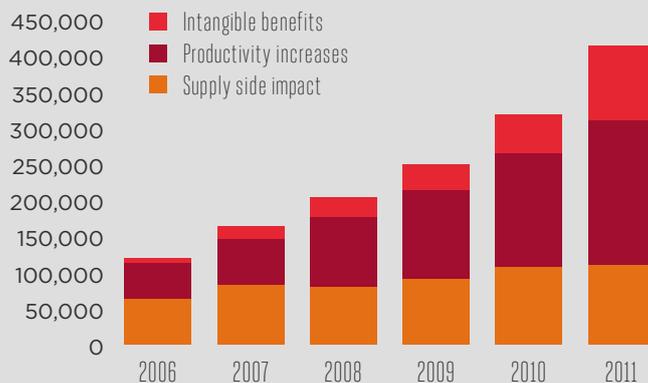
Impact of reducing VAT on handsets



Source: Deloitte/GSMA: Mobile telephony and taxation in Kenya

Figure 12

Economic impact of mobile in Kenya



Source: Deloitte/GSMA: Mobile telephony and taxation in Kenya

Figure 13

34. Deloitte (2011), 'Mobile telephony and taxation in Kenya'.  
 35. GSMA (2012), 'Taxation of mobile telecoms: Sector-specific taxes on consumption and international traffic'. 36 Deloitte (2011), 'Mobile telephony and taxation in Kenya'.  
 37. Ibid.  
 38. CIO (2013), 'Kenyan government VAT on ICT will hurt the underprivileged'. <http://www.cio.co.ke/news/main-stories/kenyan-government-vat-on-ict-will-hurt-the-underprivileged>

Case study:

LOWER TAXATION BOOSTS MOBILE SECTOR GROWTH IN URUGUAY

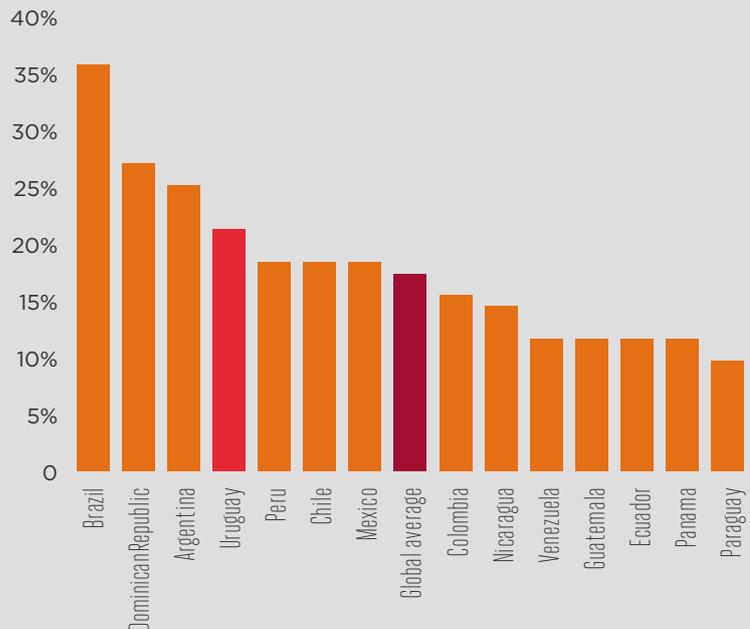
In 2007, the Uruguayan government abolished an excise tax (ITEL) on airtime that affected telecom usage, directly impacting mobile consumers. This fixed tax, consisting of UYU 0.4 per minute for local calls and UYU 2 per minute for long distance calls, accounted for 30%-50% of the cost of calls<sup>39</sup>.

This fixed tax affected usage and also contributed to increasing barriers to mobile ownership, especially for low income consumers. Consequently, the removal of this tax has led to a number of positive effects:

- Call prices have fallen by 67%.
- In the years following the tax abolition, mobile penetration has more than doubled, increasing from 65% to 141%.
- Usage increased by more than three times.

As a result of the growth in the market the tax contribution of mobile operators has also increased four-fold, providing a significant windfall to the government. This illustrates that revenues lost through reductions in distortive, mobile-specific taxes can be recovered through more broad-based taxation on the sector as it grows.

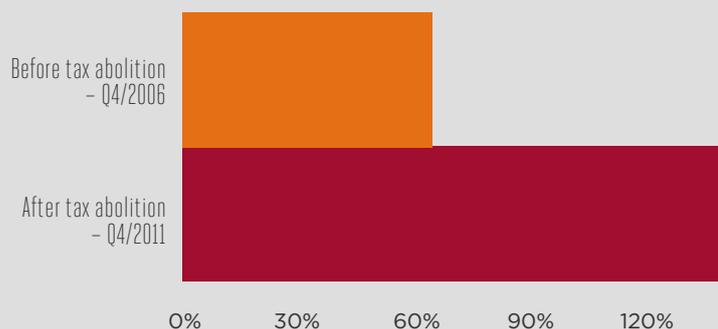
Tax as a percentage of total cost of mobile usage, 2011



Source: GSMA Latin American Mobile Observatory 2011

Figure 14

Uruguay's mobile and smartphone penetration



Source: GSMA Latin American Mobile Observatory 2011

Figure 15

Through the reduction of mobile-specific taxation, the government of Uruguay increased the usage of mobile services by removing barriers to affordability. By developing supportive taxation and regulatory policies, the government enabled the growth of the mobile sector, and the associated benefits from increased employment and investment.

39. Throughout, figures are sourced from Deloitte/GSMA "Mobile taxes and fees: A toolkit of principles and evidence": [http://www.gsma.com/publicpolicy/wp-content/uploads/2014/02/Mobile-taxes-and-fees-A-toolkit-of-principles-and-evidence\\_fullreport-FINAL1.pdf](http://www.gsma.com/publicpolicy/wp-content/uploads/2014/02/Mobile-taxes-and-fees-A-toolkit-of-principles-and-evidence_fullreport-FINAL1.pdf)

Case study:

**INCREASES IN MOBILE-SPECIFIC TAXATION REDUCED INVESTMENT IN NETWORK INFRASTRUCTURE IN CROATIA**

After years of strong growth, Croatia suffered from a strong recession in 2009 following the global financial crisis<sup>40</sup>.

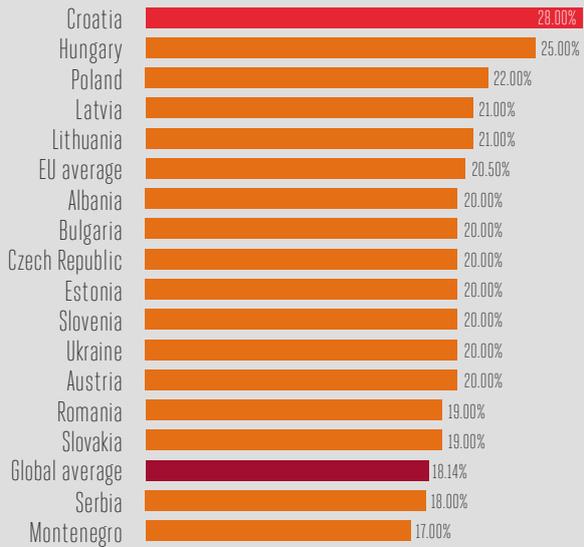
In addition to the direct impact of the recessionary environment on the mobile industry, in 2009 the Government introduced a 6% tax on mobile operators gross revenue from mobile calls and SMS. This aimed to raise funds as part of its response to the financial crisis.

Following the introduction of the tax, the tax burden increased to 28% of the cost of mobile ownership, the highest in Europe.

Croatia's mobile tax had important implications:

- Following this, volumes of mobile calls and SMS decreased (for the first time) in 2010 by 4% and 14% respectively.
- Additionally, unlike VAT, the tax could not be itemised in prices/receipts, and was therefore not transparent to consumers.
- Mobile-specific taxation as a proportion of mobile operators revenue increased significantly after 2008. The total tax burden on mobile grew by 2% in 2009 and by 10% in 2010 as a result of the introduction of this mobile-specific tax.
- Falls in operator revenues led to noticeable decreases in mobile operator capital expenditure, particularly towards network expansion.

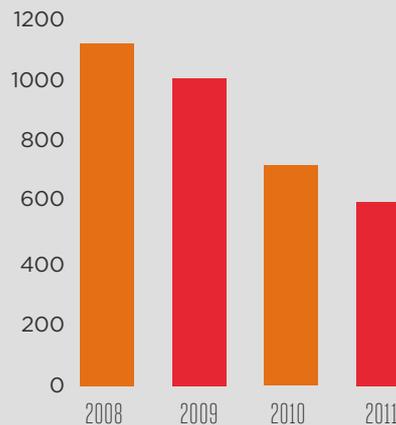
Tax as a percentage of the total cost of mobile ownership, 2011



Source: GSMA/Deloitte Global Mobile Tax Review 2011

Figure 16

Mobile operator capital expenditure, HRK millions



Source: GSMA Intelligence Database

Figure 17

The increase in mobile-specific taxation constrained the usage of mobile services and reduced operator investment in network infrastructure, reducing quality of service. By taxing mobile operators at a higher rate than other businesses, the government imposed an additional cost on consumers and raised barriers to entry. Consequently, the Croatian government removed the 6% tax on calls and SMS in 2012.

40. Throughout, figures are sourced from Deloitte/GSMA "Mobile taxes and fees: A Toolkit of principles and evidence": [http://www.gsma.com/publicpolicy/wp-content/uploads/2014/02/Mobile-taxes-and-fees-A-toolkit-of-principles-and-evidence\\_fullreport-FINAL1.pdf](http://www.gsma.com/publicpolicy/wp-content/uploads/2014/02/Mobile-taxes-and-fees-A-toolkit-of-principles-and-evidence_fullreport-FINAL1.pdf)

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# 4 How can the government rebalance mobile taxes to achieve economic growth and fiscal stability

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The current system of taxation on the mobile sector in Ghana risks being counterproductive to digital inclusion, economic growth and long-run fiscal stability. In particular, the following five taxes risk increasing barriers to affordability, reducing investment, and undermining the competitiveness of the Ghanaian economy:

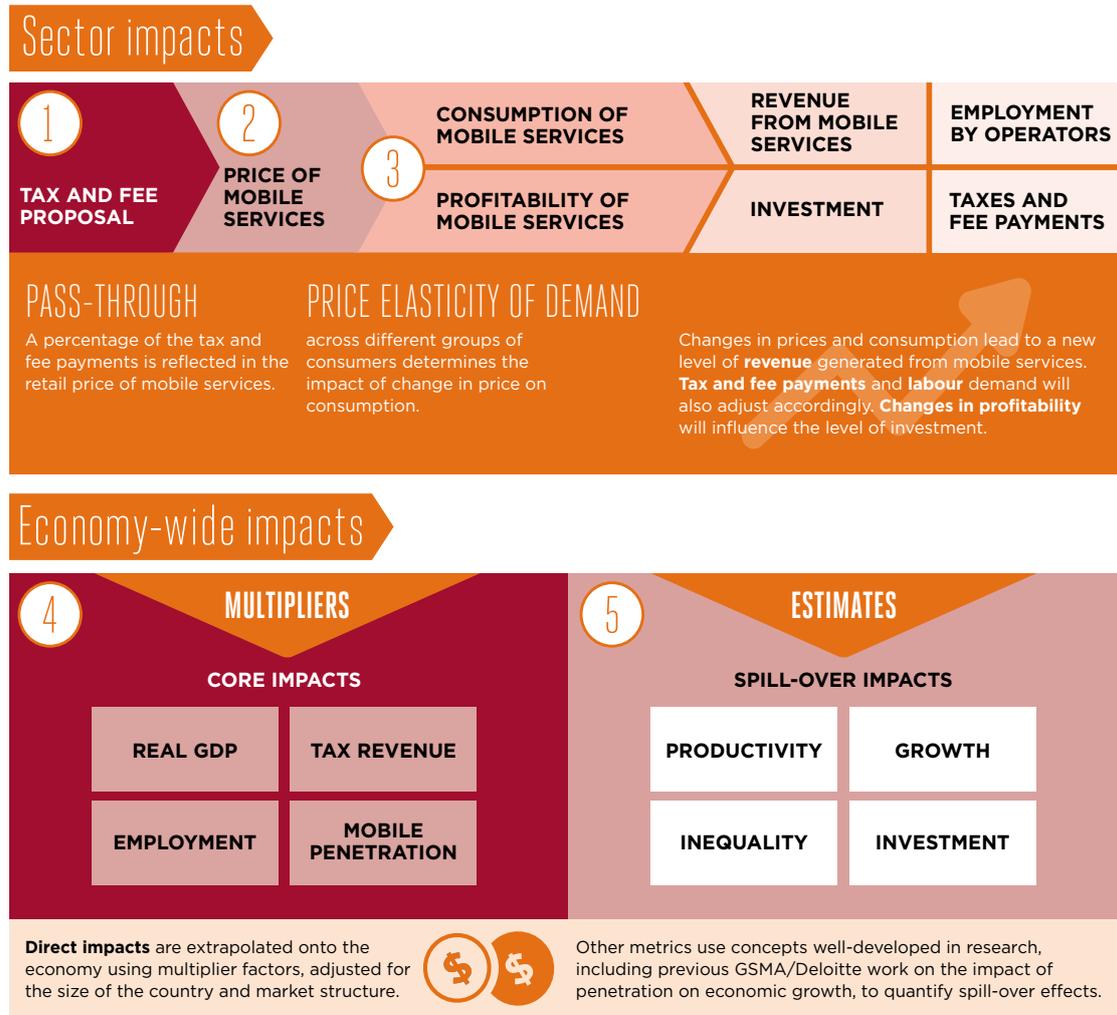
1. The CST on usage
2. Customs duties on handsets
3. Customs duties on imported network equipment
4. The SIIT
5. The CST on interconnection

**By rebalancing these taxes, the government of Ghana can further its goals of promoting digital inclusion and increasing access to ICT, while benefitting from increased tax revenues in the medium-term as a result of GDP growth.**

The impact of various changes to taxation on mobile are discussed, using a combination of qualitative evidence and a quantitative model of the mobile sector and its impact on the wider Ghanaian economy.

## MODELLING THE IMPACT OF CHANGES TO MOBILE TAXATION IN GHANA

The figure below provides an overview of how the various macroeconomic impacts of taxation on mobile services are estimated.



For each of the scenarios for taxation considered, the model calculates the impact of a change in the level of taxation on consumer prices.

The impact on demand for mobile devices and services in Ghana is estimated based on the elasticity of demand; this in turn affects the revenues of mobile operators.

These changes within the mobile sector have ramifications for the wider economy.

First, an increase in mobile penetration is directly associated with an increase in productivity and GDP growth.

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There is also an additional impact through the effect on mobile operators: increased demand generates additional employment opportunities in the sector, while the increase in operators' revenues enables additional investment.

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Thanks to this additional GDP growth, the potential loss of tax revenues from the mobile industry can be offset by tax revenues from more broad-based consumer and corporate taxes.

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The inputs for the model are provided by three of the four leading operators in Ghana, the GSMA and publicly available statistics from the World Bank and the IMF. The outputs are derived based on estimates of the elasticity of demand for mobile services from a number of developing markets, while the impacts of mobile and broadband penetration on GDP have been derived from robust econometric analysis of similar markets in Africa.

For a full discussion of the methodology and assumptions, please see the Appendix.

## 4.1 Reducing the CST promotes digital inclusion and economic growth

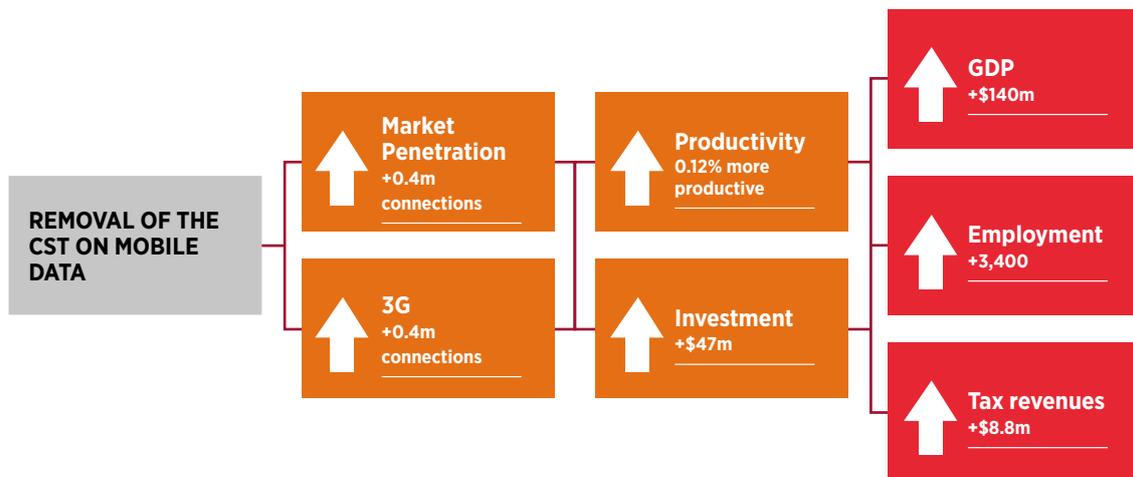
The CST on mobile services such as calls, SMS and data increases the total cost of mobile ownership and may deter Ghanaians from purchasing devices. By removing this tax, the government of Ghana can **increase both mobile penetration and use of mobile and internet services**. Three options are considered for changes to the CST:

- Eliminating the CST on data only.
- Eliminating the CST on all services.
- Eliminating the CST on mobile data and halving it to 3% on other services.

### 4.1.1 Eliminating the CST on mobile data promotes 3G access and digital inclusion

Increasing internet penetration is a priority of the government of Ghana, and mobile broadband is the most cost-effective way of achieving this aim. Eliminating the CST on mobile data can help reduce the cost of smartphone ownership and usage.

#### Economic impact in 2020 of removing the CST on mobile data



Source: Deloitte analysis based on mobile operator data

Figure 18

In 2020, the increase in demand for 3G (data) enabled handsets will add an extra 0.4 million mobile broadband connections relative to the base case. This will increase 3G coverage and hence access to the internet in Ghana, promoting digital inclusion.

Increased revenues in the mobile sector will encourage investment in infrastructure, improving network coverage and service quality.

Through increased access and use of mobile broadband, Ghana could experience up to US\$140 million in additional GDP by 2020.

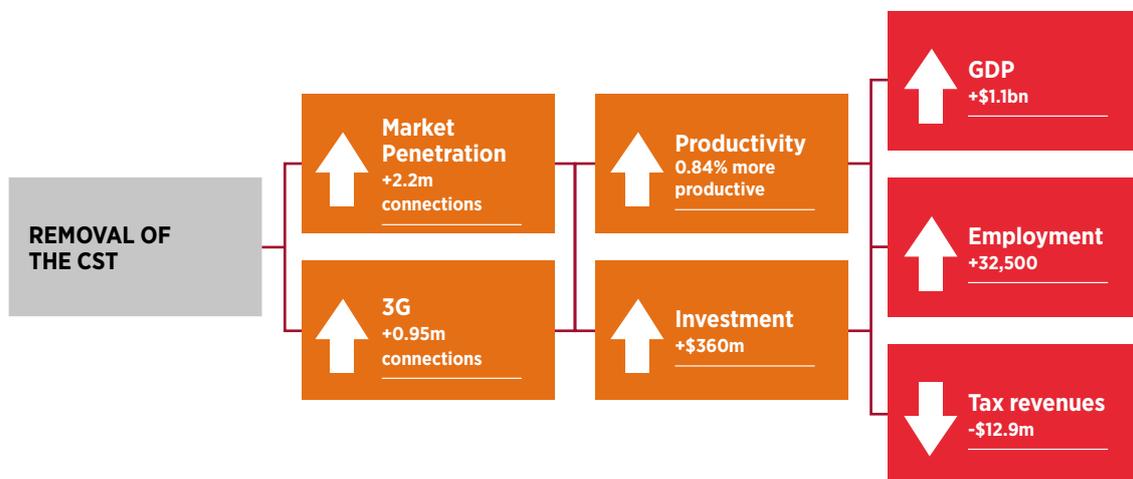
While the removal of the tax would lead to a small reduction in tax revenues in 2015, revenues would quickly recover, and by 2016 the government is likely to be better off.

**Removing the CST on all mobile data promotes digital inclusion by increasing access to the internet via 3G services. With 0.4m extra 3G enabled connections, the Ghanaian economy will benefit from increased broadband penetration, and therefore attain the wider economic benefits associated with the spread of mobile and internet technology.**

#### 4.1.2 Eliminating the CST on all services promotes economic growth

Eliminating the CST on all services would have a greater impact on affordability, and bring consumer taxes on mobile in line with taxes on most other goods and services. Mobile operators currently pay over US\$100 million in CST, representing about 15% of their total tax payments.

Economic impact in 2020 of removing the CST on all services



Source: Deloitte analysis based on mobile operator data

Figure 19

By 2020, increased demand for mobile broadband will add an extra 2.2 million connections, including 0.95 million 3G connections, and will increase usage of mobile services by 6.63%.

This increase in broadband penetration will increase the productivity of Ghanaian workers and businesses, leading to the Ghanaian economy being 0.84% more productive.

Through the direct impacts of the mobile operators and the indirect impacts generated by the activities enabled by mobile operators, increased mobile broadband usage will lead to additional GDP growth, delivering an additional US\$1.1 billion in 2020 and providing employment for an additional 32,500 Ghanaians.

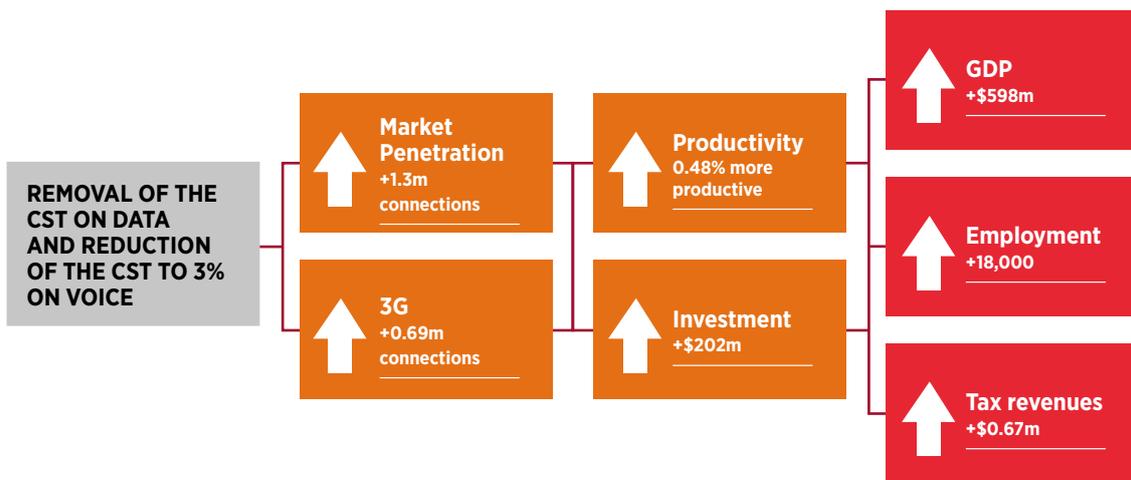
However this tax accounts for about US\$100 million in government revenues, and while the majority of these lost revenues can be recovered as a result of GDP growth the government is unlikely to achieve revenue neutrality by 2020.

**Removing the CST on all mobile services promotes digital inclusion by increasing access to mobile and the internet via 3G services. This has wider economic impacts, specifically leading to higher economic growth, productivity and employment.**

**4.1.3 Removing the CST on data and reducing the CST on voice services to 3% promotes growth and productivity while protecting tax revenues**

While the complete removal of the CST may present a challenge to government revenues, an intermediate scenario in which the CST is eliminated on data and halved on other services enables Ghana to benefit from mobile and broadband services while protecting government revenues in the medium-term. Further reductions to the CST could be made in the future, when government revenues are more secure.

Economic impact in 2020 of removing the CST on mobile data and reducing the CST to 3% on voice and SMS services



Source: Deloitte analysis based on mobile operator data

Figure 20

This scenario could enable an additional 1.3 million connections in Ghana, the majority of them 3G connections.

The 1.3m increase in mobile connections, including the 0.69m additional 3G connections, will facilitate a 0.48% increase in productivity, enabling the government to reach its economic objectives.

This increase in economic activity will contribute to a US\$598m increase in GDP relative to the base case in 2020. This can support an additional US\$202 million of investment, and the creation of 18,000 jobs.

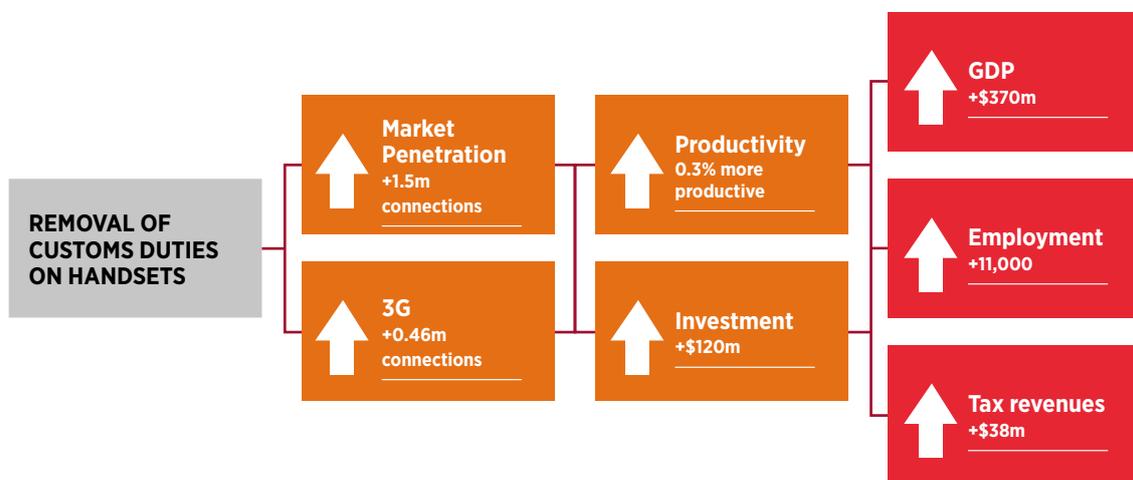
Moreover, despite an initial fall in tax revenues after the reduction in CST, by 2020 increase in GDP growth will enable an additional US\$0.67 million in tax revenues to be collected through more broad-based taxation. This therefore provides greater protection to the government's fiscal position than the complete removal of the CST.

**Removing the CST on data and reducing this tax to 3% on mobile voice services promotes economic growth via increases in mobile and 3G coverage. This increases GDP, productivity, employment and investment, while enabling the government of Ghana to reach revenue neutrality by 2020.**

## 4.2 Removing customs duties on handsets promotes digital inclusion and increases economic growth

Customs duties increase the cost of mobile handsets by 20%, worsening barriers to device ownership. For poorer consumers in particular, the initial cost of purchasing a device represents a major hurdle to mobile access. The Ministry of Finance has recently announced removal of customs duty on smartphones only. By removing customs duty on all handsets and making devices more affordable, the government of Ghana can promote internet access and digital inclusion.

Economic impact in 2020 of removing customs duties on handsets



Source: Deloitte analysis based on mobile operator data

Figure 21

By reducing the cost of both data usage and calls/SMS usage, this will lead to:

Higher demand for devices, increasing market penetration. This could increase handset purchases by 3 million by 2020, with almost 1 million of these handsets being 3G-enabled. If half of these new devices represent new connections, rather than upgrades to existing devices, an additional 1.5 million connections would be enabled.

Increases in handset and smartphone ownership and use could increase the productivity of the Ghanaian economy by 0.3%, and lead to US\$120 million in additional investment.

The wider economic impacts result in an additional US\$370 million in GDP and over 11,000 more Ghanaians in employment in 2020.

In the medium-term, the government will be better off, with up to 37 million in additional tax revenues by 2020.

**Removing customs duties on handsets lowers the price of mobile ownership, relieving pressures on affordability and promoting digital inclusion. This has wider economic impacts on GDP growth and employment, while allowing the government to become tax neutral by 2017.**

### 4.3 Removing the SIIT and CST on interconnection promotes Ghanaian business

The introduction of the SIIT in 2013 increased the price of international incoming calls to Ghana by 58%<sup>41</sup>, leading to a significant drop in demand. A previous GSMA study has found that one operator experienced a 35% decrease in international call minutes terminated on its network in five months after the introduction of the SIIT<sup>42</sup>. By increasing the cost of international calls, the imposition of the SIIT has had a number of negative implications for the Ghanaian mobile sector, the local community and the wider Ghanaian economy.

Economic impacts of the SIIT in Ghana<sup>43</sup>

	Impact	Estimated annual cost
<b>Mobile Sector</b>	<ul style="list-style-type: none"> <li>Reduces revenues and tax payments</li> <li>Increases illegal traffic, congesting networks and reducing service quality</li> </ul>	<ul style="list-style-type: none"> <li>Up to US\$0.75 million in corporate tax revenues</li> </ul>
<b>Consumers</b>	<ul style="list-style-type: none"> <li>Reduces remittances from overseas</li> </ul>	<ul style="list-style-type: none"> <li>Up to US\$1 million in remittances and their contribution to the economy</li> </ul>
<b>Businesses</b>	<ul style="list-style-type: none"> <li>Increases in the cost of trade</li> </ul>	<ul style="list-style-type: none"> <li>Over US\$5 million in revenues from international trade</li> </ul>
<b>Ghanaian Economy</b>	<ul style="list-style-type: none"> <li>Reduces international competitiveness and disincentivises foreign direct investment</li> </ul>	<ul style="list-style-type: none"> <li>Investment in network infrastructure</li> </ul>

Table 4

Another sector-specific tax is the **CST on interconnection services**, which increases the cost of calling between networks and represents double taxation, since the CST is already payable on the total cost of the call. This cost is a liability to operators but may also be passed onto consumers in the form of higher prices, limiting traffic across networks and reducing the funds available for investment. This has negative implications for both consumers and operators in terms of access to mobile broadband services and quality of service. The removal of the SIIT and the CST on interconnection services will provide significant benefits to the Ghanaian economy:

Removing these taxes increases affordability, enabling more Ghanaians to realise the benefits of mobile and 3G services and their impacts on productivity.

This impacts operators' profits and revenues, providing them with additional funds to expand their networks and enabling Ghanaians in remote and underserved areas to access the benefits of mobile broadband. Operators are also able to improve the quality of their existing network, increasing the capacity.

41. The analysis throughout this section is based on the following report that estimates the impacts of the SIIT in a number of African economies, compared to a counterfactual case: Deloitte/GSMA "Surtaxes on International Incoming Traffic in Africa" [http://www.gsma.com/publicpolicy/wp-content/uploads/2012/03/Surtaxes\\_on\\_International\\_Incoming\\_Traffic\\_in\\_Africa\\_FULL-REPORT\\_WEB.pdf](http://www.gsma.com/publicpolicy/wp-content/uploads/2012/03/Surtaxes_on_International_Incoming_Traffic_in_Africa_FULL-REPORT_WEB.pdf) it should be noted that the figures in the SIIT report are estimated over a ten month period; the figures are reported here on an annual basis.

42. One operator identified a 35% decrease in international call minutes terminated on its network just one month after the introduction of the SIIT, as reported in Deloitte/GSMA, "Surtaxes on International Incoming Traffic in Africa"

43. Ibid

By removing the SIIT, Ghana could benefit from an increase in remittances, which has a wider impact on GDP.

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Eliminating these taxes will increase the ease of doing business in Ghana, supporting the growth of Ghanaian businesses. This promotes both regional and international trade. In addition to having a direct positive impact on the Ghanaian economy, increased competitiveness can lead to greater diversity and stability in the economy in the longer term.

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## 4.4 Removing customs duties on network equipment incentivises investment

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As well as affordability, lack of continued investment is also a barrier to providing access to mobile and internet services in rural areas. Mobile operators in Ghana will only take on investment projects that aim to increase 2G and 3G coverage if they are economically viable and they can fund the investment. Mobile operators already face pressure on their revenues due to declining ARPU and high taxation. Furthermore, they are subject to additional pressure on expansion from the customs duty on network equipment. This tax has a direct effect on the cost of infrastructure investment, which is a key determinant of whether mobile operators have the ability to expand their networks into rural areas.

Other measures for increasing investment in infrastructure include providing customs duties exemptions for network equipment. This has been the case for some sectors in Ghana. Specifically, machinery, plant and apparatus and spare parts for agricultural purposes are exempt from customs duties<sup>44</sup>. At present, imported network equipment is subject to customs duties of up to 20%; base stations, for example, carry customs duties of 10%<sup>45</sup>. These duties increase the cost of investment and threaten to make some projects, particularly in remote areas, economically unviable.

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44. Ghana Revenue Authority "Customs Guide" [http://www.gra.gov.gh/docs/info/customs\\_guide.pdf](http://www.gra.gov.gh/docs/info/customs_guide.pdf)

45. Ghana Revenue Authority "The Harmonised System and Customs Tariffs Schedules" [http://www.gra.gov.gh/docs/info/customs/Ghana\\_Customs\\_HS\\_Code.pdf](http://www.gra.gov.gh/docs/info/customs/Ghana_Customs_HS_Code.pdf)

# 5 Reducing taxes on mobile supports the government's ICT objectives while maintaining revenues

It is recognised that reducing the level of taxation on the mobile sector may impact government revenues in the short term. However, by increasing mobile penetration and promoting economic growth, reducing the tax burden on mobile will also increase the tax base, enabling the government to recover these revenues. As shown in the figure below, this second effect is likely to quickly predominate in Ghana, with additional economic growth enabling the government to reach tax neutrality within five years.

Tax revenues compared to the counterfactual under each scenario, 2015-2020



Source: Deloitte analysis based on mobile operator data

Figure 22

The elimination of the customs duty on handsets has the largest impact on total revenues, potentially resulting in US\$38 million in additional tax revenues by 2020. By eliminating the CST on mobile data and halving it on other services the government can recover the initial loss of revenues by 2020, while benefiting from increased mobile and internet access and economic growth. This provides a compromise between the total removal of the tax (which enables the greatest benefits to the wider-economy at the expense of tax revenues) and the removal of the CST on data (which enables the government to reach revenue neutrality in 2017 but does not facilitate the benefits of mobile to the same extent as the removal of the tax on all services).

It is acknowledged that the Ghanaian government will need to take steps to

address the immediate gap in revenues resulting from reduced taxation on the mobile sector. One solution to this would be to gradually reduce the tax burden on mobile, although this risks delaying the realisation of the wider benefits. The government could also consider increasing excises on products and services that are recognised to create negative externalities. A temporary removal of exemptions or reduced corporate tax rates on other sectors could also address the short-run drop in revenues through more broad-based taxation.

**By reducing the tax burden on mobile, the Ghanaian government can promote digital inclusion, productivity and economic growth while maintaining revenue neutrality.** This enables the government to achieve its ICT goals while maintaining fiscal stability.

## Ghana's ICT objectives and taxation policy

ICT objectives	Taxes that impede objectives	Impacts of removing these taxes
1. Promote development of the national ICT infrastructure	• CST on all mobile services including interconnection services	• Affordability of 3G mobile services 
2. Promote the use of ICT in all sectors of the economy	• Customs duty on handsets and imported network equipment	• Access to mobile and 3G services in all areas 
3. Provide affordable broadband for all Ghanaians by 2020	• The SIIT	• 3G penetration 
		• Investment in network infrastructure 
		• Quality of existing mobile networks 

Table 5

In order to achieve its ICT objectives, it is crucial that the government of Ghana creates an environment that enables all Ghanaians to access to mobile telephony and its benefits; in particular, access to mobile telephony is fundamental to increasing internet access. Analysis in the previous sections showed the clear distinction between the benefits that can be realised by reducing mobile-specific taxation and the significant negative implications of increasing such taxes. By eliminating taxes such as the CST, the SIIT and customs duties on handsets, smartphones and network equipment, the government of Ghana can increase mobile and internet access and promote digital inclusion.

Increased access to mobile and internet services will lead to increased innovation in other sectors of the economy. This includes the development of mobile applications for use in agriculture, healthcare and education, and the creation of local content. This not only supports the delivery of government services, but **generates high-skilled employment and supports the move towards a more knowledge-based economy.**

Importantly, this analysis has shown that the pursuit of Ghana's ICT objectives need not come at the expense of other areas of public policy. By supporting increases in productivity and economic growth, a moderate reduction in the tax burden on mobile can expand the tax base and enable lost revenues to be recovered by 2020. In contrast, measures to increase revenues through taxes on mobile come at the cost of economic growth and are ultimately counter-productive.

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# Appendix: The impact of taxation on the mobile sector

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The impacts of taxation were estimated using a detailed model of mobile telephony and its macroeconomic impacts in Ghana. This model is able to forecast the impact of more than 25 sector-specific and macroeconomic variables out to 2020. These impacts can be driven either by removing or changing current taxes and fees or by the introduction of a new tax or

fee. The model uses country-specific inputs that are provided by the operators and the GSMA, in addition to publicly available statistics from the World Bank and the IMF. The outputs are subsequently derived through assumptions on elasticities<sup>46</sup> that have been estimated from robust econometric analysis.

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

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The purpose of the model is to simulate policy scenarios, in the form of changes to taxes and/or fees levied on mobile services, and quantify the resulting impacts over time on the mobile sector and wider economy.

The modelling approach can be summarised as the development of a baseline for the mobile sector and economy, and the simulation of tax alternatives which include the quantification of the policy scenario impacts. It is assumed that the tax policy is implemented in 2015, and the model estimates the effects out to 2020.

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

### A.1.1 The base case

A base case is constructed which covers the mobile sector and the macroeconomy of Ghana. The purpose of this base case is to quantify the current economic environment and serve as a basis for comparison against any policy reform. The base case is composed of three interlinked components:

- **Taxes and fees paid on the provision and consumption of mobile services**  
 In order to estimate this, data was provided by three operators that serve over 90% of the Ghanaian mobile market: Vodafone, MTN and Airtel. Data included the total tax and fee payments, broken down by the type of tax or fee, so the current burden of taxation on operators' revenues could be assessed.
- **Size and economic footprint of the mobile services sector**  
 The GSMA Intelligence database provides data on mobile sector variables such as penetration rates, revenues and number of connections. This is used to estimate the size of the mobile sector in Ghana and to forecast its growth.
- **Size of the macroeconomy**  
 Macroeconomic data comes from the IMF and the World Bank. In particular, the IMF produces forecasts up to 2019 for variables such as Ghanaian GDP and population, which are used as the basis for forecasting other macroeconomic variables in the model.

Using these data inputs, the model is able to estimate a base case scenario that describes what the Ghanaian economy would look like up to 2020 if the taxes and fees were to remain unchanged.

### A.1.2 Introduction of a tax or fee reduction

A tax scenario is considered as a shock to the base case, leading to quantifiable variations in the size and economic footprint of the mobile services sector and the wider economy. The tax scenarios analysed can be in the form of a change in the rate and level of taxes and fees, abolition of current taxes and fees or an introduction of a new tax or fee. The change in policy is assumed to occur in 2015. The tax scenarios analysed in this report are explained in more detail in the following section.

The modelling methodology is shown in Figure 23. The impacts are quantified at the sector level and the economy-wide level. At the sector level, changes to taxes and fees impact prices and consumption of mobile services, and therefore impact the economic activity in the mobile sector. At the economy-wide level, impacts on the mobile services sector influence macroeconomic variables such as GDP and employment, tax revenues and mobile penetration. This is extrapolated onto the wider economy using a set of multipliers and research-based empirical principles.

## Modelling methodology

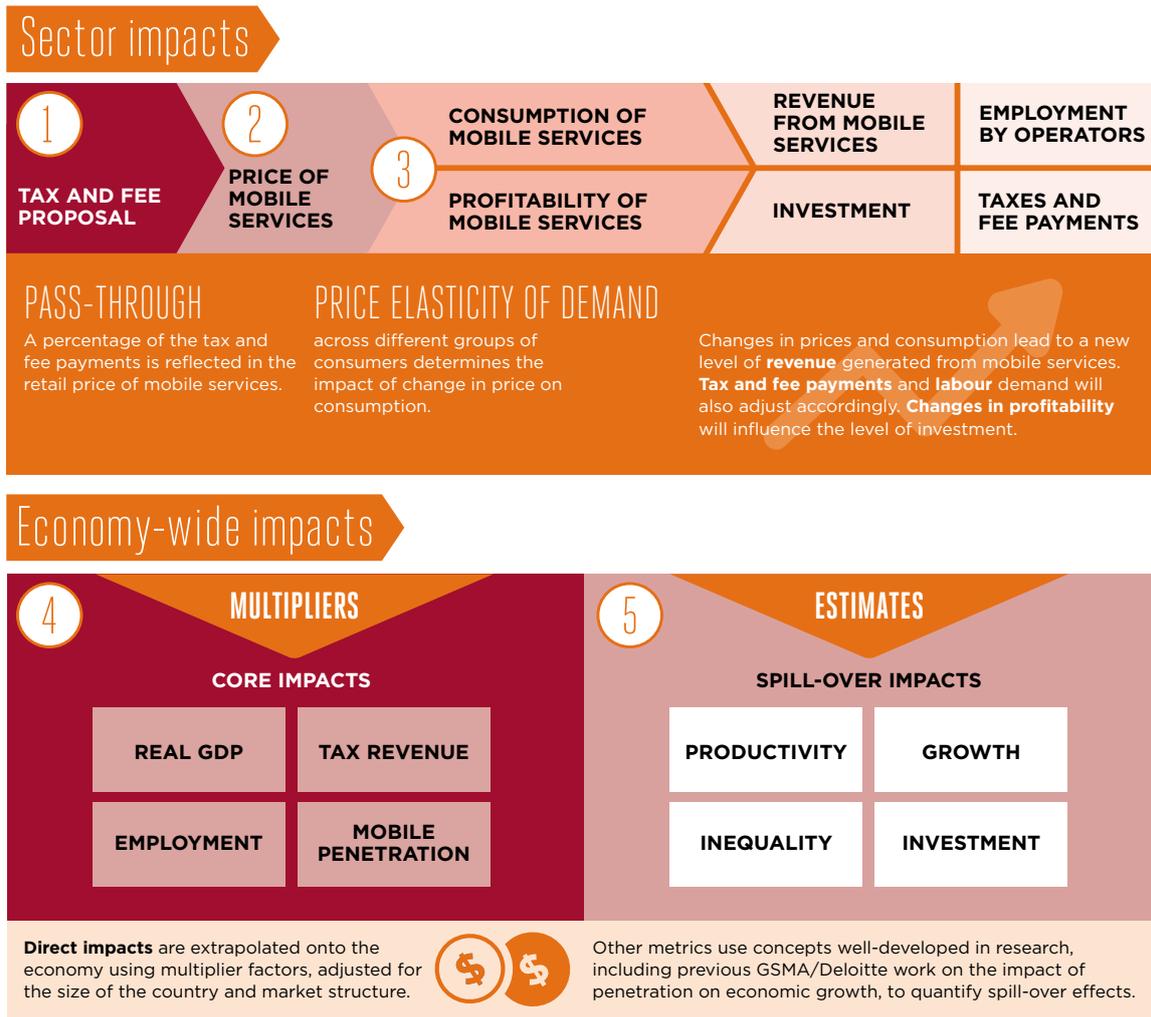


Figure 23

### Steps in the modelling process:

1 The tax or fee change can effect both the price of mobile service and the profitability of each unit sold, depending on the extent to which the tax reduction is passed on to consumers, as opposed to increasing the margin for operators. This is modelled by a pass-through rate, which determines the percentage of the tax and fee payments that is reflected in the retail price of mobile services. All assumptions in the model are described in more detail in the section below; these have been discussed with experts on the Ghanaian market.

2 The price of mobile services determines the level of consumption. In order to estimate this, assumptions are made on the price elasticity of demand, which states how much demand for mobile services change in response to a price change.

3 Changes in prices and consumption alter the amount of revenue generated from mobile services, and tax and fee payments and labour demand adjust accordingly. Changes in profitability affect the level of investment.

4 These sector impacts lead to economy wide impacts, which are estimated based on assumptions regarding the impact of the mobile sector on the wider Ghanaian economy. These effects include the impact on GDP, calculated through a multiplier that links mobile and 3G penetration to economic growth, and the effect on employment, calculated

through a multiplier based on the number of new jobs generated in the mobile sector.

5 The spillover effects are driven by the core economy wide impacts. Changes in GDP, tax revenues, employment and investment lead to changes in productivity and growth.

### A.1.3 Key assumptions behind the model

The outputs of the policy scenarios depend on the assumptions made in the methodology. The assumptions in the model come from a review of academic literature and previous studies in this area. They are discussed in more detail below.

#### Pass-through rates

As illustrated in the first step in the modelling methodology, taxes and fees paid by operators and consumers may be completely or partly passed through to the end-consumer prices. The level of pass-through of taxes and fees to final prices will depend on market power and the price elasticity of demand, among other factors. For this analysis, an average pass-through rate of 1 has been assumed; this is based on conversations with mobile operators.

#### Price elasticity of demand

As illustrated in the second step in the modelling methodology, a change in the price of mobile services leads to a change in the consumption of these services, both in terms of ownership and usage. Consumption changes depend on the price elasticity of demand, that is, the responsiveness of consumers to price changes. The assumptions regarding elasticity of demand are based on a review of studies conducted in a number of developing markets. Based on this review, the elasticity of demand for mobile subscriptions is assumed to be  $-0.83^{47}$ . For those that own mobile devices, demand for mobile and broadband services is more elastic: the elasticity of demand for mobile services is assumed to be  $-0.95^{48}$ ; the elasticity of demand for broadband services has been assumed to be  $-2.2^{49}$ .

#### Employment multiplier

It is assumed that employment within the mobile sector increases in line with the demand for mobile services. The employment multiplier is then used to estimate the impact of a change in employment in the sector on total employment in the economy. The magnitude depends on the economic features of the sector, such as how interconnected it is across its supply chain. The employment multiplier is assumed to be 11.1<sup>50</sup>; that is, for every additional job created within the mobile sector, an additional 11.1 jobs are generated in the wider Ghanaian economy.

#### Market penetration impact

There is substantial evidence in the literature on the impact of mobile penetration on GDP growth, and Deloitte has also conducted its own research in this area. Robust analysis has been conducted by Deloitte into the impact of mobile and 3G penetration on GDP growth; this study analysed the impact of mobile penetration on growth, controlling for factors such as GDP and the advancement of the mobile market. Taking into account Ghana's macroeconomic situation and its moderately developed mobile market, the multiplier associated with mobile penetration is assumed to be 0.14%: that is, a 1% increase in market penetration leads to an increase in GDP growth of 0.14 percentage points<sup>51</sup>. In terms of the impact of internet penetration, it is assumed that a 1% increase in internet penetration increases the GDP growth rate by 0.077 percentage points in African economies<sup>52</sup>.

47. Chabossou et al (2009), UK Competition Commission (2003).

48. Ibid

49. Galperin, H and Ruzzier, C (2013) "Price elasticity of demand for broadband: Evidence from Latin America and the Caribbean", Telecommunications Policy, Volume 37.

50. This figure was based on a number of studies conducted in developing and developed countries: see, for example, Moretti (2010); O2 for ONS (2002); Ovum (2010); Zain, Ericsson (2009); Kaliba et al (2006).

51. For full details of the methodology, see <http://www.gsma.com/publicpolicy/wp-content/uploads/2012/11/gsma-deloitte-impact-mobile-telephony-economic-growth.pdf>

52. Qiang, C. Z. W., Rossotto, C.M., 2009. Economic Impacts of Broadband, in Information and Communications for Development 2009: Extending Reach and Increasing Impact, World Bank, Washington D.C., 35-50.

This model does not model switching between 2G and 3G services and so these impacts are treated separately<sup>53</sup>.

**Total Factor Productivity impact**

The impact on Total Factor Productivity (TFP) is calculated based on the change in GDP, employment and investment. TFP is a measure

of economic productivity that accounts for changes in output over and above those expected as a result of increased employment and investment. It is defined as follows:

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

where it is assumed that  $a = 0.3$  and  $\beta=0.7$  <sup>54</sup>.



## A.2 Results

In this report, a taxation policy simulation model was used in order to assess the impacts of a change in taxation policy on the mobile sector and the wider economy. Three scenarios were addressed and each compared against the base case scenario. The overall findings of each scenario are described in more detail in the sections below, on the assumption that the change in tax policy is implemented in 2015.

the base case, which is particularly prominent given that 3G penetration currently remains low in Ghana compared to leading sub-Saharan African countries. Data services are particularly important to Ghana through allowing the spread of information across the economy, enabling greater productivity, and the current CST is limiting the uptake of these services.

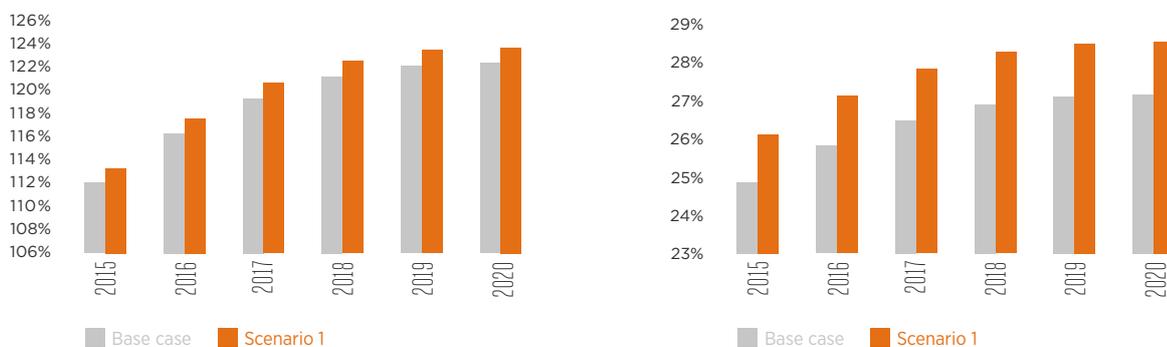
### A.2.1 Scenario 1

#### Scenario 1.1

This first scenario models the impact of abolishing the CST on mobile data whilst maintaining it at 6% on all other services. Removing this tax on data would lead to a large increase in 3G penetration relative to

Removing the CST on data leads to lower costs from using 3G, stimulating both uptake and usage of these services. By 2020, 3G penetration will reach 29%, 5% higher than under the base case of maintaining the CST at 6%. Mobile penetration will also see a slight increase from these new 3G connections, reaching 124% in 2020, 1.12% higher than under the base case.

Mobile (left) and 3G (right) penetration in scenario 1.1 compared to the base case



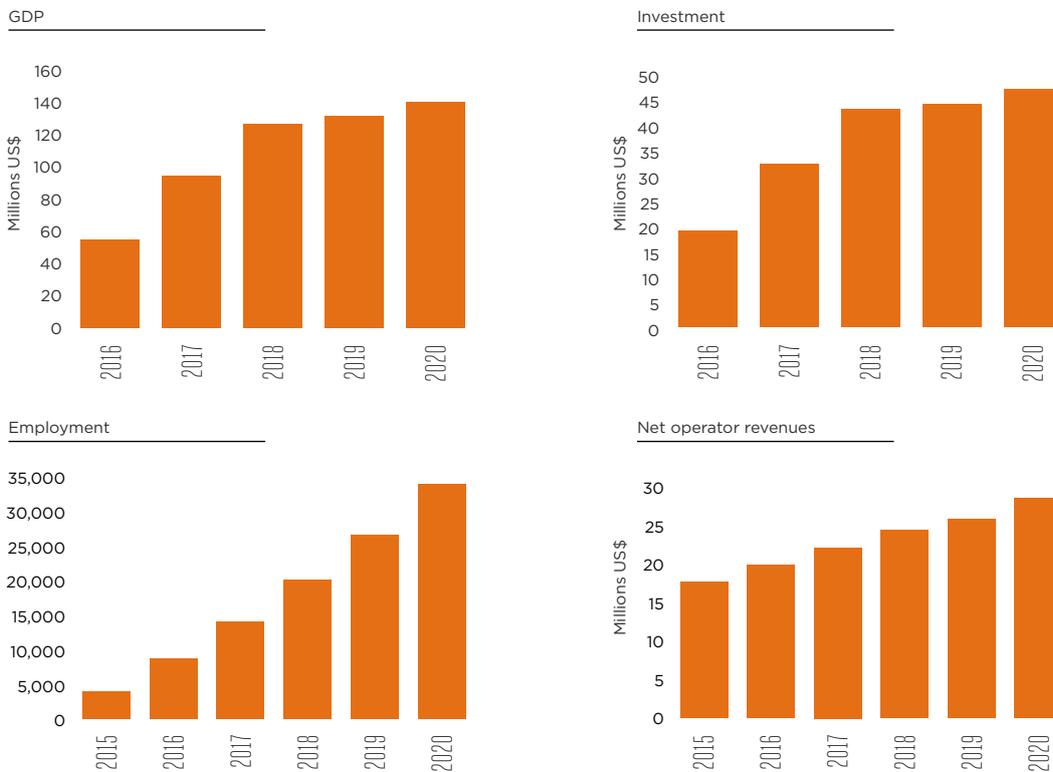
Source: Deloitte analysis based on operator data

Figure 24

53. That is, given that it is not known whether a new 3G subscriber may previously have been a mobile user, this is treated as an increase in internet penetration only, not as an increase in mobile and internet penetration.  
 54. Bassanini A and Scarpetta S (2001), "The Driving Forces of Economic Growth: Panel Data Evidence for the OECD countries".

The large increase in 3G will consequently affect the wider Ghanaian economy. Firstly, increased usage of 3G will raise operator revenues, which will be \$28.6 higher relative to the base case in 2020. This will incentivise an additional \$47.3m investment across the Ghanaian economy as opportunities for both domestic and foreign investment arise. Moreover, removing constraints on operator revenues would allow for investment in infrastructure, improving both coverage and quality of 3G services. These opportunities will employ an additional 3,400 Ghanaians in 2020, whilst the increase in economic activity will be reflected by a 0.19% increase in GDP relative to the base case in 2020. Proliferation of 3G services will also allow for Ghana to become 0.12% more productive in 2020 relative to the base case.

Difference between base case and scenario 1.1 for selected variables

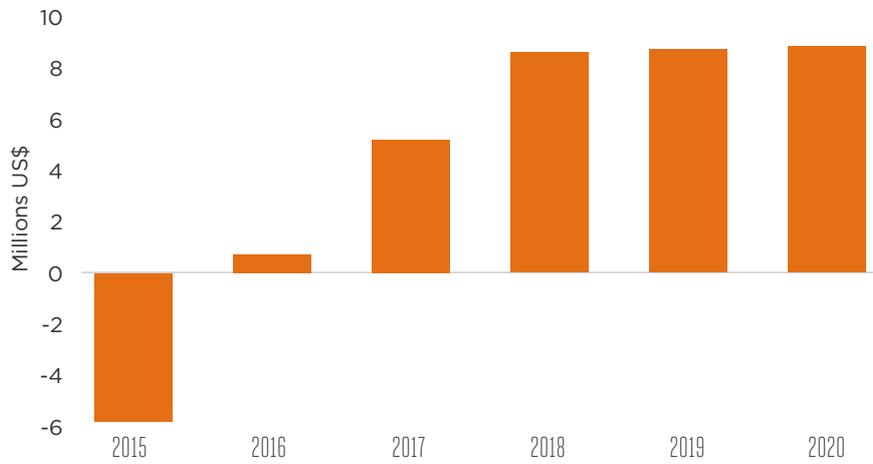


Source: Deloitte analysis based on operator data

Figure 25

Together with these economic benefits, the Ghanaian government will benefit from an improved long-run fiscal position through lowering the CST on data. As to be expected, tax revenues would fall in 2015 relative to the base case, as the lower tax rate reduces overall receipts on mobile data. However, as consumers respond to the reduced cost of data services, this will increase the tax base over time. Indeed, the government will reach revenue neutrality by 2017, with tax revenues \$8.83 billion higher than the base case in 2020. Over the period, this represents a net benefit of \$26.3 million to the government balance from 2014-2020.

Tax revenues in 2020 relative to the base case



Source: Deloitte analysis based on operator data

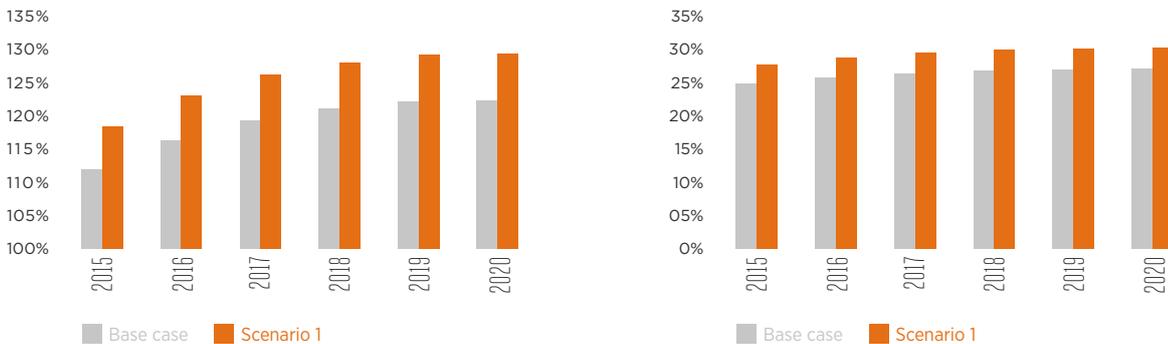
Figure 26

Scenario 1.2

This scenario assesses the impacts of removing the 6% Communications Service Tax (CST) on all mobile services. Mobile services contribute significantly to the Ghanaian economy both through basic communication and data capability, and the current CST is constraining the economy-wide benefits associated with the provision of these services.

Abolishing the CST on mobile services leads to a reduction in the costs of purchasing and using a handset for SMS, calls and 3G data. This increases demand for handsets, resulting in both higher mobile and 3G penetration rates. By 2020, mobile penetration will reach 129.5%, 5.5% higher than if the CST was maintained at 6%. Moreover, the 3G penetration rate will expand to 30%, 2.8 percentage points higher than if the CST remains at the current rate until 2020.

Mobile (left) and 3G (right) penetration in scenario 1 compared to the base case

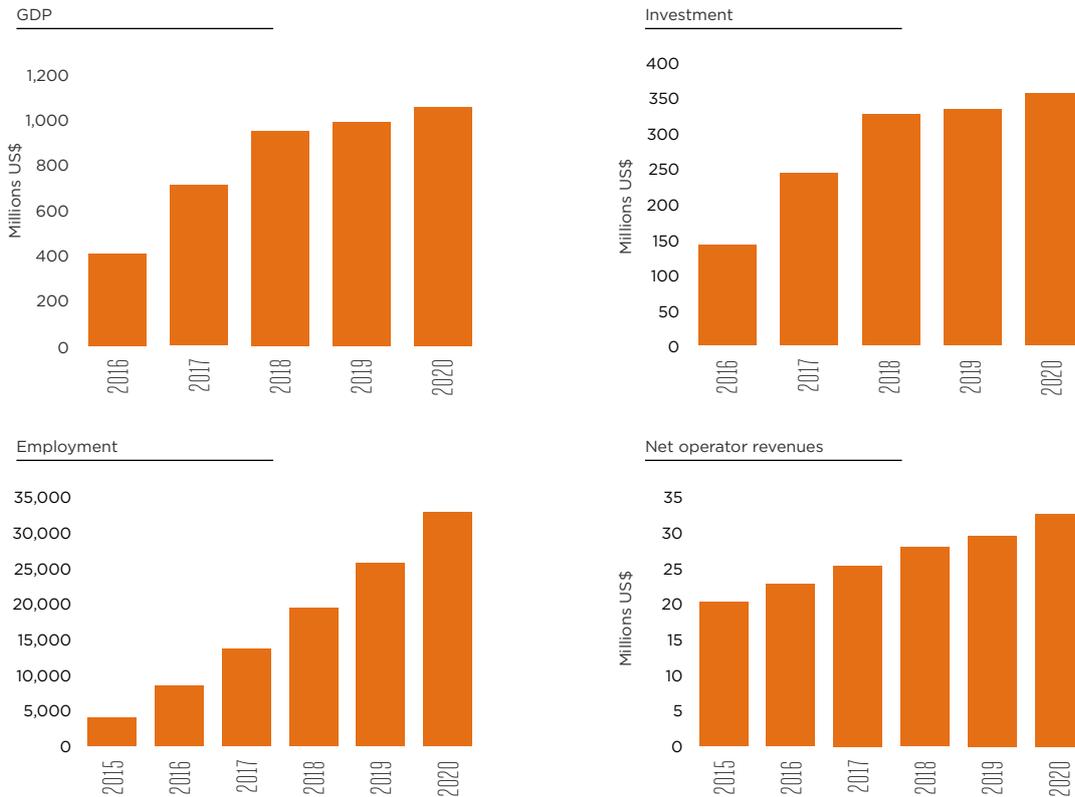


Source: Deloitte analysis based on operator data

Figure 27

As a consequence of increased mobile and 3G penetration, operator revenues will increase: by 2020, they will be US\$32.6 million better off if the CST is abolished versus the base case. This will have a wider impact on the Ghanaian macroeconomy. Significantly, GDP will be US\$1.06 billion higher in 2020 after the tax removal, whilst 32,600 more Ghanaians will be employed. Furthermore, the elimination of the CST tax rate tied with increased demand for mobile services will incentivise an additional 1.45% investment into the Ghanaian economy by 2020, contributing to an increase in productivity by 0.84% across the period, compared to the base case.

Difference between scenario 1 and base case for selected variables

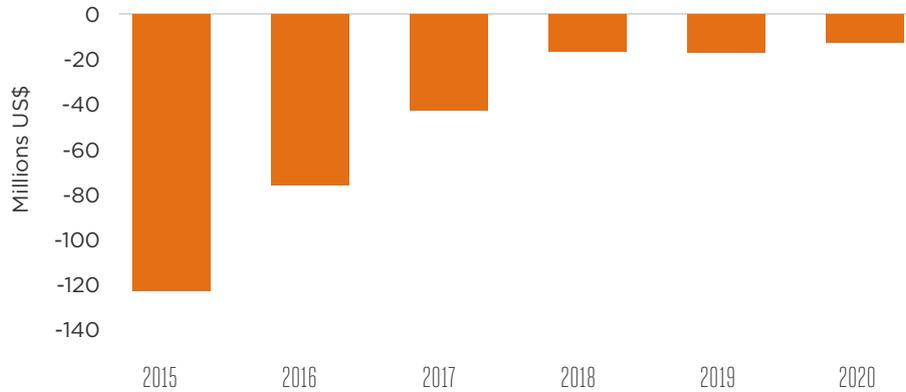


Source: Deloitte analysis based on operator data

Figure 28

Despite these economic benefits, the Ghanaian economy would face lower long-run tax revenues from removing the CST. However, after a large initial decline following the abolition of the tax, the rise in consumer expenditure (due to the reduction in cost of mobile services) and subsequent economic growth results in a reduction in the difference between the base case and this policy choice, such that tax revenues are only 0.13% lower than the base case in 2020. Moreover, rebalancing the tax structure on mobile phones can result in clear benefits across the Ghanaian economy, which may justify lower tax revenues.

Government tax revenues in scenario 1 relative to the base case



Source: Deloitte analysis based on operator data

Figure 29

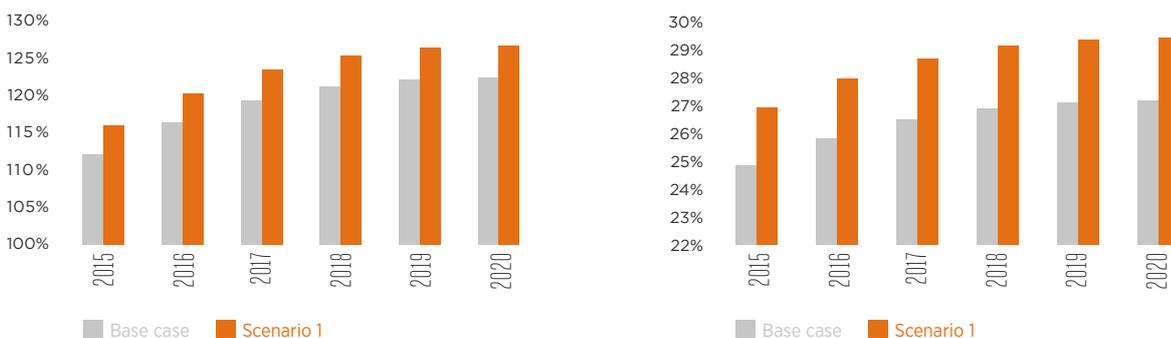
Scenario 1.3

This scenario represents a compromise between those analysed above, with the aim of realising large wider-economy benefits whilst simultaneously providing greater protection to medium-term government revenues. Consequently, this scenario models the removal of the CST on data and the reduction of the CST to 3% on mobile voice services from the current level of 6%.

Removing the CST on data, whilst reducing it on mobile voice, reduces the cost of usage

for both of these services. This increases penetration rates for both mobile and 3G as consumers respond to lower costs. By 2020, mobile penetration will be 3.44% higher than under the base case, reaching a level of 126.7%. 3G penetration will increase more significantly, however, due to the complete removal of the CST on these services. 3G penetration will climb to over 29% in 2020, a notable increase of 8.28%, enabling Ghana to attain the economy-wide benefits associated from the spread of internet technology.

Mobile (left) and 3G penetration (right) relative to the base case, 2020

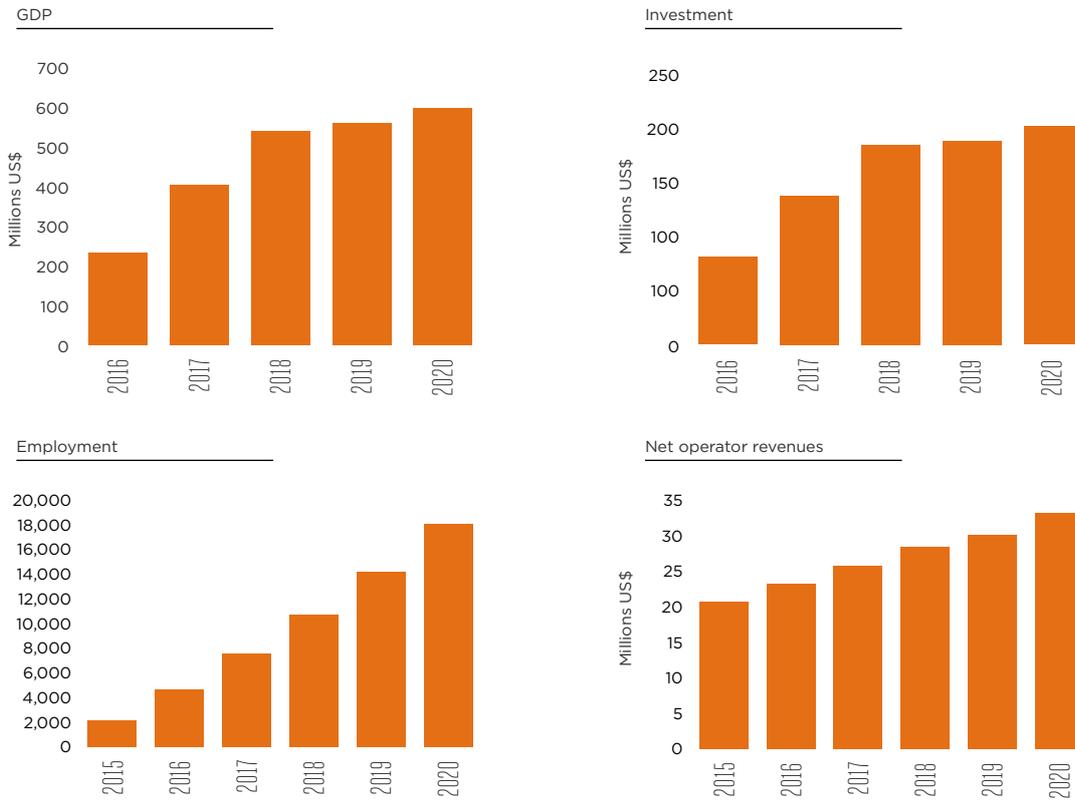


Source: Deloitte analysis based on operator data

Figure 30

These large increases in mobile penetration will enable operators to increase revenues: by 2020 total sector revenue will be \$33.1m higher than under the base case. This will incentivise an additional 0.82% investment into the Ghanaian economy, an increase of \$202m. Removing limitations on operator revenues will also allow increased investment in mobile and 3G infrastructure, whilst enabling an increase in employment by over 18,000 Ghanaians relative to the base case in 2020. The increase in 3G and mobile penetration rates will also allow Ghana to become 0.48% more productive in 2020, whilst the rise in economic activity will be demonstrated by a relative output increase of 0.82% in 2020, or \$598 million.

Difference between scenario 1.3 and the base case for selected variables

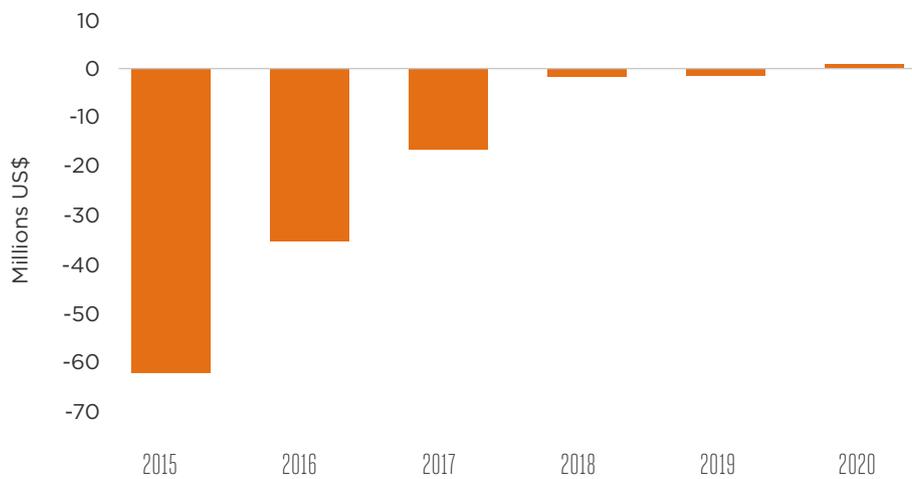


Source: Deloitte analysis based on operator data

Figure 31

Under this scenario, the Ghanaian government would also achieve a greater balance between strong economic performance and tax revenue protection in the medium term. Despite initial losses, the increase in market penetration and economic growth in the years following implementation would consistently reduce the deficit to the base case. Indeed, by 2020, tax revenues would be \$0.67m higher than under the base case, demonstrating the opportunity to offset any initial losses. In any case, the clear economy-wide benefits associated with the proliferation of 3G and mobile telephony provide a strong justification for any short-term revenue losses.

### Tax revenues relative to the base case, 2020



Source: Deloitte analysis based on operator data

Figure 32

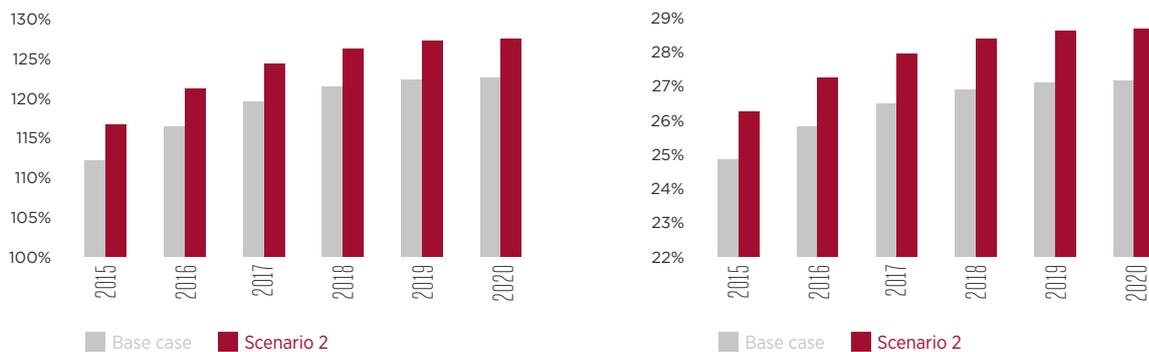
#### A.2.2 Scenario 2

The second scenario models the impact from removing the customs duty on handsets, which currently exists at 20%.

The abolition of the customs duty will directly reduce the cost of purchasing both 2G and 3G handsets. Therefore, demand for all handsets will increase, raising penetration rates due to the increase in 2G and 3G connections. Compared to the base case, by 2020, there will be 3 million more handset

purchases, of which 0.93 million will be 3G enabled. Assuming that half of these purchases represent new connections for the 50% of the population that do not currently own mobiles, the number of connections would increase by 1.5 million, about 4%, relative to the base case. 3G penetration could increase to almost 30%. Hence the abolition of the customs duty on handsets would allow the Ghanaian government to achieve the economy-wide benefits associated with the proliferation of mobile technology.

### Mobile (left) and 3G (right) penetration rates in scenario 2 compared to base case

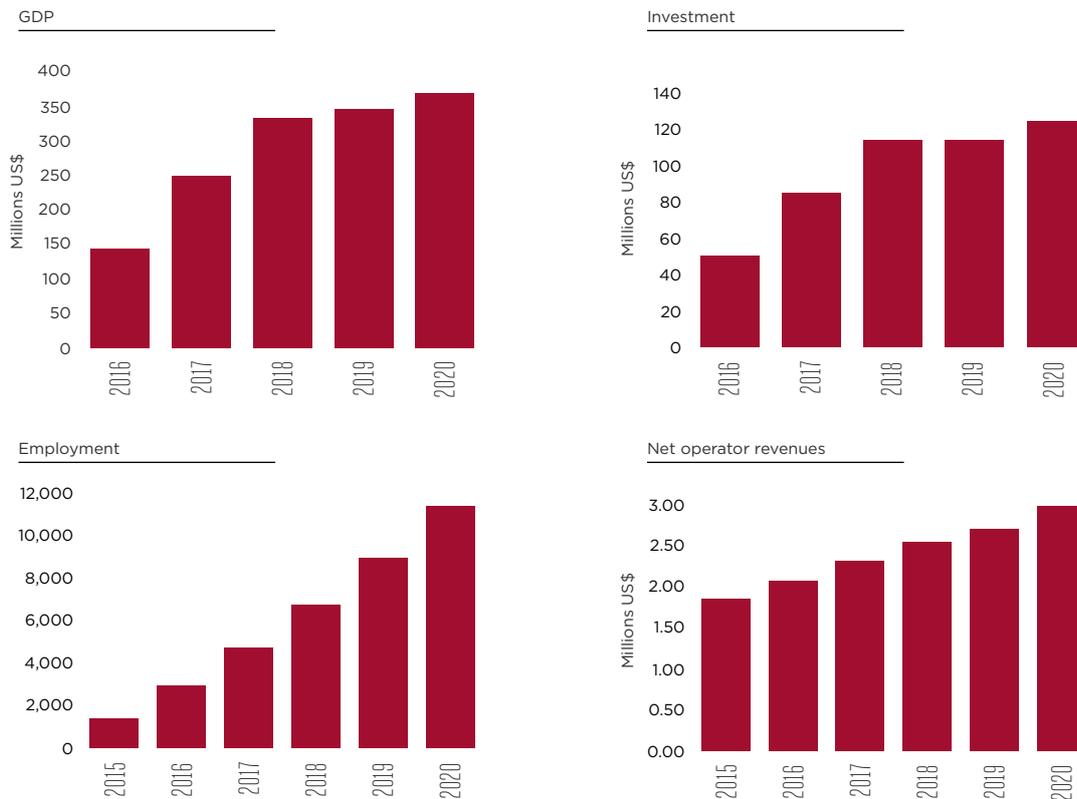


Source: Deloitte analysis based on operator data

Figure 33

As a result of the increase in 2G and 3G penetration rates, operator revenues will increase by US\$3.0 million, by 2020, relative to the base case. These revenue increases, together with the increase in consumer demand following the removal of the customs duty, will also encourage an additional US\$120 million of investment into the Ghanaian economy by the end of the forecast period, an increase of 0.5% from the base case. This will lead to a 0.3% increase in productivity, while almost 11,000 additional Ghanaian workers will be employed in 2020. Consequently, Ghanaian GDP will increase by US\$370 million versus the base case in 2020, an improvement of 0.5%.

### Difference between scenario 2 and the base case for selected variables

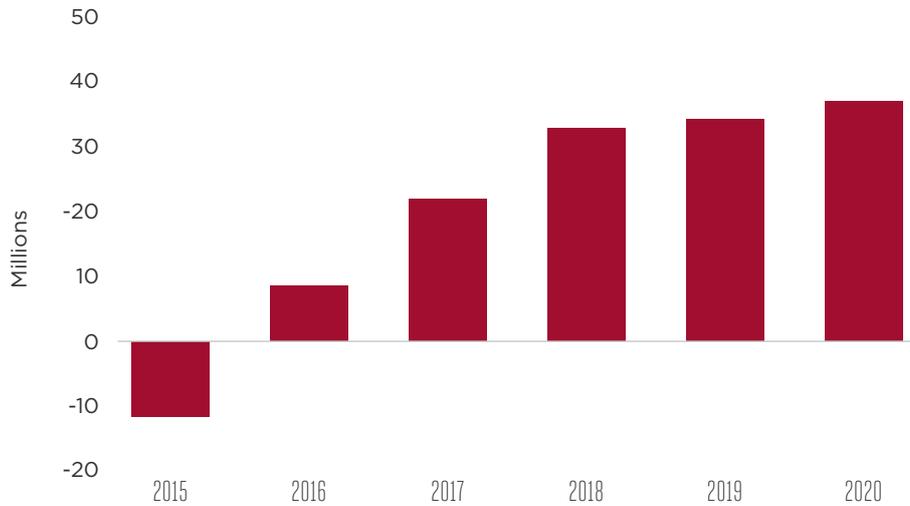


Source: Deloitte analysis based on operator data

Figure 34

Scenario 2 also results in higher tax revenues by 2020. Despite an initial reduction in tax revenues of US\$11 million in 2015 relative to the base case (following the removal of the customs duty), by 2016 tax revenues from this scenario outweigh those of the base case by US\$8 million. Indeed from 2015-2020, the removal of the customs duty contributes to an aggregate gain of US\$120 million in tax revenue for the Ghanaian government over the base scenario, thanks mainly due to the increase in consumer demand for handsets following the abolition of the tax.

Tax revenues relative to the base case, 2020



Source: Deloitte analysis based on operator data

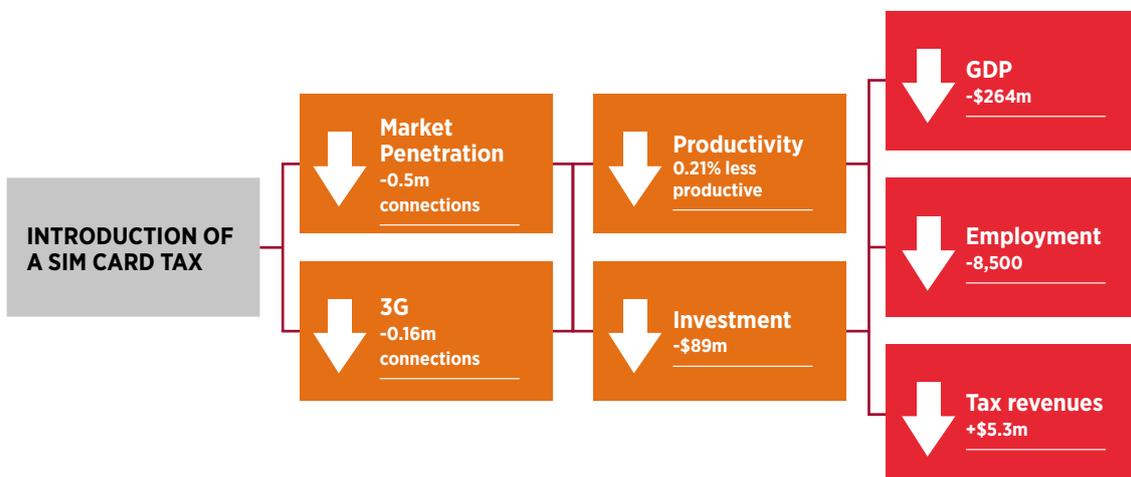
Figure 35

**A.2.3 Further analysis: The economic impact from the introduction of a GHS 5 tax per SIM card activation**

In contrast to the positive impacts of reducing taxation on mobile, the introduction of additional taxes on the sector would limit digital inclusion and economic growth. The possibility of introducing a tax on SIM card activation has been raised in Ghana, with the

National Identity Authority suggesting a charge of GHS 5 on the registration of SIM cards. By introducing a charge on SIM cards, handsets become more expensive, resulting in lower penetration rates compared to the base case scenario, with a negative impact on productivity and economic growth.

Economic impacts of introducing a charge on SIMs, in 2020



Source: Deloitte analysis based on operator data

Figure 36

Reduced demand for mobile phones and as a result lower penetration: total connections will fall by 0.5 million compared to the base case, with 0.16 million of these being lost 3G connections.

This lower penetration will lead to Ghana being 0.21% less productive. This could cost the economy US\$264 million in GDP and 8,500 jobs by 2020.

Although the government benefits from increased tax revenues from the mobile sector, this is offset by the reduction in economic growth and the loss of tax revenues from more broad-based taxation. While the net effect on tax revenues remains positive by 2020, the value of these additional revenues is falling over time.

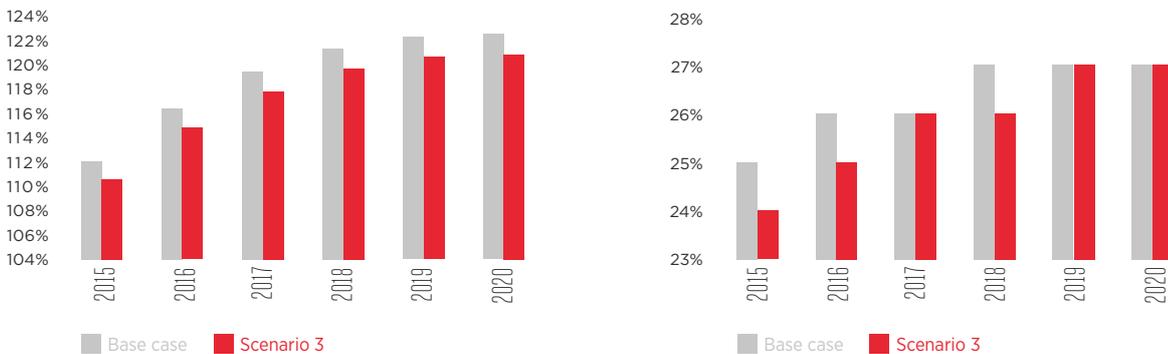
**Introducing a SIM card tax limits digital inclusion in Ghana through higher retail prices and reduced investment incentives. Increases in government revenues come at the cost of up to US\$264 million annually in lost economic growth, and decreases in productivity, investment and employment relative to the base case.**

### Results

The introduction of the SIM card tax makes owning a handset more expensive as it directly increases the cost of activation. Therefore, demand for handsets will decrease as a result and penetration rates will see an initial fall in the year that the tax is introduced, relative to the base case. Over time, both mobile and 3G penetration will continue to grow,

yet these follow a lower path than that of the base case scenario. Indeed by 2020, there will be 0.50 million fewer 2G connections and 0.16 million fewer 3G connections (a fall of 1.88%) relative to the base case. Hence the introduction of the SIM card tax would limit the ability of the Ghanaian economy to realise the widespread benefits of mobile technology.

Mobile and 3G penetration rates



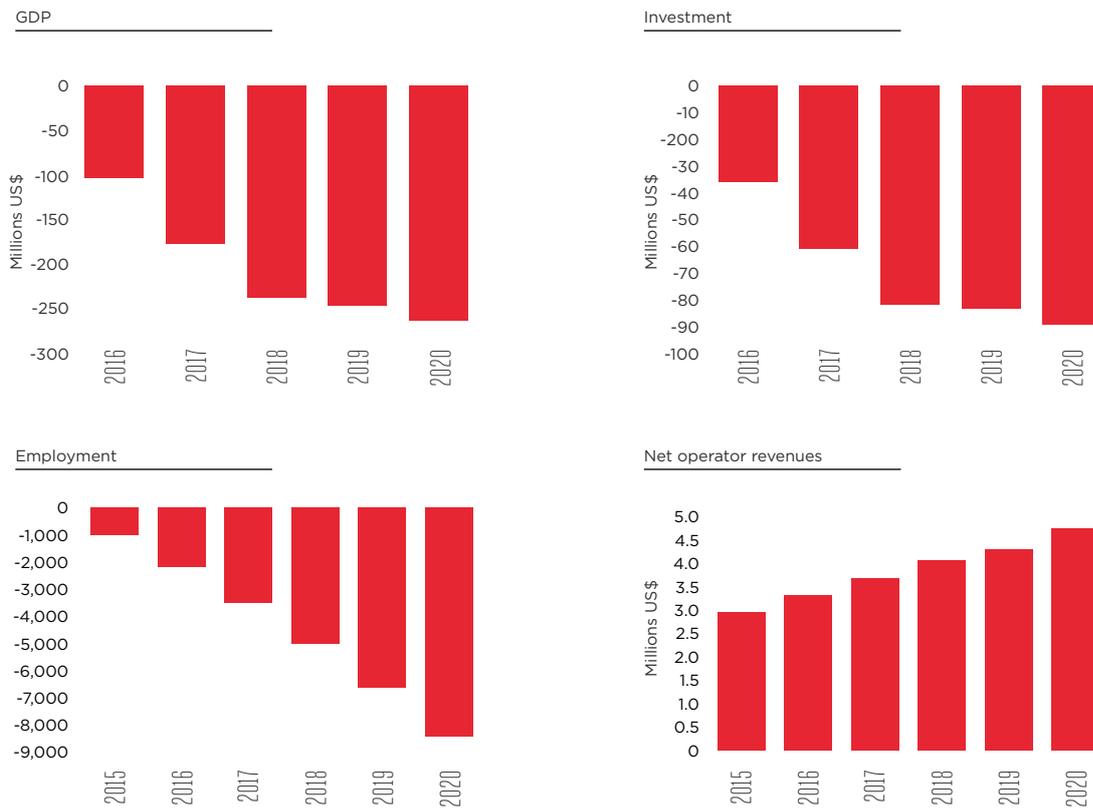
Source: Deloitte analysis based on operator data

Figure 37

Although the higher prices resulting from the SIM card tax would benefit operator revenues by US\$4.7 million in 2020 relative to the base case, the SIM card tax would have widespread negative consequences for the Ghanaian economy. The introduction of a new tax would disincentivise further investment in the mobile sector, whilst reduced economic development (following reduced proliferation of mobile handsets and quality of service) relative to the base case may constrain investment opportunities elsewhere. Consequently,

investment would fall by US\$90 million relative to the base scenario, a decrease of 0.36%, whilst 8,500 fewer Ghanaian workers would be in employment by 2020. This relative reduction in investment would also lead to a 0.21% decrease in productivity versus the 2020 base case, further constraining the Ghanaian economy. Overall, this reduced economic activity would also be reflected in Ghanaian GDP figures, which would fall by US\$264 million in 2020 relative to the base case scenario.

Difference between scenario 3 and the base case for selected variables



Source: Deloitte analysis based on operator data

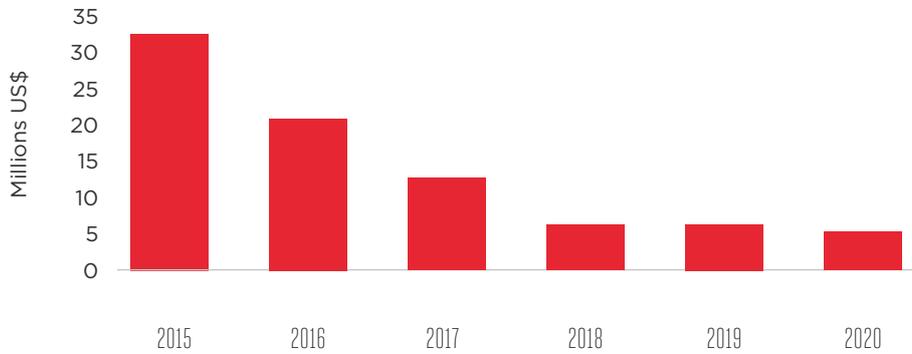
Figure 38

In the first year following the introduction of the SIM card tax in 2015, the government will benefit from increased tax revenues. However, reduced economic activity in further years will reduce the difference compared to the base case from 2016 onwards. Moreover, although

the Ghanaian government stands to earn 5.32 million more revenue in 2020 than under the base case, this would come at the cost of consumers and the Ghanaian economy as a whole in the long run, with reduced GDP, productivity, investment and employment figures.

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Tax revenues in scenario 3 relative to the base case



Source: Deloitte analysis based on operator data

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Figure 39





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