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# Mobile telephony and taxation in Kenya

# Contents

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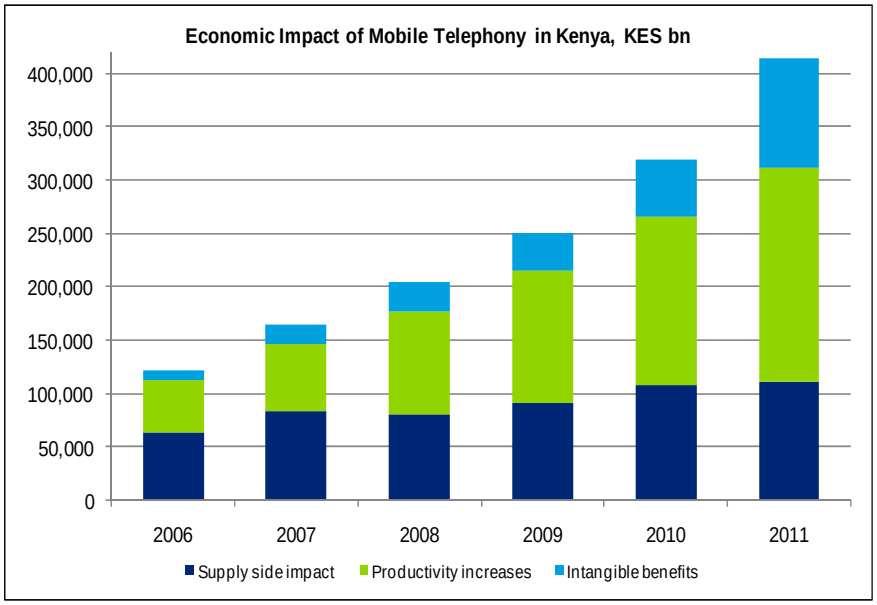
# Executive Summary

Kenya's mobile market has grown significantly over the last few years. Competition has increased with the introduction of two additional Mobile Network Operators ("MNOs"), and this has contributed to a price drop of over 70% in the last four years. Mobile coverage has increased to 96% of the population, and there are now over 3,500 3G sites in the country. As a result, in Kenya, consumers, businesses and government continue to benefit from the positive developments in the mobile sector.

> ***"The contribution of the mobile sector to the Kenyan economy represents over 5.6% of GDP, and up to a further a 1.9% from intangibles"***

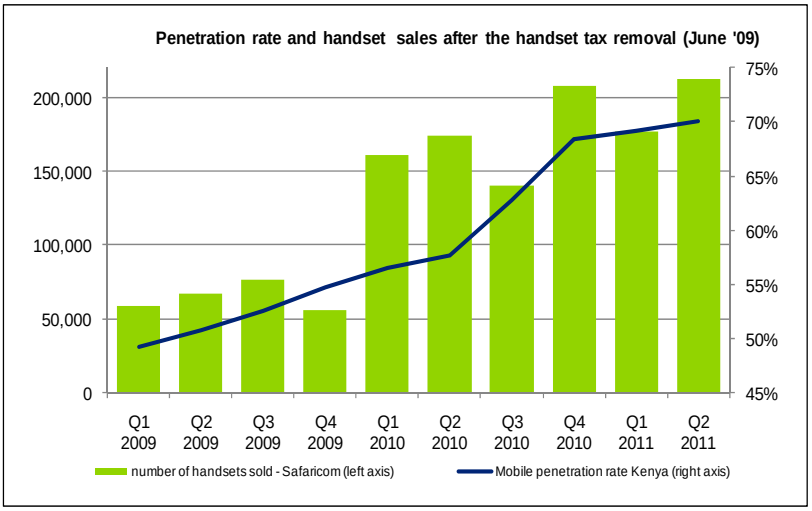
In 2011 the mobile communications industry contributes over KES 300bn and up to a further KES 100bn from intangible benefits to consumers. Additionally, these estimates indicate that in 2011 the mobile communication industry as a whole employs almost 250,000 people in Kenya.

Over the last five years, the contribution of mobile telephony to the Kenyan economy has grown by almost 250%, while mobile-related employment has increased by 67%. As a result of improved coverage, quality of service and affordability, the productivity impact of mobile telephony on the Kenyan economy is estimated to have increased by a similar scale.




This also highlights the importance of the mobile sector to the productivity of the economy as a whole. MNOs contribute to such increases by providing services such as Mobile banking, M-agriculture and M-education, and contributed to a number of social projects in Kenya's rural areas. Here, mobile network installation often leads the developments of roads and electricity provision, and these installation costs are sustained directly by the MNOs.

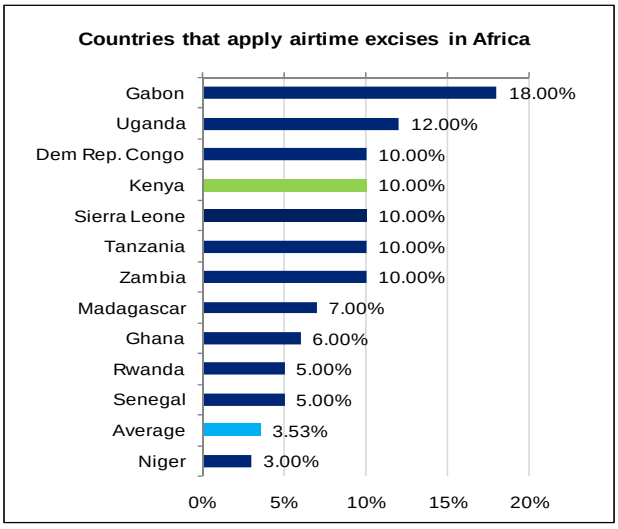
*"The experience of the Kenyan government's removal of taxation on handsets indicates there could be significant benefits for consumers from the removal of mobile specific taxes"*




In June 2009 the Kenyan government, recognising the importance of enhancing access to mobile telephony, decided to exempt mobile handsets from VAT. This has generated significant benefits for many Kenyans. Handset purchases have increased by more than 200% since the removal of VAT and penetration rates have increased substantially, from 50% to 70%. This successful policy confirms that consumption taxes can have a significant impact on consumer behaviour in Kenya.

*"When compared to the Kenyan income per capita, mobile telephony costs, including Kenya's airtime tax, still represent a significant proportion (7.5%) of income, and may not be affordable to the poorer sectors of the population"*

Mobile consumers in Kenya are still impacted by a specific tax on airtime. This tax is levied at 10% and is additional to VAT. This is amongst the highest in Africa, and contributes to raise consumer tax as a proportion of the total cost of mobile ownership in Kenya to 21%, well over both the African and the global average. This tax is regressive in nature and may signal the government's intention to discourage consumption of mobile services. This mobile-specific taxation contributes to raising the total



cost of mobile ownership in Kenya to $58 per year per user.

> ***"Market, regulatory and taxation pressures represent a significant challenge for MNOs in Kenya and potentially constrain network and service investment"***

MNOs in Kenya operate in a challenging investment environment and are subject to a number of market and regulatory pressures. Falling prices have lead to decreasing ARPU levels for MNOs, and three out of four MNOs are receiving negative returns. Additional pressures on investment and profitability that MNOs are facing include the high civil works costs sustained by MNOs to set up sites in rural areas, unequal treatment compared to other industries with regards to input costs such as fuel, regulatory decisions affecting retail prices, as well as a high corporation tax and a range of additional taxes on their revenues, turnover and inputs, including a new tax for a Universal Service Fund ("USF").

> ***"In 2011, MNOs in Kenya will pay approximately KES 41 billion to the government in taxes, regulatory and spectrum fees. This represents an increase of 33% compared to 2008"***

Of particular concern to MNOs' investment in the country's network are custom duties applying to the network inputs required for the operation of mobile network, and spectrum fees. These are set in a way that may discourage investment, as fees increase with the number of sites set up by MNOs. Also of concern to MNOs is a recent government's decision to create a USF for the promotion of next generation networks in Kenya. Despite MNOs contributing 0.5% of their turnover to the fund, they have reported a lack of transparency on the fund management and on the fund's investment decisions, which has generated significant uncertainty for their investment.

The Kenyan government has successfully implemented a taxation policy that has promoted the benefits of the mobile telephony on the economy and on consumers. To ensure that benefits continue to be delivered to consumers and to businesses, the government could consider the potential benefits from a revised approach to mobile-specific taxation and regulatory policy.

MNOs make a significant contribution to the government's tax receipts despite the current difficult economic climate and the challenging cost conditions and uncertainty under which they operate in Kenya. Any further increases in this tax burden could have negative impacts on investment, product development, the financial contribution made by MNOs to community projects and on the ability of MNOs to retain current levels of employment.

# 1 Introduction

This paper was commissioned by the GSM Association ("the GSMA") and follows two previous studies on the economic impact of mobile telephony and taxation in Kenya, carried out by Deloitte and by the GSMA[1]. This report is part of a wider Deloitte/GSMA study on global mobile taxation trends[2].

These previous studies described the significant economic impact generated by mobile telephony in Kenya through effects on the supply side of the economy, employment, increases in productivity and benefits gained by Kenyan consumers. They also argued that removing mobile-specific taxation would provide benefits to consumers, to the economy and to the government.

This paper revises the analysis of the beneficial impact of mobile telephony for Kenyan people and for the Kenyan economy in the last three years. It also discusses the positive effects that removal of certain mobile specific taxes has had on the economy, and describes the high level of taxation for consumers and MNOs that still applies in Kenya.

## 1.1 Mobile communications in Kenya in recent years

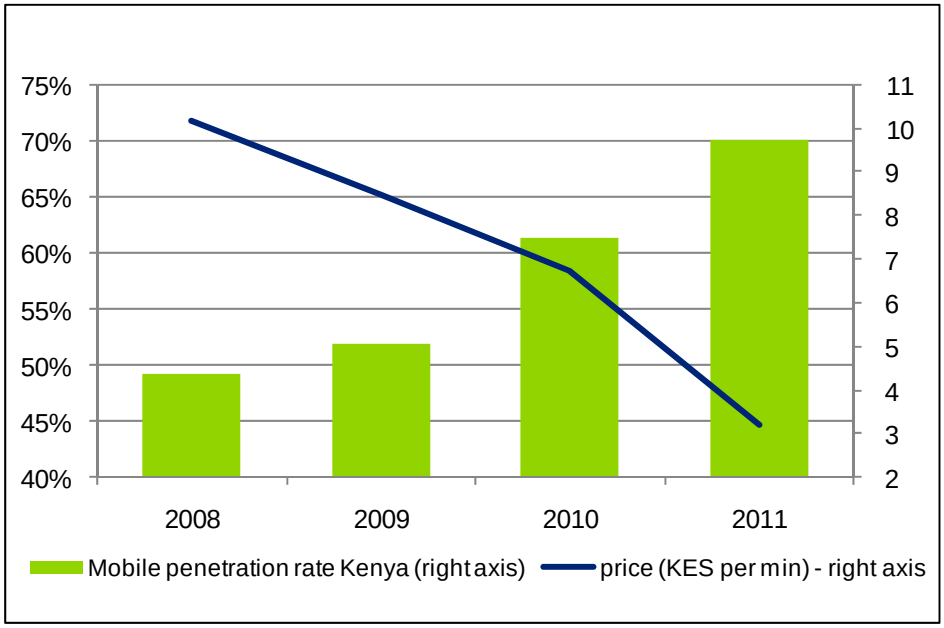
Kenya's mobile market has changed significantly over the last few years with the introduction of the third and fourth MNOs, Yu and Orange. MNOs' networks now cover 96% of the population, and intense price competition has seen prices fall by over 70% in the last four years, leading to a significant increase in usage levels.

Another recent positive development was the government's policy on the partial reduction of mobile specific taxation. Recognising that handset prices represented a barrier to development of the sector, the Kenyan government exempted mobile handsets from VAT as of June 2009. Penetration levels have reached 70% in early 2011, a positive improvement from the 50% level only three years ago. Consumers are also increasingly benefiting from high value mobile service offerings such as M-banking, which have opened up opportunities for previously unbanked Kenyans. Figure 1 shows the significant reduction in call prices and increase in penetration over the last three years.

[1] "The economic impact and taxation of mobile telecommunications in East Africa", Deloitte/GSMA, February 2007, and "Taxation and the growth of mobile in East Africa – Making Connections", Deloitte/GSMA, 2008.

[2] Separate Deloitte/GSMA reports on the Global Mobile Tax Review 2011, Surcharge on International Inbound Termination and on Croatia and Bangladesh will be published in parallel to this report.

**Figure 1: Positive developments in the Kenyan mobile market**




*Source: Wireless Intelligence and data from MNOs*

Although the marked decreases in call prices as a result of increased competition have provided significant benefits for consumers in recent years, these falling prices have also led to decreasing Average Revenue Per User ("ARPU") levels for MNOs and three out of four MNOs receiving negative returns.

## 1.2 This report

This report presents the results of the updated analysis on the economic impact of mobile telephony and the impact of mobile specific taxation in Kenya, and is structured as follows:

- Section 2 presents the impact of mobile telephony in Kenya on Gross Domestic Product ("GDP"), productivity, employment and consumer benefits.
- Section 3 analyses taxation of the mobile telephony industry in Kenya.

Appendix A describes in more detail the methodology used to calculate the economic impact of mobile telephony and mobile-specific taxation, and the data and assumptions employed in the study.

# 2 The economic impact of mobile telephony in Kenya

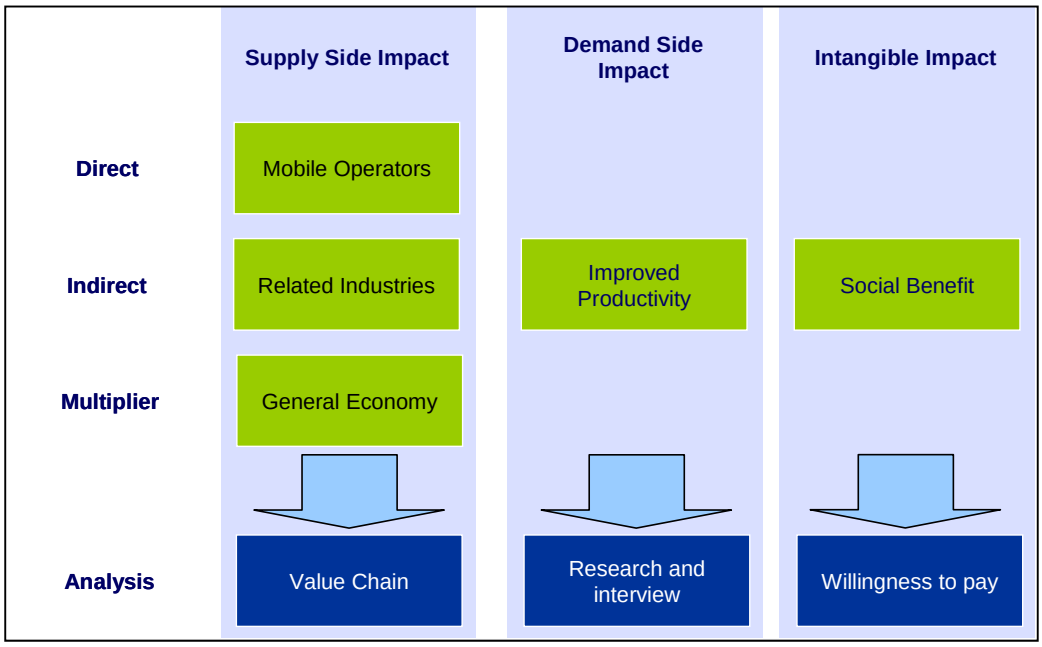
Mobile telephony in Kenya generates significant economic impact through effects on the supply side of the economy, employment, increases in productivity and benefits gained by Kenyan consumers. This section estimates the size of these impacts in the last four years.

## 2.1 Approach to estimating the economic impact

As illustrated in Figure 2, the economic impact of mobile telephony in Kenya is estimated by quantifying both the supply and demand side impacts:

- For the supply side impact, the analysis focuses on the flow of funds across the mobile supply chain to estimate the value-add created by the MNOs and other participants in the mobile supply chain. An economic multiplier was added to this to capture the 'knock-on' impact to the wider economy.
- For the demand side impact, the increase in productivity that occurred through the use of mobile telephony for business purposes was estimated.
- An additional estimate was also made of the intangible and social benefits. This reflects the potential consumer value of the service above the price they pay.

**Figure 2: Structure of the analysis of economic impact on GDP and employment**




*Source: Deloitte*

This analysis was undertaken using publicly available statistics, company accounts and interviews with Safaricom and Airtel. By combining supply-side and demand-side analysis, it is possible to

estimate the GDP contribution, employment created and taxation paid in Kenya over the period 2008 to 2011.[3]

## 2.2 Impact on the supply side of the economy

To calculate the benefits to the supply side of the economy, the value add created by the mobile communications industry was estimated. The 'leakages' from the system were also estimated, i.e. what percentage of any shilling spent will remain within the national economy to be spent in the next round and used this to isolate the impact on the Kenyan economy from the total international impact of the mobile communications industry.

The value add of the MNOs in Kenya is estimated to provide a direct contribution of KES 50,607m in 2011 to the Kenyan economy. The breakdown by category is provided in Table 1 below.

**Table 1: Value add of MNOs (excluding multiplier effect), KES millions**

| Value add | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 |
|---|---|---|---|---|---|---|
| Employee wages and benefits | 2,630 | 3,798 | 4,048 | 4,932 | 5,659 | 5,558 |
| Contractors | 34 | 81 | 31 | 28 | 29 | 29 |
| Taxes and regulatory fees | 18,875 | 23,662 | 27,217 | 32,581 | 38,216 | 40,831 |
| CSR | 449 | 310 | 262 | 274 | 354 | 387 |
| Dividends | 1,795 | 2,400 | 2,025 | 3,326 | 3,802 | 3,802 |
| **Total** | **23,783** | **30,251** | **33,583** | **41,141** | **48,061** | **50,607** |

*Source: Deloitte analysis based on data provided by MNOs, interviews and analysis of company accounts*

Tax and regulatory fees are by far the biggest element of the value add generated by the industry. In 2011, MNOs in Kenya will pay approximately KES 41 billion to the government in taxes and regulatory fees, this is an increase of 33% from the 28 billion paid by MNOs in 2008. Taxation results are discussed in more detail in Section 3.

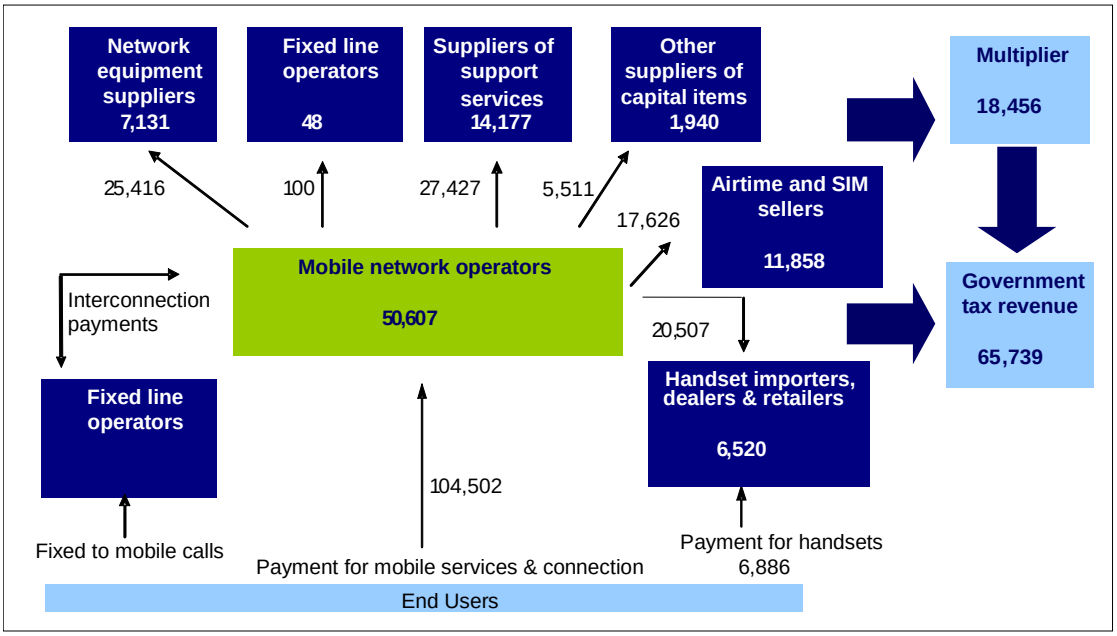
Revenue flows from MNOs to other players in the industry were then analysed, and the quantity translated into further value add[4]. The estimates of value add include the multiplier effect on the wider-economy which is assumed to be 20% of value-add[5]. The result of this calculation is shown in Figure 3 below.

[3] Data relating to previous years was taken from previous Deloitte/GSMA studies quoted in footnotes 1 and 2.

[4] Details on value add margins, percentage of revenue translated into value add, are contained in the assumptions appendix.

[5] The value of multiplier chosen for Kenya is discussed in Appendix A.1.1.3

**Figure 3: Mobile value chain in Kenya in 2011, KES millions**




*Source: Deloitte analysis*

The figures next to the arrows represent the flow of money from one group to another. The figures inside the boxes represent the value add by each group. These value add figures relate solely to the domestic economy. Table 2 shows the calculation of value add.

**Table 2: Calculation of value add from mobile communications in Kenya in 2011, KES millions**

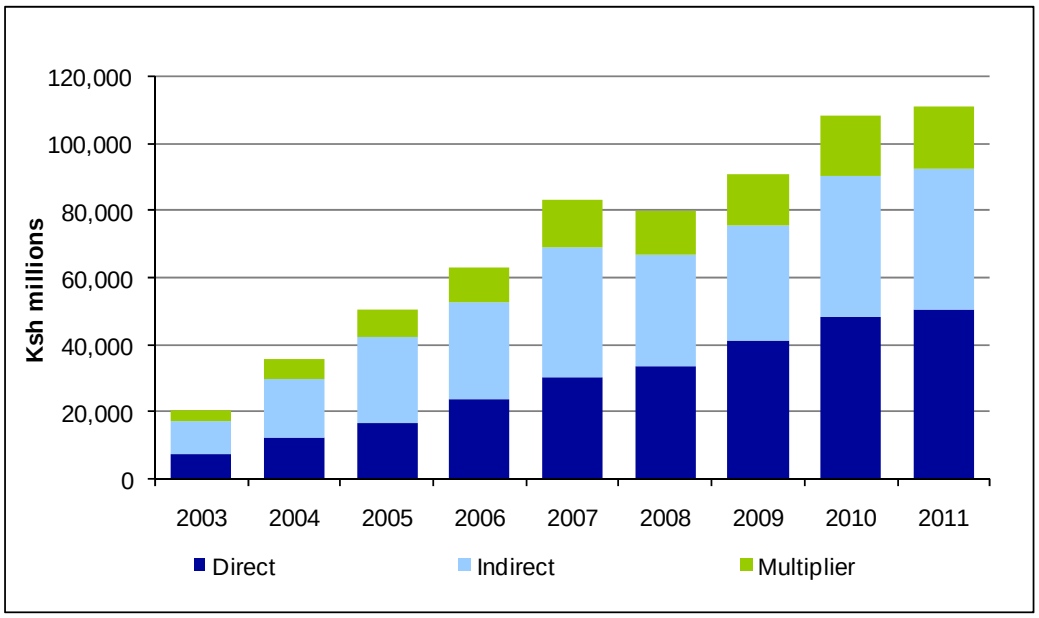
| Value add in 2011 | Total revenue | Domestic revenue | Domestic cost | Domestic value add | Value add with multiplier |
|---|---|---|---|---|---|
| MNOs | 120,605 | 120,605 | 69,998 | 50,607 | 60,729 |
| Fixed telecom operators | 100 | 130 | 82 | 48 | 58 |
| Network equipment suppliers | 25,416 | 10,328 | 3,197 | 7,131 | 8,557 |
| Handset designers and dealers | 20,507 | 16,004 | 9,485 | 6,520 | 7,824 |
| Other suppliers of capital items | 5,511 | 4,408 | 2,468 | 1,940 | 2,328 |
| Suppliers of support services | 27,427 | 25,679 | 11,502 | 14,177 | 17,012 |
| Airtime & payphone commission | 17,626 | 17,626 | 5,767 | 11,858 | 14,230 |
| **Total** | **217,191** | **194,779** | **102,498** | **92,281** | **110,737** |

*Source: Deloitte analysis*

Based on the data provided by MNOs, 77% of the revenue flows from the MNOs are estimated to remain in Kenya. Of this, a large portion relates to network and non-network support services and commission paid to handset and airtime dealers.

The contribution of mobile telephony to the supply side of the economy in Kenya in years 2003 to 2011 is summarised in Figure 4.

**Figure 4: Supply side value add from mobile communications 2003 to 2011**




*Source: Deloitte analysis*

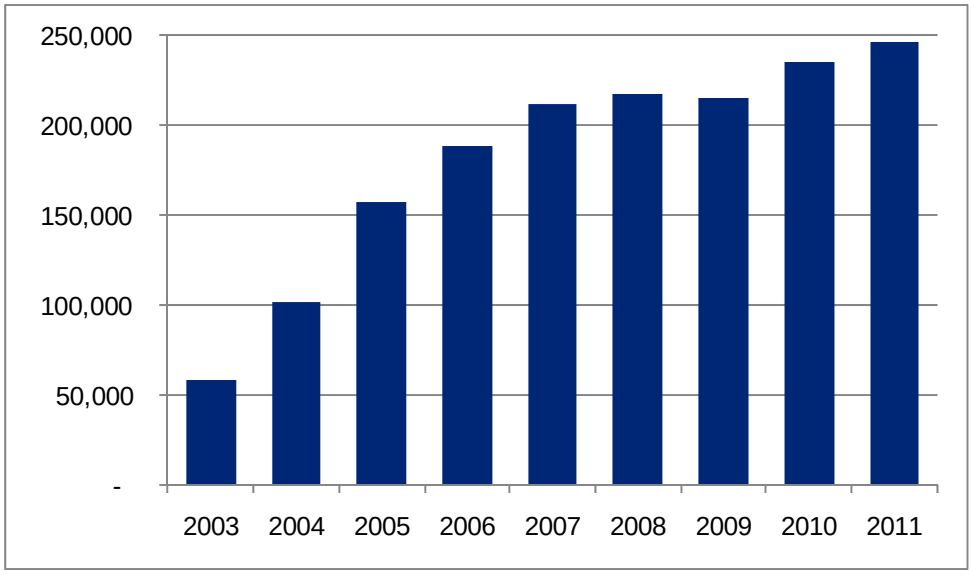
## 2.3 Impact on employment

Mobile services contribute to employment in several ways. These include the direct employment of the industry and related industries, the support employment created by outsourced work and taxes that the government subsequently spends on employment generating activities, and the induced employment resulting from the above employees and beneficiaries spending their earnings, and creating more employment[6].

The mobile telephony's contribution to employment in Kenya has grown considerably over time, from just under 60,000 FTE in 2003 to almost 250,000 in 2011. Figure 5 shows the change in the industry's contribution to employment between 2003 and 2011. A lower growth rate can be seen in the years most impacted by the global financial crisis 2008 and 2009.

[6] The first effect is obtained directly from MNOs. The support and induced employment is estimated using a multiplier of 1.2. For MNOs, no multiplier was applied as the majority of induced employment will be captured by the first round flows.

**Figure 5: Industry contribution to employment 2003-2011, without multiplier**




*Source: Deloitte analysis*

Of the almost 250,000 FTEs in 2011, the largest category of employment is airtime sellers and payphone operators, as shown in Table 3. There are an estimated 280,000 points of sale for mobile services in Kenya including Dukas, Kiosks, phone and electrical goods stores, hotels and restaurants, street hawkers, pharmacies and photo studios. This has grown significantly from 80,000 in 2008, and it is estimated that together these points of sale employ over 150,000 FTEs for purpose of airtime sale alone.

Network equipment providers have also employed an increasing number of people. This is largely a function of the rollout of Econet and Orange but is also related to Kenya being a regional hub for some of the international providers[7].

[7] For example Ericsson, NSN , Huawei, Alcatel have offices in Kenya that provide back office functionality for Rwanda, Uganda, Tanzania, Burundi, and some of the Indian Ocean Islands.

**Table 3: Contribution to employment from the mobile value chain in 2011**

| Employment Impact | Number of employees | Number of employees including multiplier |
|---|---|---|
| MNOs | 4,113 | 4,113 |
| Network equipment suppliers | 7,150 | 8,580 |
| Handset designers and dealers | 4,000 | 4,800 |
| Other suppliers of capital items | 742 | 890 |
| Suppliers of support services | 31,741 | 38,089 |
| Airtime commission, payphone commission | 157,291 | 188,749 |
| Total | **205,036** | **245,221** |

*Source: Operator data, interviews and Deloitte analysis on average wage rates. The fixed operator in Kenya is owned by mobile operator Orange, therefore their employment figures have been removed from the calculation to avoid double counting.*[8]

## 2.4 Impact on Kenyan productivity

There are numerous ways in which mobile services have led to productivity increases. In addition to the well-established effects described in previous studies[9], numerous additional positive impacts in Kenya have been identified. These are often generated by high-value services provided by MNOs in the country, including:

- M-banking and money transfer services: These provide mobile banking and micro finance service that reduces the need to 'meet in person' to conduct business and extends the reach of financial services to rural areas and many Kenyans who previously fell outside the formal banking system. This service now covers the purchase of goods and services and currently all MNOs provide money transactions services. These are discussed in more detail in Box 1 below.

- M-agriculture: MNOs act as a platform between farmers and insurance companies (for example as part of the M-Pesa services). Through SMS, farmers can purchase insurance against bad weather, which has helped local farmers in small rural communities.

[8] These figures represent only employment directly created by revenue flows from the mobile services and does not represent total employment in each business.

[9] These are discussed in Appendix A.1.3.

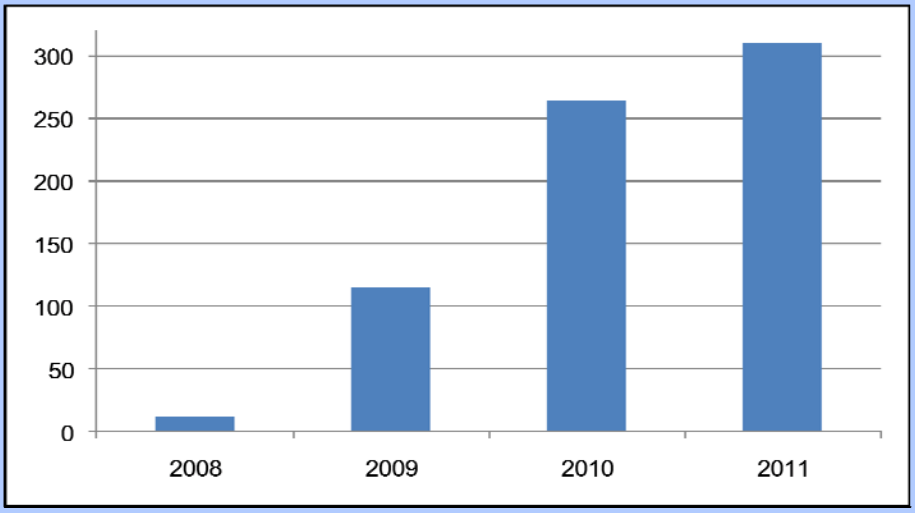
- M-education: MNOs have created a platform, referred to as a 'Learning Management System', which is a software application for the administration, documentation, tracking, and reporting of training programs, classrooms and online events, e-learning programs, and training content.

**Box 1: Mobile money services in Kenya**

Mobile banking enables those with no bank account to move money, receive cash, and pay bills (utilities and others) through a mobile phone, therefore creating banking for the previously unbanked. In a country where less than 30% of the population have access to a bank account, the provision of this service has changed the lives of millions of Kenyans, allowing citizens working away to send money home, to buy their shopping and more recently to pay for goods online through a joint arrangement with credit card companies.

M-Pesa, Safaricom's mobile banking offer, was introduced in 2007 with the aim of providing banking services for rural users some distance away from their local branches. Today it has 14 million plus subscribers and facilitates payments for over 1,000 businesses. Since then the other three MNOs have launched similar services: Airtel has launched 'Airtel money', Orange has launched 'Orange money' and Yu has released 'Yu Cash'. Across the market, transaction numbers have increased from just 12 million in the financial year ending March 2008, to over 300 million in the financial year ending March 2011.

**Figure 6: Number of M-banking transactions in Kenya**

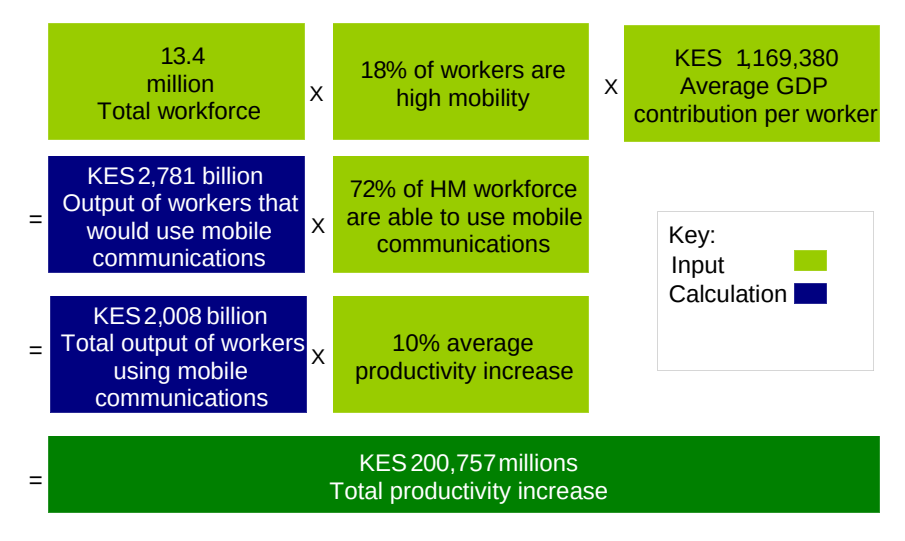



*Source: Deloitte analysis based on data from MNOs*

The impact of mobile telephony on productivity was then calculated. To do so, in line with previous analysis, it was assumed that a productivity gain of 10% has been experienced by high mobility workers who own a mobile phone. It is also noted that this gain may increase as a result of network effects in the economy, whereby the higher the number of consumers that have access to mobile telephony, the more the positive effects will be amplified in the economy.

Using the economic value concept that set-out in Figure 7, it is estimated that the incremental impact on the economy was KES 200,757m 2011. This calculation is set out below[10].

**Figure 7: Economic impact in 2011 of increased productivity amongst high mobility workers**



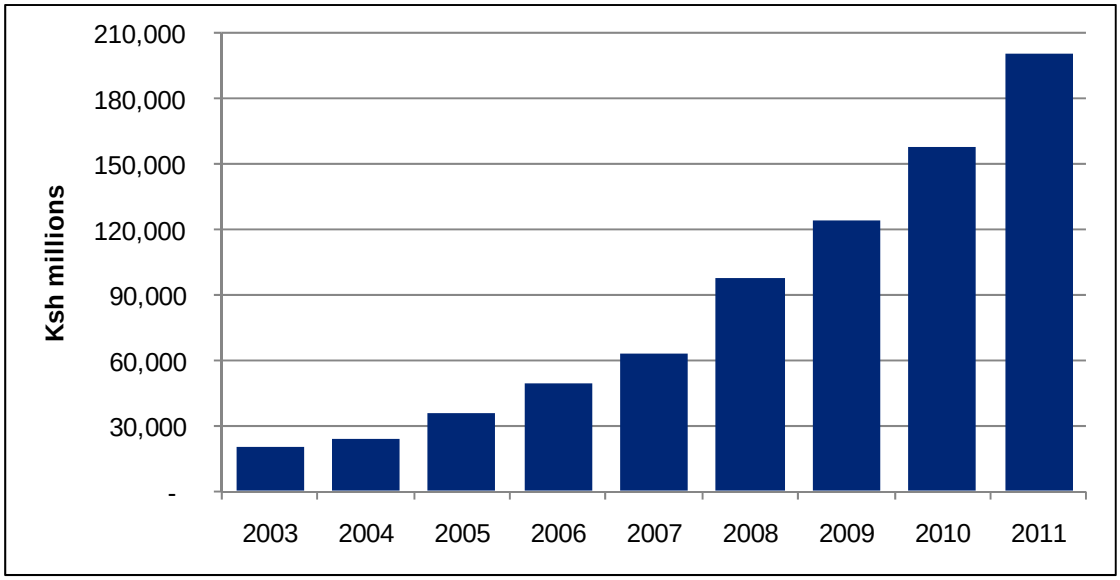

*Source: Deloitte analysis based on Deloitte assumptions, interviews and Kenya Bureau of Statistics*

These calculations show large increases in productivity between 2003 and 2011, as shown in Figure 8. These are driven by both by the increase in population coverage which has allowed a greater proportion of high mobility workers to access mobile technology, the increasing number of high mobility workers using mobile telephony and the increase in value-add services provided by MNOs such as 3G data services (e.g. emails) and the services mentioned above.

As a result, the productivity impact of mobile telephony on the Kenyan economy has increased by over 300% in the last five years. This highlights the importance of the mobile sector to the productivity of the economy as a whole as it has expanded.

[10] This calculation does not include impact on low mobility workers.

**Figure 8: Economic value from increases in productivity, 2003 to 2011**




*Source: Deloitte analysis. Population coverage calculated by GSMA*

## 2.5 Benefits to consumers

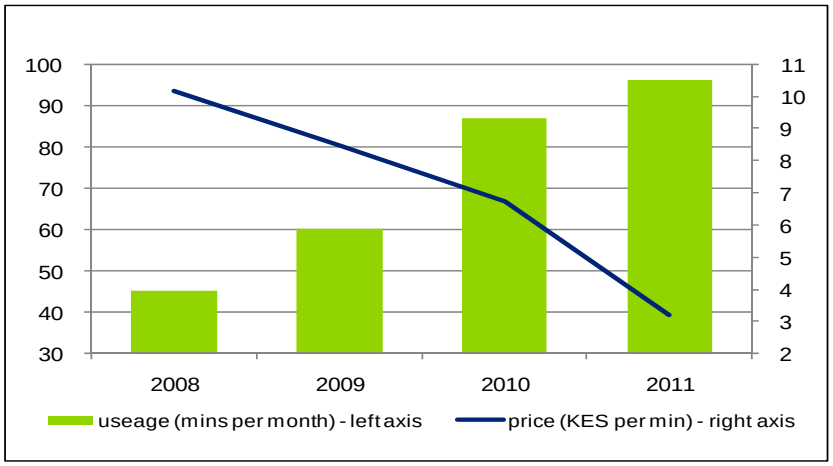
Consumer benefits of mobile telephony are widely recognised in social and economic papers and have been highlighted in previous economic impact studies on Kenya[11]. In addition, in recent years, Kenyan consumers have benefitted greatly from increased competition in the mobile services market, which has resulted in price decreases, service proliferation and coverage increases. Consumers have also benefited significantly from the Kenyan Government's decision to exempt handsets from the 16% VAT.

### 2.5.1 Prices and usage

As discussed in Section 1.1 above, Kenya's mobile market has changed significantly over the last few years with the introduction of the third and fourth MNOs, Yu and Orange. Intense price competition has seen prices fall by 70% in the last three years. As illustrated in Figure 9 below, this significant fall in call prices has led to an increase of more than 110% in the average number of minutes used per month by mobile customers.

[11] Typical positive impacts of mobile telephony in developing markets are reported in section A.1.3 of Appendix A to this paper.

**Figure 9: Falling prices and increased average usage**



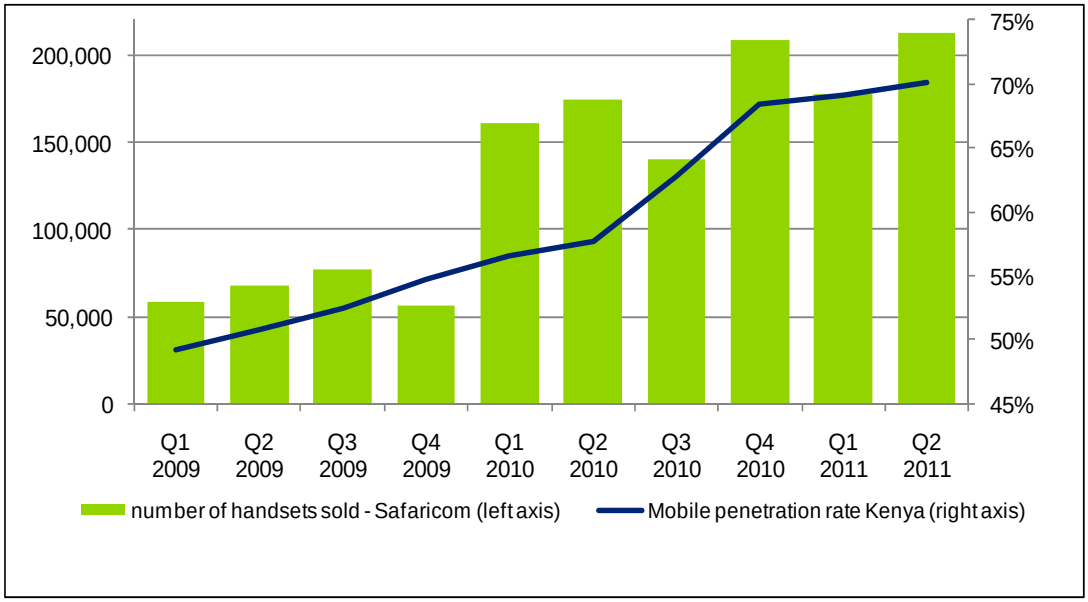

*Source: Deloitte Analysis based on operator data*

## 2.5.2 VAT exemption for handsets

The expense of purchasing of a handset can represent a high barrier to entry into the mobile market for many poorer Kenyans. Recognising that handset prices represented a barrier to development of the sector, the Kenyan government exempted mobile handsets from VAT as of June 2009, in order to promote mobile phone usage and allow increasing numbers of Kenyans access to the benefits it entails.

This policy appears to have been very successful: MNOs and other handset dealers immediately passed this exemption onto consumers and handset purchases have increased by more than 200% since the removal of VAT. Figure 10 below illustrates the impact of the removal of VAT on Safaricom's handset sales and the market penetration rates.

**Figure 10: Increase in handset sales and penetration after the removal of VAT on handsets**




*Source: Deloitte analysis and interviews with MNOs*

Penetration rates have increased substantially, from 50% to 70% of the population in Kenya, which is above the average penetration rate in Africa (63%). This means that an increasing amount of Kenyans have access to the benefits of mobile phone ownership including social integration and access to valuable mobile services such as M-banking.

### 2.5.3 MNOs' contribution to infrastructure investment and community projects

In addition to these factors, MNOs have identified a number of Corporate Social Responsibility projects and services provided by the MNOs in Kenya that deliver significant intangible benefits to consumers, in particular low-income rural users, and to businesses, including:

- MNOs undertaking civil works such as roads and contributing to electricity rollout as part of their investment in sites. MNOs are therefore contributing to the country's infrastructure. Often, electricity coverage rolled out by MNOs is extended into rural areas, and transactions using roads built by MNOs are also facilitated.

- MNOs seconding staff to NGOs and other social partners to transfer skills and capabilities in programme management. For example, through the Safaricom's "World of Difference" programme, over 30 Safaricom's employees have been seconded to the Kenya Red Cross and other NGOs including "Moving the Goal Post" and the "Northland Trust": each of them worked for three months passing on knowledge on IT, administration and supplier management services to these organisations.

- MNOs funding health, education, water and environment projects in organised local communities in rural areas, including the provision of services whereby consumers can purchase water with SIM card airtime money. An example is Airtel's programme seeking to 'adopt' schools in rural and disadvantaged urban areas. This programme, carried out in collaboration with the Ministry of Education, helps refurbish and re-organise a school, equipping it with water facilities and educates pupils about health and hygiene allowing children access to education in an improved environment.

- M-health services: MNOs, working with medical partners, provide 'dial-a-doctor' services, whereby remote consumers can call doctors located at MNOs' call centres to seek medical advice. Other services include drug authentication, wellness programmes, drug reminders and health advice services provided via SMS.

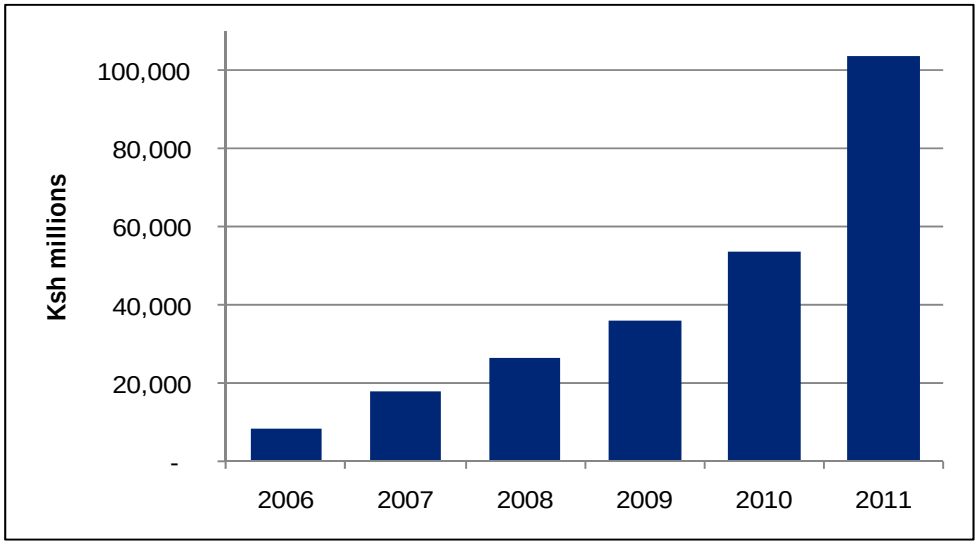
### 2.5.4 Intangible benefits from lower prices, higher penetration and increased average usage

The 'willingness-to-pay' methodology described in more detail in Appendix A seeks to quantify the intangible benefits to consumers described above. In particular, this methodology allows capturing the beneficial impact of the penetration increases, of the price reductions and of usage increases experienced in Kenya in recent years.

Applying this methodology, it was estimated that consumers enjoyed the equivalent of KES 103,326m in intangible benefits in 2011[12]. These have increased significantly in the last two years due to the price decreases discussed above.

[12] There are numerous reasons why these estimates may either underestimate or overestimate the true value of intangible benefits. For example, this methodology assumes that all subscribers joined the network in 2003 and does not account for the increased or decreased willingness to pay that would have resulted from the ARPU changes in early years. We have not been able to quantify the impact of these effects. To reduce the extent of benefits' overestimation, it was assumed that willingness to pay has been impacted by the increase in competition and significant fall in prices in recent years. A discount factor, based on the price decreases, was applied to calculations in 2009, 2010 and 2011.

**Figure 11: Intangible benefits using willingness to pay concept**



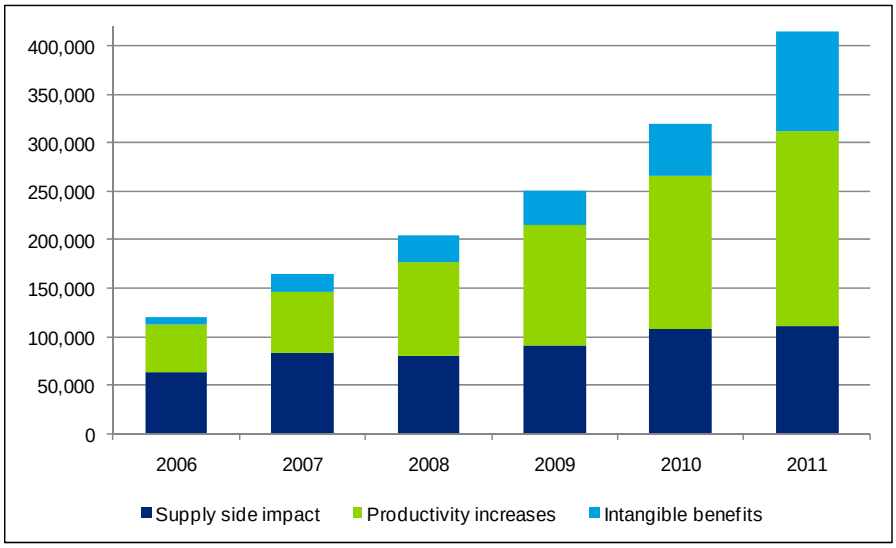

*Source: Deloitte analysis. Population coverage calculated by GSMA*

## 2.6 Overall benefits to the economy

In summary, this study of the economic impact of mobile telephony in Kenya finds that the mobile communications industry contributed a total of KES 311,494m in 2011 (KES 110,737 from the supply side impact plus KES 200,757m from the productivity impact) with up to a further KES 103,326m relating to intangible consumer benefits. This impact has increased significantly in the last 5 years from KES 63,285m, plus an additional KES 8,053m for intangibles, in 2006.

Figure 12 shows the economic impact of mobile telephony in Kenya, separated into supply side impact, productivity increases and Intangible benefits, for years 2006 to 2011. Over the last five years, the contribution of mobile telephony to the Kenyan economy has grown by almost 250%, while mobile-related employment has increased by over 30%. As a result of improved coverage, quality of service and affordability, the productivity impact of mobile telephony on the Kenyan economy has increased by over 300% in the last five years.

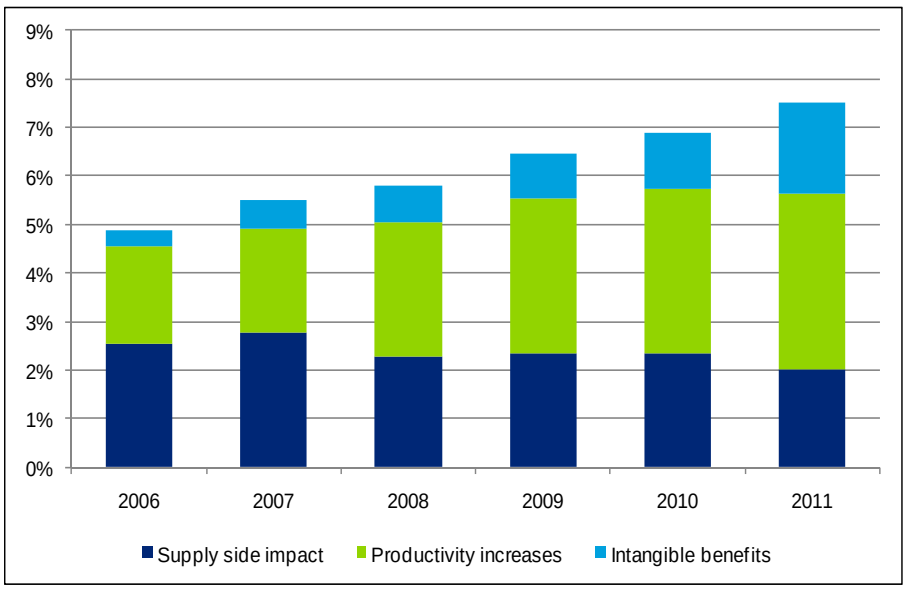
**Figure 12: Economic impact of mobile telephony in Kenya, KES Millions**




*Source: Deloitte analysis*

As illustrated in Figure 13, relative to GDP this contribution represents 5.6% and a further 1.9% from intangibles. In total, this contribution has increased substantially in the last five years, at a rate of over 0.5% per year. Although the supply side component of the impact has increased in absolute terms in the last four years, it has decreased as a portion of GDP in recent years as Kenya's GDP has successfully grown at a greater rate. This analysis also highlights the importance of the mobile sector to the productivity of the economy as a whole as it has expanded.

**Figure 13: Economic impact as a percentage of GDP**




*Source: Deloitte analysis*

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# 3 Taxation on consumers and MNOs in Kenya

The previous section of this report showed that tax is the biggest element of the value add generated by MNOs in Kenya, making up 80% of the total value add generated by the industry. This significant amount of taxation paid has implications for both consumers and MNOs in Kenya.

Despite the removal of mobile handset taxation, consumers in Kenya are still subject to one of the highest rates of mobile-specific taxation in Africa. MNOs in Kenya operate in a challenging investment environment. In addition to the current difficult economic climate, the cost of network or service expansion in a country like Kenya is high, as this often involves building road and utility infrastructure. The regulatory and taxation regime adds further challenges, in particular due to high taxes and uncertainty around government investment in next generation networks.

This section discusses in more detail the taxation and regulatory pressures on consumers and on MNOs in Kenya by reviewing the contribution the mobile industry makes to the Kenyan economy through taxation, and by discussing taxation on mobile consumers and MNOs in Kenya.

## 3.1 Value add from taxation

In 2011, it is estimated that MNOs in Kenya will pay approximately KES 41 billion to the government in taxes and regulatory fees. This represents a notable increase of 33% from the KES 28 billion paid by MNOs in 2008. The total amount of corporation tax, sales and mobile specific taxes, income tax paid by employees and regulatory fees paid by the industry since 2006 is shown in Table 4.

**Table 4: Tax and regulatory payments in Kenya from MNOs, KES millions**

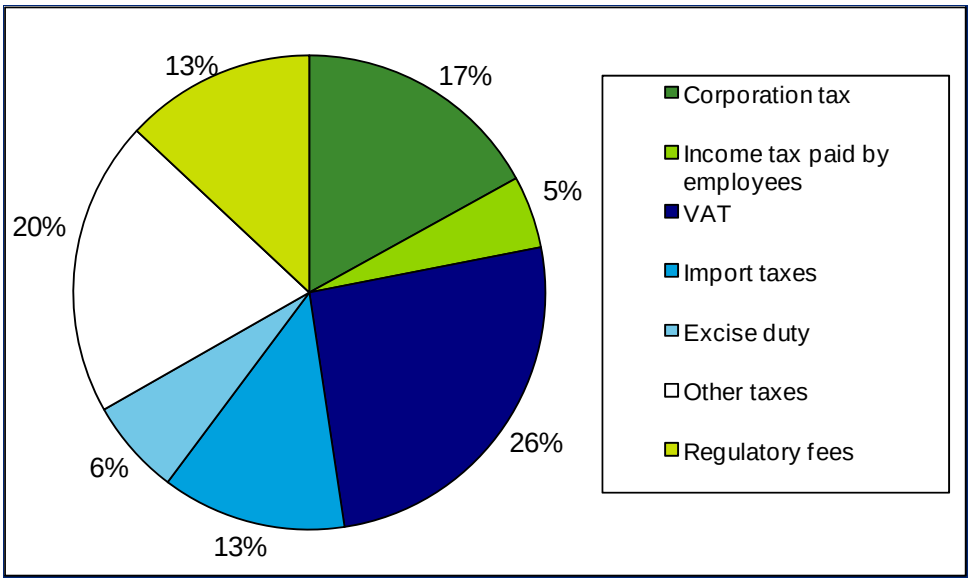
| Taxes from MNOs | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 |
|---|---|---|---|---|---|---|
| Corporation tax | 2,800 | 6,070 | 5,509 | 4,994 | 6,374 | 6,929 |
| Income tax paid by employees | 479 | 760 | 978 | 1,339 | 1,818 | 2,025 |
| Sales and mobile specific taxes | 14,542 | 15,402 | 18,716 | 23,402 | 25,830 | 26,560 |
| Regulatory fees | 1,054 | 1,430 | 2,015 | 2,846 | 4,195 | 5,317 |
| **Total taxes and fees** | **18,875** | **23,662** | **27,217** | **32,581** | **38,216** | **40,831** |

*Source: Deloitte analysis based on operator data*

Tax and regulatory fees represented 34% of company revenues for Kenyan MNOs in 2011. The largest proportion of tax revenue is raised through mobile specific and sales taxes, which

accounted for 65% of taxes and regulatory fees paid in 2011. The excise tax on usage makes up 31% of these mobile specific and sales taxes. The breakdown of taxes paid to the government by the mobile industry for 2011 is illustrated in the Figure 14.

**Figure 14: Breakdown of 2011 tax revenues from MNOs by source**




*Source: Deloitte analysis based on operator data*

In addition to the direct tax revenue received from MNOs, when considering the tax revenue received from other players in the value chain, the mobile industry value chain generates another KES 14 billion for the government in 2011. The largest payers of tax in the mobile supply chain, aside from the MNOs, are the suppliers of support services and handset and airtime retailers.

**Table 5: Total tax revenues from the mobile value chain in 2011, KES millions**

| Tax Revenue | Tax revenue | Tax revenue with multiplier |
|---|---|---|
| MNOs | 40,831 | 48,997 |
| Fixed telecommunications operators | 17 | 20 |
| Network equipment suppliers | 2,656 | 3,187 |
| Handset designers and dealers | 880 | 1,056 |
| Other suppliers of capital items | 911 | 1,094 |
| Suppliers of support services | 5,698 | 6,838 |
| Airtime commission, payphone commission | 3,789 | 4,547 |
| **Total** | **54,783** | **65,739** |

*Source: Deloitte analysis based on Deloitte tax data, analysis of company accounts and interviews. This represents tax revenues directly created by revenue flows from mobile services and not total tax revenues from the businesses*

## 3.2 Taxation on mobile consumers

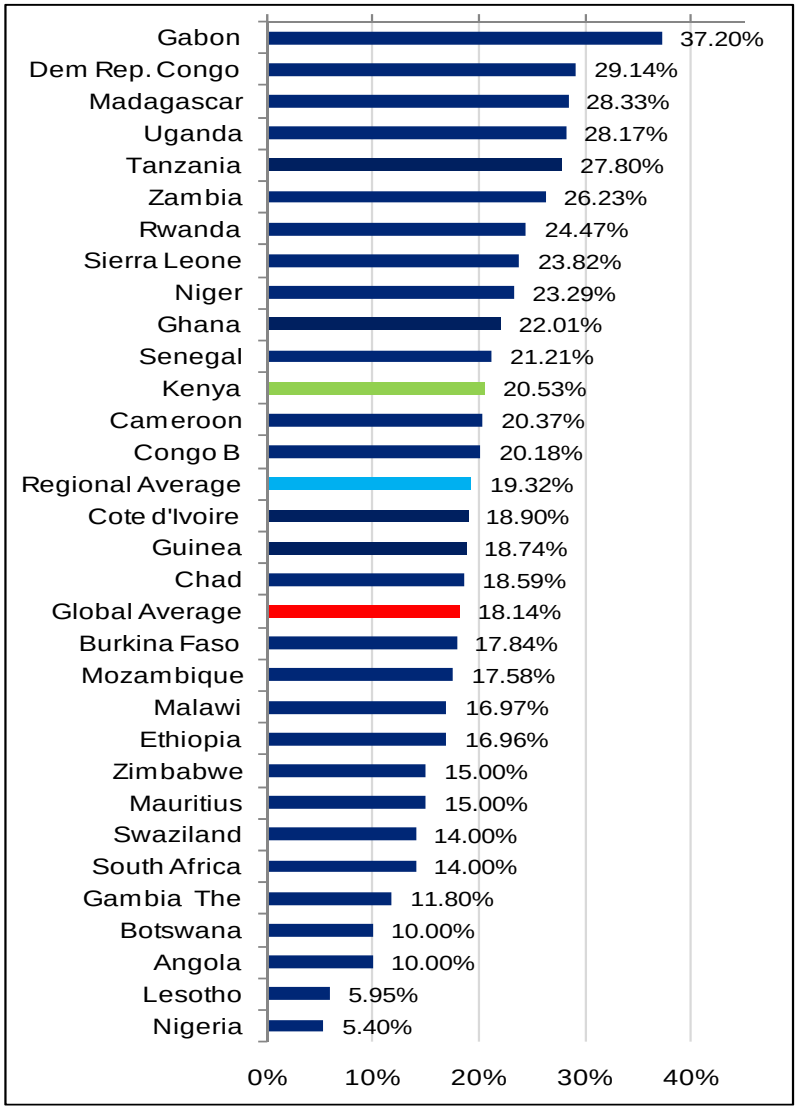
Despite the removal of handset specific taxes, consumers in Kenya are still subject to a 10% mobile specific usage tax that applies additionally to VAT. This tax contributes to increase the average annual cost of mobile ownership ("TCMO") to $US57.58 (KES 5,398)[13].

In 2011 tax on mobile telephony still makes up 21% of the total cost of mobile ownership in Kenya[14]. Although this has decreased in the last five years from 25%, mobile taxes in Kenya are still above the African average of 19%, and above the global average level of 18%. Figure 15 compares tax as a percentage of mobile phone ownership in Kenya with other countries in Africa.

[13] Deloitte and GSMA Global Mobile Tax Review 2011 (forthcoming)

[14] Deloitte Global Mobile Tax Review 2011 (forthcoming)

**Figure 15: Tax as a % of TCMO in Africa**



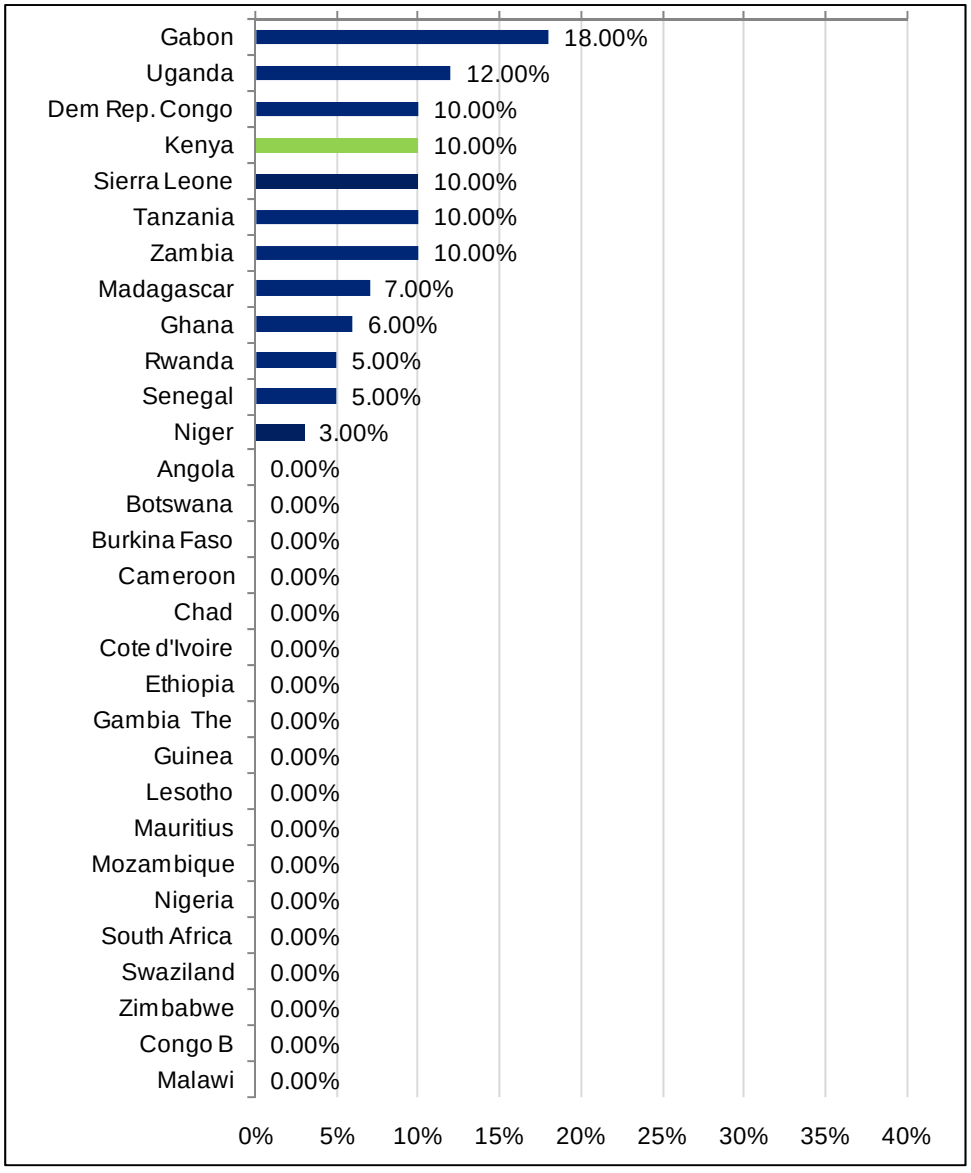

*Source: Deloitte Global Mobile tax review 2011 (forthcoming)*

When compared to the Kenyan Gross National Income per capita $US770 (KES 72,185)[15], mobile telephony costs still represent a significant proportion (7.5%) of the income, and may not be affordable to the poorer sectors of the population.

The level of airtime tax in Kenya compared to other African countries is set out in Figure 16. The majority of African countries do not levy such a tax, but the Kenyan Government obtained KES 8.3 billion from its operation.

[15] http://www.unicef.org/infobycountry/kenya_statistics.html

**Figure 16: Airtime tax in the region**




*Source: Deloitte Global Mobile tax review 2011 (forthcoming)*

This form of mobile specific taxation may have a number of negative consequences for mobile consumers. This type of taxation often discriminates against fixed telephony, despite mobile services being recognised as providers of universal telecom services. This is particularly the case in Kenya where fixed line penetration is less than 2% of population[16]. In addition, this tax is often regressive in nature and contributes to reduce both access/penetration and usage. By acting regressively, this tax can generate perverse consequences on the poorer sectors of the population that taxation intended to benefit. Finally, the imposition of this tax may signal that the government

[16] Budde Report 2010

may wish discourage usage in mobile services, as governments sometimes increase the consumption tax on goods for which they wish to discourage consumption.

If the Government wants to encourage the use of mobile telephony and allow all consumers access to the associated benefits, it could consider adding to the positive outcomes from VAT exemption for handsets by removing or lowering the 10% excise on airtime. As shown by the impact of the handset tax removal, the consumption behaviour of much of the Kenyan population is likely to be highly responsive to changes in price.

## 3.3 Taxation on MNOs in Kenya

Each year MNOs deliver increasingly significant benefits to the Kenyan economy. However, they operate in a challenging investment environment and are subject to a number of market and regulatory pressures:

- Competition has increased significantly, contributing to a price drop of over 70% in the last four years. However, these falling prices have also lead to decreasing ARPU levels for MNOs, and three out of four MNOs are receiving negative returns.

- A complex geographic costing environment, whereby the costs involved in expanding their network into rural areas or adding more capacity often include building access roads and installing generators, which then become available to local communities and other business. MNOs are not being compensated for this valuable investment. Although this is a positive outcome for communities, expansion of mobile services in Kenya is more expensive than in other countries.

- Unequal treatment compared to other industries with regards to input costs: for example, the fuel used to power generators for network sites is not tax exempt for MNOs, while other industries are allowed certain exemptions.

- Regulatory decisions, for example on the level of mobile termination rates that have created unintended negative impacts on market prices, as recognised by the Regulator.

- In addition to these high costs, MNOs are impacted by high corporation tax and a range of additional taxes on their revenues, turnover and inputs, including a new tax for a USF.

These pressures are illustrated in Figure 17, while taxes and governments contributions are discussed in more detail below.

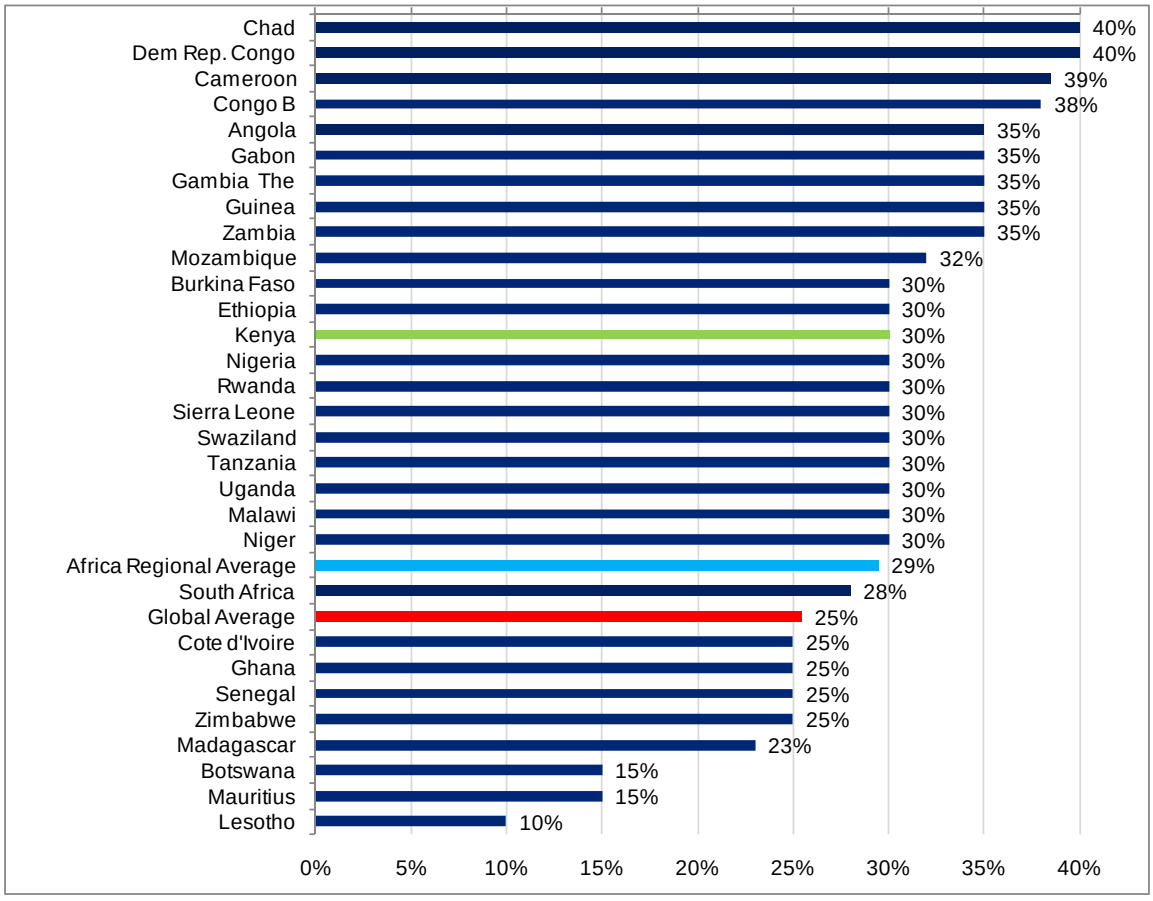
**Figure 17: Pressures on MNOs in Kenya**


*Source: Deloitte analysis*

### 3.3.1 Corporate tax rate and licence fees

Kenyan businesses face a corporate tax rate of 30%. Based on findings from Deloitte's 2011 Global Mobile Tax Review, as shown in Figure 18, this is similar to the African average of 29.5% but higher than the global average of 25.5%.

**Figure 18: Corporate tax rates in the region**




*Source: Deloitte analysis*

In addition to corporate tax, MNOs must also pay an annual licence fee amounting to 0.5% of their turnover, further adding to the cost of providing mobile services in Kenya. In 2011, MNOs paid a total of KES 3.6 billion in licence fees, almost three times the amount paid in 2008.

### 3.3.2 Inputs into the production of mobile services

In addition to paying tax on turnover and licence fees, Kenyan MNOs also pay a number of customs duties and fees on the telecommunications equipment, which input into the production of mobile telephony services. Import duties are applied to value of the following items:

- Antennae are subject to an import duty of 25% of value.
- Telecommunication parts/spares are subject to an import duty of 10% of value.
- SIM cards are subject to an import duty of 10% of value.
- All imports are also subject to a 2.75% import declaration fee, which is calculated on top of the customs fees.

Where imports are transferred by air, each delivery is also subject to an Airport Authority fee of KES 250. In 2011, MNOs paid more than KES 5 billion in import taxes.

Finally, spectrum access, which is another input into mobile service provision, is subject to further fees which are detailed below.

### 3.3.3 Spectrum fees

Spectrum is an essential input into the MNOs' business. MNOs in Kenya have access to 2G and 3G spectrum. MNOs have successfully developed 3G networks in the last three years. For example Safaricom has over 3,500 sites that are 3G enabled in 2011, and has recently undertaken LTE tests.

However, in 2011, MNOs paid over KES 4 billion in spectrum access charges and usage fees. The fees are set by the regulator in an unusual two part form:

- An annual fixed spectrum bandwidth assignment fee (where a bandwidth is assigned nationwide), which is calculated as a function of the amount of spectrum allocated.
- Variable spectrum usage fees, which are dependent on the number of TRXs installed in the network at the end of the year. This variable cost is KES 43,000 per TRX, or 50% of this amount for TRXs in rural areas.

Therefore, the spectrum usage fee paid by MNOs depends on the number of microwave links, radio transceivers, and radio spectrum the MNOs have, i.e. the more an operator invests in sites, the more it pays in spectrum fees.

This spectrum pricing policy discourages MNOs from investing in new sites, particularly where investments might be risky or have lower potential returns. The government could also seek to encourage investment in sites to extend coverage, in particular for 3G services that deliver a number of high value services to consumers, e.g. emails and applications that can further enhance the country's productivity[17].

Generally, interviews with MNOs have suggested that the spectrum regime in Kenya is still characterised as one of 'command and control', whereby spectrum is allocated and priced by the central administrative body, with limited market inputs. This method of spectrum management potentially slows the growth of Kenya's mobile industry:

- Currently all MNOs receive the same spectrum allocation, regardless of market shares and number of customers, meaning some MNOs have surplus capacity and others are reaching maximum capacity.
- Once spectrum has been allocated, rights and spectrum cannot be transferred between MNOs without the written consent of the Competition Commission of Kenya ("CCK").
- There are currently no markets mechanisms for the allocation of spectrum in Kenya, preventing spectrum from flowing to its highest value use.

### 3.3.4 USF

In addition to corporate tax and taxes on consumption, turnover, imported inputs and spectrum, the government has recently imposed an additional tax of 0.5% of operator revenue with the purpose of establishing a USF. This represents a significant additional burden for MNOs. When added to the licence fee, a total 1% of turnover is taken directly in tax receipts.

The stated purpose of the USF is to facilitate investment in infrastructure in order to fill in gaps in access to telecom services. However, MNOs have raised significant concerns about the establishment and management of the fund:

- Although they provided a large amount of data to the access gap study commissioned by the CCK to identify gaps in connectivity in the country, MNOs have not had the opportunity to contribute to the study using their commercial and planning expertise, nor have they had the opportunity to review the study results.
- A lack of transparency has characterised the USF management process so far, and none of the MNOs are represented on the USF board.

[17] Operators have also noted that this pricing policy could slow the rollout of LTE (fourth generation network or 4G), see http://allafrica.com/stories/201103110116.html.

- As such, the government is intervening in infrastructure investment without considering the wider impacts of their intervention on the existing mobile and fixed networks.

MNOs have invested significantly in the country's telecom network infrastructure, and have developed the latest mobile technology. If the government intends to expand the reach of existing technology to Next Generation technology, MNOs can provide their expertise on network rollout and planning to realise this objective.

In particular, considering that they have met and exceeded all coverage objectives in licence conditions, the MNOs appear well placed to contribute to any extension to the wireless broadband network in Kenya:

- MNOs may enjoy scale economies from their existing network, and upgrading the existing network for next generation services appears an efficient and effective way to deliver mobile broadband.

- MNOs have effectively employed site sharing as a mechanism to enhance coverage while protecting the business case of MNOs and enhancing competition in the market. Over 1,000 sites are today shared among MNOs, which represents over 25% of total sites.

- MNOs have developed expertise and capabilities in the telecom market, and appear well placed to manage the transition to new technologies.

During interviews with MNOs, they noted that if the government decides to proceed with the USF, and to manage it without the direct impact of the MNOs, there is a risk that this may create uncertainty for network investment. Investment may depend on whether MNOs will be competing with similar investments made by the Government, particularly in low population density rural areas where duplication of services such as broadband might not be viable.

## 3.4 Conclusions

This analysis has shown that MNOs in Kenya are currently subject to a number of market and regulatory pressures, including a high level of taxation, which subsequently impacts consumption of mobile services by consumers.

The Kenyan government has successfully implemented a taxation policy that has promoted the benefits of the mobile telephony on the economy and on consumers. To ensure that benefits continue to be delivered to consumers and to businesses, the government could consider the unintended consequences of the existing mobile-specific taxation policy and other regulatory instruments.

MNOs make a significant contribution to the government's tax receipts despite the current difficult economic climate and the challenging cost conditions and uncertainty under which they operate in Kenya. Any further increases in this tax burden could have negative impacts on investment, product development, the financial contribution made by MNOs to community projects and on the ability of MNOs to retain current levels of employment.

# Appendix A Methodology and assumptions

This section outlines the approach taken in estimating the impacts of the economic contribution of the mobile industry in Kenya.

## A.1 Static Analysis, including intangible benefits

Static analysis refers to the impact of mobile services for a particular period of time and does not seek to estimate the longer term impacts of economic welfare. However, static analysis is extremely useful due to the greater availability of disaggregated data relative to dynamic analysis where a greater number of assumptions are typically required.

Publicly available and operator data was employed together with interviews and assumptions based on economic literature to estimate the value of the mobile communications to the economy in terms of employment and GDP, both direct and indirect. The total economic impact is defined as consisting of the following elements[18]:

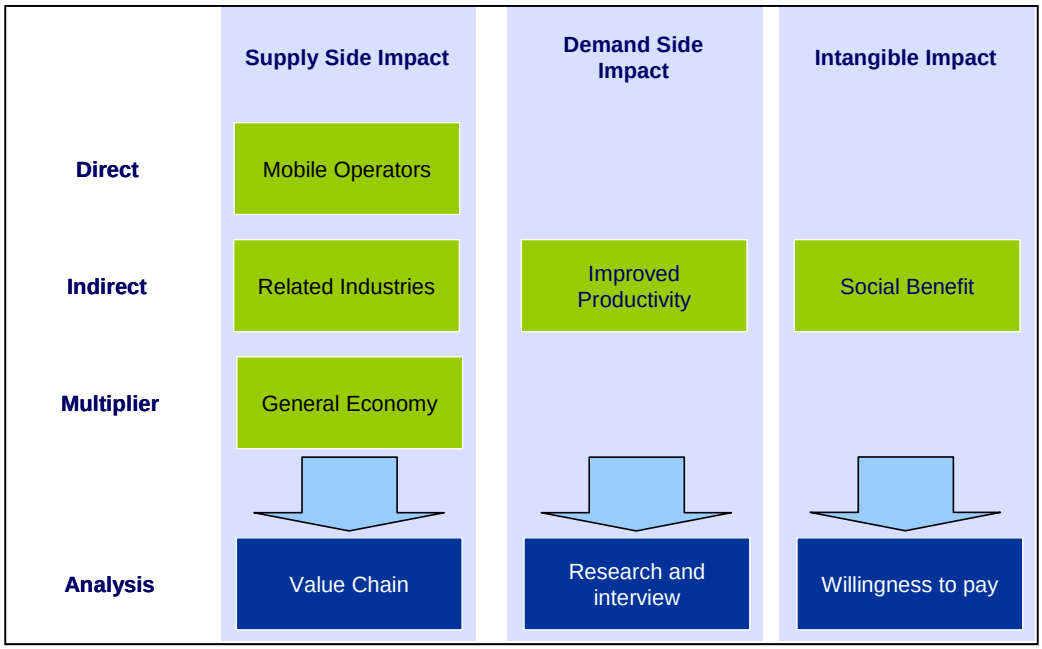
- The direct impact from the MNOs.
- The indirect impact from other industries related to mobile services.
- The indirect impact due to the surplus enjoyed by end users in terms of productivity improvements.
- The indirect impact due to more qualitative social benefits enjoyed by the population, defined as 'intangible benefits'.

The static analysis has been structured as illustrated by the following figure. The different impacts are summed together to give the total economic impact[19].

[18] The approach adopted is consistent with that adopted across the economic literature, see for example: Mckinsey & Co. Wireless Unbound. September 2006. *The surprising economic value and untapped potential of the mobile phone*.

[19] To obtain the total economic impact, it is necessary to sum together the supply side, demand side and intangible impacts. Whilst these are intended to capture different impacts of mobile telephony, there is a potential for limited double counting.

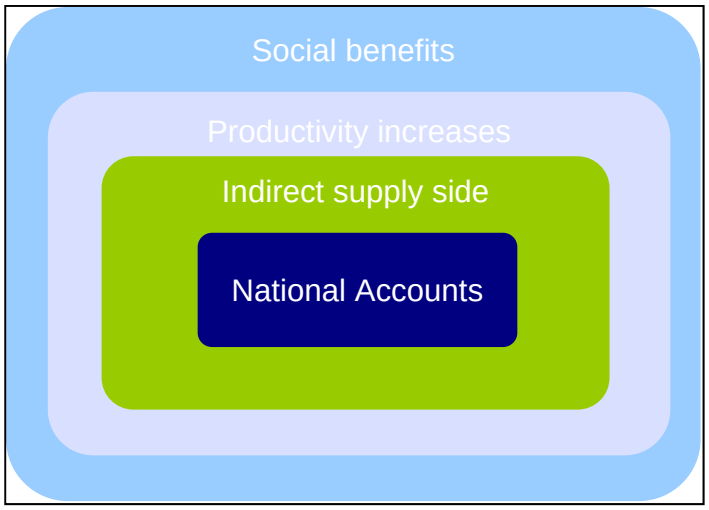
**Figure 19: Structure of the analysis of economic impact on GDP and employment**




*Source: Deloitte*

The methodology estimates the contribution of the sector on the basis of a wider definition than that commonly cited in national accounts. The adopted definition captures the 'economic footprint' of the mobile sector.

**Figure 20: This methodology and national accounts**

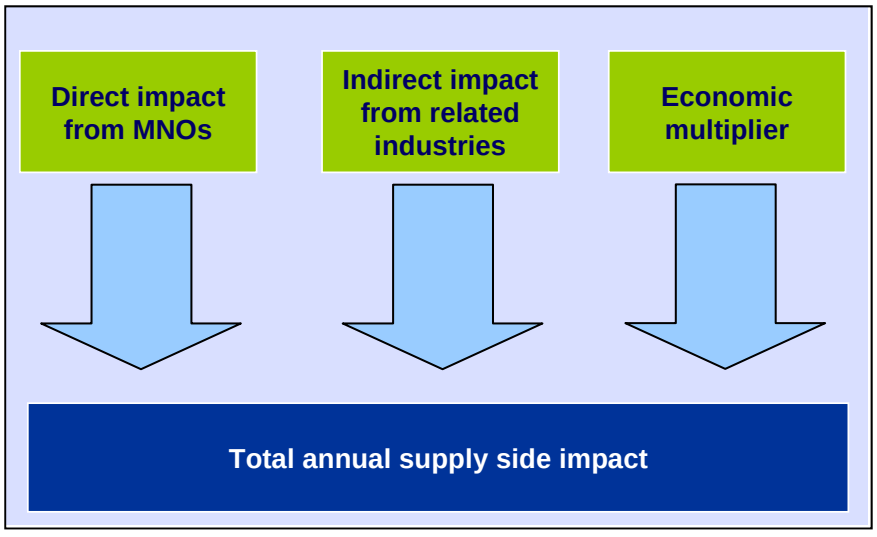



*Source: Deloitte*

### A.1.1 Supply-side impact

The contribution of the mobile industry to the economy was quantified, covering the industry and its adjacent sectors. This is calculated by aggregating the direct, indirect and economy wide (multiplier) effects that have occurred in each year.

**Figure 21: Structure of the supply side analysis**




*Source: Deloitte*

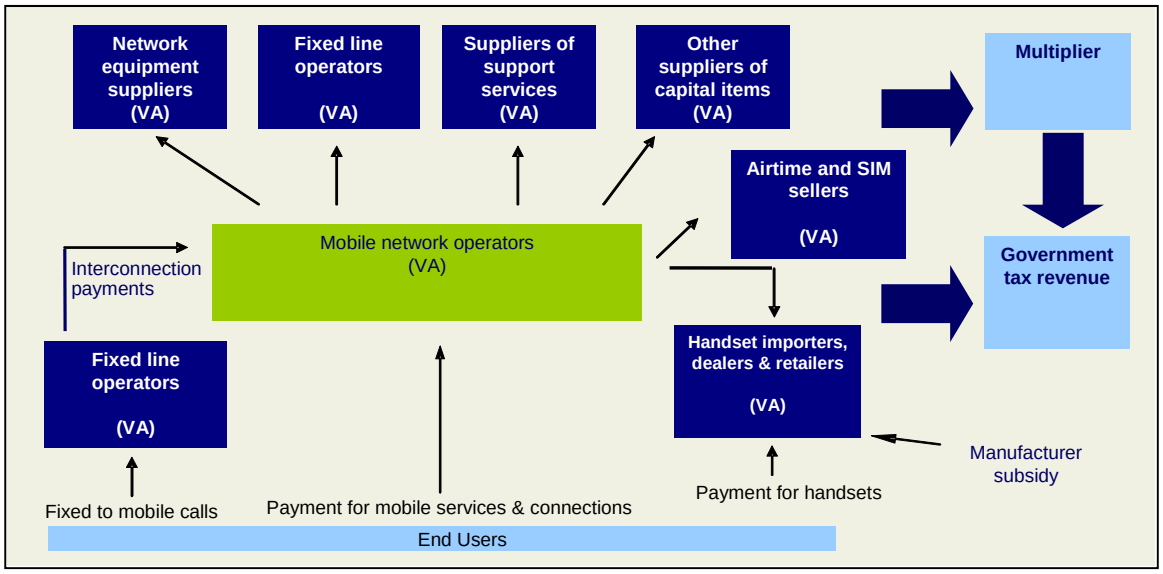
This gives a snapshot view but does not take into account the future benefits to the economy resulting from growth. A customer's spend on mobile services flows along the value chain to the players within the industry: MNOs, suppliers, distributors and others. Money flows between these economic agents and the amounts retained are used to pay wages, taxes, buy inputs and other

costs. Finally, the Government collects tax revenues from all MNOs within its jurisdiction. In this assessment, the focus is limited to the economy of the country in question and ignores international impacts.

Each of the main stakeholders in the industry has been identified and assigned flows of value between them. These flows are shown in the diagram below.

**Figure 22: Mobile value chain**




*Source: Deloitte*

Estimates of the flows are based on:

- Discussions with MNOs.
- Interviews with handset dealers and equipment suppliers.
- Discussions with other stakeholders (suppliers, chamber of commerce, etc).
- Analysis of Government taxation statistics.
- Analysis of accounts and billing information.

Following the identification of the revenue flows, the proportion of these flows that remain within the domestic economy was estimated and are translated into a positive economic benefit, referred to in this report as value add.

### A.1.1.1 Direct value add from MNOs

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

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

For each of these categories, the proportion of value add which relates to the domestic economy was identified. This analysis is based upon operator management accounts interviewing which identify the final destination of monetary flows.

### A.1.1.2 Indirect value add

The revenues that flow directly from the MNOs to other domestic industry players have been identified. The proportion of revenues that are value add was then estimated, using the five categories of value add used in the mobile network operator analysis above. These proportions for each country are outlined in A.2.

### A.1.1.3 The multiplier

The value add created by the mobile communications industry will have a subsequent positive impact on the economy. These effects are generated by further rounds of expenditure. For example, the indirect domestic industry players will additionally incur operating expenses paid to additional players. These players will then create value as they pay wages and taxes etc. The economic literature quantifies these effects by applying an 'economic multiplier' to the initial rounds of value generated. The table below shows the values of multipliers that have been calculated in other studies.

**Figure 23: Multiplier benchmarks**

| Title of study | Multiplier |
|---|---|
| The contribution of mobile phones to the UK economy, 02 for ONS | 1.13 |
| Ovum studies on economic impact of mobile telephony in Bangladesh and USA based on review of various other studies* | 1.6 |
| Association Française des Opérateurs Mobiles * | 1.7 |
| Economic impact of spectrum use in the UK, Europe economics, based on ONS | 1.1 |
| Sicrana, R., and de Bonis, R. 'The Multiplier Effects of Telecommunications Investments on Economic Growth and Restructuring'.'** | 1.5 |
| Radio authority UK. 1995. 'Economic impact of radio'. | 1.4 |
| Deloitte for Telenor. 2008. 'Economic Impact of mobile telephony in Serbia, Ukraine, Malaysia, Thailand, Ukraine and Pakistan'. | 1.2 - 1.4 |
| Zain/Ericsson 2009. 'Economic impact of Mobile Communications in Sudan' | 1.2 |
| Aloyce R. Kaliba et al 2004 multiplier estimates 'Multipliers for Tanzania: implications on developing poverty reduction programs' (transport and communication multiplier estimate) | 1.63 |

*Source: Deloitte*

Based on a review of the above studies, a multiplier value of 1.2 was assumed. This is at the lower end of the estimates provided in the table above since it is likely that there are greater leakages in Kenya economies relative to the French, UK and US economies on which the benchmark multipliers are based.

### A.1.1.4 Calculating tax revenues

Tax revenues to the Government are raised through taxes specific to mobile services, corporation tax, income tax and regulatory fees. Tax revenues are collected from the Government from all components in the value chain. However, based on interviews with parties, a degree of leakage from the informal sector has been assumed.[20]

Information on revenues for various taxes was collected as follows:

- Economy wide taxes: value added (sales) taxes, corporate taxes and income tax paid by employees.

[20] Assumptions are made on the percentage of money flows that are subject to the national tax regime. For example, it is assumed that legitimate registered businesses pay sales, import, employee and corporate taxes whilst it is assumed that only a small proportion of streetside airtime sellers and handset dealers pay taxes. Therefore not all flows are assumed to be subject to taxation.

- Mobile taxes: licence and spectrum fees, import duties, and other mobile specific taxes.

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

### A.1.2 Calculating the impact on employment

Mobile services contribute to employment via several avenues:

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

The first impact is estimated directly by collecting data from the MNOs and, for the related industries, dividing the proportion of revenue spent on wages by the average wage rate in each sector. Typically, support and induced employment is estimated using a multiplier and other studies have used a ratio of 1.1 to 1.7 for induced employment. The use of such multipliers can often be criticised for the lack of consideration to the economic basis of the industry and country under consideration. Extensive discussions with stakeholders were conducted on this issue and it was chosen to apply a multiplier of 1.2 on all value add including employment due to the high leakages from the Kenyan economy.

### A.1.3 Increases in productivity

Significant economic and social research was undertaken in the last ten years on the numerous ways in which mobile services can improve productivity, particularly in developing countries where mobile services have 'leap-frogged' fixed line services and are the provider of universal service. In section 2.4 of the main paper the key effects identified in the last three years in Kenya were identified, discussed and measured. Several important effects have been identified in the research[21] in the last years. These are presented here for general review and include:

- Improving information flows: mobile services allow certain occupations (such as commodities and agriculture, both prominent in developing countries) to cut out the middle-man as traders can obtain information on prices, quality, quantities directly. This improves the incomes of producers, and helps reduce wastage.

[21] See, for example: Vodafone. March 2005. *Africa: The Impact of Mobile Phones*. Vodafone Policy Paper Series, No.3.

- Reducing travel time and costs: similarly, mobile services allow workers to trade and share information without travelling. The Vodafone paper on Africa (2006) contains analysis on Tanzania and South Africa that found 67% of users found mobiles greatly reduce travel time in Tanzania[22].

- Improving efficiency of mobile workers: mobile services improve the efficiency of all workers in the economy. This effect will particularly be felt by workers with unpredictable schedules, for example those involved in repair and maintenance, or collection and delivery. Mobiles will give them greater accessibility and better knowledge of demand.

- Improving job search: mobile services improve the chances of the unemployed finding employment through enabling people to call for opportunities rather than relying on word of mouth. Further to this, owning a mobile phone makes workers more employable as they are contactable while absent from their place of work.

- Encouraging entrepreneurialism: mobile has encouraged the growth of small business and has increased its efficiency. For example, there are few taxi firms in Kenya and taxi drivers print business cards with their mobile number. Several drivers are able to share a taxi, using mobile phones to agree arrangements.

No established economic methodology exists to estimate the GDP and employment effects of such productivity improvements across the economy. As such, available evidence from the literature in the area was considered and interviews with stakeholders (including business and government representatives) have been undertaken in order to provide an indication of the demand side impact of mobile communications. Of particular relevance to the African context, Zain commissioned in 2008 a survey in Sudan trying to identify how average business revenue has increased with mobile usage[23]. Across the 800 people interviewed, average business revenue increases were found to be just below 11%. The survey also asked the degree to which people agreed with the following statement:

*'Mobile phone is a business enabler. It allows business to be more efficient and build, keep and maintain customer relations.'*

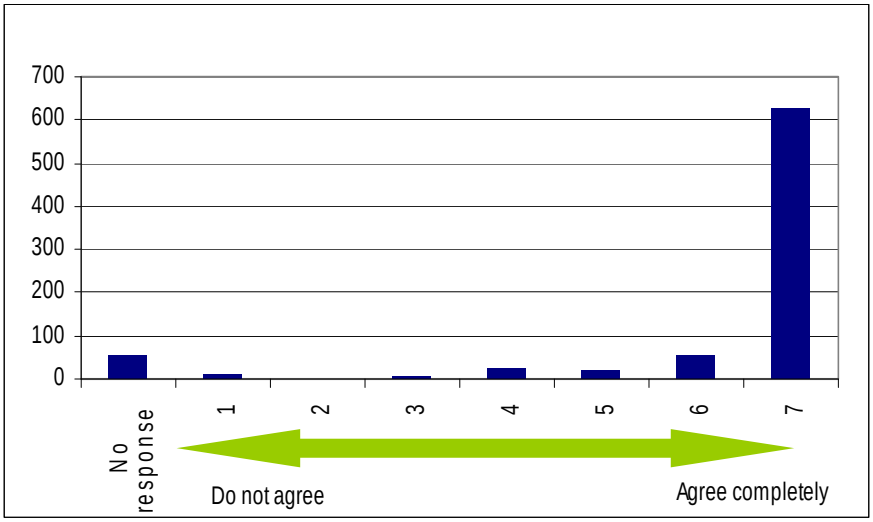
Of the 744 respondents, 84% stated that they 'completely agreed' with the statement[24].

[22] Vodafone. March 2005. *Africa: The Impact of Mobile Phones*. Vodafone Policy Paper Series, No.3.

[23] Referenced in: Deloitte, 2008. *Economic Impact of Mobile Communications in Sudan*.

[24] Based on a sample of 800 people across a broad section of Sudan geographically and socially. Survey results at the time of writing this report were unpublished.

**Figure 24: Are mobile phones business enablers? (Number of people)**



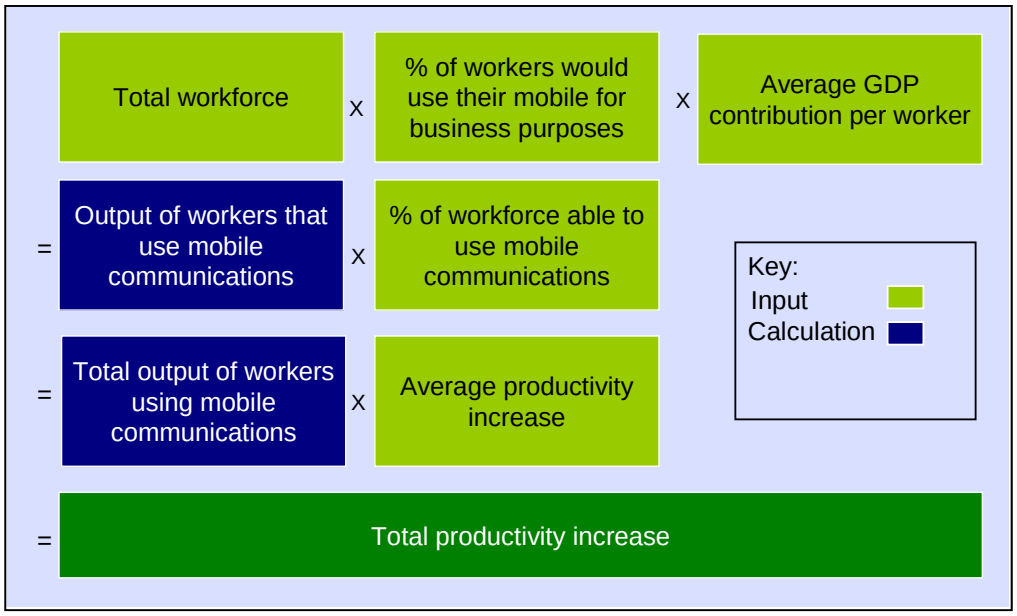

*Source: Zain survey data*

The impact on the productivity improvements on the overall economy is estimated by assuming that the productivity improvement will be experienced by high mobility employees within the economy. In line with similar studies[25], high mobility workers are defined as those workers who undertake a moderate to high degree of travel in the course of their employment e.g. taxi drivers, agricultural workers selling produce in town, salesmen and transport workers. The proportion of high mobility workers was calculated by reference to data from the national bureau of statistics and international labour databases. The productivity gain of high mobility workers with access to a mobile phone was estimated by undertaking interviews to identify the impacts seen in each country and by reference to previous studies.

The process for calculating the impact of the productivity improvements on the economy is set out in the figure below.

[25] Aside from Zain's survey other examples include: Mckinsey & Co. Wireless Unbound. September 2006. *The surprising economic value and untapped potential of the mobile phone.*

**Figure 25: Calculation of economic impact of productivity improvements**




*Source: Deloitte*

## A.1.4 Intangible impacts

Finally, the intangible impact of the mobile industry was identified. Information provided during interviews with MNOs, governments and regulators in Kenya was utilised and additionally findings from other economic impact reports were drew upon and extended.

As with productivity, economic and social research was undertaken in the last ten years on the numerous ways in which mobile services can promote intangible benefits. In section 2.5 of the main paper the key effects identified in the last three years in Kenya were identified, discussed and measured. Several important effects have been identified in the research in the last years. These are presented here for general review and include:

- Promoting social cohesion: through enabling contact when family members or friends who have moved away, and building trust through sharing of handsets (which has been found to be common in developing countries). In addition, a number of studies found a statistically robust relationship between mobile ownership and willingness to help others in the community.

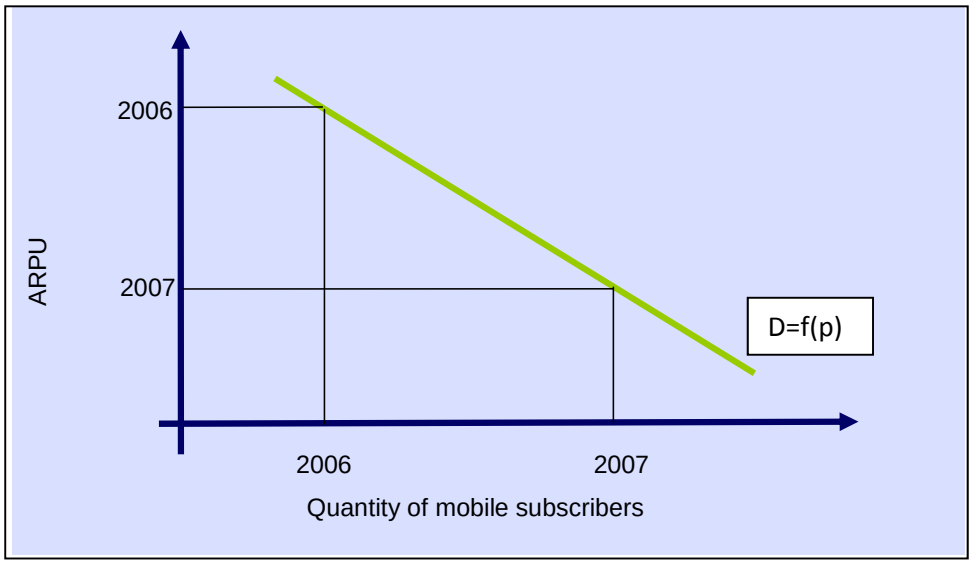
- Extension of communications: especially to users with low education and literacy, particularly through the use of texts.

- Stimulating local content: this can be particularly useful for allowing users to learn about local services such as healthcare or education.

- Assisting in disaster relief: mobile services allow families and friends to stay in touch in the event of a natural disaster, which can also ensure that they obtain more rapid relief.

Whilst it is difficult to assign a specific value to these benefits in terms of contribution to GDP or employment, it is clear that many of these social and educational benefits could make people happier, healthier and more motivated; and hence more employable and able to contribute to GDP. One method for estimating a value using actual data is the willingness to pay concept[26]. This seeks to calculate the increase in consumer surplus that has resulted from a change in the price of a good.

**Figure 26: Increase in consumer surplus following a reduction in price**




*Source: Deloitte*

The willingness to pay concept was used to calculate the value of the intangible benefits of mobile phones in this study[27]. Historical average revenue per user (ARPU) shows us how much customers are willing to pay for mobile services. If it is assumed that these intangible benefits of owning a mobile are unchanged over time, then the value for this form of consumer surplus can be considered to be the difference between ARPU at the time of subscription, less ARPU today (which is likely to be less due to increased competition and other factors). Total consumer surplus is then the difference in ARPU multiplied by the total mobile subscribers.

There are numerous reasons why these estimates may either underestimate or overestimate the true value of intangible benefits. For example, this methodology assumes that all subscribers joined the network in 2003 and does not account for the increased or decreased willingness to pay that would have resulted from the ARPU changes in early years. The calculation also assumes that the

[26] See: Mckinsey & Co. Wireless Unbound. September 2006. *The surprising economic value and untapped potential of the mobile phone*.

[27] There is a potential for double counting between the productivity improvement and the intangible impact.

number of subscribers in each year is a function of price. However, subscriber levels during the period are highly influenced by the level of network coverage and therefore, had mobile coverage been greater, then it is likely more subscribers would have been signed up at higher ARPUs in the early years.

To reduce the extent of benefits' overestimation, in this instance it was assumed that willingness to pay has been impacted by the increase in competition and significant fall in prices in recent years. A discount factor, calculated as a function of the price decreases, was applied to calculations in 2009, 2010 and 2011. This may reflect the non-linearity of the demand curve for low price levels.

# A.2 Data limitations and detailed Assumptions

## A.2.1 Kenya specific assumptions

**Assumptions used in the economic impact assessment**

| Assumption | Value |
|---|---|
| Employment levels | Direct employment by MNOs<br><br>Data was obtained directly from Safaricom and Airtel and estimates for Orange and Yu were based on publicly available information or estimated based on market shares.<br><br>Indirect employment<br><br>Employment figures for most segments of the value chain were estimated based on discussions with MNOs and other business. However, employment figures for some segments were estimated as revenue inflow multiplied by wages as percentage of revenue divided by average wage. Wages as percentage of revenue estimated based on discussions with MNOs and other businesses. Average wage was estimated by using assumptions on operator wage and average wage in Kenya.<br><br>For airtime employment, interviews with airtime dealers and operator staff identified the number of points of sale and distributors by type. Based on interviews, an appropriate level of employment was assumed for each type. On average 0.7 FTEs were assumed for each point of sale. This is lower than in previous reports due to better information regarding the airtime supply chain being available.<br><br>Network equipment employment was estimated on the basis of information provided by operators. The information provided was an estimate of the total market.<br><br>A multiplier of 1.2 was applied to indirect levels to gauge the total employment effect in the economy. No multiplier was also applied to direct employment, as a large amount of employment will already be captured by the first round flows. |

<table>
<tr><th>Assumption</th><th>Value</th></tr>
<tr><td>Value add margins for each segment of the value chain</td><td>
Value add margins are the total % of revenue spent domestically on (i) sales, import, income, corporate and regulatory taxes; (ii) wages; (iii) CSR; and (iv) profit.<br><br>
<u>Direct value add of MNOs</u><br><br>
All data was obtained directly from MNOs<br><br>
<u>Indirect value add</u><br><br>
These percentages are estimated based on interviews with operators and external parties (such as airtime dealers) and a review of accounts of companies in Kenya. From 2008 we have applied different margins from those used pre-2008 (in the previous studies) to reflect the changing market conditions and improved data availability.<br><br>
<table>
<tr><th>Margin on domestic revenues</th><th>% value add margin pre 2007</th><th>% value add margin 2007 onwards</th></tr>
<tr><td>Fixed telecommunications operators</td><td>53%</td><td>48%</td></tr>
<tr><td>Network equipment suppliers</td><td>71%</td><td>69%</td></tr>
<tr><td>Handset designers and dealers</td><td>64%</td><td>41%</td></tr>
<tr><td>Other suppliers of capital items</td><td>68%</td><td>44%</td></tr>
<tr><td>Suppliers of support services</td><td>62%</td><td>55%</td></tr>
<tr><td>Airtime commission, payphone commission</td><td>73%</td><td>67%</td></tr>
</table>
</td></tr>
<tr><td>Airtime commission</td><td>Commissions pre 2008 were estimated based on 99% of airtime revenues assumed to be sold through third parties with an average commission based on weighted average of figures provided by operators. For 2008 onwards however commission data was provided by the network operators.</td></tr>
<tr><td>Payphone commission</td><td>Pre-2008 payphones commission was obtained on a per payphone basis from operators and grossed up for estimated number of payphones in Kenya. From 2008, operators provided payphone numbers and commission estimates.</td></tr>
<tr><td>Handsets</td><td>Handset prices and percentage of handsets sold by operators, following legal import and on the black market were estimated following obtained following interviews with handset dealers, and estimates from operators.</td></tr>
<tr><td>Productivity improvement</td><td>
An annual productivity improvement of 10% for high mobility workers was assumed based on interviews and a review of similar studies.<br><br>
High mobility workers were estimated as 18% of the total workforce. The estimate of the percentage of high mobility workers in each employment activity is provided below.<br><br>
<table>
<tr><th>Employment by sector</th><th>2008</th><th>2009</th><th>2010</th><th>2011</th><th>% high mobility</th></tr>
<tr><td>Agriculture and Forestry</td><td>289700</td><td>288000</td><td>295554</td><td>303306</td><td>15%</td></tr>
<tr><td>Mining and Quarrying</td><td>1016200</td><td>1057800</td><td>1085546</td><td>1111840</td><td>10%</td></tr>
<tr><td>Manufacturing</td><td>638000</td><td>653500</td><td>668445</td><td>683731</td><td>7%</td></tr>
<tr><td>Electricity and Water</td><td>21725</td><td>22222</td><td>22730</td><td>23250</td><td>10%</td></tr>
<tr><td>Building and Construction</td><td>83689</td><td>85602</td><td>87560</td><td>89562</td><td>35%</td></tr>
<tr><td>Wholesale and Retail Trade, Restaurants and Hotels</td><td>188032</td><td>192332</td><td>196730</td><td>201229</td><td>60%</td></tr>
<tr><td>Transport and Communications</td><td>125533</td><td>128404</td><td>131340</td><td>134344</td><td>70%</td></tr>
<tr><td>Finance,Insurance, Real Estate and Business services</td><td>91715</td><td>93812</td><td>95958</td><td>98152</td><td>85%</td></tr>
<tr><td>Community, Social and Personal Services</td><td>801998</td><td>820339</td><td>839099</td><td>858288</td><td>10%</td></tr>
<tr><td>Average high mobility</td><td></td><td></td><td></td><td></td><td>18%</td></tr>
</table>
</td></tr>
</table>

| Assumption | Value |
|---|---|
| | Employment information for 2008-2009 is obtained from the national statistics office. Post 2009 employment is estimated on the basis of the labour force growth rate. Percentage of workers who are high mobility are Deloitte assumptions based on benchmarks from previous studies and experience. Average high mobility is a weighted average.<br><br>The GDP contribution of these workers was estimated by calculating the total GDP relating to high mobility sectors and dividing by the total number of high mobility workers. |
| Multiplier | A multiplier of 1.2 was applied to supply side direct and indirect value add in order to capture the full impact on the Kenyan economy.<br><br>A multiplier of 1.2 was assumed following a literature review and interviews with Kenyan officials. |

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