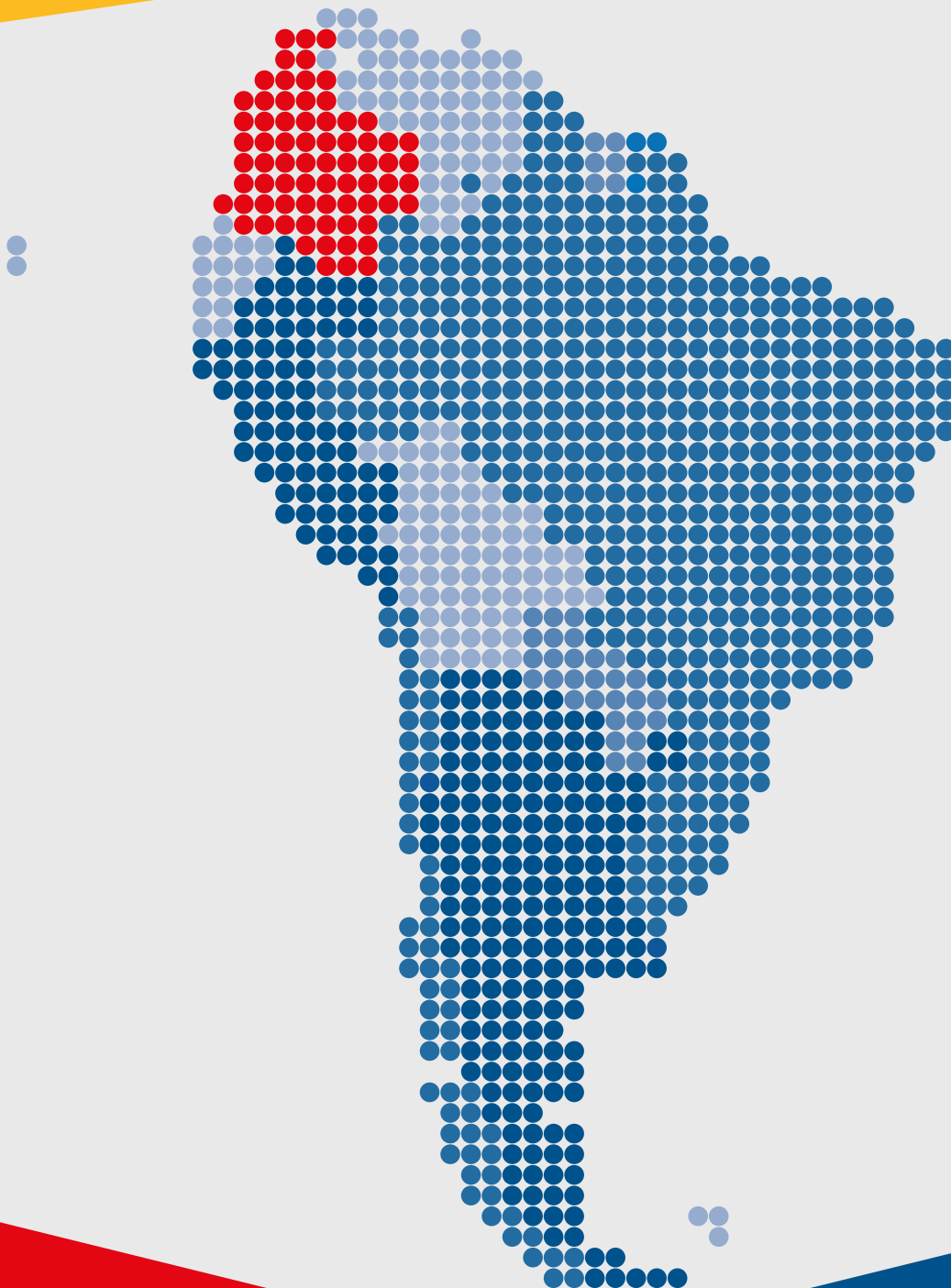




Digital Inclusion and Mobile Sector Taxation in Colombia

Reforming sector-specific taxes and regulatory fees to drive affordability and investment





About the GSMA

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

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CONTENTS

IMPORTANT NOTICE FROM DELOITTE	4
EXECUTIVE SUMMARY	5
1 THE MOBILE INDUSTRY IN COLOMBIA	11
2 TAXATION ON THE MOBILE SECTOR	18
3 IMPACTS OF TAX REFORMS ON AFFORDABILITY, INVESTMENT AND ECONOMIC GROWTH	30
4 REFORMING TAXATION ON THE MOBILE SECTOR IN COLOMBIA	40
APPENDIX A - METHODOLOGY	42

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Executive Summary

Mobile services today connect over 33 million people in Colombia, and are a key economic and social contributor in the country

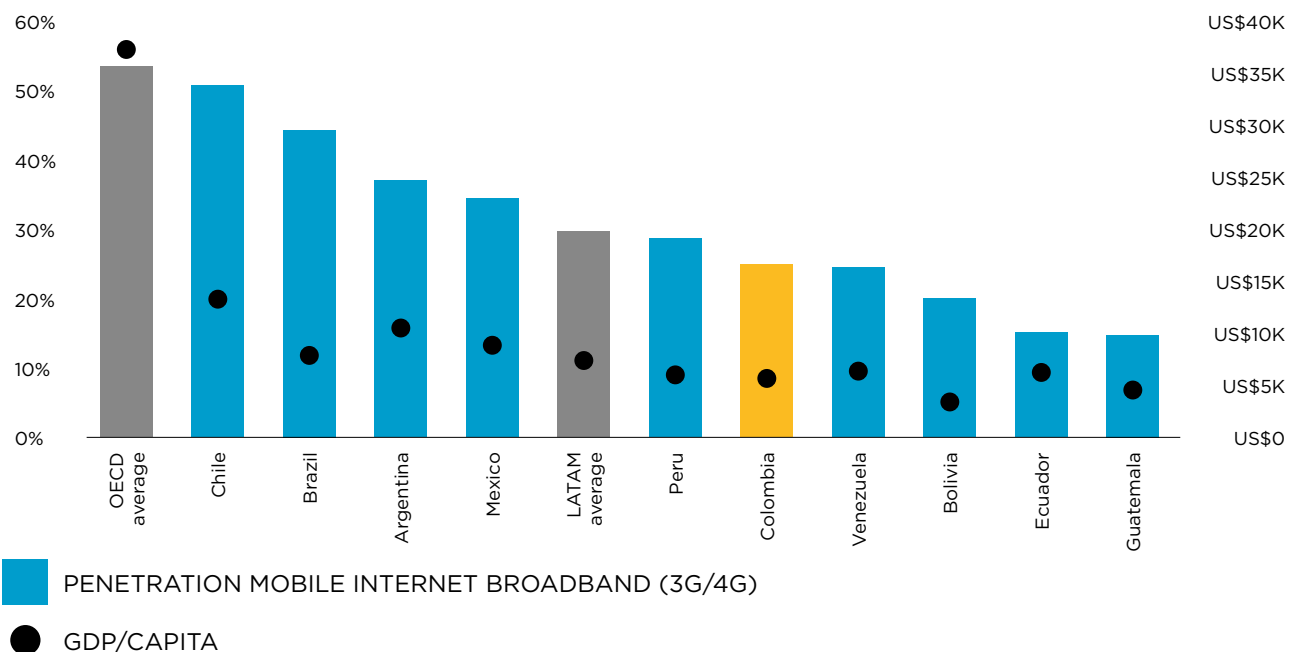
Colombia has the third highest Gross Domestic Product (GDP) and population in Latin America. The mobile industry plays a major role in the country with revenues of US\$5.7bn in 2015, representing almost 2% of GDP.

Mobile penetration by connection was approximately 100% in Q1 2016, with 66% people holding a mobile

subscription,¹ making Colombia the fourth largest mobile market in Latin America. Whilst mobile internet penetration has developed rapidly, reaching 47% in Q1 2016, it still remains lower than penetration averages for Latin America and OECD countries.

FIGURE 1

Penetration rate of mobile internet subscribers and GDP per capita in selected countries, 2014



Source: GSMA Intelligence and World Bank

1. Mobile penetration by connections is calculated as the number of SIM cards per inhabitants, while mobile penetration by unique subscribers is the share of individuals owing a mobile subscription. Given that an individual may own more than one SIM card, the former is typically larger than the latter.

The OECD and other international observers suggest that Colombia's telecommunication policies and regulatory framework are advanced.² A third of Colombians however, remain unconnected and market penetration, as well as the voice market, has plateaued in recent years, suggesting a different approach may be needed for underserved populations.³

Key economic benefits that mobile connectivity can provide to Colombia are:

- The facilitation of communications and fostering of economic exchanges across the entire economy. Economic studies and the academic literature have found strong positive relationships between mobile penetration and economic growth. Broadband, in particular, is critical to the delivery of economic

benefits. A World Bank study has found that in developing world economies, such as Columbia, every 10% increase in broadband subscriber penetration accelerates economic growth by 1.38%.⁴

- Contribution to the Colombian government's revenues. Mobile operators paid over US\$1.36bn in taxes and regulatory fees to the government in 2014, representing over 26% of their revenues.⁵ In addition, through payments made to secure spectrum, mobile operators further contributed US\$400m in the last three years alone.⁶ It is estimated that the mobile sector's share of tax payments is over 1.3 times its share of GDP, making the sector a more than proportionate contributor to the public finances.⁷

Higher taxation on mobile services compared to other standard goods and services risks limiting connectivity for the poorest Colombians

In addition to general taxation, the Colombian mobile sector is subject to a number of sector-specific taxes and regulatory fees levied both on mobile consumers and operators, notably:

- Consumption Tax: consumers of mobile voice services in Colombia are subject to an additional 4% tax on top of general VAT of 16%.
- A FONTIC (fund for information and communication technologies) contribution of either 2.2% or 5% of operators' revenue.⁸
- Other operators' regulatory fees such as the regulatory commission fee and recurring spectrum fees aimed to cover the costs of the regulator and of managing spectrum.

Mobile services in Colombia are taxed at a higher rate than similar services offered on fixed networks for the 60% of the population in the two most disadvantaged socio-economic classifications, who are exempted from paying VAT on fixed telephony. Additionally, while mobile handsets and smartphones are subject to VAT, personal computers and laptops are exempt, in recognition of the importance of internet connectivity.

In Colombia, sector specific taxation represented 37% of mobile services' total tax payments in 2014; a larger share, with the exception of the Dominican Republic, than in any other Latin American country surveyed in the GSMA's 2016 mobile taxation survey.

2. OECD, 2014, 'Review of Telecommunication Policy and Regulation in Colombia'

3. GSMA-I, 2016

4. Qiang and Rossotto, 2009, 'The economic impact of broadband'

5. Deloitte, GSMA, 'Mobile Taxation Global Survey, 2016'

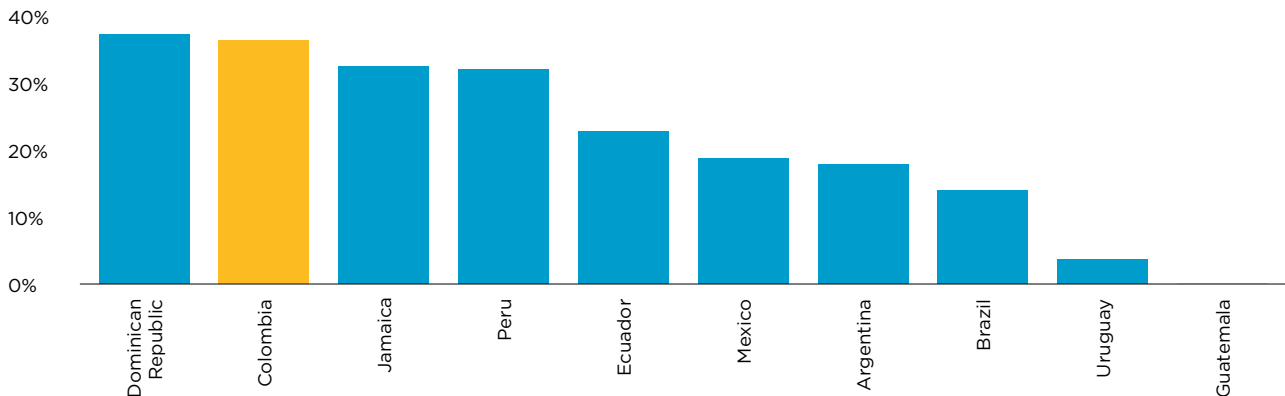
6. Budde, 2016, 'Colombia - Telecoms, Mobile, Broadband and Digital Media'

7. Deloitte analysis on OECD and operators' data

8. The FONTIC is Colombia's Universal Service Fund (USF)

FIGURE 2

Sector-specific taxes share of total taxes in selected LATAM countries for which data is available, 2014



Source: Deloitte GSMA Mobile taxation survey 2016

Taxation over and above that which applies to other standard goods and services is not fully aligned with the best practice principles of taxation, set out by international organisations such as the World Bank, IMF and OECD that recommend taxation to be levied on broad bases. This creates a number of issues:

- **Reduced affordability of mobile services:** Sector-specific taxes and regulatory fees can be passed onto consumers either directly, through retail prices, or indirectly, through quality reductions. Colombia has the second highest level of economic inequality in Latin America. This inequality may contribute to make mobile services unaffordable for the poorest consumers:
 - ▶ Traditional voice and SMS services cost 3.1% of average annual income per capita, which is 47% higher than the Latin American average, and 19% of annual income for the poorest 20% of the population.⁹
 - ▶ Mobile broadband costs the poorest 20% of Colombians 19% of their income, which is nearly four times the 5% affordability threshold suggested by the Broadband Commission and ITU.¹⁰

- ▶ A basic smartphone represents 6% of the annual income of the poorest quintile while a premium smartphone represents approximately 24% of income.

- **Disincentives for investment:** Sector-specific taxation reduces the returns on investment, potentially leading to inefficient investment decisions, which could slow the development of the sector and delivery of the positive effects of mobile on the wider economy. The Colombian Government has a target of achieving 100% 4G coverage by 2018, and gaps remain to achieve this objective. Industry sources report that operators in Colombia have invested 70% of their profits in networks.¹¹

The OECD, in its assessment of Colombia's telecommunication policy, states that "Colombia should refrain from adding a "luxury" VAT tax for mobile services ['the Consumption Tax'] and should decrease the current obligation on operators to fund the ICT Fund (FONTIC), with a view to transitioning to funding from general government revenue".

9. Deloitte analysis on ITU and World Bank

10. ITU, 'Measuring information society', 2015

11. Deloitte analysis on GSMA Intelligence data, 2016

Removing the Consumption Tax could increase the affordability of mobile services and spur digital inclusion for the poorest Colombians

Affordability of services is particularly impacted by the special tax on voice usage. Removing special taxes on mobile consumption has recently resulted in significant extensions of mobile access in Uruguay and Ecuador, where economic inequality is lower than in Colombia, and the Mexican government has proposed a similar approach.

Based on an analysis which examines the impact of changes to sector-specific taxation on mobile penetration and economic growth, it is estimated that removing the Consumption Tax, in line with the OECD recommendation, could:

- Increase unique subscribers by over 440,000 by 2021, of which over 312,000 could be 3G/4G connections.

- Add around 100 new sites and upgrade another 170 sites to mobile broadband over a five-year period.
- Add over US\$1.4bn in GDP¹² by 2021, representing a 0.4% increase in GDP.
- Increase tax revenue by over US\$100m in 2021.
- Create over 1,200 jobs through increased activity in the mobile sector in 2021.

To reduce affordability barriers, the Colombian government could also consider removing VAT on mobile handsets and smartphones, similarly to the approach adopted for laptops and computers.

Removing the FONTIC contribution could increase investment in mobile networks, reducing access gaps

Operators are facing low returns on capital expenditure, especially in rural areas, with many operators not making any profit on a regular basis.¹³ In order to further support investment, the government could consider removing the FONTIC contribution to free up resources for network upgrades and extension. Based on an analysis that examines the savings from the fund contribution and the cost of rolling out network sites in Colombia, it is estimated that removing the FONTIC contribution could:

- Increase unique subscribers by over 250,000 by 2021, of which over 178,000 could be 3G/4G connections.

- Add around 340 new sites and upgrade over 590 sites to broadband over the five years.
- Add over US\$900m in GDP¹⁴ in 2021, representing a 0.3% increase in GDP.
- Increase tax revenue by over US\$119m in 2021.¹⁵
- Create over 2,700 jobs through increased activity in the mobile sector in 2021.

12. The GDP figure is based on the IMF GDP projection, in constant 2015 national prices

13. GSMA Intelligence

14. The GDP figure is based on the IMF GDP projection, in constant 2015 national prices

15. FONTIC (USF) contributions not being a central government resource, there were not considered as a tax revenue loss.

Alternative and more efficient tax structures have the potential to reduce the digital divide, increase economic growth and protect Colombia's fiscal position

The mobile industry recognises the importance of the current revenues that the Colombian government obtains from the Consumption Tax, the FONTIC and other taxes and fees paid by the industry. In the medium term, the removal of sector-specific taxes has the potential to generate more tax for the government as a result of larger user bases and higher economic activity generated by the reform.

However, in the short term, the government may consider alternative ways to cover the tax revenue shortfall from removing sector-specific taxes. International organisations such as the World Bank suggest general taxes on wider bases are to be preferred to taxes on narrow bases, such as sector-

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

For example, the current revenues obtained by the government through the Consumption Tax amount to around 0.48% of all VAT collection, or to 2.18% of Income tax collection. Considering 2014 data on revenues collected by the government through general taxation, a static economic analysis suggests that the increase in general VAT may be equivalent to a rise from 16% to 16.08% to recover the tax revenues from the Consumption Tax; and that social security contributions may only need to rise from 20.5% to 20.71%.

TABLE 1

Relative value of consumption tax to general taxes

General tax	Consumption Tax payment relative to economy wide general taxation	Representative tax rate increase to recover lost tax revenue
Corporation tax	0.48%	0.19%
VAT	0.50%	0.08%
Income tax	2.18%	0.4% for the lowest bracket to 0.7% for the highest
Social security contributions	1.00%	0.21%

Source: Operator data and OECD.

Revenues obtained by the government through the FONTIC amount to around 0.80% of all VAT collection or to 3.5% of income tax collection.^{16,17} Considering 2014 data on revenues collected by the government through general taxation, a static economic analysis suggests

that the increase in VAT may be equivalent to a rise to 16.13% to recover the revenues from the FONTIC. Alternatively, the Income Tax could increase of up to 1.2 percentage points for the highest bracket to recover the revenues from FONTIC.

TABLE 2

Value of FONTIC contribution relative to general taxes and increases in general tax required to cover this contribution, 2014

General tax	FONTIC payment relative to economy wide general taxation	Representative tax rate increase to recover lost tax revenue
Corporation tax	0.77%	0.3%
VAT	0.80%	0.13%
Income tax	3.50%	From 0.7% for the lowest bracket to 1.2% for the highest bracket
Social security contributions	1.61%	0.33%

Source: Operator data and OECD data on tax revenue

While these alternatives do not take into account the impacts that these tax increase may have on the wider

economy,¹⁸ they do however illustrate the marginal impact of sector-specific taxes on general taxation.

16. Deloitte analysis on operators' data and OECD

17. Proceeds from the FONTIC do not accrue to the Colombian government but to the USF, which could be funded in alternative ways, e.g. through general taxation as illustrated here.

18. The representative tax rate increases in the table are estimated through a static analysis and subject to a number of stringent assumptions, discussed in section 3.

1 The mobile industry in Colombia

Colombia is the fourth largest mobile market in Latin America (LATAM), with nearly 33 million unique subscribers and over 50 million connections in 2015. The Colombian economy has grown rapidly at an average rate of 4.6% over the past five years;¹⁹ GDP²⁰ per capita stood at US\$6,900 in 2015,²¹ and in 2013, the country launched its application process to become a member of the Organisation for Economic Co-operation and Development (OECD). Mobile services, with market revenue of US\$5.7bn in 2015²² representing 0.9% of Colombia's GDP,²³ have been a key contributor to the Colombian economy.

Colombia's telecommunication market is serviced by five operators. The three largest, Claro (América Móvil), Movistar (Telefónica) and Tigo (Millicom) with connections market shares of 55%, 25% and 18% as of Q1 2016, respectively, account together for over 98% of total mobile connections.²⁴

Colombia's telecommunication policies and regulatory framework is generally recognised as advanced by think tanks²⁵ and international organisations such as the OECD.²⁶ The Colombian Ministry of Information and Communication Technology (MinTIC)'s 'Vive Digital' strategy, in particular, was reported by the OECD to have helped increase the number of municipalities connected to the internet from 17% to 96% from 2010 to 2014.²⁷ The next phase of the strategy aims to increase the number of municipalities covered by broadband by five times,

triple the number of connections to internet, and reach 100% 4G coverage by 2018.²⁸

Colombia performs slightly above the LATAM average in terms of mobile connectivity overall, although affordability and infrastructure remain development areas for the country.²⁹ In particular, with regards to the impact of taxation on the cost of owning and using a mobile phone, Colombia underperforms compared to the LATAM average, suggesting that the country has room to improve the fiscal treatment of the mobile sector to further improve connectivity.

Against this background, this report assesses the potential role of tax policy on connectivity, digital inclusion, network investment and economic growth in Colombia. The analysis uses an economic model of the Colombian mobile sector and economy and estimates the impact of possible taxation reforms on the affordability of mobile services, investment in mobile networks, economic growth and employment. It further discusses these findings in relation to the Colombian government's development goals, Information and Communications Technologies (ICT) objectives and best practice principles of taxation across the economy and within the mobile sector.

- The remainder of Section 1 discusses connectivity in Colombia and its benefits for the country's social and economic development.

19. World Bank database, 2016

20. "The gross domestic product is an aggregate measure of production equal to the sum of the gross values added of all resident institutional units engaged in production [...]" OECD, 2001.

21. IMF World Economic Outlook database, 2016, Gross domestic product per capita, current prices (US dollars)

22. GSMA intelligence, 2016

23. World Bank, GDP calculated in PPP terms

24. An alternative measure of market share is voice revenues. In Q1 2016 Claro had a market share of 49.5%, Movistar 22.8%, and Tigo 19.3% (Source: operator data)

25. Copenhagen Consensus centre, 2015, 'Colombia Perspective, ICT infrastructure'. In 2012, the Colombian telecommunication ministry received the GSMA government leadership award for its role in ICT development in the country.

26. OECD, 2014, 'OECD Review of Telecommunication Policy and Regulation in Colombia'

27. OECD, 2015, 'Digital economy outlook'

28. Colombia's Ministry of Information and Communication Technologies, 2014, 'Vive digital, Colombia 2014-2018'

29. GSMA's 'Mobile Connectivity Index' which measures different aspects of connectivity worldwide

- Section 2 describes the taxes levied on the mobile sector in Colombia and the implications of these taxes for the mobile market and the wider economy. It also compares the taxes levied in Colombia with international benchmarks and best practice, as recommended by leading international organisations.
- Section 3 considers the impacts of potential tax reforms on affordability, investment and economic

growth. It discusses how these policies could support the Colombian government’s ICT strategy.

- Section 4 concludes discussing options for tax reform.
- The Appendix describes the economic model of the Colombian mobile sector and economy that has been used in the analysis to estimate the impacts of reforming mobile sector taxes.

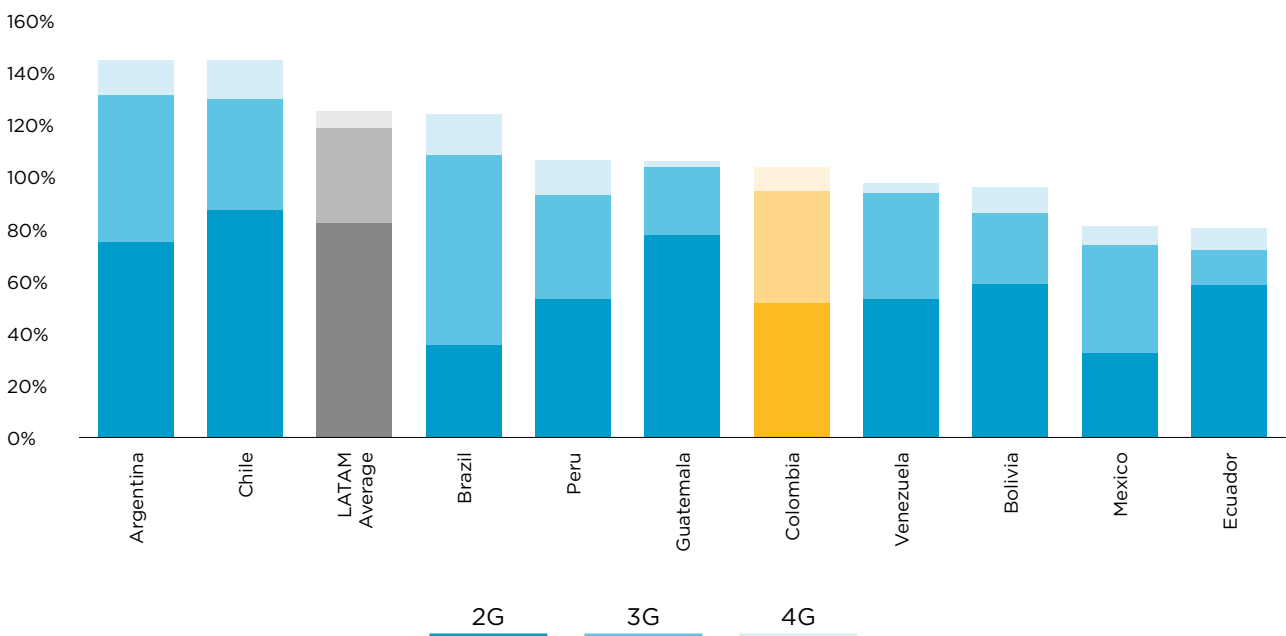
1.1 The majority of Colombians enjoy the benefits of connectivity

After growing at an average growth rate of 22% from 2000 to 2009, total mobile penetration in Colombia has remained close to 100% over the past three years.³⁰ Between 2011 and Q1 2016, 3G and 4G connections more

than tripled to 20.7m and 4.3m respectively, and could represent a larger number of connections than 2G for the first time by the end of 2016. Total market penetration, however, remains lower than the LATAM average.

FIGURE 3

Market penetration (connections) by technology in selected LATAM countries, 2016



Source: GSMA intelligence

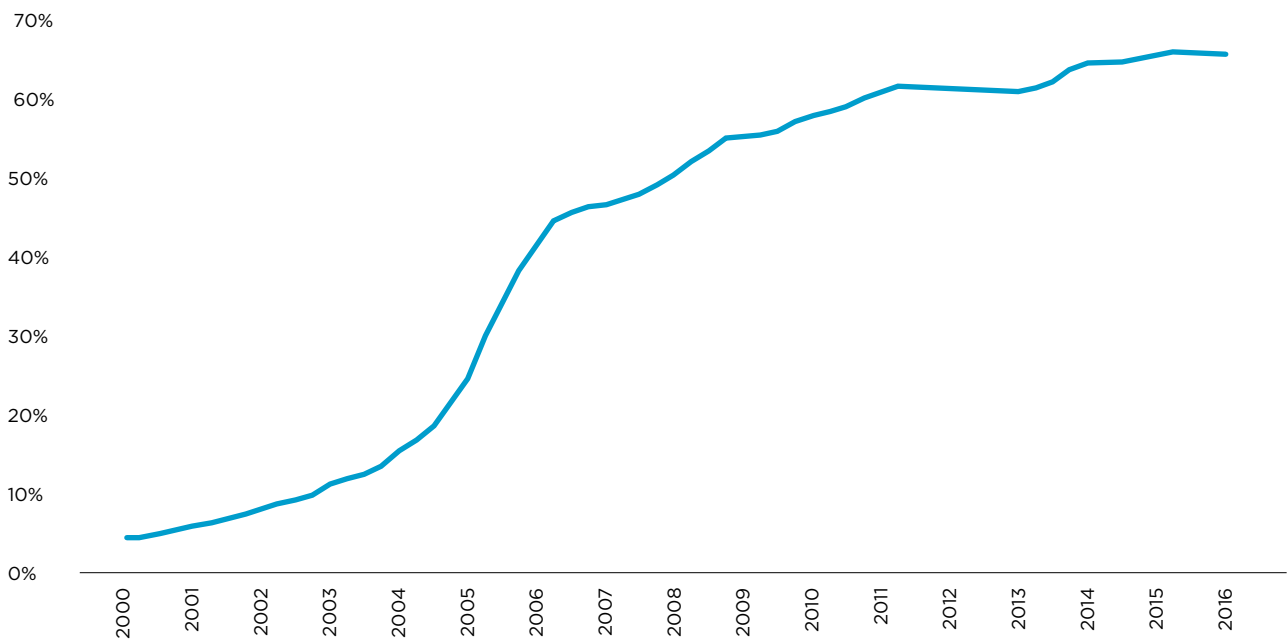
30. GSMA intelligence, 2016. Unless otherwise stated, all other figures in this subsection come from GSMA intelligence. Other sources for market information are available such as mobile broadband internet penetration was found to be 27.1% in Q1 2016 in the “Boletín Trimestra de las TIC”, compared with 25% according to the GSMA Intelligence.

However, with the mobile penetration of unique subscribers standing at 66% in Q1 2016, over 16.4m Colombians remain unconnected.³¹ Despite this persistent digital divide, market penetration has

plateaued over the past years, suggesting a different approach may be needed to connect the remaining one third of the population.

FIGURE 4

Market penetration in Colombia, unique subscribers



Source: GSMA intelligence

As of Q1 2016, mobile broadband penetration in Colombia stood at 25%, lower than the LATAM average of 30%,³² with Colombian authorities' pledging to connect 63% of Colombian households to the optic fibre network by the end of 2018.³³

The Colombian economy remains one of the most unequal in the continent: the share of income earned

by the poorest 20% of the population in Colombia was 23% lower than the LATAM average in 2013.³⁴ There is a negative correlation between the GINI coefficient³⁵ and mobile broadband subscriber penetration for a selection of LATAM and OECD countries. This suggests that affordability of mobile services for the poorest sectors of the population could partly explain why significant proportions of society remain unconnected.

31. Deloitte analysis on GSMA intelligence, 2016

32. GSMA intelligence, 2016

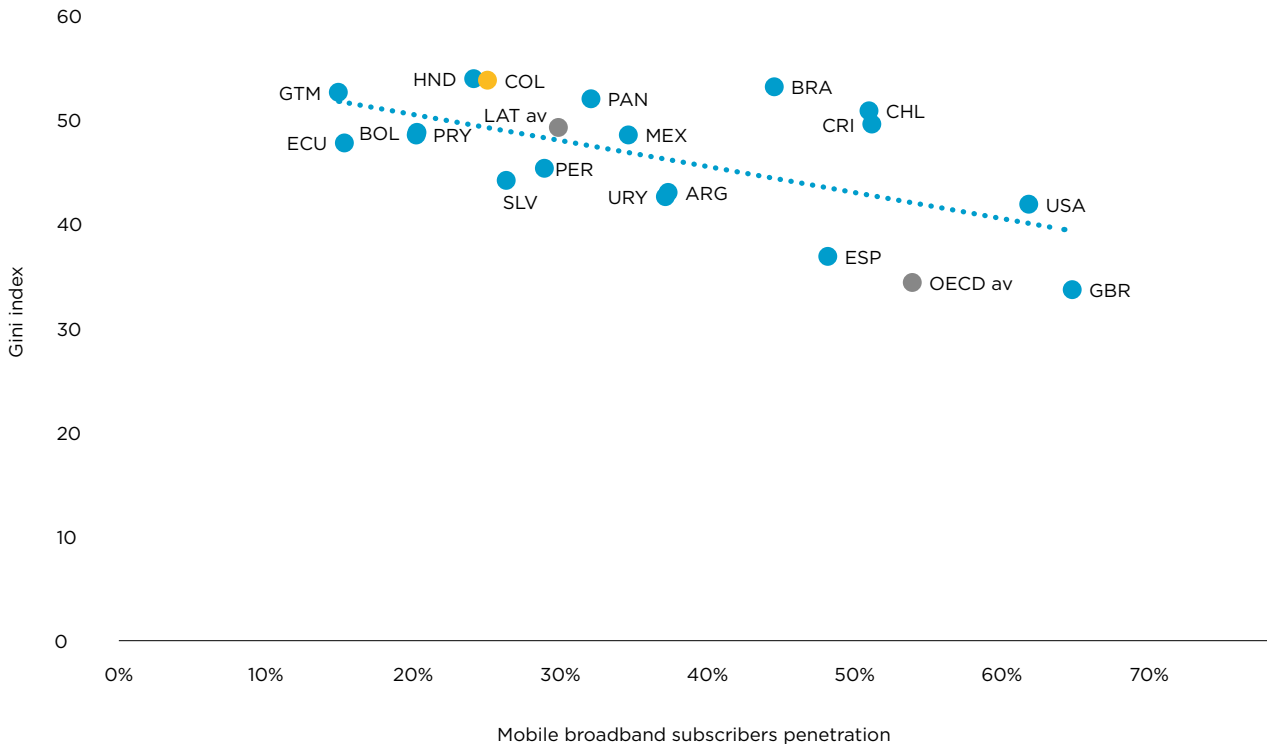
33. Colombia's Ministry of Information and Communication Technologies, 2014, 'Vive digital, Colombia 2014-2018'

34. World Bank, 2016

35. The Gini coefficient measures the inequality among values of a frequency distribution (for example levels of income). It is commonly used as a measure of inequality of income or wealth. A higher value represents more inequality.

FIGURE 5

Mobile internet unique subscriber penetration on 3G and 4G networks and GINI index, latest year available



Source: GSMA Intelligence and World Bank. Note that mobile broadband penetration is reported for 2016, while the value of the GINI index was only available for 2011 for Guatemala, 2012 for Mexico, the UK and Ecuador, and 2013 for the rest of the sample.

The UN Broadband Commission and International Telecommunication Union (ITU) have suggested an affordability threshold of 5% of income for the cost of a 500MB per month mobile broadband package. According to ITU data, this cost of mobile broadband represents 3.12% of Colombia's average gross national income.³⁶ Mobile broadband cost as a share of average income, however, is approximately 12% for the poorest 40% of the Colombian population, significantly above the 5% threshold.

While the effective price per minute in Colombia was lower than the LATAM average in 2014,³⁷ mobile services' cost in Colombia represents approximately 20% of the mean income of the poorest 20% of the population.³⁸ Improving mobile telephony affordability for the poorest Colombians can help achieve the government's objectives of increasing internet access.

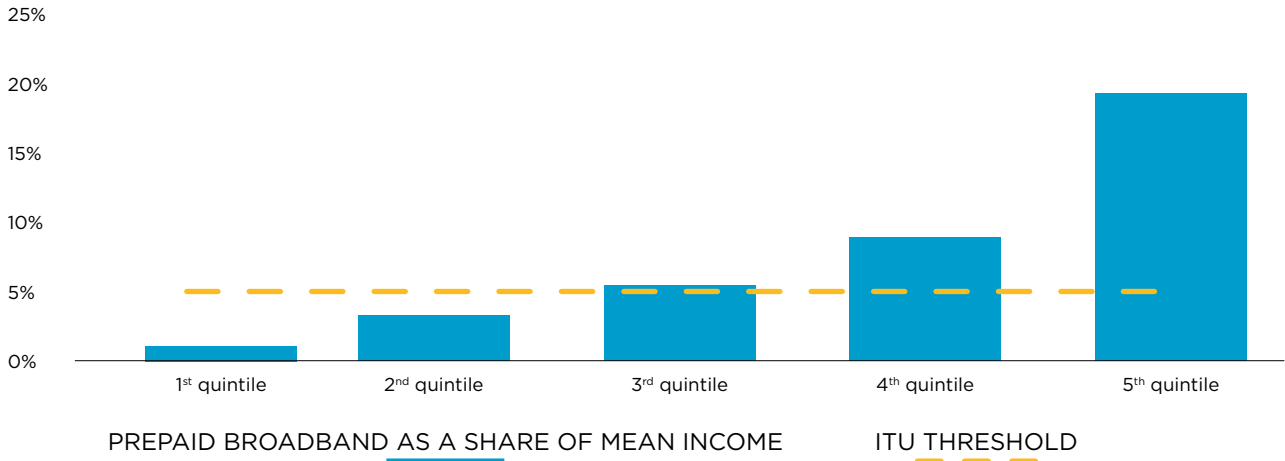
36. ITU, 2015, Measuring the Information Society Report

37. GSMA intelligence

38. Deloitte analysis on ITU and World Bank data

FIGURE 6

Mobile broadband cost as a share of income across population groups, 2014



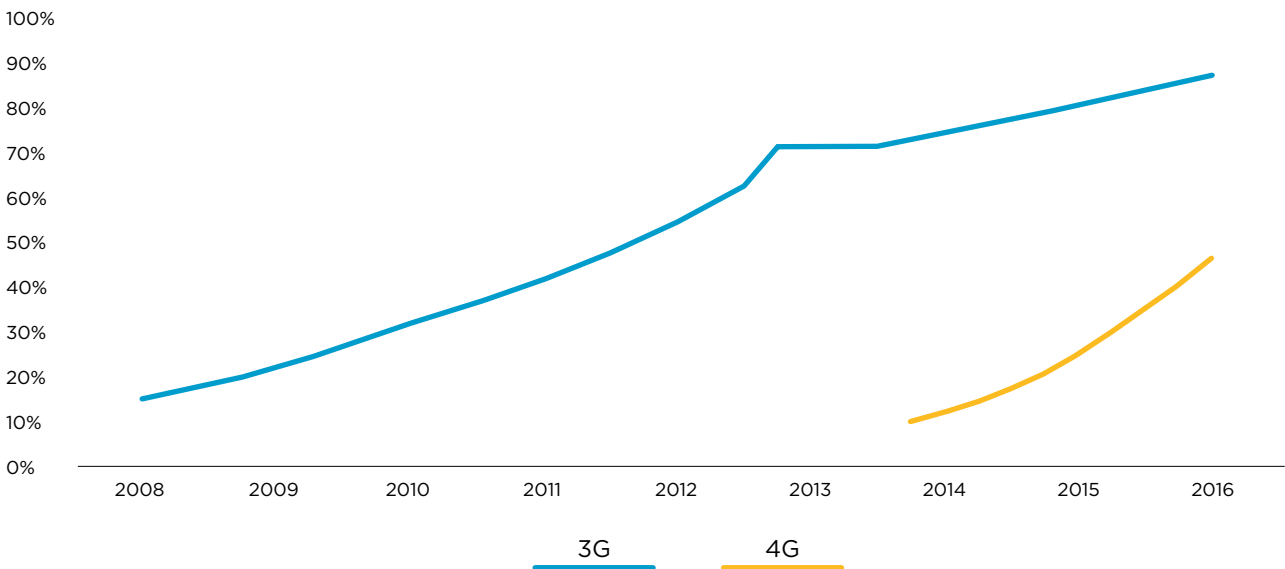
Source: Deloitte analysis on ITU and World Bank data. A quintile represents 20% of the population. A mobile broadband package consists of 500MB per month

In its 'Vive Digital' strategy, the Colombian government has set a series of goals to expand broadband and mobile internet significantly beyond the current levels of coverage. The first phase of the plan has resulted in a considerable roll out of broadband technologies in the country, with 3G coverage increasing from 31.7% in

Q1 2010 to 78.9% in Q4 2014. Colombia's 4G networks, which were first introduced in Colombia in 2012, cover 46.4% of the population in Q1 2016. Further investment would, however, be needed to reach the Colombian government's goal of 100% 4G coverage by 2018.

FIGURE 7

Population coverage in Colombia, by technology



Source: GSMA intelligence

1.2 Mobile services are a key driver of social and economic development in Colombia

Over the past five years, rapid economic growth in Colombia contributed to historically low levels of unemployment and lifted almost 2 million Colombians out of poverty.³⁹ However, the OECD expects economic growth to slow down in the context of the decline in commodity prices in the near future,⁴⁰ and new sources of growth may be needed to pursue the country's economic and social development.

The potential of ICT such as mobile to deliver inclusive economic and social development are widely recognised in academic literature and by international organisations.⁴¹ In its 2016 report on global digital dividends, the World Bank indicated that "*Digital technologies [such as mobile] are transforming the worlds of business, work, and service delivery. These advances are making the leading parts of the economy and society more productive*".⁴² For example, a Deloitte/GSMA report found that in 2011 the wider mobile ecosystem in Colombia contributed US\$12.4 billion, representing 3.7% of GDP, if direct, indirect and induced supply-side effects, as well as demand-side effects on productivity, are considered.⁴³

The following section presents a summary of the key economic and social benefits of mobile connectivity in Colombia.

1. Mobile services promote long run economic growth

A number of studies have already highlighted the economic growth potential of mobile telephony. By facilitating communication, mobile services may foster economic exchanges across the entire economy. Indeed, studies by the GSMA and the World Bank have found strong positive relationships between mobile penetration and economic growth.⁴⁴

Broadband, in particular, is critical to the delivery of economic benefits.⁴⁵ A World Bank study has found that in developing economies such as Colombia every 10% increase in broadband subscriber penetration⁴⁶ accelerates economic growth by 1.38%.⁴⁷ Importantly, broadband enables more data-intensive internet usage for business purposes, and local entrepreneurs in Colombia are indeed already leveraging the potential of mobile internet. Examples of Colombian technology start-ups include:

- **Mobiera**,⁴⁸ a business support systems and cloud service firm based in Bogotá. It develops and provides platforms and services for mobile operators around the world.
- **Domoti**,⁴⁹ a Colombian based technology company who develops web sites, apps and Internet of Things solutions for clients world-wide. It has received certifications from the largest industry players, such as Microsoft, Intel, Samsung and Nokia.

39. World Bank, 2016, 'World bank data base'

40. OECD, 2016, Development in individual OECD and selected non-member economies

41. World Bank (2012): "Maximising Mobile"; McKinsey & Company (2012): "Online and Upcoming: The Internet's impact on aspiring countries."; Goyal, A. (2010): "Information, Direct Access to Farmers, and Rural Market Performance in Central India." in American Economic Journal: Applied Economics, Vol. 2, pp22-45; Aker, J.C. and Mbiti, M. (2010): "Mobile Phones and Economic Development in Africa", Journal of Economic perspectives, Vol. 24, pp207-232; Qiang, C.Z.W., Rossotto

42. World Bank (2016): "World Development Report 2016 – Digital Dividends"

43. GSMA/Deloitte, Mobile telephony and taxation in Latin America, 2012

44. See for example a study of 40 economies over the period 1996-2011; for full details of the methodology, see <http://www.gsma.com/publicpolicy/wp-content/uploads/2012/11/gsma-deloitte-impact-mobile-telephony-economic-growth.pdf>; Qiang, C. Z. W., Rossotto, C.M., 2009. Economic Impacts of Broadband, in Information and Communications for Development 2009: Extending Reach and Increasing Impact, World Bank, Washington D.C., 35-50.

45. ITU, impact of broadband on the economy, 2012

46. The distinction between users and subscribers of telecommunications services should be noted. Users refer to individuals who do not necessarily own or pay for telecommunications services, but who have access to such services through work, family etc. Subscribers, on the other hand, are individuals who pay for subscriptions to such services, to which a number of individuals may have access. Based on ITU, 2014. Manual for measuring ICT Access and Use by Households and Individuals.

47. Qiang, C. Z. W., Rossotto, C.M., 2009

48. More information available at: <http://www.turismoaccessivel.gov.br/ta/>

49. More information available at: <http://domoti.rocks/>

- **Grabbity**,⁵⁰ a Colombian gaming app developed by Efectos Estudios. It featured in the Apple Store's top 100 list⁵¹ with over 500,000 downloads⁵² and won the GSMA's World Mobile Congress audience mobile premier award in 2013.⁵³
- **Kogi mobile**,⁵⁴ an app development company co-founded by a Colombian entrepreneur. It developed apps for some of the largest companies in the world, including Samsung, Google and McDonalds.⁵⁵

2. Mobile services enhance productivity and competitiveness

By enabling businesses to deliver their services faster and at a lower cost, mobile services have the potential to increase productivity across the Colombian economy. Evidence from the literature on the impact of broadband on productivity suggest that every 10% increase in broadband penetration increases productivity by 1%.⁵⁶ Through wider effects on the economy, this could help Colombia increase the populations' standards of living.

Mobile services and information infrastructure can contribute to Colombia's international competitiveness.⁵⁷ In particular, mobile telephony can facilitate the exchange of information and lower transaction costs throughout the economy,⁵⁸ increasing firms' ability to compete on the global markets. While Colombia's exports remain heavily dependent on commodities,⁵⁹ increased competitiveness could support the country's exports of services and manufactured goods.

3. Mobile services support social development, financial inclusion and the delivery of public services in Colombia

Mobile telecommunications provide a number of intangible benefits to consumers. These include the development of interpersonal and family communications, and the promotion of social cohesion. Mobile services can help support wider social development objectives, such as extending financial inclusion and improving public governance.

Mobile technologies such as mobile money (m-Money) can contribute to a greater financial inclusion in the country: a 2015 paper by the IMF and MIT suggests that financial intermediation costs and access to credit have a significant impact on GDP growth, inequality and productivity.⁶⁰ As only 39% of the adult population in Colombia had a bank account in 2014, according to the World Bank,⁶¹ mobile money could yield significant economic benefits in the country. As of 2014, however, despite the existence of five mobile money deployments in Colombia,⁶² only 2.2% of Colombia's adult population had a mobile money account.⁶³

In its guidelines on e-government, the World Bank indicates e-government's potential to enhance public accountability, reduce the cost of administration and improve service delivery.⁶⁴ In 2012, Colombia implemented the national government website, 'Gobierno en Línea', to provide approximately 1,000 procedures and services online.⁶⁵ In its strategy 'Vive Digital', Colombia's Ministry of Information and Communication Technologies (MinTIC) stated the goal of connecting 80% of local and national government entities to 'Gobierno en Línea'.⁶⁶ Global rankings recognise Colombia's performance in e-government; in the 2015 World Economic Forum's sub-index for Government usage for ICT, Colombia ranked 30th worldwide, the third best performance in Latin America.⁶⁷

50. More information available at: <http://whitebook.com.br/>

51. Colombia bring IT on, 2014, <http://colombiabringiton.co/en/suces-stories/grabbity>

52. ProColombia, 2013, <http://eu.procolombia.co/colombians-european-mobile-applications-market>

53. Televisa, 2013, <http://www.televisa.com/noticias-corporativas/565646/grabbity-obtiene-audience-award-mobile-premiere-award/>

54. More information available at: <https://www.kogimobile.com/>

55. ProColombia, 2013, <http://eu.procolombia.co/colombians-european-mobile-applications-market>

56. LECG, 2009, Economic impact of Broadband: An empirical study

57. World Bank, The four pillars of a knowledge-based economy, 2009.

58. OECD, 2015, Colombia policy priorities for inclusive development

59. BBVA Research, 2012, Economic watch

60. Dabla-Norris et al., 2015, Identifying constraint to financial inclusion and their impact on GDP and Inequality

61. World Bank, 2016, Global Findex

62. Ahorro a la Mano (Bank BanColombia), Daviplata (Bank Davivienda), DDDedo (VTU Colombia), Mi Plata (CoopCentral) and Transfer Aval (Aval Group)

63. World Bank, Global Findex

64. World Bank, 2004, building block of e-government

65. Ministry of information and Communication technologies of Colombia, 2013, Colombia's Digital Agenda

66. Ministry of information and Communication technologies of Colombia, 2014, 'Vive Digital'

67. World Economic forum, 2015, Network readiness index

2 Taxation on the mobile sector

The Colombian mobile sector is subject to over 15 different taxes and regulatory fees. The extent to which these ultimately fall on mobile operators or consumers depends on the type of tax and market conditions. Some taxes and regulatory fees may be absorbed by operators in the form of lower profits, whilst others may be passed through to consumers through higher prices, or there may be a combination of the two.

This section firstly reviews the taxes applied to mobile consumers and operators in Colombia, discussing

recent changes to sector-specific taxation. It then evaluates the tax contribution of the mobile sector in the country, comparing the sector's tax burden to its relative size in the Colombian economy. Lastly, the section concludes by comparing the current fiscal treatment of the mobile sector in Colombia with best practices in public finance, drawing on the recent work of different international organisations such as the International Monetary Fund (IMF), World Bank and the OECD.⁶⁸

2.1 Taxes on mobile consumers

Mobile consumers in Colombia are subject to a Value Added Tax (VAT), charged at 16% on the pre-tax value of mobile traffic, handsets and SIM cards.

Importantly, in addition to the standard 16% VAT rate, mobile consumers are also subject to a 4%

Consumption Tax on voice services, for a combined rate of 20% of product's value.⁶⁹ The Consumption Tax on voice services is estimated to have cost mobile operators close to US\$80m in 2015.⁷⁰


68. OECD (2014), "Fundamental principles of taxation", in *Addressing the Tax Challenges of the Digital Economy*, OECD Publishing, Paris. IMF (2011) *Revenue Mobilization in Developing Countries*. Bird and Zolt (2003) "Introduction to Tax Policy Design and Development" for a course on Practical Issues of Tax Policy in Developing Countries, World Bank, April 28-May 1, 2003

69. Deloitte, 2016, 'Taxation and investment in Colombia'

70. Deloitte analysis on GSMA, 2016 and operators data

FIGURE 8

Taxes levied on consumers in Colombia, 2015

	PAYMENT BASE	TAX TYPE	TAX RATE
Consumer taxes	Production, goods and services	VAT	16%
	Voice	 Consumption tax	4%
	Imported telecommunication goods	IVA (VAT)	16%
		Custom service tax	1.2%
		Customs duty	5%

 TELECOMMUNICATIONS-SPECIFIC TAX

 MOBILE-SPECIFIC TAX

Source: Operator data and Deloitte, 2016, 'Taxation and investment in Colombia'

The costs borne by consumers in order to own and use a mobile phone include the expenditure on calls, SMS and data, as well as connection and handset costs, and can be expressed as the Total Cost of Mobile Ownership (TCMO). Each of these cost elements is subject to taxation, and taxation of mobile operators can also be passed through to influence the costs of these components.

The GSMA has recently released a Mobile Connectivity Index, and as part of that, it has measured the TCMO in Colombia: the Index shows that Colombia scores below the LATAM average,⁷¹ and that taxes' share of the TCMO rose from 16.2% in 2010 to 19.1% in 2013.⁷²

71. GSMA Connectivity Index, 2016

72. GSMA Deloitte Global tax survey, 2014

2.2 Taxes on mobile operators

General taxation on business can be significant in Colombia and taxes in the country represent 70% of

commercial profit, according to the World Bank 'Paying taxes' 2016 survey.⁷³

FIGURE 9

Operator taxes and regulatory fees, 2015

	PAYMENT BASE	TAX TYPE	TAX RATE
Operator taxes	Profit	Corporation tax	25%
		CREE	14% (inc. 5% surcharge)
	Gross income	Municipal Industry and commerce tax	0.2% - 1%
	Contracts' value	Registration duty	0.3% - 1%
	Payroll	Payroll tax	9%
		Social security contributions	Min. 20.83%
	Equity	Wealth tax	1.15%
	Property	Property tax	3.30%
	Financial transactions	Tax on financial transactions	0.4%
	Royalties and interests	Withholding tax	33%
	Other	Municipal street lighting tax	Varying rate and bases
Regulatory fees	Gross income	★ Contribution to the FONTIC	2.2% - 5%
		★ Regulatory fee	0.1%
	Flat fees	★ Spectrum fee	0.7%
		★ One-time licence fee	Varies
		★ One-time spectrum fee	Varies

★ TELECOMMUNICATIONS-SPECIFIC TAX

Source: Operator data and Deloitte, 2016, 'Taxation and investment in Colombia'. Note that the rate of the CREE, financial transaction tax and wealth tax is currently due to change in 2016.

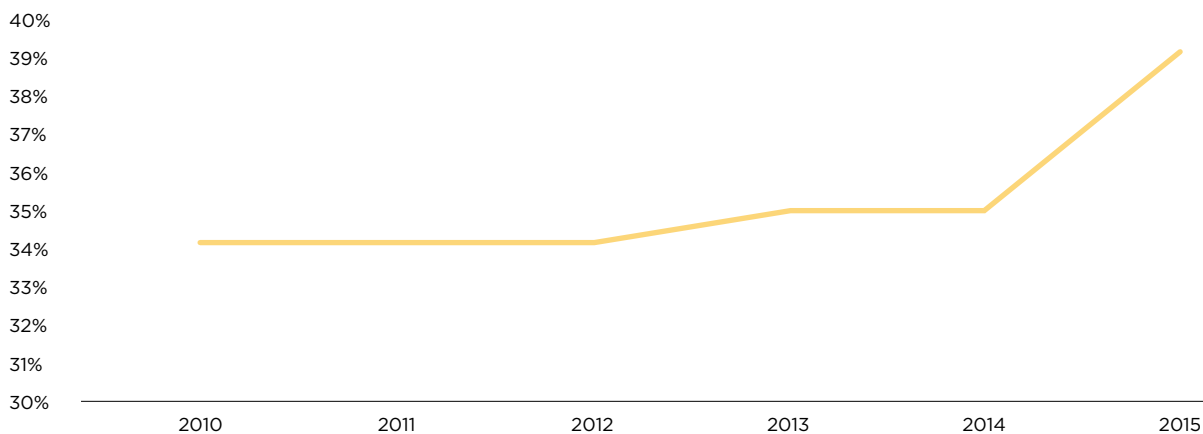
73. World Bank, PWC, 2016, 'Paying Taxes'

Mobile operators are subject to corporation taxes and 'Income tax for equality' (CREE): Corporation taxes and the CREE are levies based on companies' gross profit. The level of taxation on profits has gradually increased over time, to reach a cumulative tax rate of 39% of

taxable profit in 2015.⁷⁴ Profit taxation in 2015 was divided across three taxes: corporate income tax (25% of profit), CREE (9% of profit), and, lastly, a 5% CREE surtax.⁷⁵ The CREE surtax is planned to increase to 6% in 2016, 8% in 2017, and 9% 2018.⁷⁶

FIGURE 10

Corporation tax and CREE cumulative tax rate on profits



Source: Operator data

Other general taxes paid by mobile operators include:⁷⁷

- *Industry and commerce tax:* The industry and commerce tax is a municipal levy against the income of local firms and businesses. Its rate varies between 0.2% and 1% across municipalities and industries, generating some level of complexity. Operator data suggests that for the mobile sector the average rate is approximately 0.6%.
- *Payroll taxes:* In 2016, employers' payroll taxes amounted to 9% of total payroll, 3% of which was allocated to the institute for family welfare, 2% to

the national apprenticeship service, and 4% to the family subsidy fund.

- *Import duties:* Imports are also subject to additional duties, divided in three tariff levels, 0-5% for capital goods and raw materials not produced in Colombia, 10% for manufactured goods, and 15%-20% for consumer goods.⁷⁸ Many countries are partially exempt from import duties, Colombia having signed free trade agreements with the EU,⁷⁹ the US,⁸⁰ Peru, Ecuador, Bolivia, Chile, Mexico.⁸¹ Telecommunication network equipment is typically subject to a 5% duty,⁸² on top of the standard 16% VAT.

74. Mobile operator data.

75. Ibid.

76. Deloitte, 2016, 'Taxation and investment in Colombia'

77. Deloitte, 2016, 'Taxation and investment in Colombia'. Unless otherwise stated, all other figures and tax information in this subsection come from this Deloitte report.

78. Deloitte, 2016, 'Tax and investment in Colombia'

79. European commission, 2012, 'Trade agreement between the European Union and Colombia and Peru'

80. US Department of Commerce, 2016, <http://www.export.gov/colombia/doingbusinessincolombia/traderegulationsstandards/index.asp>

81. See Alianza del Pacifico and Comunidad Andina

82. Operator data US Department of Commerce, 2016, <http://www.export.gov/colombia/doingbusinessincolombia/traderegulationsstandards/index.asp>

- *Property tax:* The property tax is a municipal real estate duty levied against the owner or occupier of land. Its amount depends on the use of the property and can be deductible from the corporate income tax. Colombian operators' properties are, on average, taxed at an annual rate of 0.85%.⁸³
- *Wealth tax:* The wealth tax is a levy on entities which net worth is above COP 1bn; Mobile operators' equity was taxed at a 1.15% rate in 2015. The wealth tax is currently being phased out and scheduled to disappear in 2019.⁸⁴
- *Financial transaction tax:* The tax on financial transactions applies a 0.4% fee to most financial withdrawals, payments and transactions.⁸⁵ Its rate was raised twice since its introduction⁸⁶ despite having raised criticism from the academic literature.⁸⁷
- *Registration duties and withholding tax:* Contracts, acquisitions and other administrative acts, are in addition subject to a registration duty of 0.3% to 1% of the contract value.⁸⁸ Royalties and interest payments to foreign entities are finally subject to a 33% withholding tax.⁸⁹
- *Municipal street lighting tax:* This tax has various rates and bases across municipalities. This tax has been repealed and reinstated over the past years,⁹⁰ creating some level of uncertainty and compliance costs. In 2016, Colombian operators reported paying US\$2.7m in judicial and administrative processes related to this tax.⁹¹

In addition to general taxation, mobile operators are subject to sector-specific levies:

- *Licence fee:* Mobile operators pay a licence fee every ten years in order to be granted the ability to provide services: they reported having paid US\$120m in license fees over the past five years.
- In addition to paying one-off payments and in-kind contributions for spectrum usage (see below), Colombian mobile operators are subject to recurring spectrum fees, which amount to 0.7% of their gross income.⁹²
- *FONTIC contribution:* Colombian telecommunication providers must also contribute to the fund for information and communication technologies (FONTIC), which is the USF in Columbia. Operators under a concession contract must contribute 2.2% of their income to the fund and 5% otherwise.⁹³
- *CRC contributions:* Telecommunication companies are responsible for the budget of the Colombian regulator, the Communications Regulations Commission (CRC); regulatory income fees represented 0.1% of mobile operator's income in 2015.⁹⁴

Contributions by the mobile industry to acquire spectrum, a scarce resource that is awarded by government, are illustrated in Figure 11. For example, the 2013 4G auction raised over US\$400m of revenue for the government.⁹⁵ In addition to these fees, the Colombian government generally conditions operators' spectrum rights to certain social obligations, such as providing internet to schools, connecting unconnected municipalities or providing tablets and devices.

83. Operators' data.

84. Deloitte, 2016, 'Tax and investment in Colombia'

85. Ibid

86. El Universal, <http://www.eluniversal.com.co/opinion/columnas/triste-historia-del-4-por-mil>

87. Arbelaez et al, 2004, 'Bank Debit tax in Colombia'

88. Deloitte, 2016, 'Tax and investment in Colombia'

89. Ibid

90. See Vicepresidencia de Asuntos Jurídicos, 2015, 'Plan nacional de desarrollo 2014-2018' and http://www.podermunicipal.com.co/2016/04/la-corte-declaro-exequible-la-nueva_6.html

91. Operators' data

92. Operators' data.

93. Ibid

94. Ibid

95. Budde, 2016, 'Colombia - Telecoms, Mobile, Broadband and Digital Media'

FIGURE 11

Recent spectrum auctions in Colombia

Operator	Year	Auction price	Obligations
Tigo	<ul style="list-style-type: none"> • 2009 (3G) • 2013 (4G) 	<ul style="list-style-type: none"> • US\$16.1m • US\$50m 	<ul style="list-style-type: none"> • Connect 45 municipalities with less than 7,500 inhabitants, connecting schools to internet • Connect, with ETB, 114 municipalities and provide 67,426 tablets
Claro	<ul style="list-style-type: none"> • 2009 (3G) • 2013 (4G) 	<ul style="list-style-type: none"> • US\$16.1m • US\$62m 	<ul style="list-style-type: none"> • Connect 56 municipalities with no service, connecting schools to internet • Connect 660 municipalities and provide 309,630 tablets
Movistar	<ul style="list-style-type: none"> • 2009 (3G) • 2013 (4G) 	<ul style="list-style-type: none"> • US\$47.7m • US\$101m 	<ul style="list-style-type: none"> • Part of the auction price was paid in-kind through connecting schools to internet • Connect 255 municipalities and provide 119,317 tablets
UNE-EPM	<ul style="list-style-type: none"> • 2010 (4G) 	<ul style="list-style-type: none"> • US\$40m 	
DirecTV	<ul style="list-style-type: none"> • 2013 (4G) 	<ul style="list-style-type: none"> • US\$76m 	<ul style="list-style-type: none"> • Connect 57 municipalities and provide 30,000 tablets
Avantel	<ul style="list-style-type: none"> • 2013 (4G) 	<ul style="list-style-type: none"> • US\$55m 	<ul style="list-style-type: none"> • Connect 57 municipalities and provide 30,000 tablets
ETB	<ul style="list-style-type: none"> • 2013 (4G) 	<ul style="list-style-type: none"> • US\$50m 	<ul style="list-style-type: none"> • Connect, with Tigo, 114 municipalities and provide 67,426 tablets

Source: Budde, 2016, 'Colombia – Telecoms, Mobile, Broadband and Digital Media'. Note that Tigo and ETB bought together their 4G spectrum in a joint venture, splitting equally the US\$100m cost, according to operators. The auction price includes the value paid for the tablets.

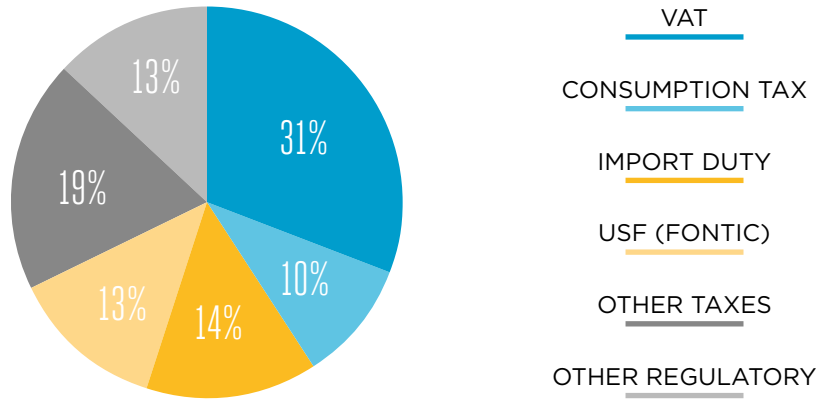
2.3 The contribution of mobile sector taxation to the economy

As a result of these taxes and fees, in 2014 the mobile sector in Colombia paid over US\$1.36bn (COP 2.7

trillion), representing over 26% of market revenues.

FIGURE 12

Breakdown of taxes and regulatory fees in Colombia, 2014



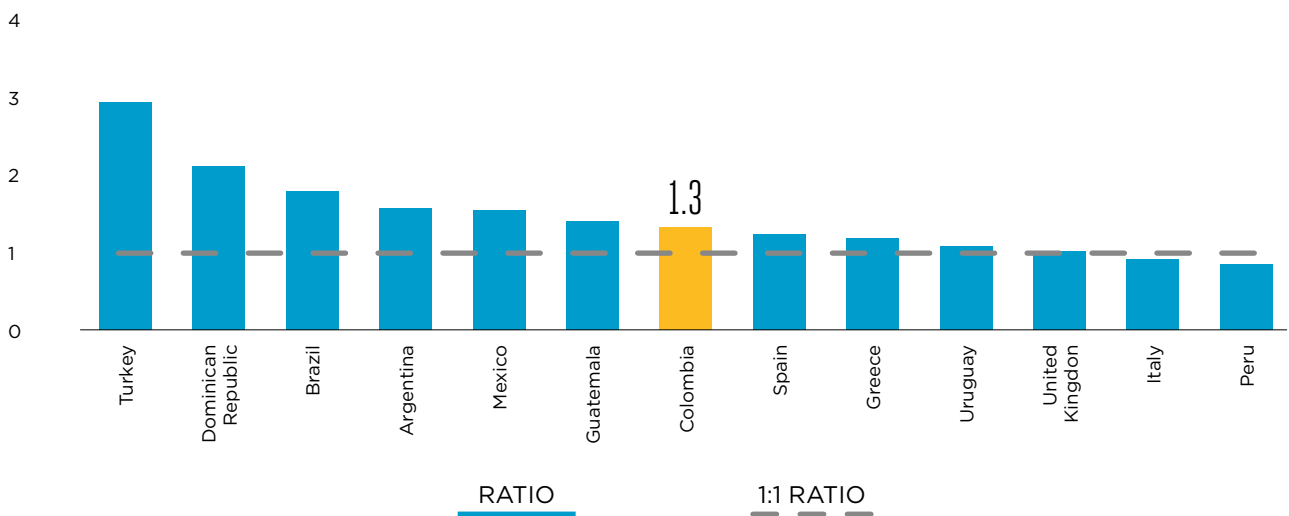
Source: Operator data. This does not include corporation tax due to data confidentiality

The mobile sector’s tax and fee contribution is larger than its economic footprint. Findings from a 2016 Deloitte/GSMA survey of sector-specific taxation in 30 countries suggest that the mobile sector’s share of total government revenue is over 1.3 times larger than

its share of GDP.⁹⁶ In other OECD member countries, for which similar data was available, such as Italy, the UK and Greece, mobile services’ contribution to government revenue is closely in line with their share of GDP.⁹⁷

FIGURE 13

Mobile services ratio of tax revenues share and GDP share in selected countries, 2014



Source: Deloitte GSMA Mobile taxation survey 2016.

96. Deloitte GSMA, 2016, ‘Mobile taxation global survey 2016’

97. Ibid.

Further, this contribution is affected by the magnitude of the tax revenues levied by the government on the gas and oil industry in Colombia, the highest tax contributor in the country.⁹⁸ When non-oil government revenues are considered, the mobile services' share of non-oil government revenues was 1.6 times greater than their share of the non-oil economy.⁹⁹

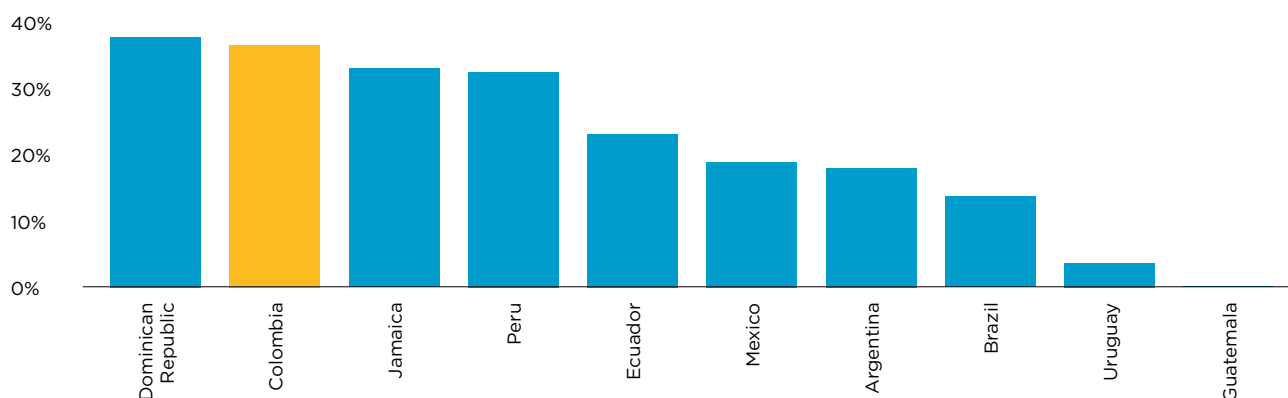
Sector-specific taxation represents a significant share of mobile services' fiscal contribution. Combined, sector-specific taxation and regulatory fees amounted

to approximately US\$300m in 2015,¹⁰⁰ with mobile services' contribution to the FONTIC, recurring spectrum fees and the Consumption Tax on mobile usage amounting to US\$103m, US\$100m and US\$80m, respectively.

In Colombia, sector-specific taxation represented 37% of mobile services' total tax payments in 2014; a larger share than in any other surveyed Latin American country, Dominican Republic excepted.¹⁰¹

FIGURE 14

Sector-specific taxes share of total taxes in selected LATAM countries for which data is available, 2014



Source: Deloitte GSMA Mobile taxation survey 2016

Further, taxes and regulatory fees levied on operators in Colombia amounted to 17% of mobile operators' revenues, the third highest rate of the surveyed Latin American countries. As Colombia is working to move

its policies closer to OECD's best practice,¹⁰² in the six OECD countries¹⁰³ which were part of the survey, mobile operator taxes amounted to only 8% of revenues.

98. Deloitte analysis on EITI and OECD

99. Deloitte calculations on Deloitte GSMA Mobile taxation global survey 2016, EITI and OECD.

100. Deloitte analysis on operators data

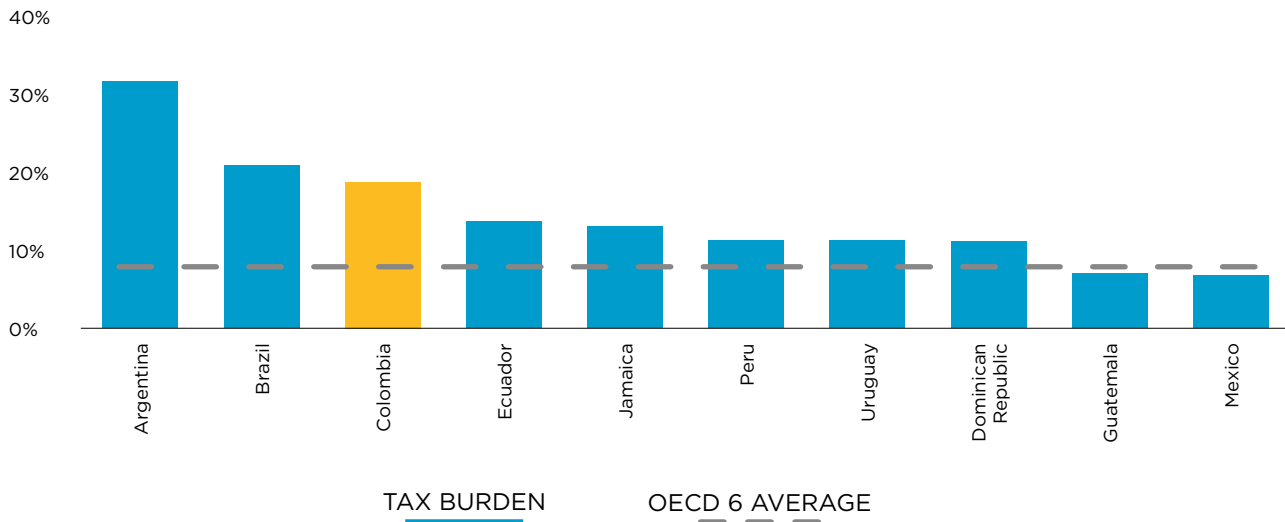
101. Deloitte GSMA 'Mobile taxation global survey 2016'

102. OECD, 2013, 'OECD sets roadmap to Colombia's membership'

103. Greece, Italy, Mexico, Spain, Turkey and the UK

FIGURE 15

Operator taxes as a share of revenue, 2014



Source: Deloitte GSMA Mobile taxation survey 2016

2.4 Best practice principles of taxation and how sector-specific tax is applied in Colombia

There are a number of principles that are generally recognised as contributing to an effective tax system, as outlined by international organisations such as the IMF and ITU.¹⁰⁴ These principles are intended to minimise the inefficiencies associated with taxation and regulatory fees and the distortive impacts that they may have on the wider economy.¹⁰⁵

As Colombia is facing the decline of a number of government revenue sources in the near future, such as the phasing out of financial transaction tax and the decline of hydrocarbon related revenues,¹⁰⁶ different options of revenue generating tax reforms have been considered by Colombia's fiscal commission.¹⁰⁷

In this context, this section emphasises a number of principles that are generally recognised as contributing to an effective tax system, as outlined by international organisations¹⁰⁸ and also by Colombia's own constitution.¹⁰⁹ These principles are intended to minimise the inefficiencies associated with taxation and regulatory fees and the distortive impacts that they may have on the wider economy.¹¹⁰

If applied in Colombia, these principles have the potential to promote mobile penetration and expand investment in the mobile sector, fostering economic growth and increasing tax revenues for the government.¹¹¹

104. See IMF, Tax policy for developing countries, 2001. And ITU, ICT regulation toolkit, 2014. And ITU, ICT Regulation Toolkit, <http://www.ictregulationtoolkit.org/5.5>

105. For more details, see Deloitte/GSMA, Taxation on the mobile sector - Principles, best practice and options for reform, forthcoming

106. OECD (2015), OECD Economic surveys: Colombia 2015

107. <http://www.portafolio.co/economia/impuestos/especial-reforma-tributaria-2016-155080>

108. See IMF, Tax policy for developing countries, 2001. And ITU, ICT regulation toolkit, 2014. And ITU, ICT Regulation Toolkit, <http://www.ictregulationtoolkit.org/5.5>

109. Mejia, J.C. 'Principios constitucionales del derecho tributario en Colombia y México'

110. For more details, see Deloitte/GSMA, Taxation on the mobile sector - Principles, best practice and options for reform, forthcoming

111. Other principles of taxation can include transparency and incidence of taxation.

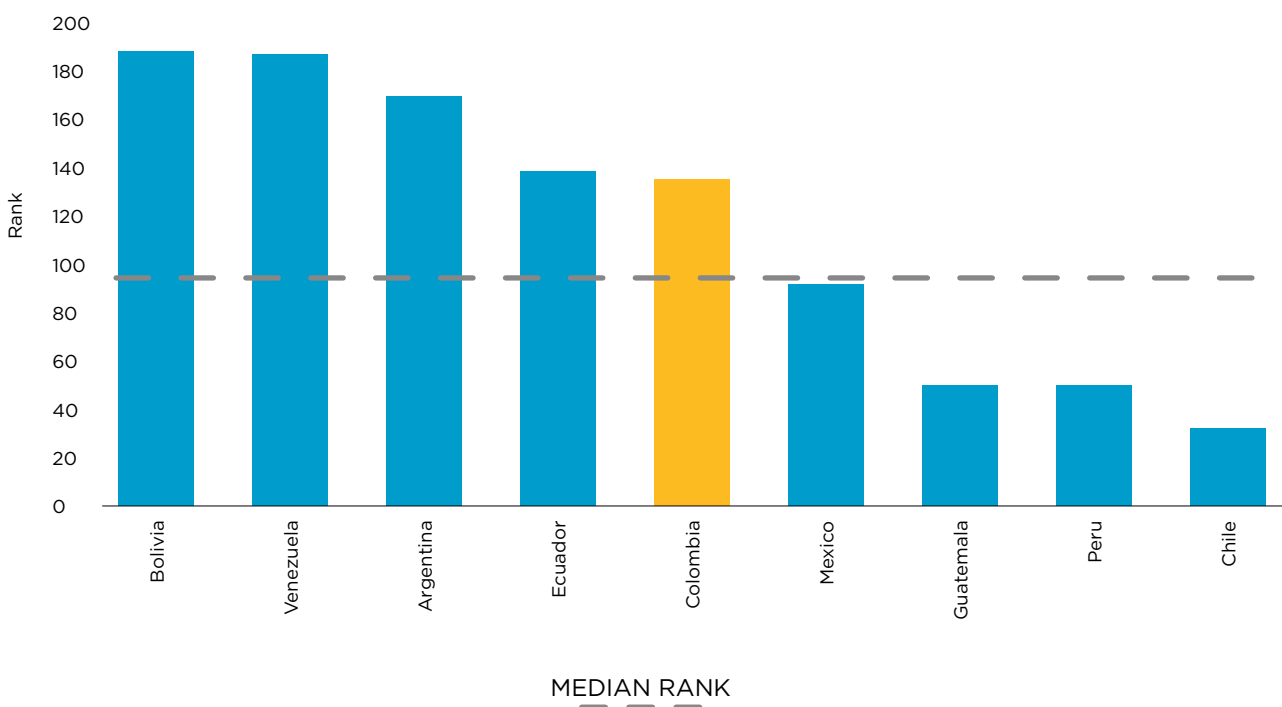
- **Efficiency:** By creating competitive distortions between closely substitutable products, such as VoIP and voice calls or fixed internet and mobile internet, differentiated taxation such as the Consumption Tax can generate economic inefficiencies. As a principle, general taxation tends to be more efficient than specific taxes.¹¹²
- **Equity:** Equity suggests that those who are better off could bear relatively more taxes than those who are worse off. For the poorest spending a relatively higher share of their income on consumption goods, excise taxes tend to be regressive.¹¹³ As discussed later in this report, mobile telephony taxation represents 4% of the income of the poorest 20% of population in

Colombia,¹¹⁴ and this could have a negative impact on digital inclusion in the country.

- **Simplicity:** Reducing the complexity of the tax system makes it simpler for taxes to be paid, resulting in less time, resource and cost being spent paying taxes. International organisations such as the IMF,¹¹⁵ the OECD¹¹⁶ or the ITU¹¹⁷ emphasise simplicity as a key taxation principle. With over 15 different taxes and regulatory fees applicable to mobile services, including six sector-specific levies, Colombia has room to simplify the taxation of the mobile sector. This complexity can impact the country's international attractiveness; in the World Bank's annual 'Paying taxes' survey, Colombia ranks 136th out of 189 countries.¹¹⁸

FIGURE 16

'Paying taxes' 2016 rankings in selected LATAM countries



Source: World Bank, PWC 'Paying taxes' 2016

112. IMF, 2014, 'Taxing principles'

113. Giertz, 2008, 'Excise taxes'

114. Deloitte analysis on Deloitte, GSMA, 'Mobile Taxation Global Survey, 2016'

115. Ibid.

116. OECD, 2014, 'Review of telecommunication policy and regulation in Colombia'

117. ITU (2013) Taxing telecommunication/ ICT services: an overview

118. World Bank and PWC, 2016, 'Paying taxes'

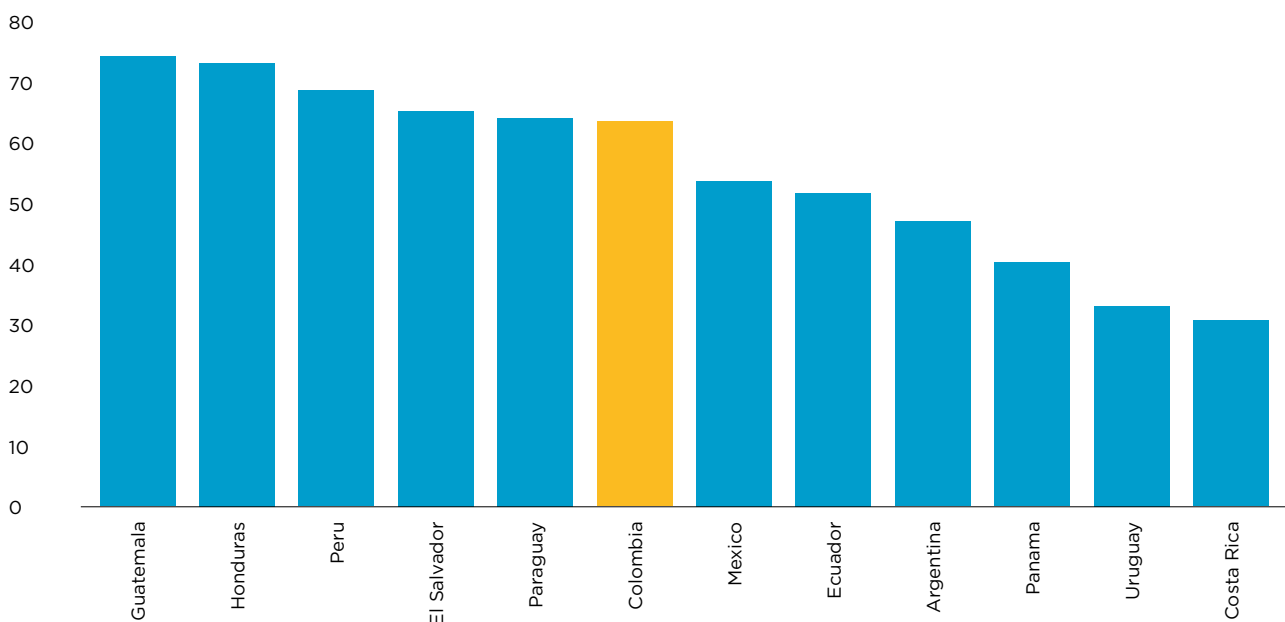
Applying taxation principles in countries with large informal economies

With over 60% of the Colombian labour force working in the informal economy, Colombian tax authorities may have an incentive to increase tax of sectors in which informality is low, such as the mobile sector. However, evidence from academic literature suggests that general indirect taxation remains the most viable option in the short term,¹¹⁹ even in the presence of an

informal sector.¹²⁰ Sector-specific taxation introduces distortions in consumption and production choices, which general taxation may not introduce, even in the presence of an informal sector. In particular, leading international organisations such as the IMF suggest that VAT alone could be fully optimal under certain conditions, as it acts as a tax on the purchases and imports of the informal sector, and gives relatively greater incentives to tax compliance.¹²¹

FIGURE 17

Share of non-agricultural workers in the informal economy, 2013



Source: World Bank

Taxation of mobile and similar services in Colombia

Within the telecommunication industry, a differential tax treatment exists between different communication players. Mobile services in Colombia are taxed at a higher rate than similar services offered on fixed networks for over 60% of the population, who are exempt from paying VAT on

fixed telephony.¹²² The OECD, in its assessment of Colombia's telecommunication policy, states "Colombia should refrain from adding a 'luxury' VAT tax for mobile services and should decrease the current obligation on operators to fund the ICT Fund (FONTIC), with a view to transitioning to funding from general government revenue".¹²³

119. Ehtisham et al, 2012, 'Tax Reforms in the Presence of Informality in Developing Countries'

120. Kaplow, 2004, 'On the undesirability of commodity taxation even when income taxation is not optimal'

121. IMF, 2007, 'VAT, Tariffs, and Withholding: Border Taxes and Informality in Developing Countries'

122. OECD, 2014, 'Review of telecommunication policy and regulation in Colombia'. Stratas are socio-economic categories classifying each individual's housing into six strata according to physical characteristics, urban environment and town planning.

123. OECD, 2014, the Governance of Regulators

Moreover, while mobile handsets are subject to a 16% VAT, most personal computers and laptops in Colombia are exempt from VAT,¹²⁴ while a similar exemption does not exist for smartphones, which are currently the most popular way to access the internet.

Finally, the tax treatment of mobile operators could also be considered in the context of the wider ecosystem of providers of substitutable services. An example is given by Over-The-Top operators (OTTs) that provide services such as VOIP,¹²⁵ where mobile operators have voiced concerns that the current taxation system creates competitive distortions between mobile operators and the equivalent services provided by OTTs.

There are a range of factors that influence the competitive dynamics between OTTs and mobile

operators, including differences in the mix of revenue streams, underlying cost base and structure, and scalability. The differences in tax treatment in the provision and consumption of these services may contribute to these dynamics. Two aspects of the tax treatment differentials may create distortions:

- Cross-border services and implications for taxation: Substitutable services, such as VoIP, can be offered without the same geographic ties, with implications for tax liability.
- The regulatory/legal status of mobile operators and OTTs: Variations in the regulatory or legal status between traditional and non-traditional mobile services, such as VoIP, may also generate additional differences on their tax treatment.

124. Intel, 2012, 'The Merit of decreasing VAT on personal computers'

125. Voice Over the Internet Protocol.

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

In line with the OECD recommendation, by reforming mobile taxation and transitioning to a structure where mobile is taxed similarly to other standard goods and services, the government of Colombia can promote the agenda of the 'Vive Digital' plan, increase affordability of mobile services and boost investment.

MNOs, mobile usage and ownership are currently subject to taxes and regulatory fees that differ from best practice and similar products. This has informed the following tax reform scenarios:

- **Removal of the Consumption Tax on voice:** Removal of this excise tax would align the taxation of voice with that of standard goods and services.
- **Removal of the FONTIC contribution:** Over the past decade there has been significant investment in networks and increases in coverage in Colombia. Although FONTIC has played a part in increasing network coverage and is generally recognised as an example of USF best practice,¹²⁶ as the government and regulator are increasingly including coverage obligations in license and spectrum renewals, less reliance can be placed on the USF for encouraging rollout. Likewise, operators have paid for some of the spectrum through payment in kind, such as the 3G auction where 50% of the spectrum fee was paid for through connecting 5,400 schools to the internet for 10 years and installing sites in unprofitable areas. Conditions of the 4G auction required the operators to provide over 500,000 tablets to poor students and connect over 1,100 municipalities.¹²⁷

Evidence from other markets in LATAM suggests that tax interventions could increase digital inclusion and infrastructure investment:

- The elimination of an airtime tax similar to Colombia's Consumption Tax by the Uruguayan government in 2007 has been followed by a fall in price by over two thirds in the following year. In parallel, connections penetrations more than doubled from 65% in 2006 to 140% in 2011. Alongside increased penetration, mobile usage rose from just under 400 minutes per subscriber per year in 2006 to 1,600 in 2011.¹²⁸
- In 2008, the Ecuadorian government abolished a telecommunications excise tax similar to Colombia's Consumption Tax that applied on mobile usage and subscriptions. The elimination of this sector-specific tax was accompanied by an increase in mobile penetration from 70% in 2007 to over 110% in 2012. Moreover, the cost per minute of calls fell by 63%, while there was a 133% increase in minutes of usage per user per month.¹²⁹
- A recent report by Deloitte and the GSMA on mobile sector taxation in Mexico has estimated that a reduction of the Impuesto Especial sobre Produccion y Servicios (IEPS), a tax on mobile airtime similar to Colombia's Consumption Tax, from 3% to 1.5% could potentially lead to an increase in 1.1 million connections, US\$2.227bn in GDP and 15,000 jobs by 2020. The government has recognised these impacts and has announced

126. GSMA, 2015, 'Transparency helps Colombia make the most of its USF'

127. Budde. Colombia: Telecoms, Mobile, Broadband and Digital Media- Statistics and analyses

128. GSMA Connectivity Index, 2016 - GSMA Deloitte Global tax survey, 2014

129. GSMA and Deloitte, *ibid.*

that a reduction in IEPS will be brought to the parliamentary agenda in 2016.¹³⁰

- In 2014, in an initiative called ‘programa nacional de banda larga’, the Brazilian government exempted broadband roll out projects for social security contributions and income based taxation.¹³¹ Over US\$6.8bn of investment was registered in this scheme for a tax break,¹³² or 2.5 dollars of investment for each dollar of initial tax expenditure.¹³³

To estimate the quantitative impacts of these reforms, an economic model of the Colombian economy and mobile sector was constructed, using sector-specific data from the GSMA and mobile operators in Colombia, together with macroeconomic data from the IMF and the World Bank. This allows the model to represent both the mobile sector and its gross impacts on the economy as a whole. This approach also enables comparison between a base case that uses current projections for the sector and the tax reduction scenarios.¹³⁴

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

1. The model first computes the impact on prices. Level of taxation and regulatory fees applied to the mobile sector are reflected in the retail prices operators charge for using their services. Therefore, a change in taxation or regulatory fees will lead to a change in the retail price of mobile services. A pass-through rate represents the percentage of the tax and regulatory fee payments that is reflected in the retail price of mobile services.
2. The tax that is not passed through to prices can either be reinvested into the network or retained as profit for the operators. The tax payment that is reinvested into the network can be used to either build new sites or upgrade sites to mobile broadband. This additional activity can increase domestic value added and increase employment.

3. The model then computes the impact of the price change on demand. The price of mobile services determines the demand and therefore the aggregate consumption of mobile services. The price elasticity of demand describes the responsiveness of demand to a change in the price, and is defined as the percentage change in demand resulting from a given percentage change in price.
4. Changes in the level of consumption of mobile services lead to a new level of revenue generated by operators, which changes the level of taxes and regulatory fee payments and labour demand accordingly.
5. These changes to the mobile sector lead to direct impacts on value-added and employment and, through spillover effects, on the wider economy, in particular on real GDP, tax revenues, employment and investment.
6. An elasticity determines the impact of a change in mobile penetration on GDP growth. Multipliers are assumed to allow changes in mobile sector employment to affect the wider Colombian labour force. Productivity is calculated using the total factor productivity impact, described in the appendix.

The tax payments data provided by the operators refer to 2014.¹³⁵

130. GSMA and Deloitte (2015): “Digital inclusion and mobile sector taxation in Mexico”. And, Convergencia Latina, 2015. IEPS reductions, brought to the parliamentary agenda 2016 [Online]. Available from: http://www.convergencialatina.com/News-Detail/175137-6-20-IEPS_reductions_brought_to_the_parliamentary_agenda_2016?Lang=EN&SMMK=3590.649%E2%80%A6

131. <http://www.comunicacoes.gov.br/programa-nacional-de-banda-larga-pnbl>

132. Ibid.

133. Deloitte analysis on Tax news, http://www.tax-news.com/news/Brazil_Approves_USD7bn_Of_Broadband_Projects_Under_Tax_Break_Scheme_65774.html

134. Other potential impacts on the sector that may arise from the government’s current reform programme are not explicitly modelled but may have been considered in projections by the GSMA or third party sources and would therefore be taken into account in the base case. The policy reform scenarios were estimated separately and their interactions are not considered.

135. The modelled impacts therefore do not account for taxation changes that came into effect in 2015

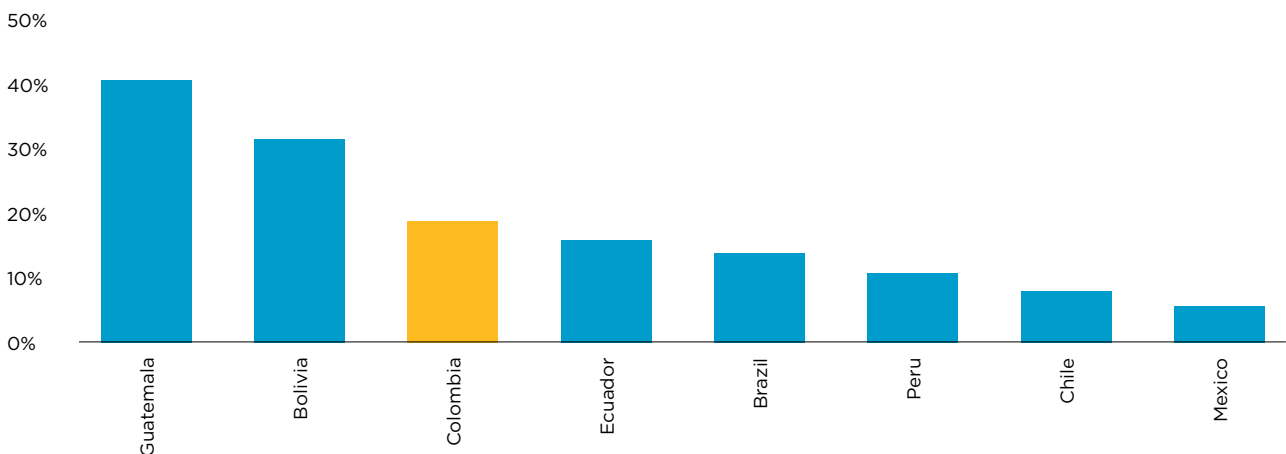
3.1 Affordability of mobile services in Colombia

Mobile penetration in Colombia has not increased in recent years and approximately a third of the population remain unconnected. Affordability of mobile services for the poorest sectors of the population is a key issue, with a recent GSMA consumer survey indicating that 49% of non-users list affordability as a barrier to mobile adoption.¹³⁶ Other data supports this finding showing that over 75% of households in the bottom three income quintiles did not have access to the internet in 2012, reaching 87% and 90% for the bottom two quintiles.¹³⁷

Colombia has high levels of income inequality, with the poorest 20% in society accounted for only 3.35% of national income.¹³⁸ As a consequence, despite an effective price per minute significantly below the LATAM average,¹³⁹ the cost of a mobile bundle as a proportion of the income of those in the bottom 20% group is one of the highest in the region, at almost 18.7%.

FIGURE 18

Mobile bundle cost as a proportion of income, the bottom 20% income group, 2014



Source: Deloitte analysis based on ITU and World Bank data. A mobile bundle is defined as a basket of 50.9 minutes per month plus a 100 SMS messages.

Prices in Colombia are low compared to some other countries in the region, contributing to minutes of

use per user being over double that of other LATAM countries with the exception of Mexico.

136. GSMA, 2016, Connected Society: Digital inclusion in Latin America and the Caribbean

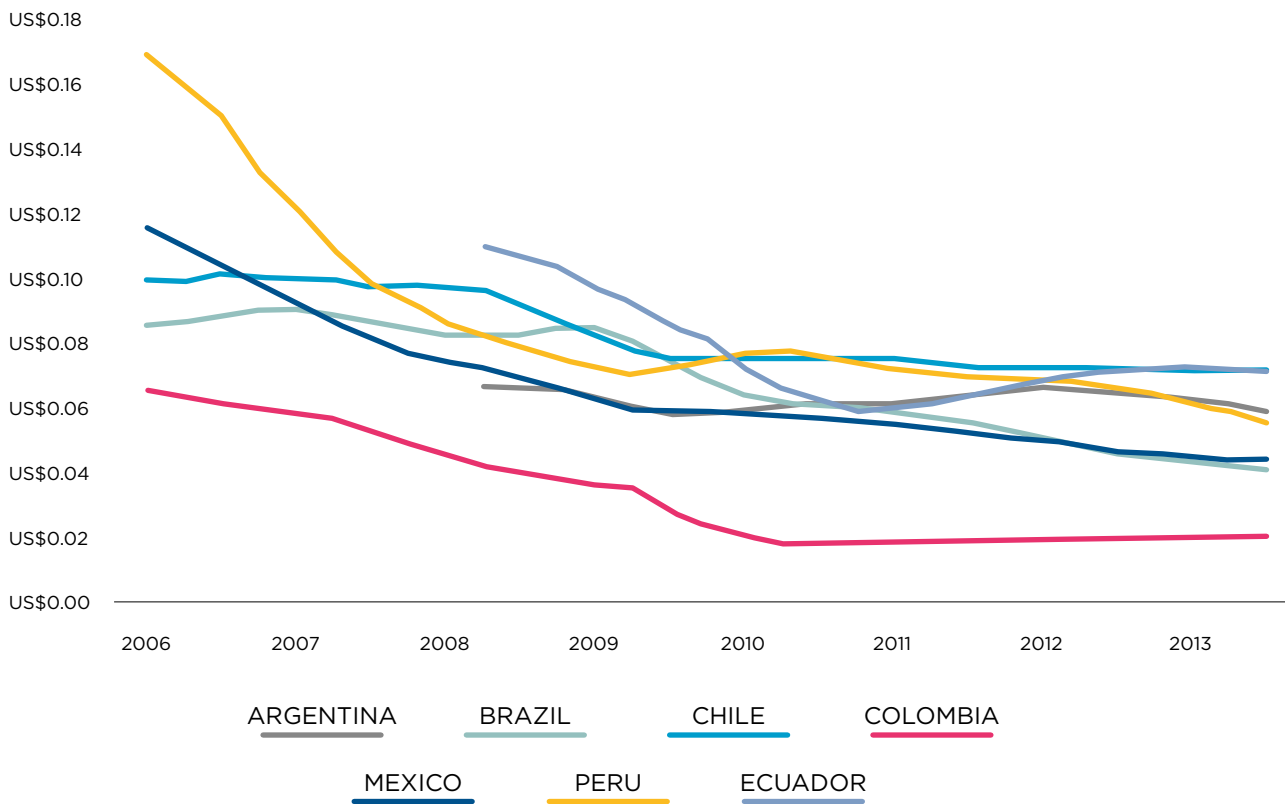
137. GSMA, 2016, Connected Society: Digital inclusion in Latin America and the Caribbean

138. ITU 2013

139. GSMA intelligence, 2016

FIGURE 19

Effective price per minute (US\$)



Source: GSMA Intelligence

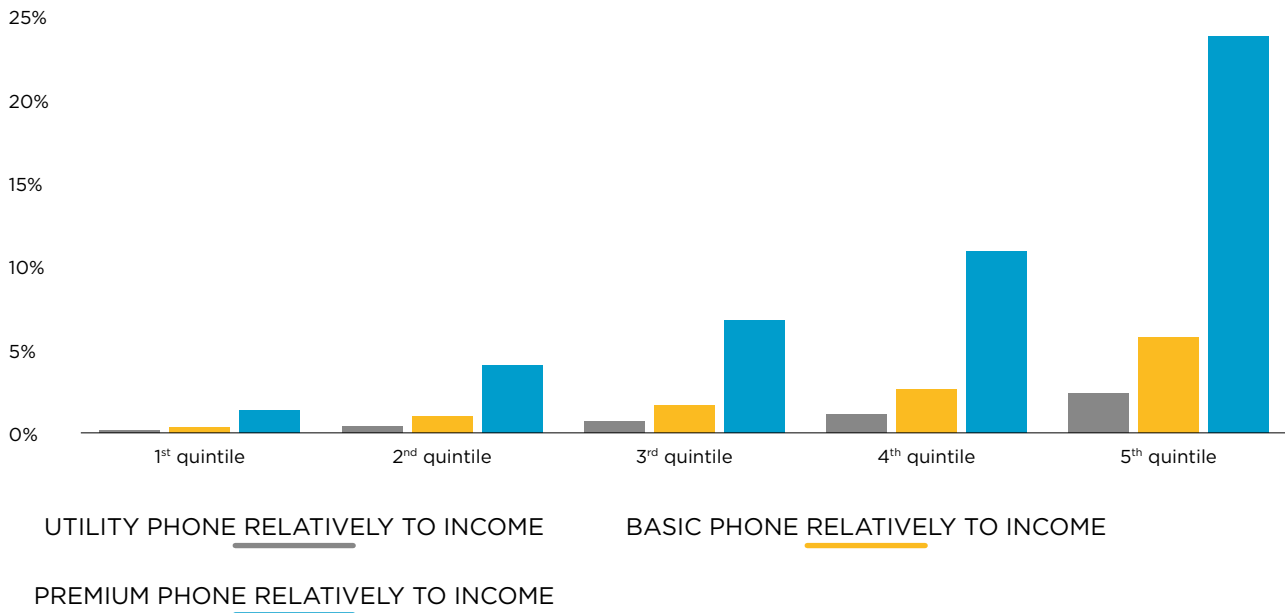
However, if reductions in usage taxes are passed through to consumers, lower prices may reduce the affordability issue for some non-users, as taxes on usage currently account for almost 20% of the overall cost.

Similarly to usage, the poorest groups in Colombia face affordability issues in purchasing handsets.

More advanced phones allow the user to make use of more applications and derive greater benefits from it. However, for the poorest groups in Colombia, this represents a significant proportion of their annual income, especially when combined with the cost of usage. Currently, import duties and VAT account for approximately 20% of the cost of a handset.

FIGURE 20

Handset cost relative to the mean income of each quintile 2015



Source: Deloitte analysis based on industry data. Note that the first quintile is defined as the 20% of the population with the highest income, while the fifth quintile includes the 20% of the population with the lowest income.

3.2 Mobile network investment and FDI in Colombia

Despite significant investment in recent years from operators in 3G and 4G networks, there remain areas in Colombia where access to mobile networks is limited. In a recent survey undertaken by GSMA, this was listed as barrier to accessing the internet for 19% of people,¹⁴⁰ although population coverage has increased to 87% in Q1 2016.¹⁴¹

To meet the government's objectives of 100% 4G coverage, operators will need to continue to invest in networks. Data from mobile operators indicates they have been investing 70% of their profits into their network:¹⁴² one operator spent over 35% of its revenue

on average on CAPEX since 2010,¹⁴³ while in 2014, Claro announced that it would invest US\$1bn on their 4G network aiming to cover 50% of the population that year.¹⁴⁴

A supportive tax environment could contribute to accelerating investment in the country. The tax environment of a country can also affect the amount of foreign direct investment (FDI) in a market. FDI in Colombia has remained relatively stable at 4% of GDP¹⁴⁵ with a fall to 2% in 2010 during the financial crisis.¹⁴⁶ The benefits of FDI on economic growth occur through channels such as:

140. GSMA. Connected Society: Digital inclusion in Latin America and the Caribbean

141. GSMA Intelligence

142. <https://www.thebusinessyear.com/colombia-2015/on-the-investment-side/vip-interview>

143. GSMA Intelligence

144. <https://www.telegeography.com/products/commsupdate/articles/2014/03/26/claro-to-spend-usd1bn-on-4g-this-year/>

145. World Bank

146. Vale Columbia Center. 2010. Inward FDI in Colombia and its policy context

- **Trade and investment:** FDI can increase exports through overcoming financial constraints within the country, such as extracting natural resources. FDI can also have a long-term impact by integrating the host country into the world economy.
- **Technology transfers:** FDI can result in technology spillovers with suppliers and the industry, through the migration of skilled labour and the internalisation of R&D.
- **Human capital enhancement:** Individuals employed by foreign companies may have their human capital further enhanced by training and on-the-job learning. Foreign companies may also encourage human capital enhancement in sectors with which they form links.

A review of studies in the effects of tax on FDI finds that FDI decreases by 3.7% on average after a one percentage point increase in the tax rate on FDI.¹⁴⁷

3.3 Impacts of tax reforms on affordability and investment

3.3.1 Impact of the removal of the voice Consumption Tax and alternative tax increases

The Consumption Tax on voice is a consumers' excise tax on the price of voice calls: this tax, if passed through to consumers, can directly affect the price of mobile services, further raising barriers to mobile services for the poorest. Removing this tax could increase efficiency and reduce the impact on those with lower incomes.

Given that the poorest consumers tend to be particularly price sensitive, even small changes in prices may create positive effects on usage and take-up. Assuming that 75% of the tax savings are passed through to consumers and 50% of the rest of the tax savings are invested,¹⁴⁸ this reform could have the following impacts:

- **New connections:** The increased demand for mobile services through the reduction in the cost of total cost of mobile ownership may increase mobile subscriptions by over 670,000 people in 2021 with 440,000 subscribing to mobile services for the first time. This represents a 1% increase in
- **Additional investment in new and upgraded mobile sites:** Increased resources for investment could lead to the installation of around 100 new sites and to the upgrade of 170 existing sites to mobile broadband by 2021.
- **Increase in economic growth:** The increase in mobile ownership and usage may increase GDP by US\$1.4bn, representing a 0.4% increase in GDP growth.
- **Increase in tax revenue for the government:** As a result of the wider tax base and increased economic activity, tax revenue for the government could increase by US\$100m in 2021.
- **Job generation:** Increased activity in the mobile sector may increase employment in the sector by nearly 470 jobs, and by over 700 employees in the wider economy.

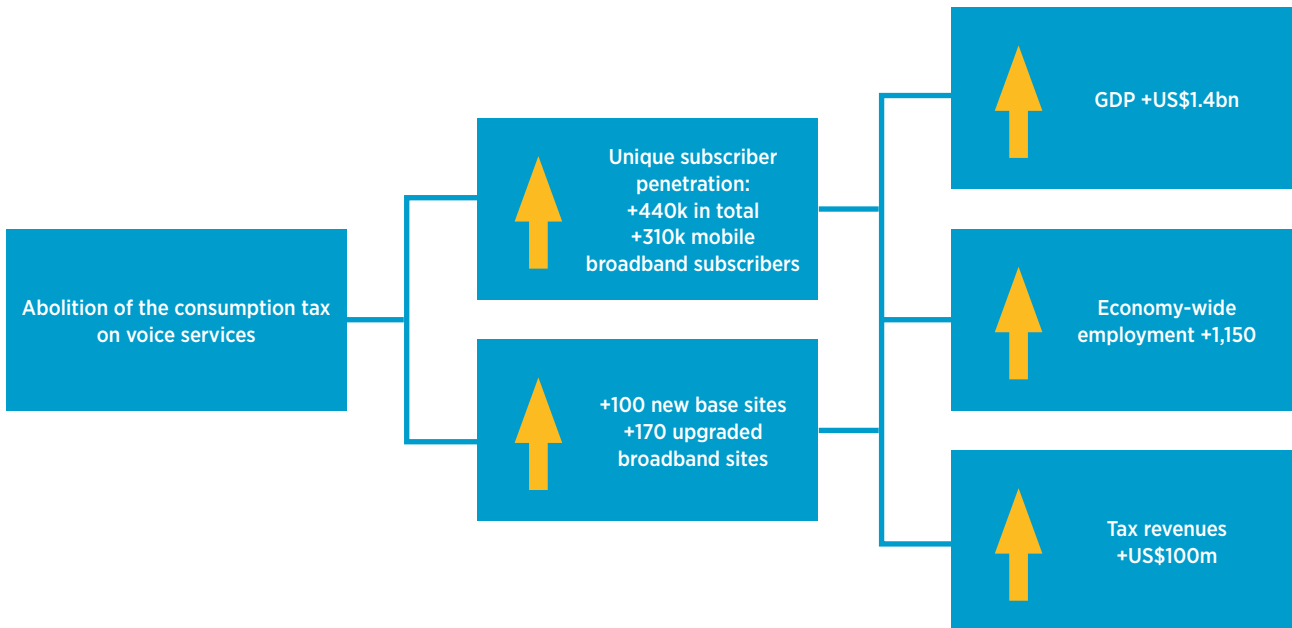
penetration. Of these, 70% are estimated to get access to mobile broadband through the saving of paying less for voice services and the lower cost of mobile ownership.

147. OECD. 2008. Tax Effects on Foreign Direct Investment

148. This illustrative assumption was based on a review of market characteristics in Colombia, and on a review of academic papers discussing pass through rates from tax changes. More details are provided in the Appendix.

FIGURE 21

Economic impact of the abolition of the Consumption Tax in 2021



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

The mobile industry recognises the importance of the current revenues that the Colombian government obtains from the Consumption Tax. In the medium term, the removal of this tax is estimated to generate more tax revenues for the government.

However, in the short term, the government may consider alternative ways to cover the tax revenue shortfall from removing the Consumption Tax. International organisations such as the World Bank suggest general taxes on wider bases are preferred to taxes on narrow bases, such as sector-specific taxes. Marginally increasing general taxes across all sectors of the economy could allow the government to collect equivalent tax revenue in a simpler and more efficient way.

For example, the current revenues obtained by the government through the Consumption Tax amount

to around 0.48% of all VAT collection, or to 2.18% of Income tax collection.

Considering 2014 data on revenues from general taxes obtained by the Colombian government, alternative general taxation increases to make up the shortfall from the Consumption Tax could be equivalent of: general VAT may only need to rise from 16% to 16.08%; alternatively, the Income tax rise may be equivalent to 0.4 percentage points for the lowest bracket to 0.7 percentage points for the highest bracket; or Social Security contributions could increase from 20.5% to 20.71%.

These estimations are based on 2014 data and do not take into account the impacts that these increases may have on the wider economy.¹⁴⁹ they however illustrate the marginal impact of mobile sector-specific taxes on general taxation.

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

TABLE 3

Relative value of consumption tax to general taxes

General tax	Consumption Tax payment relative to economy wide general taxation	Representative tax rate increase to recover lost tax revenue
Corporation tax	0.48%	0.19%
VAT	0.50%	0.08%
Income tax	2.18%	0.4% for the lowest bracket to 0.7% for the highest
Social security contributions	1.00%	0.21%

Source: Operator data and OECD.

3.3.2 Other tax reforms to increase affordability of mobile services

The cost of mobile devices such as smartphones and tablets also represents a key barrier to the uptake of mobile services for the unconnected in Colombia. Device costs represent an upfront expenditure that many of the poorest consumers may not be able to afford.

Tax policy can support a reduction in this barrier: currently, the Colombian government exempts most personal computers and laptops from VAT with the objective of increasing access to the internet. Considering similar targeted exemptions for mobile phones and smartphones could contribute to decreasing this upfront cost substantially. Critically for the government, such a policy may help to widen the user base of mobile consumers by increasing take-up, who would then contribute to general consumption taxation, potentially increasing tax revenues.

3.3.3 Impact of the removal of FONTIC and alternative tax increases

Reforming the current FONTIC contribution could provide an opportunity to spur investment in the market. Effectively, operators could directly invest part of this fund to extend their network. Assuming that a third of this is passed through to consumers and that 50% of the non-passed through tax is invested,¹⁵⁰ removing FONTIC could potentially allow:

- **New connections:** The increased demand for mobile services through the reduction in the total cost of mobile ownership may increase mobile subscriptions by 380,000 people in 2021 with over 250,000 subscribing to mobile services for the first time. This represents a 1% increase in penetration.
- **Additional investment in new and upgraded mobile sites:** Increased resources for investment could lead to the installation of around 340 new sites and to the upgrade of 590 existing sites to mobile broadband sites by 2021.

150. This illustrative assumption was based on a review of market characteristics in Colombia showing that CAPEX/revenue for Colombian operators frequently reaches the 50% region during periods of network rollout; and on a review of academic papers discussing pass through rates from tax changes. More details are provided in the Appendix on the pass through rate to consumers.

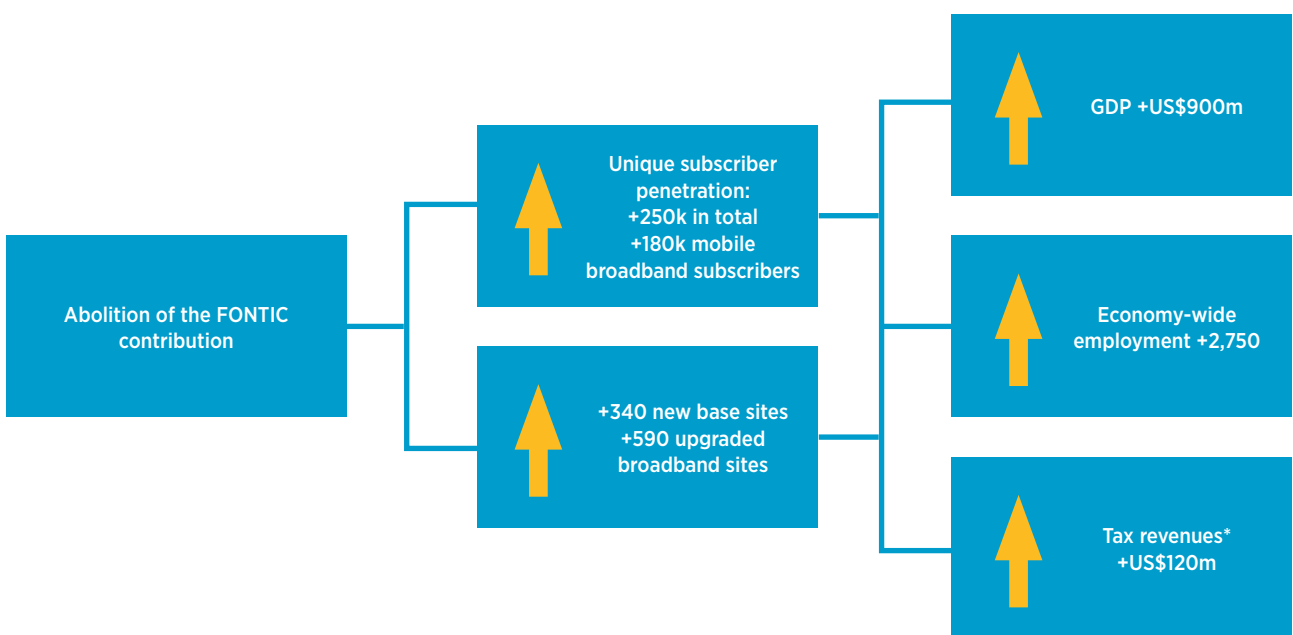
- **Economic growth:** This investment activity has a number of positive spillovers in the economy, and could increase GDP by US\$890m by 2021.
- **Increase in tax revenue for the government:** As a result of the wider tax base and increased

economic activity, tax revenue for the government could increase by US\$120m in 2021.

- **Additional employment:** This investment activity could help create over 2,750 local jobs through activities such as construction and network installation.

FIGURE 22

Economic impact of the abolition of the FONTIC contribution in 2021



Source: Deloitte analysis on GSMA. FONTIC contributions not being a government revenue were not considered as a tax revenue loss.

The mobile industry recognises the importance of the current revenues that are obtained from the FONTIC, which are generally disbursed for the purposes of the USF. In the medium term, the removal of this tax is estimated to generate more tax revenues for the government that could be used for these purposes.

However, in the short term, the government may consider a number of marginal increases in general taxation to cover for the shortfall from FONTIC funding that was used for non-network purposes.¹⁵¹ For example, the current revenues obtained by the government through the FONTIC amount to

around 0.80% of all VAT collection or to 3.5% of Income tax collection.

Considering 2014 data on revenues from general taxes obtained by the Colombian government, alternative general taxation increases to make up the shortfall from the FONTIC could be equivalent to: general VAT may only need to rise from 16% to 16.13% to recover the revenues from the FONTIC; alternatively, the Income tax increase may be equivalent to 0.7 percentage points for the lowest bracket to 1.2 percentage points for the highest bracket; or Social Security contributions could increase from 20.5% to 20.83%.

151. Proceeds from the FONTIC to do not accrue to the Colombian government but to the USF, which could be funded in alternative ways, e.g. through general taxation as illustrated here.

TABLE 4

Value of FONTIC contribution relative to general taxes and increases in general tax required to cover this contribution, 2014¹⁵²

General tax	FONTIC payment relative to economy wide general taxation	Representative tax rate increase to recover lost tax revenue
Corporation tax	0.77%	0.30%
VAT	0.80%	0.13%
Income tax	3.50%	From 0.7% for the lowest bracket to 1.2% for the highest bracket
Social security contributions	1.61%	0.33%

Source: Operator data and OECD data on tax revenue

152. See footnote 149 for a discussion on the stringent assumptions required for this static analysis.

4 Reforming taxation on the mobile sector in Colombia

While taxation from the mobile sector remains critical to continue financing public expenditure in Colombia, mobile sector taxation remains relatively high, different to fixed telephony in two stratas, and subject to special usage excises and operator taxes.

Taxation on mobile operators and consumers, in particular the Consumption Tax and the FONTIC contribution, is levied in ways that do not recognise some of the key investment and economic features of the mobile industry in Colombia, potentially creating a number of distortions that in the medium term can act to reduce the levels of investment, harm consumers, and constrain the extension of mobile connectivity to those who remain unconnected, who are still over a third of the population in Colombia.

Based on the best practice principles and on evidence from a series of studies that have examined mobile taxation in numerous countries worldwide, a number of potential areas for tax reform could be considered by the Colombian government, which has shown over recent years to have a positive approach towards the ICT sector. Further, reforming mobile taxation could align its treatment to that of other OECD countries.

Harmonising and simplifying the taxation framework on the industry could reduce the burden and negative impacts of taxation:

- To this end, governments could seek to reduce or eliminate the Consumption Tax, to align consumer taxes on mobile voice to that of standard services.

- Removing special taxes on mobile consumption has resulted in significant extensions of mobile access in Uruguay and Ecuador, where economic inequality is lower than Colombia, and the Mexican government has recently proposed a similar approach.

Taxation could be designed in a way that is consistent with the policy objective of extending connectivity to those that remain unconnected and aligned to the ‘Vive Digital’ plan. Potential tax policies to improve affordability and network rollout that the government could consider include:

- Sales taxes on mobile handsets and smartphones being removed or made subject to a temporary exemption to reduce the affordability barrier for the poorest consumers and extend connectivity. The Colombian government has already adopted this approach successfully with laptops and computers, and could recognise that today smartphones are the primary way to access the internet.
- Reconsider fees levied with the purpose of reinvesting in the market: USO (Universal Service Obligation) contributions, such as FONTIC represent a direct cost for mobile operators. While FONTIC has performed well, as coverage obligations are made part of the spectrum and licences, the reliance on this fund to encourage rollout could be reduced.

153. Bird and Zolt (2003) "Introduction to Tax Policy Design and Development" for a course on Practical Issues of Tax Policy in Developing Countries, World Bank, April 28-May 1, 2003

Sector-specific taxation could be substituted by tax reform in line with the principle, suggested for example by international organisations such as the World Bank,¹⁵³ that low rates on wider tax bases are to be preferred to higher taxes on narrow bases:

- If properly designed, taxation on wider bases could allow governments to collect equivalent tax revenue in simpler and more efficient ways whilst reducing compliance costs for mobile operators, and has the potential to stimulate sector-wide investment.
- This approach would allow the Colombian government to reduce or eliminate over time airtime duties, such as the voice Consumption Tax, that target mobile services at higher rates than other standard services. As the economy becomes more formal, airtime duties on mobile could be reduced further.
- For example, the current revenues obtained by the government through the Consumption Tax amount to around 0.48% of all VAT collection, or to 2.18% of Income tax collection, while revenues obtained by the government through the FONTIC

amount to around 0.80% of all VAT collection or to 3.5% of Income tax collection. Under a set of assumption discussed in Section 3.3, this may mean that general VAT may only need to rise from 16% to 16.09% to recover the tax revenues from the Consumption Tax; and to 16.11% to recover the revenues from the FONTIC.

As the sector develops further, it is also important that the government does not subject innovative mobile services to sector-specific taxation. The rapid growth of mobile data platforms across numerous services is already increasing the economic value delivered by the sector through products and services ranging from finance and healthcare to education and retail services.

These innovative products can generate economic and social benefits. Mobile money, for example, is thought to give the opportunity to the unbanked to access financial services such as saving accounts and borrowing.¹⁵⁴ The Colombian government could avoid reducing their uptake through imposing any sector-specific taxation, i.e. over and above general taxation, that increases the price of such goods and therefore reduces demand.

¹⁵⁴ Donovan K., 2012, 'Mobile Money for financial inclusion'

Appendix A - Methodology

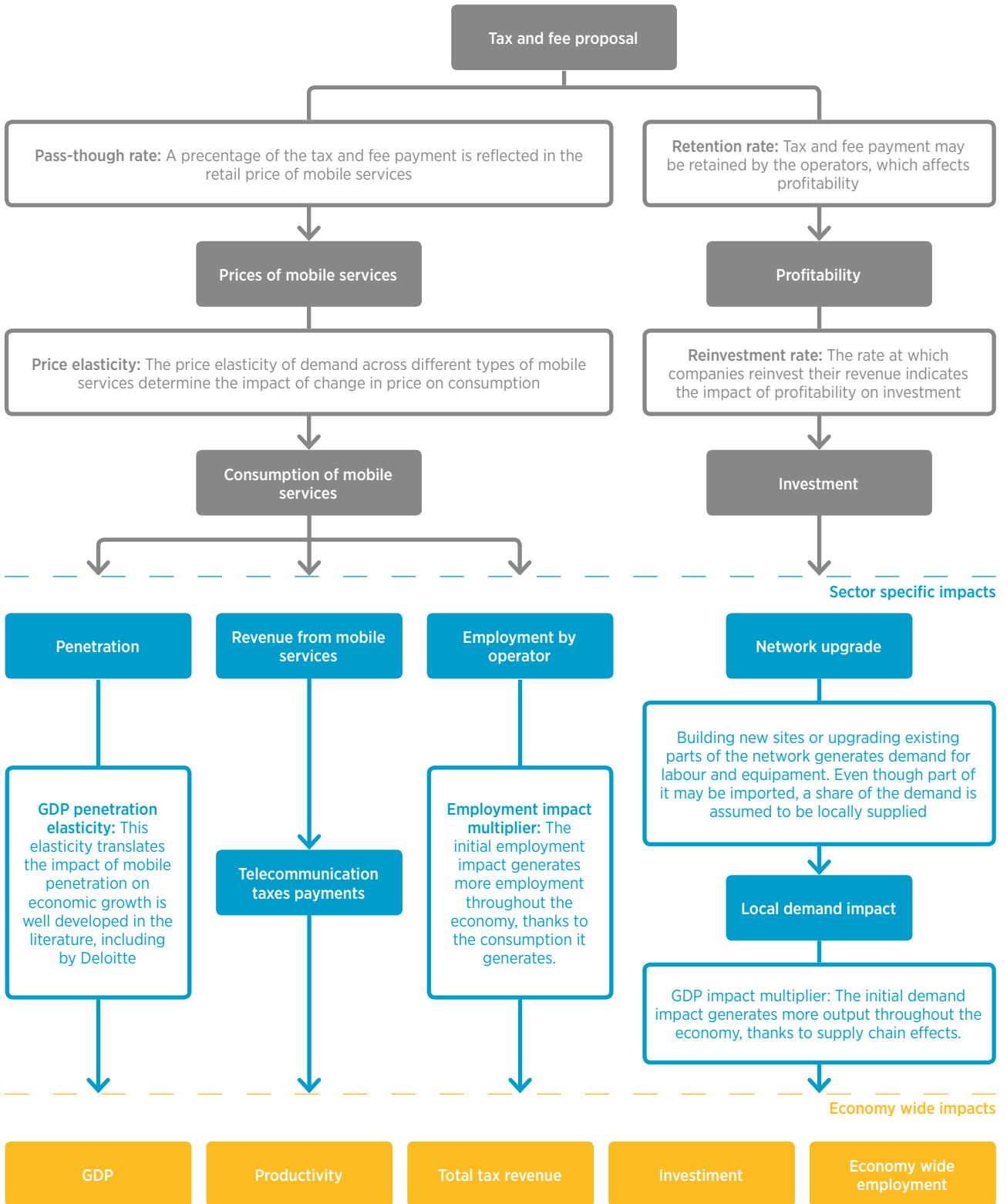
A.1 Estimation of the economic impact of a tax change

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

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

FIGURE 23

Schematics for modelling the economic impacts of mobile taxation changes



Source: Deloitte analysis

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

As illustrated in Figure 23, the model evaluates the demand and supply effect of the change in mobile taxation on the telecom market. On the demand side, a tax cut may be partly passed through to consumers as lower prices. Tax savings can also, on the supply side, be partly reinvested to expand the network or upgrade current sites to newer technologies.

The inputs for the model have been provided by operators in Colombia and the GSMA as well as publicly available statistics from the World Bank and the IMF. These include forecasts for 2017 and subsequent years. The outputs are derived based on estimates of the elasticity of demand for mobile services from a number of developing markets, while the impacts of mobile and broadband penetration on GDP have been derived from econometric studies of similar developing markets.

Demand side

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

Changes to the price of mobile services affect their consumption. In order to estimate this, assumptions are made on the price elasticity of demand,¹⁵⁵ which measures how much demand for mobile services will change in response to a price change.

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

These sector impacts lead to economy-wide effects, which are estimated through assumptions that

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

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

Supply side

The model also considers instances in which some or all of the tax savings are not passed through to consumers but reinvested in extending or upgrading mobile networks in the country. Investment resulting from tax savings is determined using a reinvestment rate assumption. Using data, informed by discussions with mobile operators, on the construction cost of a new site and on costs to upgrade existing 2G or 3G network sites, the model estimates the number of additional sites and upgrades that the tax decrease may translate into by 2021.

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

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

A.2 Key assumptions

The assumptions underlying the model have been developed on the basis of a review of academic literature and previous studies in this area. In cases where the GSMA has conducted other studies on Colombia, the assumptions have been aligned to ensure consistency. These are discussed in more detail below.

Pass-through rates

Changes in taxes and fees paid by mobile operators and consumers may be completely or partly passed through to the end-consumer prices. The level of pass-through of taxes and fees to final prices typically depends on numerous market factors: for example, it may depend on overall competition levels, on operators' market power, on the price elasticity of demand, as well as on operators' commercial strategies. As such, it is expected that each operator will determine how to pass through any tax savings in different ways. Academic literature has found a considerable variability in pass-through rates, which may be negligible, close to 100% or even above 100% in certain instances.¹⁵⁶ Having considered this evidence, as well as a number of market-specific conditions in Colombia, the following illustrative assumptions on pass-through rates have been employed: an average pass-through rate of 75% is assumed for taxes that fall directly on retail prices, such as the Consumption Tax. For taxes on operator revenue, such as the FONTIC, it is assumed that the pass through rate is 33%.

Price elasticity of demand

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

demand are based on a review of studies conducted in a number of developing markets on the elasticity rates observed. Based on evidence from the academic literature, the elasticity of demand for 2G and 3G mobile subscriptions is assumed to be -1.03.¹⁵⁷ For those that own mobile devices, demand for mobile services is more elastic: the elasticity of demand for mobile services is assumed to be -1.19 for 3G mobile services, based on a number of studies within the field.¹⁵⁸

Reinvestment rate¹⁵⁹

Literature highlights that a company's cash flow is a strong predictor of its investment; the strength of this response is stronger in economies in which firms have less access to financial markets.¹⁶⁰ To illustrate the potential for new investment through the tax reduction, the reinvestment rate is assumed to be 50% of the value not passed through to consumers. This illustrative assumption was based on a review of market characteristics in Colombia showing that CAPEX/revenue for Colombian operators frequently reaches close to the 50% mark during periods of network rollout; and on a review of academic papers discussing pass through rates from tax changes.

Part of the investment effort is spent on network coverage expansion, and the rest is spent on network upgrade; the shares were determined through discussions with the operators.

Based on a review of cost benchmarks and discussions with local operators on the cost of installing sites, the cost of a new site is assumed to be US\$287,000 and the cost of network upgrades from mobile broadband is US\$166,000.¹⁶¹ This takes into account differences in the cost of rural sites and other non-site costs that are necessary for each site.

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

157. Baigorri and Maldonado (2010); UK Competition Commission, 2003.

158. See, for example: Gruber and Kontroupis, 2010, Mobile telecommunications and the impact on economic development; Wheatley, J. J., 1998, Price elasticities for telecommunication services with reference to developing countries; GSMA, 2005, Tax and the digital divide: How new approaches to mobile taxation can connect the unconnected. London: GSMA

159. The definition of reinvestment rate used in this context differs from that used in the finance context, where it designates the interest payments which can be earned when money is reinvested out of a fixed income investment to another. In this report reinvestment rate is the proportion of the tax change that is invested.

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

161. Deloitte analysis on operators' data, APC. "Unlocking broadband for all", Ericson (2012) "Preventing a Growing Mobile Network from Becoming a CAPEX/OPEX Drain" and FCC (2010) "A broadband network cost model"

Employment and GDP multiplier

The employment multiplier is used to estimate the effect of a change in employment in the sector on total employment in the economy. The magnitude depends on the economic characteristics of the sector, such as the degree of interconnection across the supply chain and the openness of the economy. Based on the characteristics of the Colombian mobile sector and the general economy the employment multiplier is assumed to be 2.42.¹⁶² That is, for every additional job created within the mobile sector, an additional 2.42 jobs are generated in the wider Colombian economy.

The GDP multiplier is used to estimate the wider economic impacts of the additional network investment. Based on the structure of the Colombian economy and how telecommunications services are used, this is estimated to be 1.5.¹⁶³ This means that for every additional US\$1 of expenditure in the telecommunications sector, GDP increases by US\$1.50.

Market penetration Impact

There is substantial evidence in the literature on the impact of mobile penetration on GDP growth. Analysis conducted by the GSMA on the impact of mobile and 3G penetration on GDP growth estimated that a 1% increase in market penetration leads to an increase in GDP growth of 0.28 percentage points.¹⁶⁴ 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.¹⁶⁵ This model does not consider switching between 2G and 3G services and so these impacts are treated separately.¹⁶⁶

Total Factor Productivity Impact

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

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

where it is assumed that $\alpha=0.3$ and $\beta=0.7$.

162. World Economic Forum, 2013, The Global Information technology Report 2013. Chapter 2. Colombia's Digital Agenda

163. Duque J., Betancourt A. and Posso C. "Economic multipliers for Colombia: A new visualization tool"

164. This is based on a study of 40 economies over the period 1996-2011; for full details of the methodology, see <http://www.gsma.com/publicpolicy/wp-content/uploads/2012/11/gsmadeloitte-impact-mobile-telephony-economic-growth.pdf>

165. 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

166. 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.

167. Bassanini A and Scarpetta S, 2001, "The Driving Forces of Economic Growth: Panel Data Evidence for the OECD countries"

A.3 Scenario estimations

The tables below report the estimated cumulative impacts of the tax changes simulated in this report on a number of macroeconomic and industry variables, compared against the base case scenario in the

specified year, where there is no change in tax policy; and on the assumption that the change in tax policy is implemented in 2017.

TABLE 5

Annual impacts of removing the Consumption Tax on selected macroeconomic and industry variables

Criterion	2017	2018	2019	2020	2021
Macroeconomic impacts					
Incremental GDP	US\$0.5bn	US\$0.9bn	US\$1.2bn	US\$1.4bn	US\$1.4bn
Additional employment	700 jobs	950 jobs	1000 jobs	1050 jobs	1150 jobs
Labour productivity, % change	0.14%	0.22%	0.27%	0.27%	0.27%
Investment	US\$130m	US\$230m	US\$320m	US\$350m	US\$370m
Sector specific impacts					
Incremental connections: total (broadband)	290,000 (160,000)	590,000 (350,000)	618,000 (390,000)	640,000 (430,000)	670,000 (480,000)
Incremental unique subscribers: total (broadband)	180,000 (100,000)	380,000 (220,000)	400,000 (250,000)	420,000 (280,000)	440,000 (310,000)
Increase in mobile penetration total, by connections	0.6%	1.2%	1.2%	1.3%	1.3%
Cumulative number of new sites (sites upgrades)	18 (32)	37 (64)	57 (98)	76 (132)	98 (169)

Source: Deloitte analysis

TABLE 6

Annual impacts of removing the FONTIC on selected macroeconomic and industry variables

Criterion	2017	2018	2019	2020	2021
Macroeconomic impacts					
Incremental GDP	US\$0.3bn	US\$0.5bn	US\$0.7bn	US\$0.8bn	US\$0.9bn
Additional employment	1,900 jobs	2,150 jobs	2,250 jobs	2,400 jobs	2,750 jobs
Labour productivity, % change	0.08%	0.13%	0.16%	0.16%	0.16%
Investment	US\$80m	US\$140m	US\$190m	US\$220m	US\$230m
Sector specific impacts					
Incremental connections: total (broadband)	160,000 (90,000)	340,000 (200,000)	350,000 (220,000)	370,000 (240,000)	380,000 (270,000)
Incremental unique subscribers: total (broadband)	100,000 (60,000)	220,000 (130,000)	230,000 (140,000)	240,000 (160,000)	250,000 (180,000)
Increase in mobile penetration total, by connections	0.3%	0.7%	0.7%	0.7%	0.8%
Cumulative number of new sites (sites upgrades)	64 (110)	129 (224)	197 (340)	266 (460)	340 (589)

Source: Deloitte analysis



For the full report please visit the GSMA
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