



Reforming mobile sector taxation in Bangladesh:

Enhancing mobile connectivity across
Bangladesh through a more efficient
tax system





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Executive summary

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

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

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

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

The Bangladesh mobile market has expanded rapidly and, while there is significant scope to further increase penetration, there are a number of barriers to technology migration and investment in the sector

The adoption of mobile phones in Bangladesh has grown rapidly over the past decade, with 57 million new subscribers connecting to mobile services between 2007 and 2017. Unique subscriber penetration has more than tripled over the period, and now stands at approximately 51% (equivalent to 87% penetration in total connections). This growth in mobile adoption has been achieved largely through investment by operators to date, leading to a significant increase in network coverage between 2000 and 2014.²

As the sector expands, it is becoming increasingly important to the Bangladeshi economy. The sector generated approximately \$5.2 billion of direct and indirect economic value in 2015, equivalent to over 2.5% of GDP.³ However, there is still considerable room for expansion of the sector, as just under half of the population still remains unconnected to mobile services. Bangladesh ranks below a number of regional peers when it comes to unique subscriber penetration (6th out of 8 countries in South Asia). Access to mobile data services is low, with just 21% of individuals having access to mobile internet. This relatively low mobile internet penetration (7th out of 8 countries in South Asia) reflects both limited network coverage, and the lack of affordability for more advanced mobile technologies (3G and 4G).

Affordability is a barrier to technology migration for mobile services in Bangladesh. A medium consumption basket (1GB of data) would cost an individual in the bottom 20% of the income distribution approximately 11.4% of their monthly earnings, which is significantly above the long-term "1 for 2"⁴ affordability target adopted by the United Nations.⁵ Similarly, those in the bottom 40% of the income distribution would spend over 9.4% of their monthly income on mobile ownership.

1. GSMA, <https://www.gsma.com/aboutus/gsma-asia>

2. Country Overview, Bangladesh – GSMA, 2014 – <https://www.gsmaintelligence.com/research/?file=140820-bangladesh.pdf&download>

3. GSMA, Economic Impact: Bangladesh Mobile Industry, 2017 – <https://www.gsma.com/spectrum/wp-content/uploads/2017/01/Economic-Impact-Bangladesh-Mobile-Industry.pdf>

4. '1 for 2' refers to 1GB of data costing less than 2% of monthly income

5. Alliance for Affordable Internet (2017), 2017 Affordability Report – http://a4ai.org/affordability-report/report/2015/#redefine_%E2%80%9Caffordability%E2%80%9D_with_income_and_gender_inequalities_in_mind



This partially explains the relatively slow adoption of 3G technology in Bangladesh, as operators are constrained by the lack of affordability for data-intensive services. In addition, mobile sector taxes, including high usage taxes and regulatory fees, discourage investment in the sector. Given the increased importance of data for social and economic development, these barriers to mobile broadband in Bangladesh represent a significant barrier to mobile connectivity.

The affordability and investment barriers are exacerbated by the current tax system. Taxes on the mobile sector are disproportionately high compared to levels observed in other sectors, and in other Asian countries

In 2014, the total tax contribution of the mobile sector was estimated at \$1.36 billion. This is equivalent to 46% of the mobile sector's total market revenue.⁶ This total tax burden (46%) is relatively higher compared with other countries in Asia, including Sri Lanka (29%), Indonesia (23%), Malaysia (20%), and Thailand (14%).⁷

While revenues from the mobile sector only accounted for around 1.6% of Bangladesh's GDP, the sector's tax and fee payments accounted for around 7.2% of the total tax revenue. In this way, the tax contribution from the sector were 4.5 times greater than the sector's revenue.⁸

In addition, the mobile tax burden is also higher in comparison to other sectors. For example, mobile phone operating companies pay the same high rate of corporation tax as tobacco companies (40% for publicly traded companies and 45% for non-publicly traded companies), while all other sectors pay lower statutory rates (between 25% and 35%). Furthermore, mobile services are taxed with supplementary duties and surcharges. This disincentivises investment into the sector, reduces the affordability of mobile services, and penalises an industry which brings positive externalities into the economy.

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

The Bangladesh economy has experienced rapid growth in recent years, with real GDP growth averaging over 6.6% per annum between 2012 and 2017. To sustain this this level of economic expansion, the Government should seek to facilitate businesses

by providing services, infrastructure and tax policies that are conducive to further growth.

Bangladesh is ranked 177th in the world for the ease of doing business, with the World Bank identifying access to electricity (185th) and the tax environment (152nd) as areas for improvement. To enhance the business environment, in particular for the mobile sector, steps can be taken by Government to provide a tax system which is simple, predictable and hence more conducive to business. This includes tax reforms which can lead to greater adoption of mobile technology, and incentives for operators which promote investment in the sector. This would improve connectivity, which in turn will increase both digital and financial inclusion, and have wider positive effects for the productivity and economy of Bangladesh.

Tax reform in the sector would lead to considerable growth in mobile penetration, usage and migration to new generation technologies, particularly amongst low-income groups

To realise the potential benefits of increased connectivity, three potential tax reform scenarios have been developed, each of which would lead to growth in penetration, increased technology migration to smartphones and 3G connections, and increased usage per subscriber:

- By reducing corporation tax from 45% to 40% for private mobile operators, and from 40% to 35% for publicly traded mobile operators, mobile penetration would increase by 0.5 million unique subscribers (0.3%) by 2023, equivalent to 0.8 million new connections, and mobile data usage would grow by 2.2%. This would increase sector revenues by \$42 million (1.2%);
- By eliminating the supplementary duty of 35% applied on the supply of SIM cards and the VAT of 15% on SIM cards, mobile penetration would increase by 2.3 million unique subscribers (1.3%) by 2023, equivalent to 3.8 million new connections, and mobile data usage would grow by 2.1%. This would increase sector revenues by \$75 million (2.1%); and
- By eliminating the 5% supplementary duty levied on mobile services, mobile penetration would increase by 3.2 million unique subscribers (1.8%) by 2023, equivalent to 5.2 million new connections, and mobile data usage would grow by 5.8%. This would increase sector revenues by \$82 million (2.3%).

6. GSMAi data for 2014

7. GSMAi data for 2014

8. GSMAi data for 2014

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

Tax reforms would boost productivity, leading to higher GDP and taxation revenue in the medium-term

The boost to mobile penetration would lead to growth in productivity across the economy, and hence an increase in GDP. Household incomes, employment and investment would also increase. Sectors that either use mobile services intensively in their own business or supply the mobile industry will gain most, but all sectors will benefit as greater wealth is produced across the economy.

Moreover, all reforms are shown to be self-financing in terms of their impact on government revenues in the medium-term, as the expansion of the sector

and wider economy increases government revenues beyond Year 2 (2020). The economic impacts are summarised below:

- By reducing corporation tax from 45% to 40% for private mobile operators, and from 40% to 35% for publicly traded mobile operators, GDP grows by \$131 million (0.1%), and tax receipts grow by over \$14 million (0.02%), a cumulative fiscal gain of over \$29 million over five years;
- By eliminating the supplementary duty of 35% applied on the supply of SIM cards and the VAT of 15% on SIM cards, GDP grows by \$535 million (0.2%), and tax receipts grow by over \$123 million (0.2%), a cumulative fiscal gain of over \$397 million over five years; and
- By eliminating the 5% supplementary duty levied on mobile services, GDP grows by \$749 million (0.3%), and tax receipts grow by over \$135 million (0.2%), a cumulative fiscal gain of over \$397 million over five years.





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

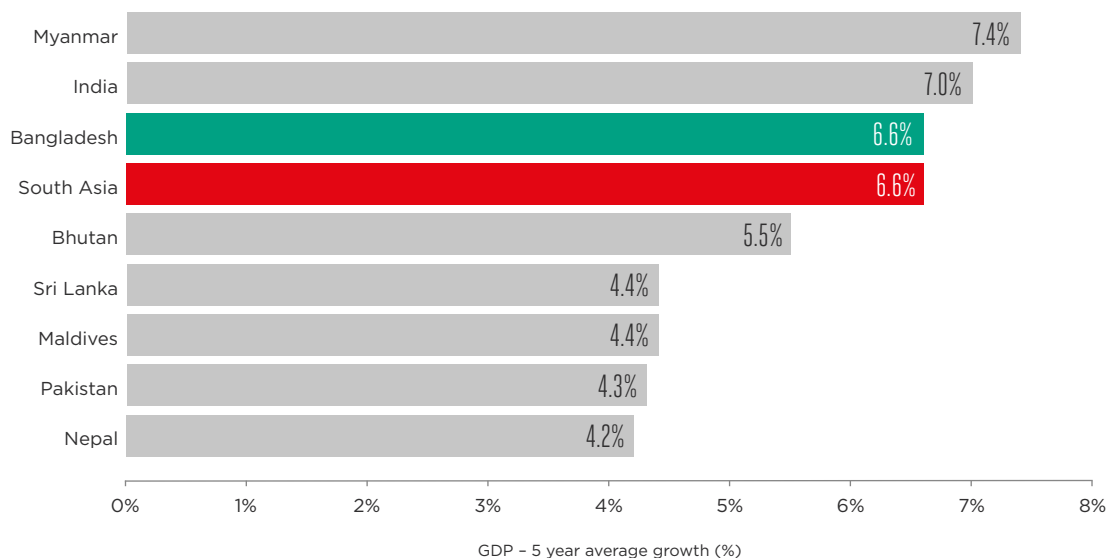
1.1 Macroeconomic overview

Sustained economic growth in Bangladesh has led to significantly reduced poverty levels, but further challenges remain

The Bangladesh economy is the third largest in South Asia,⁹ with gross domestic product (GDP) of \$245 billion in 2017. The economy is growing at one of the highest rates in the region, with real GDP growth estimated at 7.3% in 2017.¹⁰ As shown in Figure 1, real GDP growth in Bangladesh has averaged over 6.6% per annum between 2012 and 2017, which is slightly above the average rate for the region.¹¹

Figure 1

5-year-average real GDP growth rate in South Asian countries, 2012-2017



Source: Oxford Economics database

9. South Asia is comprised of Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Sri Lanka. Myanmar is not considered as being part of South Asia but is included in parts of the regional comparisons as it shares a border with Bangladesh

10. Oxford Economics database

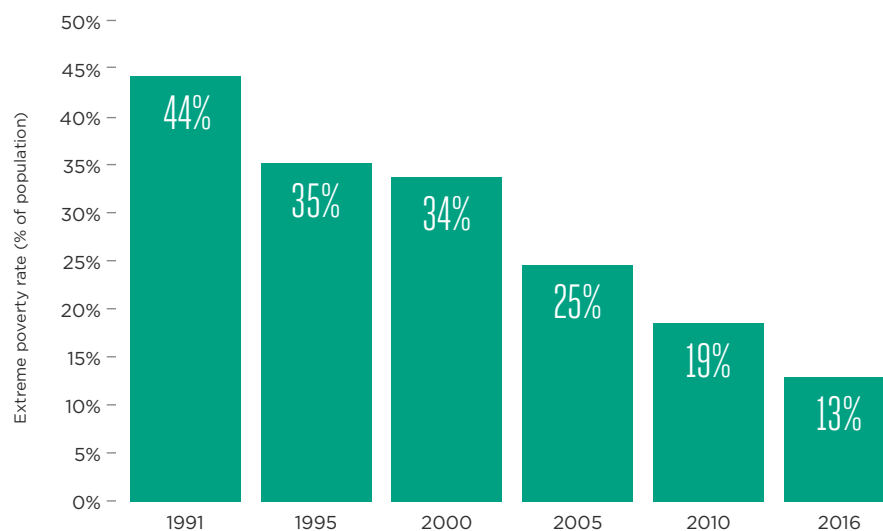
11. The average rate of growth is skewed upwards by India, due to the size of its population

This sustained period of economic growth has facilitated increasing levels of income in Bangladesh. Figure 2 shows that the number of individuals in extreme poverty¹² fell from 33.7% in 2000 to an

estimated 12.9% in 2016. The country has already achieved the United Nations Millennium Development Goal set in 2000, of halving the poverty rate between 1991 and 2015.

Figure 2

Extreme poverty headcount ratio (% of population), at \$1.90 a day (2011 Purchasing Power Parity)



Source: Oxford Economics database

However, several challenges remain for the Bangladesh economy. The export sector in Bangladesh remains heavily reliant on textiles and clothing, which accounted for over 89% of total exports in 2015.¹³ This reliance on a single sector leaves Bangladesh vulnerable to volatility in the global market for textiles, specifically in relation to price. According to the Bangladesh Garment Manufacturers and Exporters Association (BGMEA), Bangladeshi garment prices fell by 15% percent over the last two years in the US,¹⁴ a market that currently accounts for over 19% of Bangladesh's exports.¹⁵

An additional challenge for the Bangladesh economy is the global decline in remittances, which account for a significant proportion of GDP (5.1% in FY17). Remittances from the Bangladeshi expat community

decreased from \$14.7 billion in financial year 2016 (FY16) to \$12.6 billion in FY17, a drop of 14.5%.¹⁶ According to the World Bank, this is largely attributed to the fall in oil prices and a tax on non-nationals in GCC countries,¹⁷ which have decreased the disposable income of Bangladeshi expatriates.¹⁸

In spite of these potential headwinds, the Government aims to support further economic growth in the medium-term through Vision 2021,¹⁹ which has the goal for Bangladesh to become a middle-income country,²⁰ with poverty eradicated by 2021. As demonstrated in Figure 3 below, while GDP per capita in Bangladesh (\$1,356 in 2016) lags behind a number of countries in the region, it is firmly established as a lower-middle-income country.

12. Extreme poverty is defined by the World Bank to include individuals living with less than \$1.90 per day

13. World Bank – World Integrated Trade Solution

14. World Bank, Bangladesh Development Update, September 2017 – <http://documents.worldbank.org/curated/en/710651506517681504/pdf/120089-WP-PUBLIC-BDU-September-27-2017.pdf>

15. World Bank – World Integrated Trade Solution

16. World Bank, Bangladesh Development Update, September 2017 – <http://documents.worldbank.org/curated/en/710651506517681504/pdf/120089-WP-PUBLIC-BDU-September-27-2017.pdf>

17. The Gulf Cooperation Council (GCC) comprises of six member states: Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and United Arab Emirates

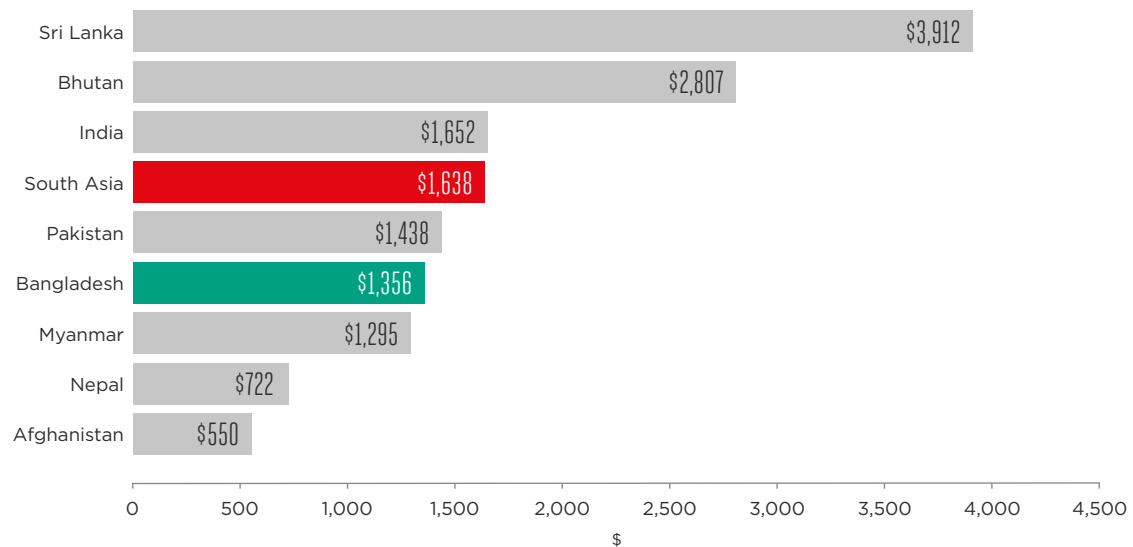
18. According to the World Bank, GCC countries accounted for over 84% of migrant outflows in FY17

19. Center for Policy Dialogue, 2007, Bangladesh Vision 2021 – available at: <http://saber.eaber.org/system/tdf/documents/Bangladesh%20Vision%202021.pdf?file=1&type=node&id=23151&force>

20. The World Bank defines middle income countries as those with a GNI per capita, calculated using the World Bank Atlas method, of over \$1,025 in 2015. Lower middle-income economies are those with a GNI per capita between \$1,026 and \$4,035

Figure 3

GDP per capita (nominal \$) in selected South Asian countries,²¹ 2016



Source: Oxford Economics database

The vision for 2021 is that citizens will have a higher standard of living, be better educated, benefit from improved social justice and enjoy a more equitable socio-economic environment. A key enabler of *Vision 2021's* objectives is *Digital Bangladesh*,²² which aims to facilitate socio-economic transformation through information and communications technology (ICT). Digital Bangladesh has four key priorities:

- developing human capital which is ready for the 21st century;
- connecting citizens in ways most meaningful to them;

- taking services to citizens' doorsteps; and
- making the private sector and market more productive and competitive through the use of digital technology.

The country has, to date, made good progress in all four areas, with particular advances in the accessibility of government services. However, further steps can be made to support the mobile sector across Bangladesh, including the development of a more efficient tax policy framework to improve connectivity and drive the digital agenda.

1.2 Fiscal overview

The Bangladesh Government has set ambitious revenue and expenditure targets, reflecting the need to support domestic growth and improve tax revenues

The Bangladesh Government has adopted an expansionary fiscal policy in recent years, with a budget deficit in excess of 5% of GDP in FY17.²³ Ambitious targets have been set for government spending, with the FY18 budget, announced on June 1 2017, specifically targeting increased spending in the education,

technology, transport, and communication sectors.²⁴

However, revenue collection is a significant barrier to improving the Government's fiscal outlook. According to the National Board of Revenue, tax compliance is low, with less than 1.2% of the population paying income tax in 2015. As shown in Figure 4, Bangladesh has a low tax to GDP ratio (8.5%) compared to regional peers, and compared to other countries at a similar stage of development.²⁵

21. Maldives is excluded from this regional comparison, as it's small population size, location and level of tourist income do not make it a useful comparator to Bangladesh

22. Government of Bangladesh - <https://www.ictd.gov.bd/>

23. World Bank, Bangladesh Development Update, September 2017 - <http://documents.worldbank.org/curated/en/710651506517681504/pdf/120089-WP-PUBLIC-BDU-September-27-2017.pdf>

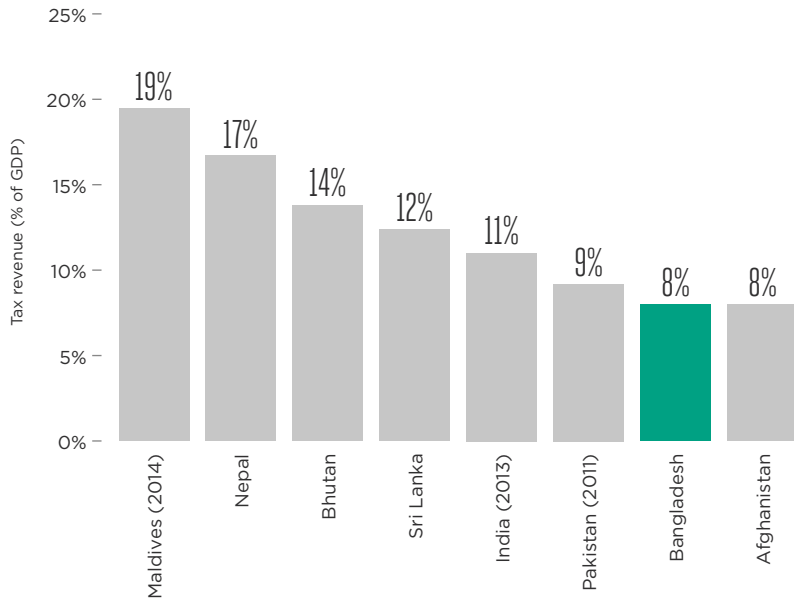
24. BMI research, Economic Analysis - Main Takeaways For Budget FY2017/18, August 2017 - <http://www.asia-monitor.com/economic-analysis-main-takeaways-budget-fy2017-18-aug-2017>

25. National Board of Revenue, Bangladesh, 2016 - <http://www.imf.org/external/np/ins/english/rmtf.htm>



Figure 4

Tax revenue (% of GDP), South Asian countries, 2015 unless otherwise stated



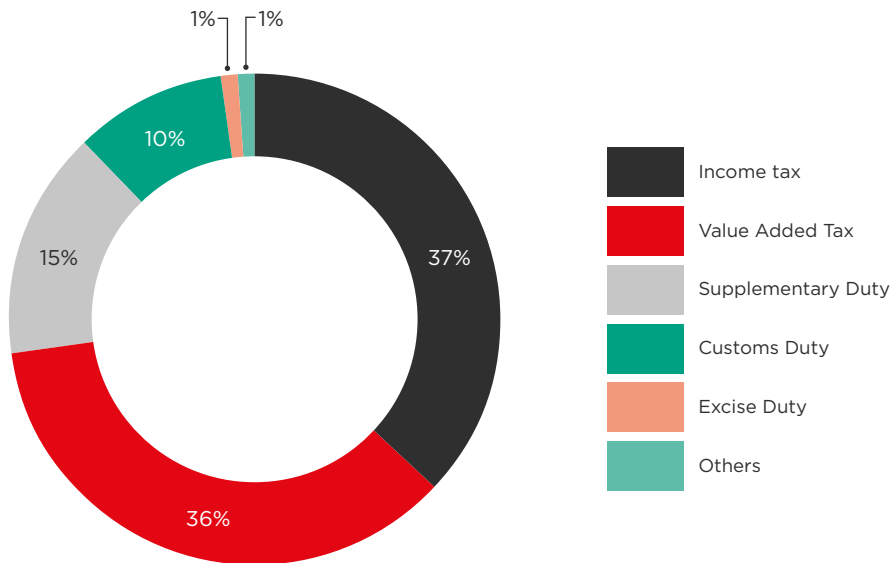
Source: World Development Indicators, World Bank Databank

The breakdown of tax revenue in FY17 is provided in Figure 5, and shows that income taxes and VAT accounted for the majority during the period, at approximately 37% and 36% respectively. Customs

duties accounted for 10% of tax revenue, while excise duties and supplementary duties accounted for a combined 16% of the total.

Figure 5

Composition of tax revenue, Bangladesh, FY17



Source: Bangladesh National Board of Revenue

In 2017, government expenditure in Bangladesh is estimated at approximately \$35 billion, equivalent to 14.3% of GDP.²⁶ Education accounted for 14% of total government spending in 2013, while health and military expenditure accounted for 6% and 14% respectively.²⁷

Gross government debt is expected to remain stable in the short term, at approximately 23% of GDP in 2018.²⁸ Given the fiscal deficit, it is appropriate that

the Bangladesh Government directs its expenditure to sectors with high growth potential (such as ICT and financial services), while measures to enhance revenue collection should also be implemented to improve the Government's fiscal position. The Government's tax policy framework should take into account the distortive impacts of taxation on certain sectors (e.g. mobile) that have the potential (in the short- to medium-term) to generate significant additional economic activity and tax revenue.

1.3 Demographic overview

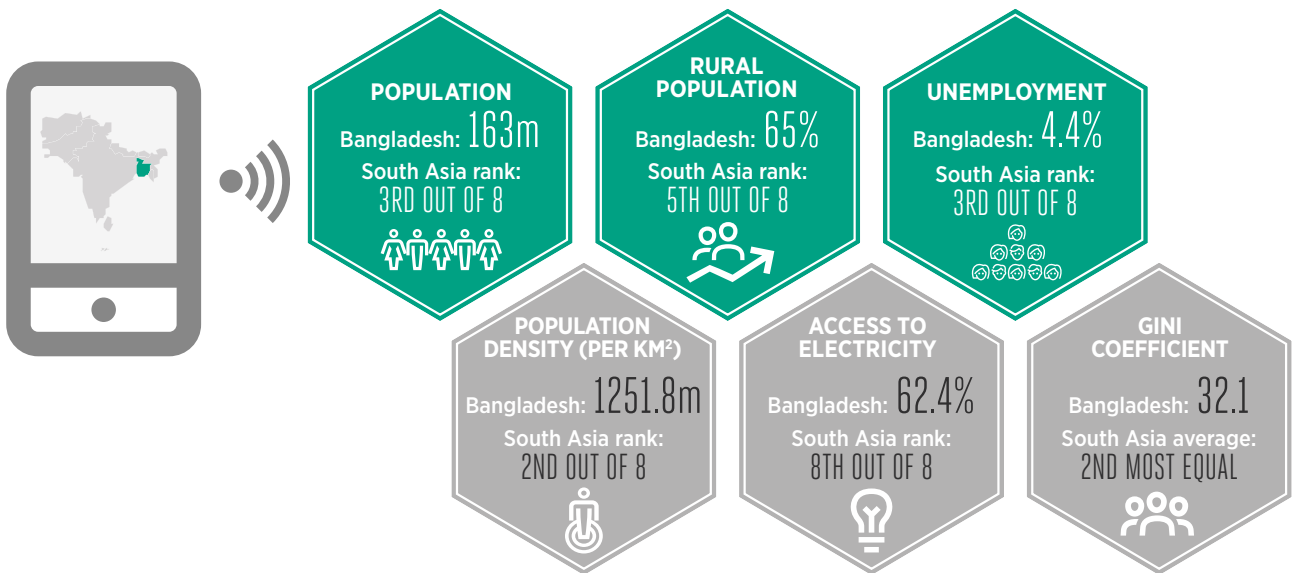
High population density and increasing rates of urbanisation pose a challenge to infrastructure and services in Bangladesh

Figure 6 provides a demographic overview of Bangladesh. Bangladesh is one of the world's most densely populated countries, with three times the

population density of India and five times that of Pakistan.²⁹ It has a large population (3rd highest in South Asia, and 8th in the World), 65% of which live in rural areas. Unemployment is low in Bangladesh at approximately 4.4%,³⁰ while income inequality is also low when compared to other countries in South Asia.

Figure 6

Overview of Bangladesh demographics



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

As shown in Figure 7, although a high proportion of individuals (65%) live in rural areas, the rate of urbanisation is increasing in Bangladesh. This poses a

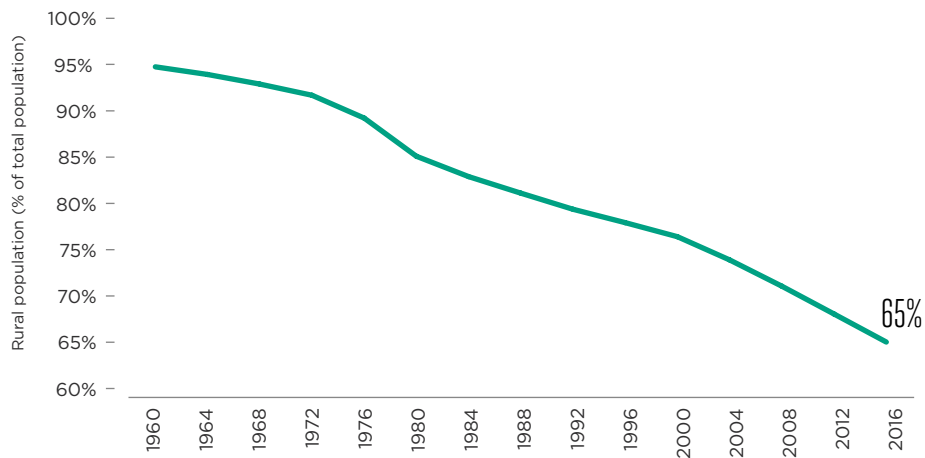
challenge to the Government to encourage investment in key infrastructure to meet the growing demand for energy, transport and communication services.

26. *Ibid.*
 27. World Development Indicators, World Bank Databank
 28. Oxford Economics database
 29. World Development Indicators, World Bank Databank
 30. International Labour Organisation, National estimate



Figure 7

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



Source: World Development Indicators, World Bank Databank

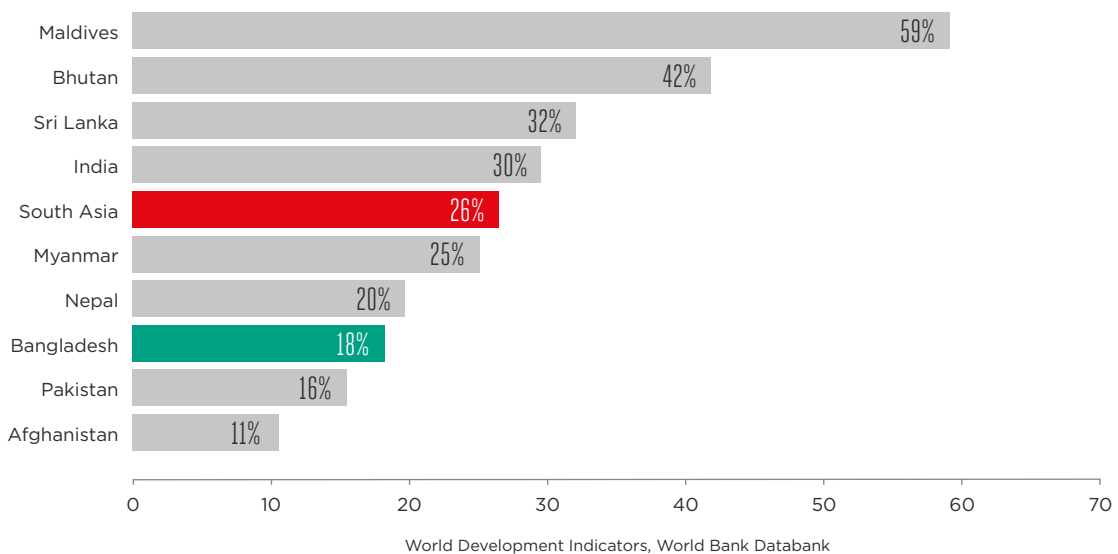
The average electrification rate in Bangladesh is 62.4%,³¹ however, this masks a significant difference between access in urban areas (90.7%) and rural areas (51.4%).³² This disparity highlights the challenge faced by policymakers to meet the infrastructure needs of the rural population.

who are internet users³³ is relatively low in Bangladesh when compared to regional peers, at 18.2%. This is roughly 8 percentage points lower than the regional average (South Asia), and presents a significant barrier to the take up of mobile services. Increasing access to internet services should therefore be considered as a policy priority for the Bangladesh Government.

As shown in Figure 8, the percentage of the population

Figure 8

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



Source: World Development Indicators, World Bank Databank

31. World Bank Databank

32. *Ibid.*

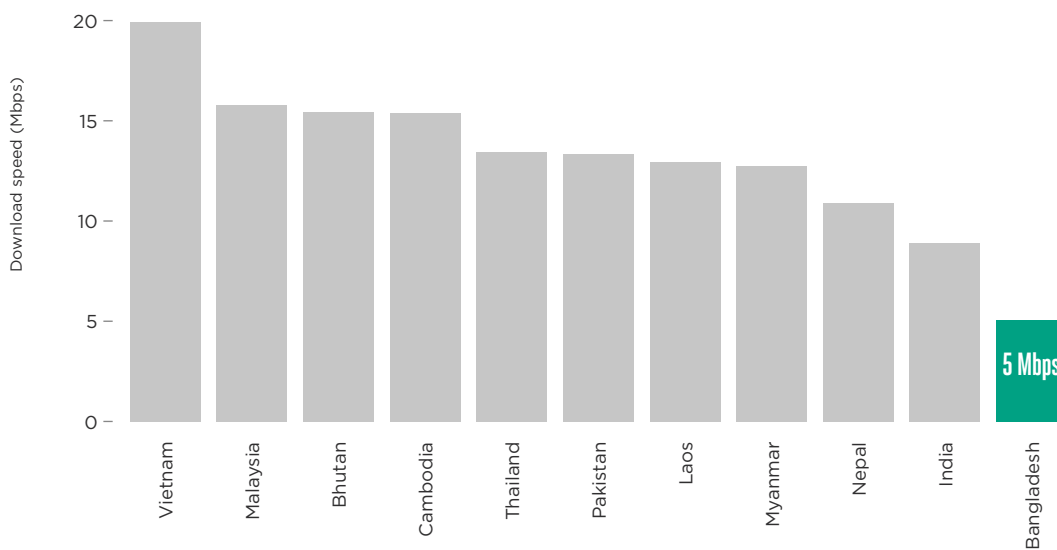
33. Internet users are individuals who have used the Internet (from any location, and through any technology, i.e. fixed or mobile) in the last three months

Figure 9 shows that Bangladesh also ranks below a number of regional peers in terms of download speed. Ookla’s analysis of average mobile speed data (Speedtest Intelligence) demonstrates that, at

approximately 5MB per second, average download speed in Bangladesh is significantly below the levels observed in India (9MB per second) and Pakistan (13MB per second)

Figure 9

Mean download speeds (MB per second) in selected Asian countries, Q4 2017



Source: World Development Indicators, World Bank Databank

With supporting infrastructure in place, the increasing rate of urbanisation and high population density represent an opportunity to increase mobile connectivity in Bangladesh. It is an opportunity to

reach a broader consumer base in Bangladesh, and Government should support the sector in increasing coverage in rural areas.

1.4 Mobile market in Bangladesh

The Bangladesh mobile market is expanding, and there is an opportunity to migrate customers to more sophisticated technologies

The mobile market in Bangladesh has grown rapidly over the past decade, with the number of subscribers increasing by over 57 million between 2007 and

2017. However, as demonstrated in Figure 10, which provides an overview of the Bangladesh mobile market, a significant opportunity exists to develop the sector over the coming years (e.g. the relatively low level of 3G penetration and smartphone usage), and in achieving the vision set out in *Digital Bangladesh*.

Figure 10

Bangladesh mobile market in figures

SUMMARY OF MOBILE MARKET



Bangladesh mobile operators generated **\$3bn** in revenue in 2017, and contributed **\$5.2bn** of direct and indirect economic value (over 2.5%) to GDP in 2015.



Third largest mobile market in South Asia, in terms of revenue.



144 million connections at Q4 2017
Equivalent to 87% total subscriber penetration
2021 forecast: 164 million, at a 4 year CAGR³⁴ of 3%.



84 million unique subscribers at Q4 2017
Equivalent to 51% unique subscriber penetration
2021 forecast: 96 million, at a 4 year CAGR of 3%.

BREAKDOWN OF TOTAL CONNECTIONS



25% 3G and 4G penetration (connections) at Q4 2017
2021 forecast: 58%, at a 4 year CAGR of 23%.



35% smartphone penetration at Q4 2017
2021 forecast: 61%, at a 4 year CAGR of 21%.



97% prepaid connections compared to total in Q4 2017.

Source: GSMA Intelligence, EY analysis

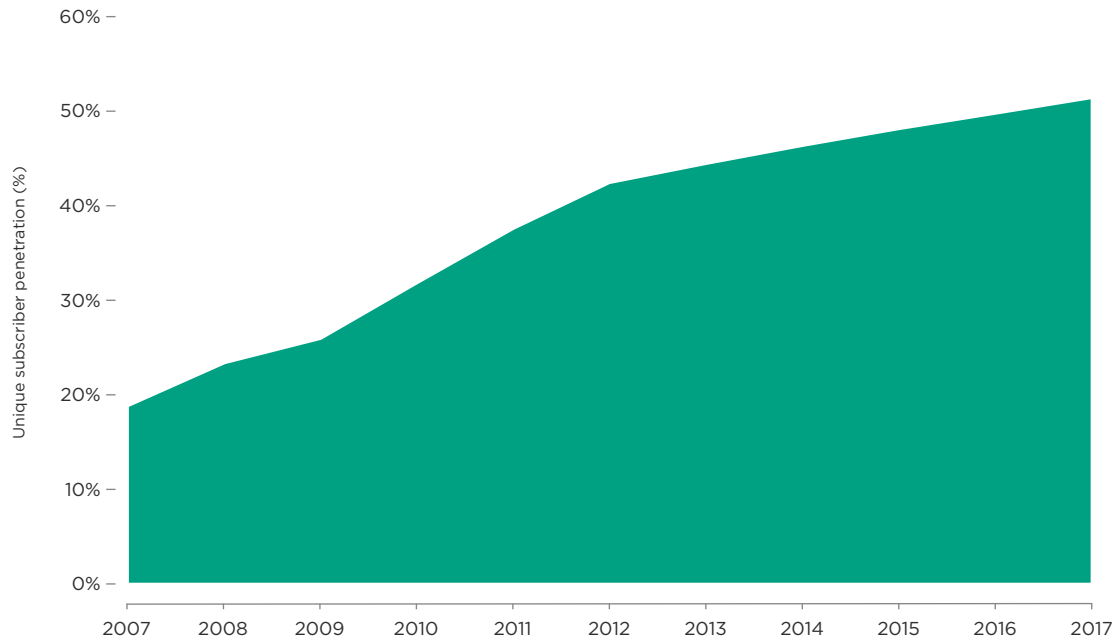
34. Compound annual growth rate (CAGR) is the mean annual growth rate for the period

As demonstrated in Figure 11, unique subscriber penetration has more than tripled since the start

of 2007, standing at 51% of the population by 2017 (equivalent to 87% penetration in total connections).

Figure 11

Unique mobile subscriber penetration in Bangladesh, 2007-2017



Source: GSMA Intelligence database

This growth in penetration has largely been achieved through the rapid roll-out of mobile infrastructure, leading to a significant increase in network coverage between 2000 and 2014.³⁵ Further improvements to coverage, particularly for 3G services, can be achieved – as Bangladesh’s high population density (1,252 people per km²), and specifically its high rural population density (854 people per km²)³⁶ provide a favourable commercial environment for network roll-out.³⁷

However, despite the rapid growth of the mobile market in Bangladesh, there is still considerable room for expansion, as just under half of the population still remains unconnected to mobile services. As shown in Figure 12, Bangladesh ranks below a number of regional peers when it comes to unique subscriber penetration (6th out of 8 countries in South Asia). Access to mobile data services is lower again, with just 21% of individuals having access to mobile internet.

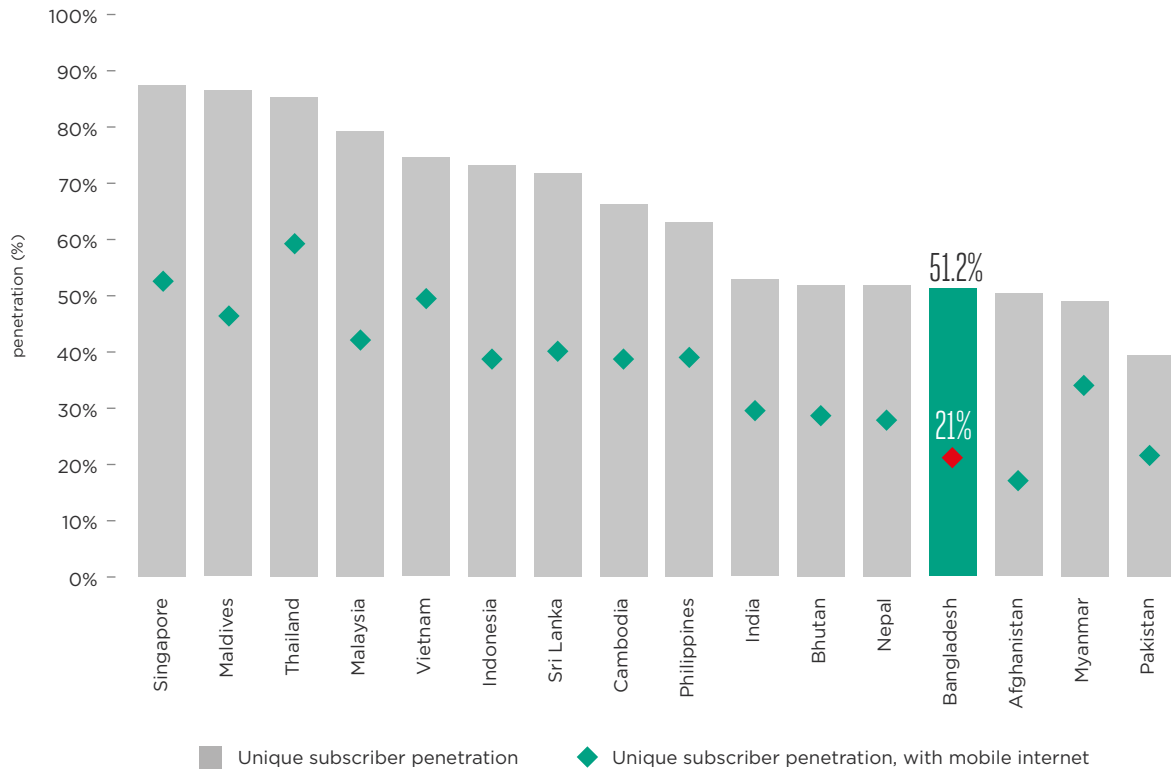
35. Country Overview, Bangladesh – GSMA, 2014 – <https://www.gsmainelligence.com/research/?file=140820-bangladesh.pdf&download>

36. World Development Indicators, World Bank Databank

37. As a comparison, the average lower middle income country has a rural population density of approximately 96 people per km²

Figure 12

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



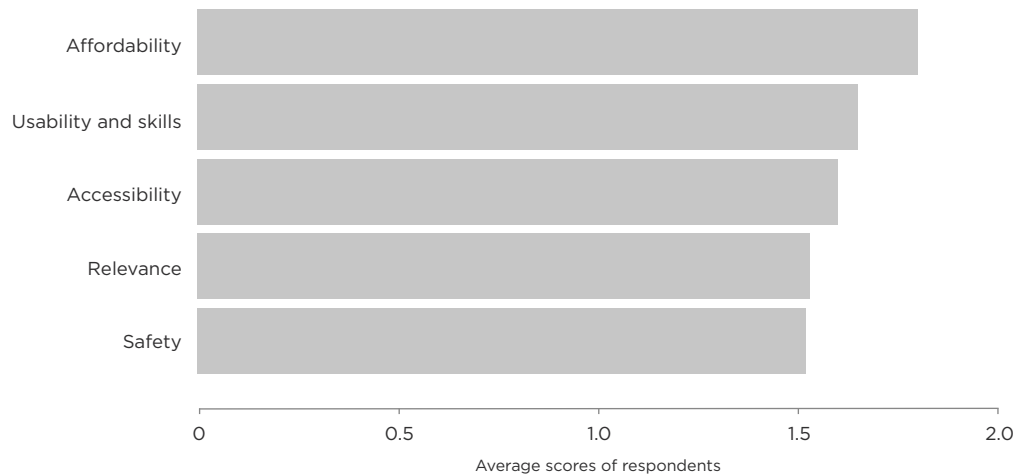
Source: GSMA Intelligence database

As shown Figure 13, the GSMA Intelligence Consumer Survey reports that the key barriers to mobile internet adoption in Bangladesh are the affordability of handsets, tariffs and data (as well as the cost of charging your phone battery), followed by digital

literacy (in terms of digital skills and ability to use mobile phone functions), accessibility to quality network coverage, and the lack of relevant services and content available to consumers.

Figure 13

Barriers to mobile internet adoption in Bangladesh



Source: GSMA Intelligence Consumer Survey 2017³⁸

Bangladesh is still a predominantly 2G market, with penetration of 3G services low compared to regional peers. In late 2013, Bangladesh became one of the last countries in Asia to award 3G licences to mobile operators, after a series of delays in the auction process.³⁹ This meant that operators were limited to offering data services via 2G networks, while take up of 3G services stalled.

As shown in Figure 14, penetration (total connections) for 3G is expected to surpass 2G by 2020, increasing from 25% at the end of 2017 to 43% by 2021. Such growth in 3G penetration will be important for Bangladesh, which currently ranks sixth in South Asia

for the adoption of 3G services, behind Maldives, Bhutan, Sri Lanka, Nepal and Pakistan.

The Bangladesh market has also been slow in rolling-out 4G services, as operators are currently restricted from providing 4G services over existing spectrum holdings. This will change when new 4G spectrum is auctioned, which is expected to happen in February 2018. While combined penetration of 3G and 4G services is expected to grow to over 58% of the population by the end of 2021, this still leaves just under half of the population without access to modern mobile technologies.

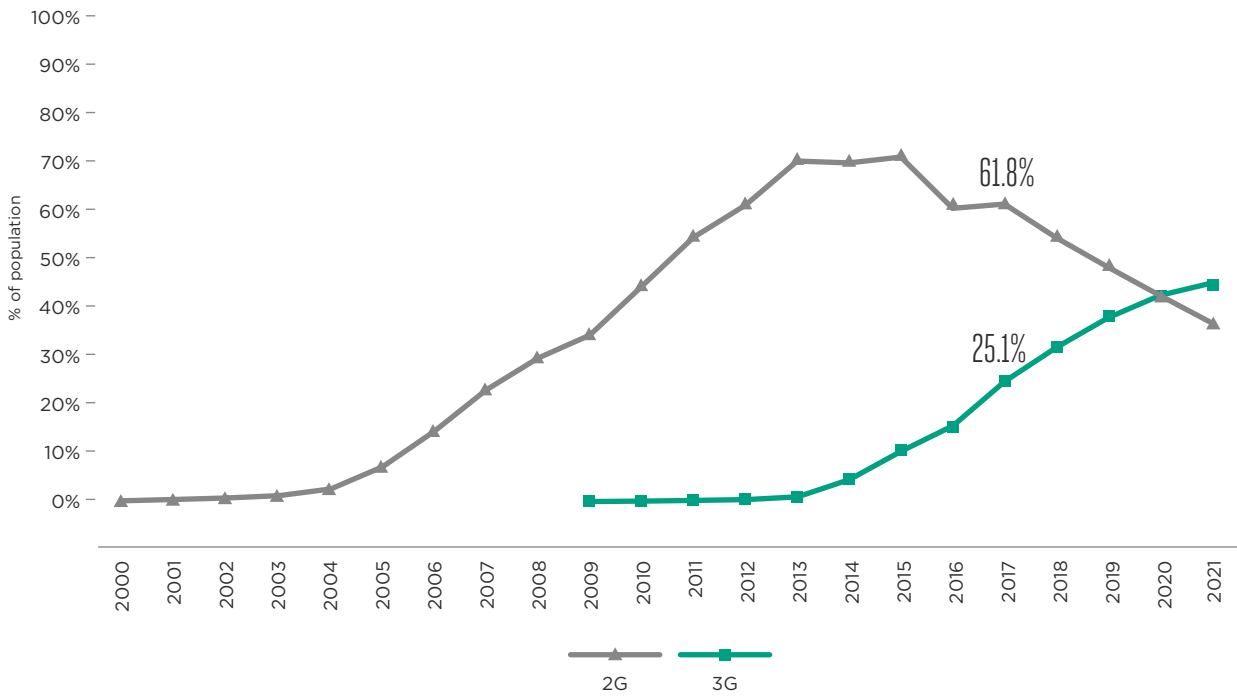
38. Respondents were asked to rate barriers to mobile internet adoption: 1 = not a reason/consideration; 2 = consideration but not a main barrier; 3 = one of the main barriers

39. Bangladesh: Asia's untapped mobile broadband opportunity, GSMA, 2013 - <https://www.gsmainelligence.com/research/2013/07/bangladesh-asias-untapped-mobile-broadband-opportunity/394/>



Figure 14

Market penetration rate (total connections), by technology



Source: GSMA Intelligence database

Monthly average revenue per user (ARPU) is also low in Bangladesh, at an estimated \$1.73 per connection in Q4 2017. As shown in Figure 15, Bangladesh ranks 8th out of 8 countries in South Asia for ARPU (per connection). By global standards, ARPU levels in Bangladesh are very low, ranking 237th out of the 239 countries and

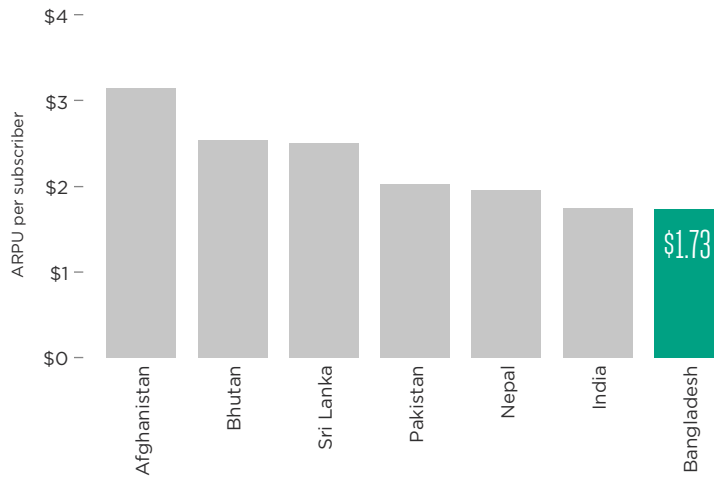
regions within the GSMA's database.⁴⁰ The low revenue levels are related to the relatively high revenue share of voice (approximately 77% in 2017) when compared to other services,⁴¹ in addition to low prices, usage levels, and income levels in Bangladesh.

40. GSMA Intelligence database

41. GSMA Intelligence database

Figure 15

Average revenue per user (Connections), 2017



Source: GSMA Intelligence database

As shown in Figure 16, average voice usage levels in Bangladesh, at 290 minutes per connection per month, are relatively low when compared to India and Pakistan, but are higher than those observed in other South Asian countries (where data is available). This can partially be explained by the relatively low levels of penetration, and pricing, in South Asia compared to countries such as Singapore, Thailand and Indonesia. Current mobile subscribers in Bangladesh, India

and Pakistan are likely to be wealthier than average (reflecting relatively low penetration), and hence have higher levels of voice usage per subscriber (but benefit from lower prices hence the lower ARPUs). As mobile penetration increases, providing access to those further down the income distribution, average usage per subscriber is likely to converge towards the levels observed in other middle-income countries.

Figure 16

Minutes of usage per connection per month in selected South Asian countries, 2016



Source: GSMA Intelligence database

1.5 Affordability of smartphones and mobile services in Bangladesh

The lack of affordability of new-generation technologies is a barrier to 3G/4G migration, which limits the growth in mobile connectivity

Lack of affordability can represent a significant connectivity barrier, particularly so for those at the bottom of the economic pyramid. The cost of purchasing and using a mobile phone can act as a barrier to both ownership and usage. The GSMA analysis highlights that countries with a high cost of mobile ownership (including both device and airtime/data) as a share of income per capita⁴² typically have lower penetration rates.⁴³ A lack of affordability has been cited by up to 80% of people in developing countries as the main barrier to mobile access and usage, and therefore there is significant scope to improve.⁴⁴

A basic measure of affordability of mobile services is the proportion of monthly income which is spent on mobile services and devices. For a range of countries, income groups and consumption baskets, the GSMA estimate the total cost of mobile ownership (TCMO), which assists in identifying the elements affecting the affordability of mobile services and devices.⁴⁵ In Bangladesh, in addition to usage and device costs, low electrification rates in rural areas can mean that subscribers incur additional time and cash costs for charging phones. This is particularly a barrier to the

adoption of smartphones which tend to have shorter battery lives.

Figure 17 shows the TCMO as a proportion of monthly income for the two lowest income quintiles in Bangladesh, compared to the entire population. For a low consumption basket (500MB of data), those individuals within the bottom 20% of the income distribution in Bangladesh spend approximately 4.9% of their monthly income on mobile ownership, marginally below the 5% threshold suggested by the United Nations Broadband Commission.⁴⁶ A medium consumption basket (1GB of data) would cost an individual at the bottom of the income pyramid approximately 11.4% of their monthly earnings, which is considerably above the long-term “1 for 2”⁴⁷ affordability target adopted by the United Nations.⁴⁸ In fact, for the two bottom quintiles of the population, the costs of all the consumption baskets in 2016 were above the unaffordability threshold set by the United Nations.

Given the increased importance of data in both social and economic settings, the lack of affordability for a medium consumption basket (1GB) in Bangladesh represents a significant barrier to mobile connectivity, and in particular would prevent data usage converging to that of more developed economies in future periods.

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

43. GSMA (2016) Digital Inclusion and Mobile Sector Taxation

44. GSMA (2015) Connected women 2015 – bridging the gender gap: mobile access and usage in low- and middle-income countries

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

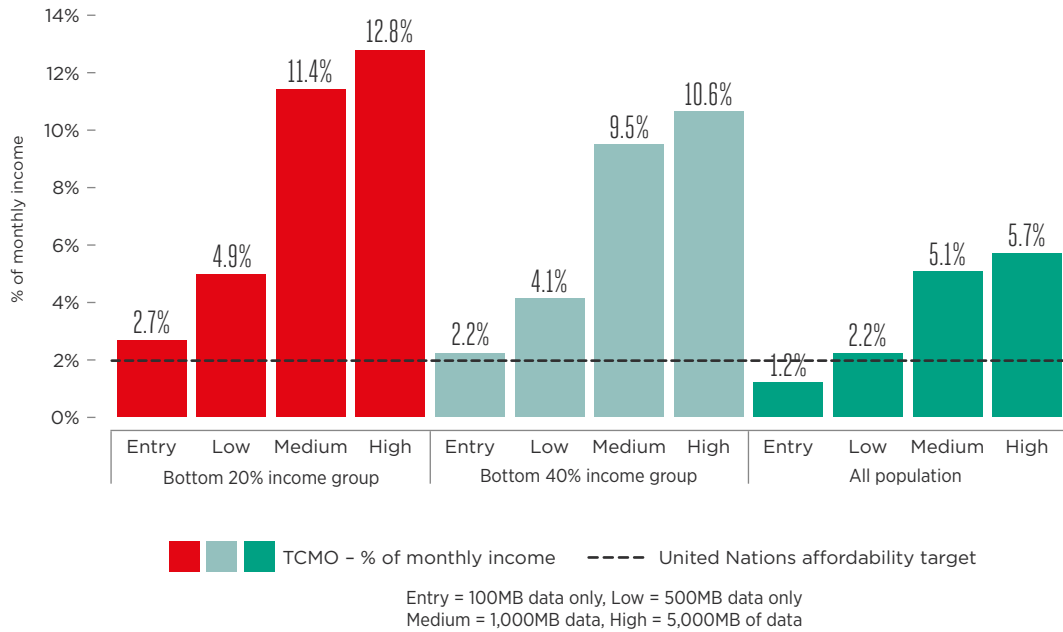
46. UN Broadband Commission (2017). ICT expenditure reflects Mobile Broadband prices, prepaid handset-based 500 MB. For further information: http://broadbandcommission.org/Documents/ITU_discussion-paper_Davos2017.pdf

47. ‘1 for 2’ refers to 1GB of data costing less than 2% of monthly income

48. Alliance for Affordable Internet (2017), 2017 Affordability Report – http://a4ai.org/affordability-report/report/2015/#redefine_%E2%80%9Caffordability%E2%80%9D_with_income_and_gender_inequalities_in_mind

Figure 17

TCMO as a proportion of monthly income in Bangladesh, 2016



Source: GSMA Intelligence database, Tarifica

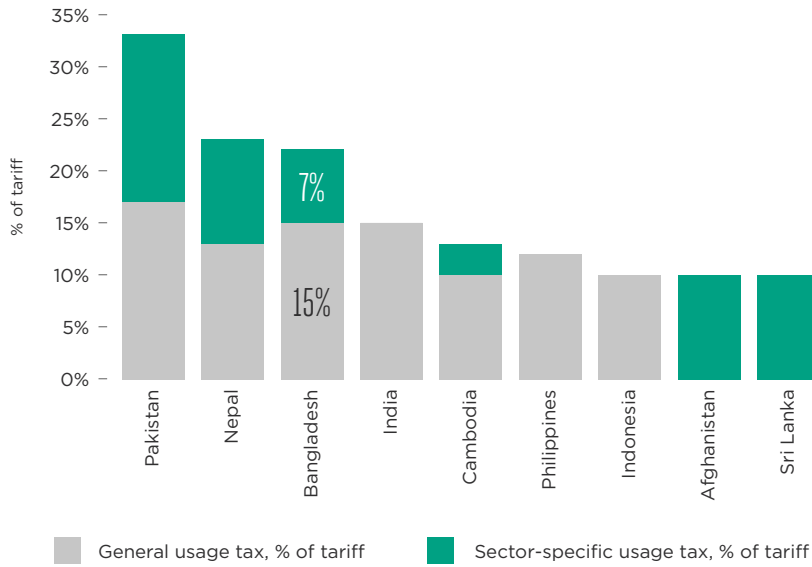
The lack of affordability of mobile services in Bangladesh is exacerbated by the high levels of taxation on usage and devices. As shown in Figure 18, taxes on the usage of mobile services represent a higher share of tariff costs (21.8%) than in a number

of neighbouring countries, including India. Similarly, Figure 19 demonstrates that taxes represent a relatively high proportion (30.2%) of device costs when compared to other countries in the region.



Figure 18

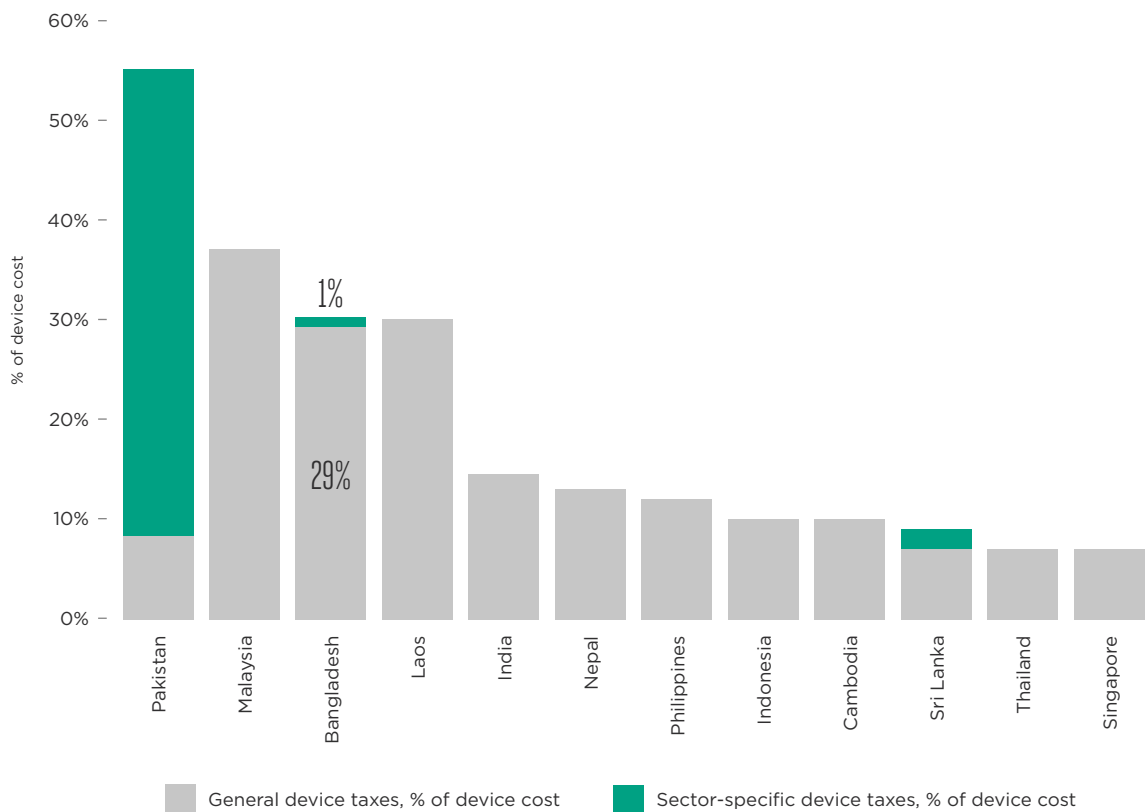
Usage taxes as a proportion of tariff costs (500MB data basket), 2016



Source: GSMA Intelligence database, Tarifica

Figure 19

Consumer taxes as a proportion of device costs, 2016



Source: GSMA Intelligence database, Tarifica

1.6 The socio-economic contribution of the mobile sector

Mobile operators directly contributed \$5.2 billion in direct and indirect value added to the economy in 2015

Total mobile sector revenues were \$3 billion in 2017.⁴⁹ According to prior GSMA research on the Bangladesh mobile market, the sector generated \$5.2 billion of direct and indirect economic value in 2015; over 2.5% of Bangladesh GDP.⁵⁰ The direct gross value added (GVA) of the sector amounted to \$3.8 billion in 2015.⁵¹ However, the benefits to the economy go beyond this direct impact: the mobile operators support a much wider mobile ecosystem, including mobile applications and mobile content developers, mobile infrastructure providers, mobile distribution and retail companies and mobile device manufacturers. These companies create further economic activity in Bangladesh by buying products and services from the firms in their supply chain (indirect effects) and by generating employee income which leads to increased consumer spending, generating demand in consumer goods markets (induced effects). In 2015, Bangladesh operators contributed approximately \$1.4 billion of indirect value to the economy, owing to the wider mobile ecosystem.⁵² In addition, the mobile connectivity enabled by the sector has significant positive impacts for productivity, by facilitating trade and communications across the country.

Mobile connectivity promotes productivity improvements in the economy

Greater access to mobile services has transformed economies, accelerating economic growth and development in countries worldwide. The effects of mobile connectivity on an economy are largely delivered through its impact on productivity. Improvements in mobile connectivity can improve communication and trade within an economy, while also making a country more attractive for foreign investment. In addition, added connectivity can boost tourism, and allow firms to access a broader pool of labour.⁵³ The benefits of mobile connectivity – and how it translates to the wider economy – have been widely studied. For example, a literature review by the International Telecommunication Union (ITU) finds

that a 10% increase in mobile broadband penetration leads to a 0.25% to 1.38% increase in GDP.⁵⁴ Further, a number of studies have shown a strong relationship between mobile penetration and productivity; these show that a 10% increase in mobile penetration increases productivity by between 1.0% and 1.3%.⁵⁵

Mobile networks promote digital inclusion and can bridge the digital divide

Where fixed broadband coverage is low (as is the case in Bangladesh, where just 3.8% of the population have fixed subscriptions),⁵⁶ mobile networks are central to promoting digital inclusion, due to the lower cost of network rollout. Mobile services can enhance digital inclusion in the economy by ensuring equal opportunity and access to information. For example, the large rural communities in Bangladesh, representing 65% of the population, can gain greater access to the knowledge and digital economy.

49. GSMA Intelligence database

50. GSMA, Economic Impact: Bangladesh Mobile Industry, 2017 – <https://www.gsma.com/spectrum/wp-content/uploads/2017/01/Economic-Impact-Bangladesh-Mobile-Industry.pdf>

51. Direct GVA includes gross operator surplus, taxes (less subsidies) on production and compensation of employees

52. *ibid.*

53. Oxford Economics (2013): The Economic Value of International Connectivity

54. ITU (2012) The Impact of Broadband on the Economy: Research to Date and Policy Issues

55. LECC (2009) Exploring the Relationship Between Broadband and Economic Growth and Waverman et al. (2009) Economic Impact of Broadband: An Empirical Study

56. World Development Indicators, World Bank Databank

CASE STUDY

mAgri services in Bangladesh⁵⁷

A number of operators in Bangladesh have developed innovations to support agriculture farmers through increased mobile connectivity:

Banglalink Krishi jigyasha: Krishi Jigyasha is an agriculture information service that provides information related to vegetable and fruit farming, poultry, livestock and fisheries. Users dial 7676 to talk to an expert for advice on their problems. At present, the service can help address issues in areas such as harvests, pesticides, agro-diseases, seeds, fertilisers, poultry and livestock feed, and fisheries techniques. The service has been helping farmers in Bangladesh since 2009.

Grameenphone Krishi Sheba: Grameenphone Krishi Sheba is an agricultural value added service (Agri VAS) launched in December 2015 in partnership with a VAS partner, Win Miaki, and with support from the GSMA mAgri programme as part of the mNutrition initiative. The service provides users with access to seasonal agricultural content from planting to post-harvest, for crops and livestock. Users pay BDT3 (\$0.04) per week to receive one outbound dialling (OBD) call per week per crop with one additional nutrition message.⁵⁸ As of December 2016 there were more than 750,000 users.

Robi Krishibarta: Robi Krishibarta is an IVR and call centre based agricultural service. Users of the service can listen to prerecorded agriculture-related content or use the call centre to talk to agricultural specialists. Different types of information are available through this service, relating to areas such as weather, production and cultivation techniques, diseases and insects, plant nutrients, water usage, prices and stock.

Mobile technology also removes other barriers to access to broadband services including the need of a permanent address, affordability of ownership of a PC or laptop, and access to a bank account. As of 2016, just 18% of Bangladesh households were internet users, with just 3.8% of the population subscribing to fixed broadband.⁵⁹ Increased roll out of mobile broadband services will therefore be key to addressing the low level of access to internet services, particularly because the fixed broadband network is limited.

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

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

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

Mobile Money services have the power to transform financial systems and promote a move away from cash based economies. They provide affordable financial services to low-income subscribers and enable safety, security and convenience for financial transactions for those who do not have access to traditional financial services.

Despite the widespread take up of mobile money services in other middle-income countries, the majority of payments made in Bangladesh are still made in cash. As of 2016, electronic payments made by government entities, businesses and individuals account for just 12% of payments by value and only 6% of payments by volume.⁶⁰

57. <https://www.gsmaintelligence.com/research/?file=e2f5981f5184fb3f389aa6c9d826f6c5&download>

58. Bangladesh: Driving mobile-enabled digital transformation, GSMA, 2017

59. World Bank Databank

60. Building Digital Bangladesh: The Way Forward for Digitizing Payments, Better Than Cash Alliance, 2016

There are several advantages to electronic payments when compared to cash payments, including contributing to higher transparency of transactions and displaying the potential to reduce the informal economy. Cash transactions are often unregistered which allows for the development of a shadow economy, and the evasion of tax payments. The promotion of electronic payments, including Mobile Money transactions, could reduce the budgetary cost of the shadow economy to the Bangladesh Government.⁶¹

Because of the regulatory framework in place in Bangladesh, mobile network operators are working in partnerships with banks. The role of the mobile operator is thus limited to one of a delivery channel: both digital (USSD access) and physical, with a supporting agent network. However, recent large-scale quantitative analysis by the GSMA shows that in other countries where mobile money services have been adopted (e.g. Kenya, Tanzania, Pakistan), mobile operator-led Mobile Money deployments have been more successful in developing and delivering digital financial services (DFS) than non-operators.⁶²

- In terms of active account growth, mobile operators obtain an average of almost 45,000 active accounts within one year of launch – 60% higher than for non-operators. By the fifth year of launch, this difference grows to almost four-fold; and;
- In terms of transaction value, by year five, operator led services, on average, have a Mobile Money transaction value equivalent to 15.6% of a country's money supply, compared to 1.4% for non-operator services.

Examples of successful implementations of mobile money services by mobile operators include Vodafone's M-Pesa in Kenya and Telenor's EasyPaisa in Pakistan.

Mobile Health

Mobile health (m-Health) applications can improve health systems through reducing the cost of service delivery, providing distribution channels for public health information, streamlining health administration and data management, and even aiding real-time supply chain management.⁶³ In a number of countries, including Bangladesh, mobile healthcare has already been shown to be effective for triaging rural patients who cannot reach urban tertiary care centres, and for enabling video-based consultations using mobile broadband thereby making healthcare accessible to this under-served population.⁶⁴

CASE STUDY

m-Health services in Bangladesh⁶⁵

A number of operators in Bangladesh have developed innovations to support agriculture farmers through increased mobile connectivity:

Grameenphone Tonic Bangladesh: Telenor Health launched its first mobile health service, Tonic, in Bangladesh in June 2016 through Telenor's local operator Grameenphone. Tonic is a health and wellness platform that provides digital health services, such as preventative advice content, appointment booking, phone-based access to primary care, discounts on health tests and specialist care, and insurance in the event of hospitalisation. Users can choose between three packages: Tonic Premium (BDT298 or \$3.60 per month); Tonic Advanced (BDT128 or \$1.60 per month); or Tonic Basic (pay per call for primary care consultations, otherwise free). As of the end of 2016 there were 2 million users.⁶⁶

Bangalink – Healthlink 789: With Healthlink 789, users receive basic health related advice over the phone from healthcare professionals and 24-hour health counselling. In addition, 3G-enabled mobile phone users are able to talk to the healthcare professionals using video. As well as receiving counselling, subscribers can receive health-related tips over SMS. The service costs BDT5/minute (\$0.06/minute) and has been provided by Banglalink since 2008.

Robi Mind Tale: Robi Mind Tale is a 24-hour service aimed at assisting people with mental illness. Robi users can access the service through IVR or a call centre and receive mental health-related tips via SMS. For all three of the above services, there are about 500,000 customers; Mdaktar alone has more than 280,000 customers.

61. EY (2016) Reducing the Shadow Economy through Electronic Payments

62. GSMA Mobile Money

63. University of Cambridge (2011) Mobile Communications for Medical Care

64. PWC - Emerging mHealth - Paths for Growth

65. Bangladesh: Driving mobile-enabled digital transformation, GSMA, 2017

66. Scaling digital health in developing markets, GSMA Intelligence, 2017

Mobile health services also create potential for further health improvements in Bangladesh, which has made strong development in health over the past few years. Maternal mortality has decreased from 569 per 100,000 live births in 1990 to 176 in 2015, while mortality rates among the under-fives have decreased from 144 per 1,000 live births in 1990 to 34 in 2016.⁶⁷ Both of these achievements show strong improvements in public health, but further gains are necessary to meet the Seventh Five Year Plan targets set for the period from FY2016 to FY2020.⁶⁸

Mobile connectivity can form part of the solution to achieving further gains in the healthcare sector, and can be used in health education, disease prevention, disease treatment, health care, and health support applications. Furthermore, mobile services can be used to overcome traditional barriers⁶⁹ to accessing essential information and services, such as geographic isolation, gender disparities⁷⁰ and social stigmas.⁷¹

Mobile learning

Mobile learning (m-Learning) has the ability to reduce inequalities in educational systems by widening access to learning materials, improving literacy and reducing drop-out rates. Bangladesh has made significant improvements in providing access to education in recent years, with net enrolment rates in 2015 of more than 90% in primary education and 57% in secondary education. However, literacy rates remain low at 73% in 2016, despite having increased from just 50% in 2001.⁷²

CASE STUDY EDUCATION AND DIGITAL LITERACY IN BANGLADESH⁷³

Robi 10 Minute School: Robi 10 Minute School is the biggest online education platform in Bangladesh, offering free education to more than 400,000 students via Facebook Live. To date, the school has taken 327 live classes and produced more than 1,740 video tutorials. The initiative is supported by the Bangladesh Government, who signed an agreement with Robi 10 Minute School to distribute education content across its 2,000 digital labs and 30,000 multimedia classrooms in primary schools.

Online Schools: JAAGO Foundation, in collaboration with Grameenphone Ltd and Agni Systems Ltd, introduced the concept of *Online Schools* in Bangladesh. This is designed to bridge the quality gap in education through modern technology. With this innovation, a rural classroom is connected to a teacher in Dhaka via video conferencing. The classes are operated with a teacher from the JAAGO Foundation's Teaching Centre and two local teachers in the rural area. *Online School* started in 2011 in Gazipur as a pilot project with 80 students. As of 2017, there are now 10 online schools operating across rural Bangladesh.

Bangalink Education Portal: Through the Education Portal, customers can access information on SSC, HSC, university admission test preparation, general knowledge, English learning related preparation and exam queries. The daily subscription fee is BDT0.20/day (\$0.0024/day) per pupil.

67. World Development Indicators, World Bank Databank

68. Seventh Five Year Plan, Government of Bangladesh, December 2015 http://www.lged.gov.bd/UploadedDocument/UnitPublication/1/361/7th_FYP_18_02_2016.pdf

69. McKee, N., Bertrand, J.T. and Becker, B.L., (2004), 'Strategic communication in the HIV/AIDS epidemic', in Sage Publications (New Delhi ; Thousand Oaks, Calif)

70. Gurman, T. A., Rubin, S.E., Roess, A.A., (2012), 'Effectiveness of mHealth Behavior Change Communication Interventions in Developing Countries: A Systematic Review of the Literature', in *Journal of Health Communication: International Perspectives*, 17 (1)

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

72. World Development Indicators, World Bank Databank

73. Bangladesh: Driving mobile-enabled digital transformation, GSMA, 2017



Gender equality

Mobile can empower women in developing countries, making them more connected, safer and better able to access information. Mobile also provides women with access to services and life-enhancing opportunities, such as health information and guidance, financial services and employment opportunities, often for the first time.⁷⁴

Bangladesh performs well compared to other countries in South Asia in the Global Gender Gap

Index.⁷⁵ Gender equality improvements are targeted in the Seventh Five Year Plan, with the target to increase the female-to-male ratio in tertiary education from 70% to 100% and to raise the female-to-male literacy ratio for the 20–24 age group to 100% from the current level of 86%.⁷⁶ A further challenge remains in employment, where women make up less than 30% of the total workforce, meaning there is significant scope to empower women to increase participation in the economy.⁷⁷



74. Bridging the gender gap: Mobile access and usage in low- and middle-income countries, GSMA, 2015

75. World Economic forum, Global Gender Gap Index

76. Seventh Five Year Plan, Government of Bangladesh, December 2015 http://www.lged.gov.bd/UploadedDocument/UnitPublication/1/361/7th_FYP_18_02_2016.pdf

77. World Development Indicators, World Bank Databank

2. Mobile sector taxation in Bangladesh

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

2.1 Overview of mobile taxation in Bangladesh⁷⁸

2.1.1 Taxation on mobile consumers

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

Table 1

Key taxes on mobile consumers, 2016

Central taxes	
Customs duty	5 - 25%
Value-added tax (VAT)	15%
Supplementary duty on SIM cards	35%
Additional supplementary duty on mobile services	5%
Surcharge on mobile services	1%

Customs duty

Customs duty is due on handsets and SIM (subscriber's identity module) cards at 10% and 25% respectively. Furthermore, base stations and network equipment are subject to custom duties ranging from 5% to 25%.⁷⁹

Value Added Tax

Telecommunications are subject to the standard rate of value-added tax (VAT) in Bangladesh of 15%, as are handsets, SIM cards and scratch cards.

Supplementary duties

A supplementary duty of 35% is charged on SIM cards, RIM (Removable User Identification Module) cards or any other similar kind of card with a microchip using Code Division Multiple Access (CDMA). Furthermore, an additional supplementary duty of 5% and a surcharge of 1% is also charged on the usage of mobile services.

78. This section is based on IBFD's information, EY 2017 Worldwide Corporate Tax Guide, the Bangladesh National Board of Revenue, and operator's data.

79. Customs duty for full BTS/node-B units is 10%, or 28% when imported as a separate part. For BTS antenna, customs duty is 10%. On top of customs duty, there is a 3% regulatory duty, 25% supplementary duty, VAT, 5% Advanced Income Tax (AIT) and 4% Advanced Trade VAT (ATV) imposed on most network equipment. The highest supplementary duty (SD) is imposed on SIM cards, batteries and cables. As a result the total tax on network equipment import becomes 10.3% to 97.1%. Source: operator's data.

2.1.2 Taxation on mobile operators

Table 2

Key taxes on mobile operators, 2016

Central taxes	
Corporation tax	45% ⁸⁰
Personal income tax (on wages)	30% (top rate)
Minimum corporation tax	0.75%
Stamp duty	0.07% - 4% ⁸¹
Workers profit participation	5% ⁸²
Real estate tax	125 BDT

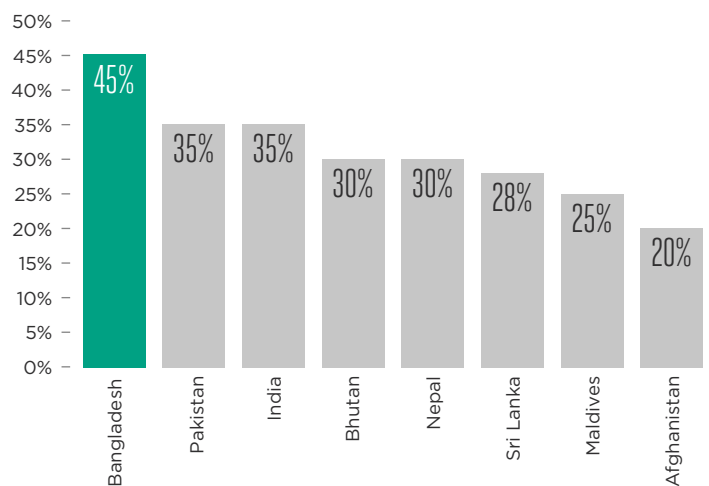
Corporation tax

Resident companies are subject to taxation on their worldwide income and capital gains. Tax rates vary across industries. Mobile phone operating companies are subject to a tax rate of 45%, unless they are publicly traded in which case they are subject to a tax rate of 40%. Cigarette manufacturing companies are

subject to a tax rate of 45%, financial institutions are subject to a tax rate 37.5% and 42.5%. All other publicly traded companies are subject to a tax rate of 25% and all other closely held companies are subject to a tax rate of 35%. In this way, the top corporate tax rate in Bangladesh is the highest in the South Asian region, as shown in Figure 20.

Figure 20

Top corporate tax rates in South Asia



Source: EY Analysis, EY 2017 Worldwide Corporate Tax Guide and IBFD

80. Reduced to 40% if converted into publicly traded companies by issue of at least 10% of paid-up capital through a stock exchange in Bangladesh, of which the pre-initial public offering placement should not be more than 5%.
 81. Rate depends on the dutiable transaction.
 82. Tax on gross receipts of the business.

On top of this, Bangladesh applies a minimum corporation tax that is payable by all companies with gross receipts of over BDT 5 million, payable by organisations whether they make a profit or a loss. The rate is 0.75% on gross receipts.

2.1.3 Other taxes

- **Personal income tax.** All resident individuals are liable to income tax on their worldwide income. The rate of tax depends on the income the individual earns, with the top rate of income tax being 30%.
- **Stamp Duty.** Stamp duty is imposed on a number of documents, including acknowledgements of debt, bonds, leases and transfers of shares, at rates ranging from 0.07% to 4%, or a fixed amount, depending on the dutiable transaction. The imposition of stamp duties is subject to a few exemptions in certain cases.

- **Workers profit participation.** Companies satisfying certain criteria must pay 5% of their profits in to a Workers Profit Participation fund which is provided to all employees who have been in employment with that employer for a minimum of nine months.
- **Land tax.** The tax applies to residential and industrial land. Residential land is taxed at BDT 22 per decimal,⁸³ while industrial land is assessed at BDT 125 per decimal.

2.1.4 Regulatory fees on mobile operators

On top of the taxes applying to mobile operators, there are also a number of different licences required in order to be able to supply telecommunication services. Many of these licences charge a fee and require an application fee as well. Furthermore, operators also have to bid for access to the spectrum in an auction, further driving up the cost of access. The details of these licences and the applicable fees can be seen in Table 3 below.

Table 3

Key regulatory fees on mobile operators, 2016

Regulatory fees	
Universal service fund (Social Obligation Fund)	1% of annual gross revenue
Licence application fee	100,000 BDT
Radio communications equipment licence	50,000 BDT
Application fee for the spectrum	50,000 BDT
Spectrum assignment fee	150,000,000 BDT per MHz
Annual licence fee	75,000,000 BDT
Annual spectrum fees	Different sums ⁸⁴
Revenue sharing (Commission)	5.5% of annual gross revenue
Revenue sharing of international phone calls	30% of the retail tariff less the carrier charge ⁸⁵
License renewal fee	10,000,000 BDT
4G licence (auction price)	\$30,000,000 ⁸⁶

Source: Bangladesh Telecommunication Regulatory Commission (BTRC)

83. A decimal is a unit of area in India and Bangladesh approximately equal to 1/100 acre (40.46 m²).

84. Spectrum charges are calculated using a formula set by the BTRC.

85. Operator shall share revenue of international incoming and outgoing phone calls. International incoming and outgoing call termination rates shall be determined and reviewed from time to time by the Commission. Source: BTRC.

86. Operators' data



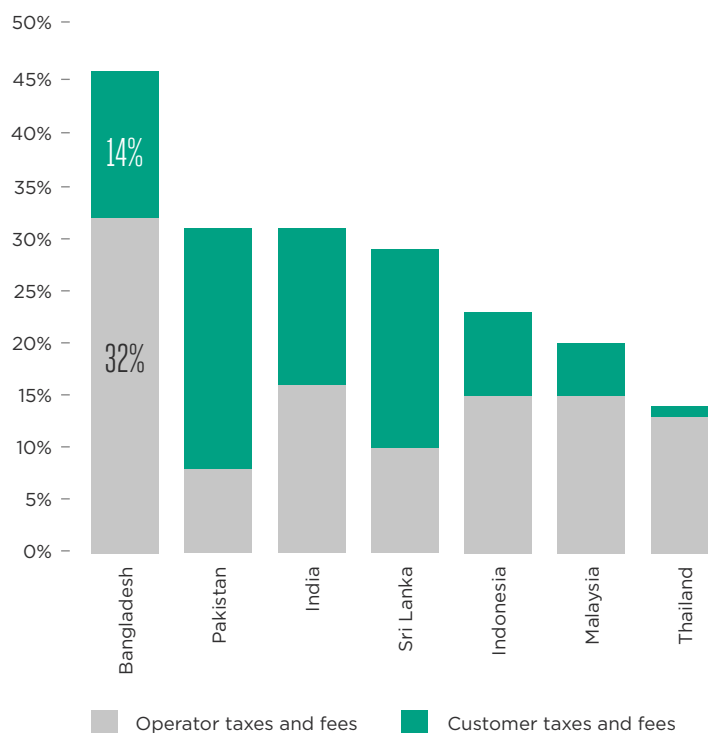
2.2 Tax contribution of the mobile sector

In 2014, the total tax contribution of the mobile sector was estimated at \$1.36 billion equivalent to 46% of the mobile sector's total market revenue.⁸⁷ Operators paid 70% of the total taxes, while consumers paid the remaining 30%.⁸⁸ As shown in Figure 21, this total tax burden is relatively high in Bangladesh (46%)

compared with other countries in Asia, including Sri Lanka (29%), Indonesia (23%), Malaysia (20%), and Thailand (14%).⁸⁹

Figure 21

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



Source: GSMA Intelligence

The mobile sector makes a large contribution in taxes and fees relative to its economic footprint. While revenues from the mobile sector only accounted for around 1.6% of Bangladesh's GDP, the sector's tax and fee payments accounted for around 7.2% of the total tax revenue. In this way, the tax contribution

from the sector was 4.5 times greater than the sector's revenue. As shown in Figure 22, this ratio is higher than most countries in the region, such as Indonesia (2.0), India (1.9), and Thailand (1.2).⁹⁰

87. GSMAi data for 2014

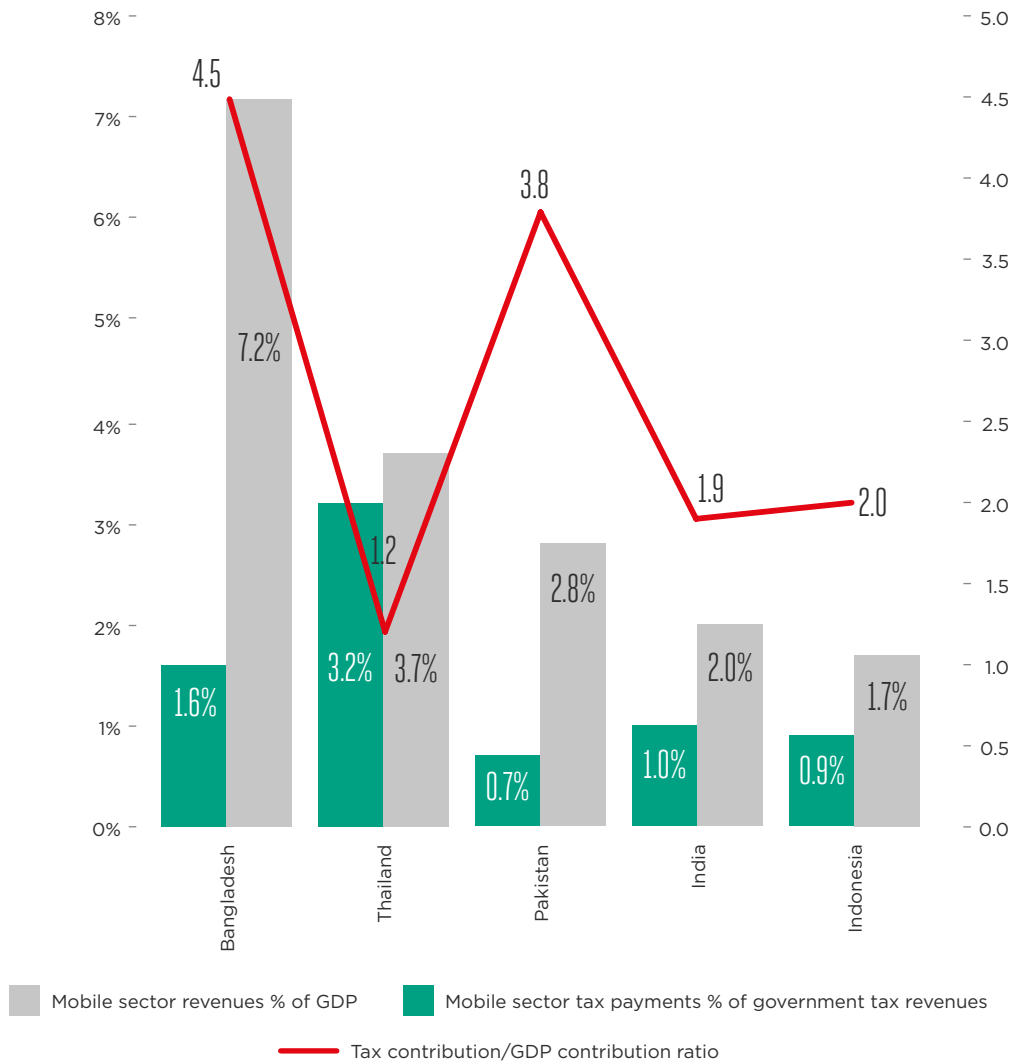
88. GSMAi data for 2014

89. GSMAi data for 2014

90. GSMAi data for 2014

Figure 22

Tax payments as a percentage of the total tax revenues and GDP of Bangladesh



Source: GSMA Intelligence

In Bangladesh, regulatory fees are the largest source of tax payments (36%), followed by VAT (21%) and corporate taxation (19%). Mobile-specific consumer taxes represent a smaller portion (9%), with import duties (5%) and all other taxes (11%) making up the rest.⁹¹

Figure 23 shows this distribution of the total tax payments of Bangladesh in comparison to other Asian countries. Regulatory fees are higher (36%) than those in Nepal (11%), Sri Lanka (8%), and Pakistan (6%).⁹² On

top of this, operators have to pay high auction prices to bid for a share of the spectrum, increasing the regulatory costs to participate in the mobile market.

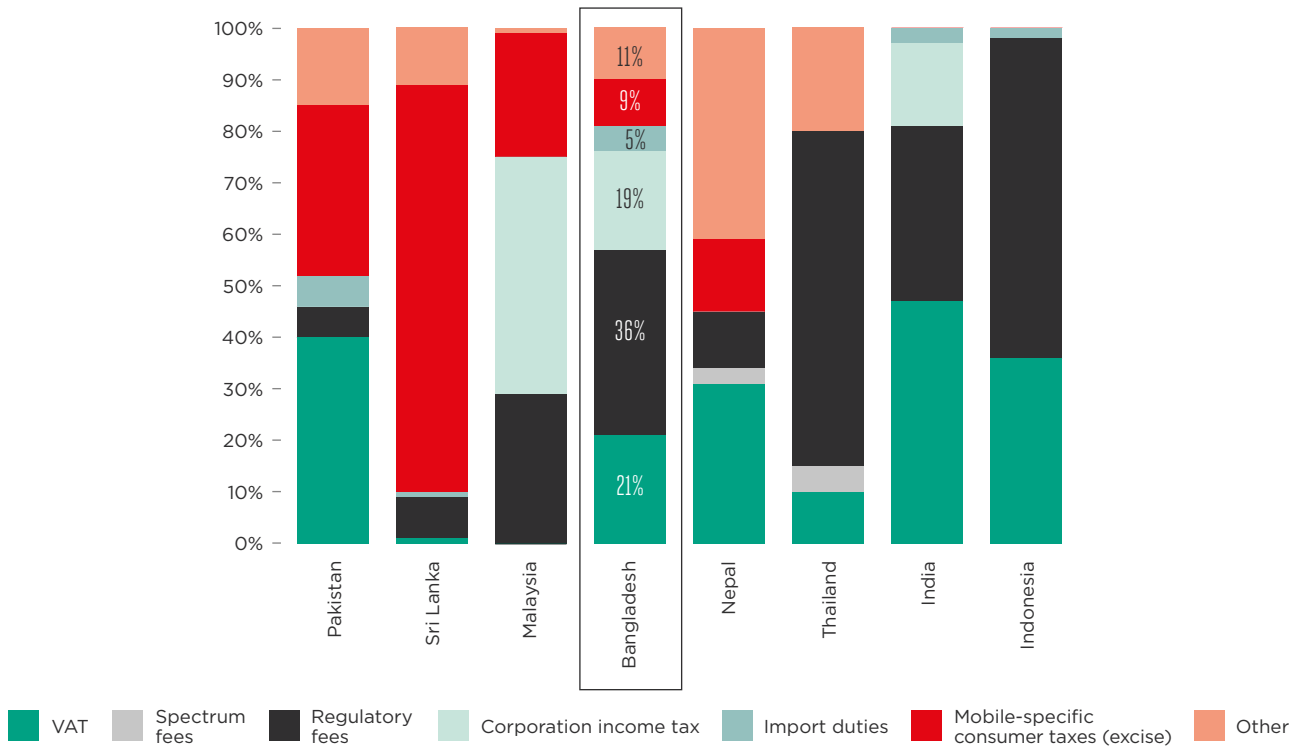
In this regard, it is noted that VAT is higher (21%) than in Thailand (10%) and Sri Lanka (1%). Bangladesh also has the second highest share of revenue made up by corporation tax (19%), surpassed only by Malaysia (with 46%). Bangladesh has the highest share of revenues made up by import duties (5%) above India (3%), Indonesia (2%) and Sri Lanka (1%).⁹³

91. GSMAi data for 2014
 92. GSMAi data for 2014
 93. GSMAi data for 2014



Figure 23

Total tax breakdown



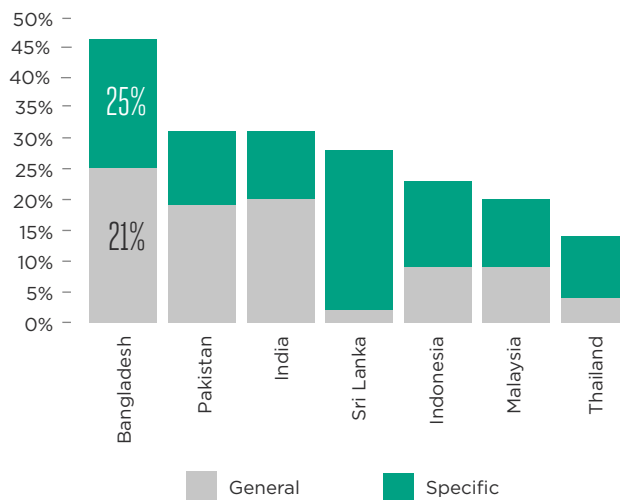
Source: GSMA Intelligence

General taxes are equivalent to around 21% of total mobile sector revenue. This is higher than the share in any other country in the sample, as shown in Figure 24. Mobile-specific taxes are equivalent to 25% of the

total mobile sector revenue, a greater percentage than in any other country in the sample, except Sri Lanka (26%).⁹⁴

Figure 24

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



Source: GSMA Intelligence

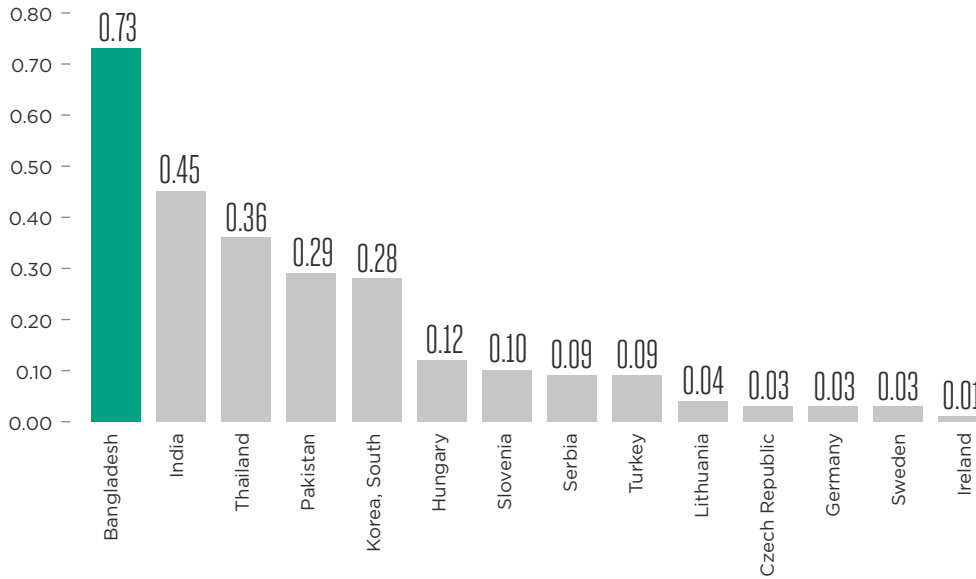
94. GSMAi data for 2014

In addition to this tax burden, mobile operators have to pay very high auction prices for the use of the spectrum. Figures 25, 26, and 27 show that the reserve prices for the 1800 MHz, 2100 MHz, and 900 MHz

bands are the highest in the sample, in comparison to other developed markets in Asia Pacific and Europe that have auctioned the same bands in recent times.

Figure 25

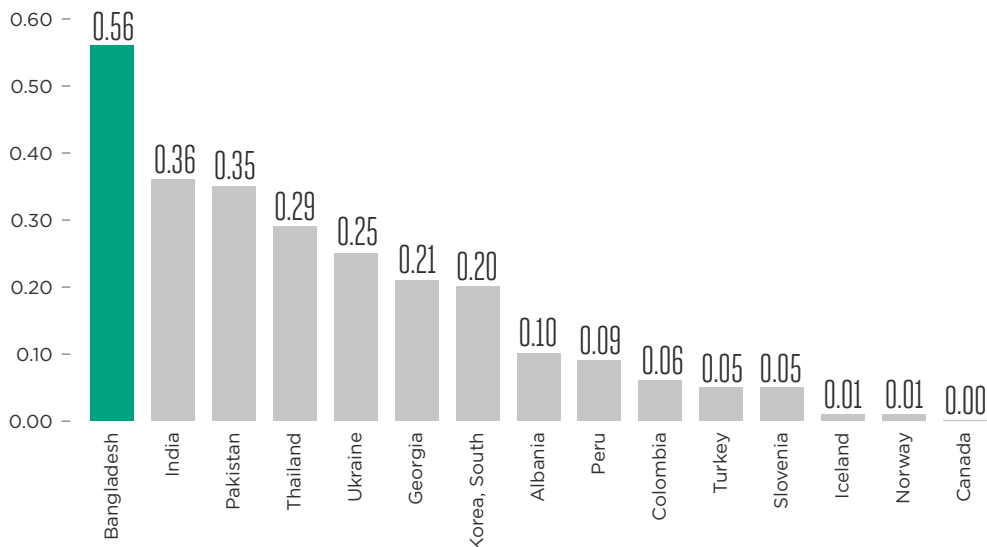
Reserve Prices for 1800 MHz (\$/MHz/Population based on GDP per capita)



Source: GSMA Intelligence

Figure 26

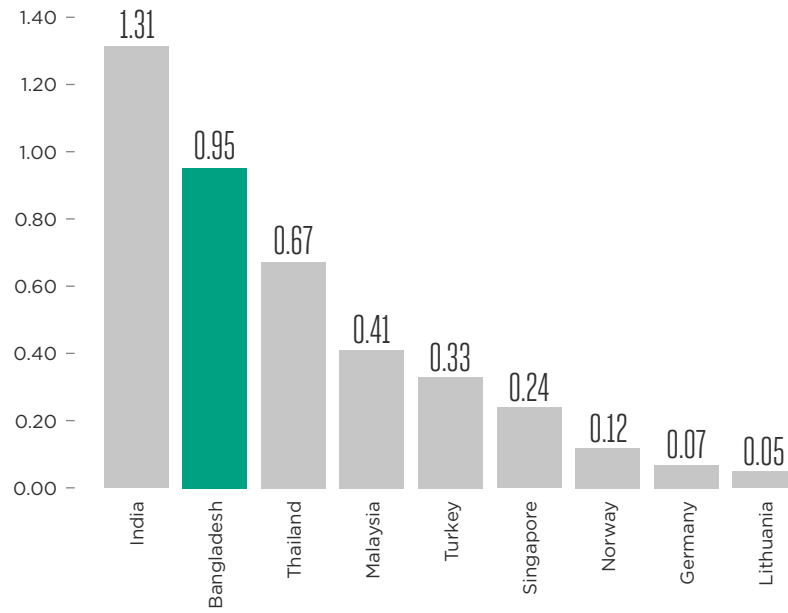
Reserve Prices for 2100 MHz (\$/MHz/Population based on GDP per capita)



Source: GSMA Intelligence

Figure 27

Reserve Prices for 900 MHz (\$/MHz/Population based on GDP per capita)



Source: GSMA Intelligence

2.3 Tax burden in comparison to other sectors

Consumption taxes in Bangladesh consist of VAT and excise taxes. VAT is charged at a standard rate of 15%. While other industries such as construction are subject to reduced rates and some industries such as agricultural industries are exempt, the standard rate applies to mobile and telecommunication service

consumers. Furthermore, there are different rates of corporation tax due on different industries.

Table 4 summarises the main VAT, excise and corporate tax rates applying to different sectors.

Table 4

Key tax rates in Bangladesh, 2016

VAT (standard rate)	15%	
VAT (reduced rate)	1.5% - 10%	<ul style="list-style-type: none"> • Land development - 1.5%, 2.5% and 4.5% • IT-enabled services - 5% • Electricity distribution - 5% • Construction - 6% • Motor repair services - 10%
VAT (zero rated)	0%	<ul style="list-style-type: none"> • Exports of goods
VAT (exempt)		<ul style="list-style-type: none"> • Live animals • Raw fruit and vegetables • Animal products • Excisable goods • Certain items of machinery
Excise taxes		<ul style="list-style-type: none"> • Excise on airplane tickets of BDT 300 per ticket • Excise on services provided by banks at BDT 10,000 per account per year • Supplementary duties across sectors varies from 10% to 500%
Corporate tax rates	25% - 45%	<ul style="list-style-type: none"> • Publicly traded companies - 25% • Non-publicly traded companies - 35% • Merchant banks - 37.5% • Banks, insurance and financial institutions publicly traded - 40% • Banks, insurance and financial institutions approved by the government in 2013 - 40% • Other banks, insurance and financial institutions not publicly traded - 42.5% • Cigarette manufacturing companies - 45% • Mobile phone operating companies not publicly traded - 45% • Mobile phone operating companies publicly traded - 40%

Source: 2017 EY Worldwide Corporate Tax Guide, IBFD, Bangladesh National Board of Revenue, World Bank Doing Business

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

In order to design an effective tax regime, policy makers will need to consider and balance the ideal principles of taxation, the practical challenges

and needs prevailing in-country (especially in the case of developing countries), and the particular features of the mobile sector.

3.1 Considerations for a more efficient tax system in developing countries

International organisations such as the International Monetary Fund (IMF), the Organisation for Economic Cooperation and Development (OECD), the United Nations (UN) and the World Bank⁹⁵ have developed a number of principles to guide tax policy making, with particular recommendations for developing countries considering their particular challenges. The need for additional revenue is pressing in many developing countries, for example, to fund programmes against poverty or to improve infrastructure. However, improving revenue mobilisation is also important, since excessive levels of taxation on the formal sector of the economy can worsen distortions and perceived inequalities.⁹⁶ Hence, additional factors to take into account when designing a more efficient tax system for developing countries include:

- **The extent of informality.** The informal sector is usually extensive in developing countries, with income and sales escaping taxation.
- **The strength of the tax administration.** An efficient tax administration is key to mobilising domestic resources in developing countries. Yet many administrations continue to face capacity challenges, have structures which do not encourage an integrated approach to different taxes, and are marked by imbalanced service and enforcement functions.⁹⁷
- **The importance of tax certainty.** Clear laws and regulations are crucial for a smooth implementation of the tax system, with adequate safeguard and protection mechanisms for taxpayers.⁹⁸

95. *Revenue Mobilization in Developing Countries* (March 2011) Prepared by the Fiscal Affairs Department. Approved by Carlo Cottarelli, IMF.

96. *Revenue Mobilization in Developing Countries* (March 2011) Prepared by the Fiscal Affairs Department. Approved by Carlo Cottarelli, IMF.

97. *Supporting the Development of More Effective Tax Systems. A Report to the G-20 Development Working Group by the IMF, OECD, UN, and World Bank* (2011)

98. IMF, 2011.

- **The impact on long-term growth.** Some taxes can have long-term effects on investment, human capital, and innovation. Lower corporate tax rates are associated with faster growth, including in non-OECD countries. Reduced reliance on trade tax revenue can have also a positive effect on trade liberalisation to foster growth. Volatility of tax revenue is associated with less public investment in developing economies; which is why having diverse sources of revenue is recommended for these countries.⁹⁹

- **The importance of distributional effects.** Poverty relief and redistribution are major motivations for raising revenue. However, an excessive level of taxation on the lowest income groups can undermine tax compliance, as the tax system can be perceived as unfair. Tax morale is an essential element for wider state-building, and the fairness of the tax system is crucial for the legitimacy of any state, especially in developing countries.¹⁰⁰

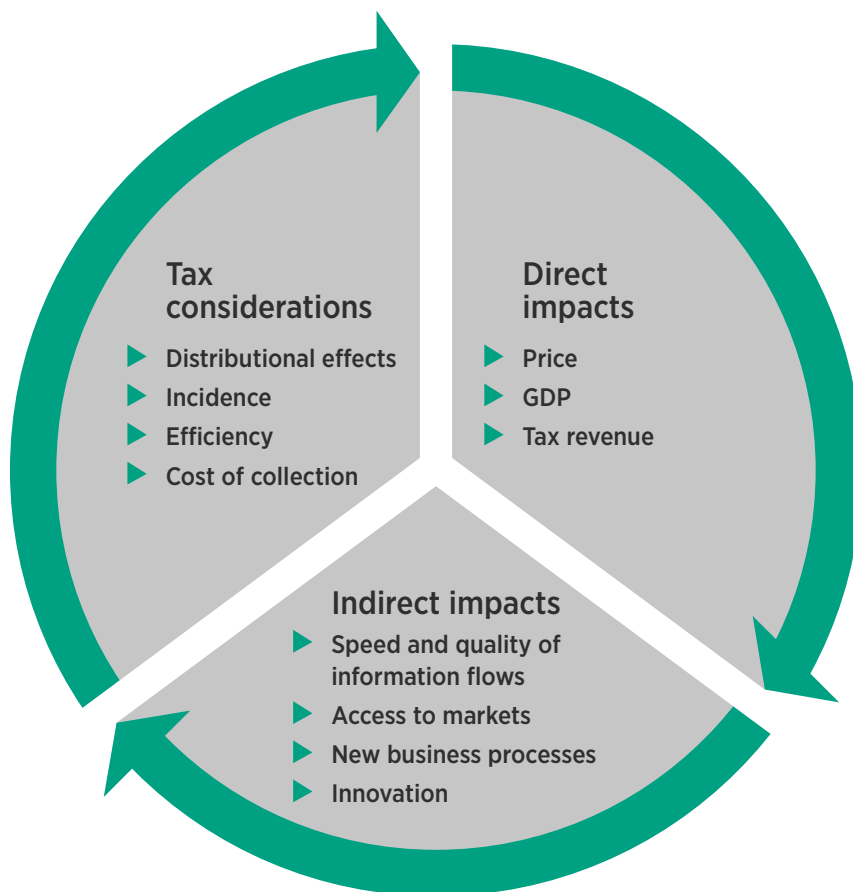
3.2 General tax policy considerations applying to the mobile sector

In addition to the specific challenges outlined above for developing countries, there are factors which will generally need to be taken into account by any tax policy, including the design of mobile taxation. The tax system has a direct impact on business decisions,

consumer choices, the efficiency of tax collection, and the performance of the overall economy. The diagram below illustrates the interactions between these different factors.

Figure 28

Factors shaping tax policy choices



99. Ibid.
100. Ibid.

Key considerations in the process of tax policy development include:¹⁰¹

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

Direct impacts

Taxes on mobile services can have the following direct impacts on the economy:

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

Indirect impacts

Many indirect impacts are sector-specific and, in the case of mobile, these will include impacts on the capacity of the economic agents to realise the full benefits of connectivity:

- Speed and quality of information flows;
- Access to markets;
- New business processes and organisational structures; and
- Innovation.

3.3 Specific considerations applying to the mobile sector

The broad theoretical framework outlined above, including the particular tax challenges of developing countries, constitutes the starting point to develop an efficient tax policy framework for the mobile sector. However, the mobile sector has particular characteristics that need to be considered when designing the tax and regulatory system:

- **The regulatory environment should be conducive to investment in the mobile sector.** As the spectrum is scarce, the involvement of public bodies in the management of licences and spectrum is necessary to ensure its efficient allocation and usage that is conducive to the successful delivery of mobile services. However, the tax and regulatory system should provide conditions under which operators can make an appropriate return on capital.

As mobile data traffic continues to grow in all geographies, spectrum remains very much

the “lifeline” of the sector, and spectrum release and auction frameworks are key regulatory concerns. Operators incur high costs for the acquisition and use of spectrum, reflected as upfront fees and annual fees.

In addition, mobile operators need to invest large amounts of capital expenditure on telecommunications infrastructure, mainly on the cell sites (BTS/Node-B/eNode-B etc.), passive infrastructure, microwave transmission over which wireless services are provided.

High spectrum fees, whether upfront or annual, result in high monthly or prepaid costs for consumers, as those higher costs are passed through to consumers. In addition, high spectrum prices also result in lower quality networks and services, as operators will have less to invest into their networks.¹⁰²

101. There are a number of theoretical studies around the taxation of mobile services, including: ITU (June 2013). *Taxing Telecommunication/ICT services: an overview*.

102. Effective Spectrum Pricing: Supporting better quality and more affordable mobile services, GSMA, 2017

- **Positive externalities generated by the sector should be considered in the design of the tax system.** Greater access to mobile services can transform economies, and accelerate economic growth and development in countries worldwide. The effects of mobile connectivity on the economy are largely delivered through their impact on productivity. The benefits of mobile connectivity – and how they translate to the macro economy – have been widely studied in the literature, as set out in section 1.6.

According to a UN report,¹⁰³ the internet is only accessible to 35% of people in developing countries. The situation in the 48 UN-designated Least Developed Countries (LDCs) is particularly critical, with over 90% of people without any kind of internet connectivity.

The UN 2030 Agenda for Sustainable Development (“the 2030 Agenda”) aims to significantly increase access to information and communications technology, and to have universal and affordable access to the Internet in least developed countries by 2020.¹⁰⁴ The 2030 Agenda recognises the power of new technologies to accelerate economic growth and development. This calls for stronger efforts by governments and all actors, in ensuring access, use and affordability.¹⁰⁵ In this regard, an excessive level of taxation can hinder the access, use and affordability of mobile services.

- **Tax challenges of the digital economy.** The digital economy is the result of a transformative process brought by information and communication technology, which has boosted innovation across all sectors of the economy. As set out in the G20/OECD Base Erosion Profit Shifting report, ring-fencing the digital economy from the rest of the economy for tax purposes¹⁰⁶ will be difficult, as the digital economy becomes more integrated with the regular economy.

The digital economy and the companies within it have new business models that present new challenges for the tax system. These new challenges are largely borne out of some key features inherent in the businesses including mobility, reliance on data, network effects, the spread of multisided business models, a tendency toward monopoly or oligopoly and volatility. The digital economy has also accelerated and changed the spread of global value chains in which multinational companies (MNEs) integrate their worldwide operations,¹⁰⁷ adding more complexity to the aspect of international taxation.

103. UN News Centre (2015). *Billions of people in developing world still without Internet access, new UN report finds*. 21 September 2015.

104. UN (2015) *Transforming our world: the 2030 Agenda for Sustainable Development*. A/RES/70/1.

105. UN News Centre (2015).

106. OECD (2015), *Addressing the Tax Challenges of the Digital Economy, Action 1 – 2015 Final Report*, OECD Publishing, Paris. <http://dx.doi.org/10.1787/9789264241046-en>.

107. *Ibid.*

3.4 Principles of taxation for the mobile sector

Based on the broad theoretical framework outlined above, including the particular tax challenges of developing countries and the particularities of the mobile sector, below is a set of principles which are relevant for the taxation of the mobile sector.

- **Taxation should be as broad-based as possible.**

Complex tax systems may be inefficient, particularly where special taxes are applied to the telecommunications sector that “crowd out” private spending.¹⁰⁸ On this basis, broad-based taxes with single and low rates, minimising the use of exemptions, would be favoured over specific-taxes. This should allow the maximisation of revenue with minimal distortions to the consumption and provision of mobile services.

In particular, VAT has been adopted in most developing countries. However, its structure is not always ideal given the provision of sectorial exemptions, excessive restrictions to the credit mechanisms, or the adoption of multiple rates. As a result, such general consumption taxes often create distortions across sectors. Rectifying such limitations in the VAT design and administration should be given priority in developing countries, where their cost may be higher than in developed countries.¹⁰⁹

- **The use of specific taxes should be limited and based on a clear rationale of externalities.**

The economic rationale of excise taxes is very different from that of general taxes. Specific taxes must be highly selective, narrowly targeting a few goods mainly on the grounds that their consumption entails negative externalities on society. The goods typically deemed to be excisable (e.g. tobacco, alcohol, petroleum products, and motor vehicles) are few and usually inelastic in demand. A good excise system is one that generates revenue from a narrow base and with relatively low administrative costs.¹¹⁰

However, mobile services are often subject to special taxes, despite being necessary commodities and having positive externalities in terms of digital inclusion and connectivity. Indeed, in many

developed and developing countries, mobile services are no longer a luxury reserved for the few, but a necessity and a key productive input. Therefore, mobile phones and services should not be included in a list of goods and services singled out for exceptionally harsh tax treatment.¹¹¹

- **The tax system should be equitable.** Mobile operators and consumers should be treated equally to other people in equal circumstances in an equal way (“horizontal equity”). In addition, the tax system should also preserve “vertical equity”¹¹² by avoiding the imposition of regressive taxes which affect more heavily consumers of mobile services in the lower income groups.¹¹³

- **Taxes should not undermine the affordability of mobile services.** Excessive taxation can increase the cost of handsets and mobile services. Therefore, specific taxes on mobile operators and consumers should be as low as possible. Reducing import tariffs is also a major policy challenge, especially for many developing countries.¹¹⁴

- **Taxation should not discourage investment.** Given the high costs associated with the development of an adequate telecommunications infrastructure, investment in the sector is critical. One of the main considerations for attracting investment in telecommunications infrastructure and services are the additional costs associated with taxes.¹¹⁵ A stable and transparent legal and regulatory framework and putting in place a tax system in line with international standards is a strategy that delivers sustained investment.¹¹⁶

- **The tax system should be certain and simple.** Tax rules should be clear and no more complex than needed to achieve the policy aim, facilitating mobile businesses and consumers to make optimal decisions and respond to intended policy incentives. This is a very important factor for developing countries where inadequate legal frameworks could create uncertainties for taxpayers and imbalances in tax administration’s powers and taxpayers’ rights. This could lead to poor revenue performance, opportunistic behaviour, and other adverse effects.¹¹⁷

108. ICT Regulation Toolkit. 6.3.4.1. Tax Law.

109. V. Tanzi and H. Zee (March 2001). *Tax Policy for Developing Countries*, IMF, Mooij and Keen (2014). *Taxing Principles*. IMF. Finance and Development, December 2014, Vol. 51, No. 4

110. Ibid.

111. ITU (June 2013).

112. Ibid.

113. Richard M Bird and Eric M Zolt, *Introduction to Tax Policy Design and Development*, (Practical Issues of Tax Policy in Developing Countries, World Bank, 2003).

114. V. Tanzi and H. Zee (March 2001).

115. ICT Regulation Toolkit.

116. V. Tanzi and H. Zee (March 2001).

117. *Enhancing the Effectiveness of External Support in Building Tax Capacity in Developing Countries*. Prepared for Submission to G20 Finance Ministers (IMF, OECD, UN, and WBG, July 2016).

- **The costs of collection should be minimised.** The collection of taxes should be as efficient as possible, i.e. low tax administration costs and minimisation of evasion and avoidance costs. Significant additional revenue can be raised in many developing countries by building systems that effectively limit incentives and opportunities for rent-seeking and inappropriate behaviour.¹¹⁸ However, large tax rises may exacerbate evasion problems and push customers and providers into the informal sector. This could increase administration costs, creating more problems for the government. This risk is particularly important in developing countries where many administrations continue to have structures which do not encourage an integrated approach to different taxes, and are marked by imbalanced service and enforcement functions.¹¹⁹

3.4.1 An assessment of mobile sector taxation in Bangladesh

An assessment of the current mobile tax regime in Bangladesh against the criteria elaborated above identifies the following characteristics:

- **Specific taxation on mobile services without a clear rationale.** Mobile services are subject to special taxes (supplementary duties and surcharges). As mentioned above, mobile services have positive externalities for the wider economy in terms of connectivity and digital inclusion. Therefore, it is not clear why they should be penalised with specific taxes alongside products with negative externalities (such as alcohol and tobacco).
- **The tax base is not as broad-based as possible.** The tax system is characterised by low tax bases and a distortive tax design with many exemptions. For example, VAT has many exemptions. In theory, the base of VAT should be broad, covering as many goods and services as possible and the point of impact of the tax should be as close to the consumer as possible, so as to tax the whole of the “value added” involved in getting a product or service to the final consumer.
- **Taxes undermine the affordability of mobile services.** As a result of the two points mentioned above, the tax burden is not equal across all the economic sectors in Bangladesh,

and communication services, which include mobile services, are more heavily taxed than others. As a consequence, mobile services are more expensive than they could be.

- **Taxation discourages investment.** Mobile companies are more heavily taxed than other sectors in Bangladesh despite the positive externalities generated by the industry. Mobile operators are subject to the highest corporate rates. On top of this, operators have to pay high auction prices to bid for the spectrum, increasing the costs of the long-term investments and capital expenditure they need to make in order to access and remain competitive in the market. As shown in section 2.2, these spectrum prices are one of the highest in a sample of Asian and European countries. The resulting reduced profits deter companies from investing in their businesses and send signals to the market that the production of mobile technology is not profitable, hampering investment in the industry.

Bangladesh is lagging behind other South Asian countries in the ICT Development Index of the International Telecommunication Union (ITU). Bangladesh is currently ranked 30 out of 34 Asia and Pacific Countries, and 147 out of 155 countries. Pakistan is the only South Asian country below Bangladesh in the ranking.¹²⁰ Similarly, in the World Bank ease of doing business report,¹²¹ Bangladesh is ranked 177 out of 190 countries and 7 out of 8 South Asian countries, only above Afghanistan. This suggests that a more friendly business environment is necessary to attract more investment, and that reforming the tax regime would help facilitate a more business friendly environment especially for the mobile sector.

- **The tax and regulatory system for mobile is not simple.** Bangladesh is ranked 152 out of 190 countries, and 5 out of 8 South Asian countries, when it comes to the ease of paying taxes. The number of tax payments, the time spent to prepare, file and pay taxes, the total tax and contribution rate, and the postfiling time, makes the Bangladeshi system extremely complex and represents a large administrative burden for companies, acting as a barrier to future investment. As shown in Table 5, Bangladesh's performance is below the average in South Asia and the rest of the world.

118. *Revenue Mobilization in Developing Countries* (March 2011) Prepared by the Fiscal Affairs Department. Approved by Carlo Cottarelli, IMF.

119. *Supporting the Development of More Effective Tax Systems. A Report to the G-20 Development Working Group by the IMF, OECD, UN, and World Bank* (2011)

120. ICT Development Index. 2017. <http://www.itu.int/net4/ITU-D/idi/2017/index.html#idi2017economytab&BGD>

121. World Bank. 2017. Doing business, Measuring business regulations

Table 5

Bangladesh tax index, 2017

	Bangladesh	South Asia	OECD high-income countries	Overall best performers
Tax payments (number per year)	33	28.5	10.9	3 (Hong Kong)
Time (hours per year)	435	277.3	160.7	55 (Luxembourg)
Total tax and contribution (% of profit)	33.4	43.0	40.1	18.47 (32 economies)
Postfiling index (0-100)	44.38	41.05	83.45	99.38 (Estonia)

Source: World Bank, Doing Business 2017

- A more conducive tax system is vital for a Digital Bangladesh.** The realisation of the Digital Bangladesh agenda is a crucial part of the government's Vision 2021, which aims to turn Bangladesh into a resourceful and modern economy through efficient use of information and communication technology by 2021. As recognised by the Vision 2021, "*there is no option but for Bangladesh to be transformed into a knowledge-driven economy to survive in this fierce competition*", since innovation is playing an increasing role in the creation of wealth. Information and communication technologies (ICT) have significantly reduced the costs and increased the capacity to codify, process and communicate knowledge and information.¹²² The Vision 2021 plans include expanding ICT, thereby creating a transparent, committed and accountable government, develop skilled manpower, greater social justice and better managed public services. In this way, the priorities of the *Digital Bangladesh* agenda include:¹²³

 - Developing a universal access policy
 - Developing legal and regulatory environment conducive to ICT development
 - Ensuring access to government information (transparency)
 - Promotion of e-commerce and automation of financial sector
 - Establishing e-citizen services
 - Enabling e- participation in decision making
 - Developing curriculum based computer labs for education institutions
 - Expanding digital content in government websites
 - Attracting local investment and FDI in the ICT sector through the Public Private Partnership (PPP) initiative, a collaborative initiative between all the public and private sector to increase investment.

A simpler and more efficient tax system for the mobile sector would be a key driver to deliver the objectives above.

122. Perspective Plan of Bangladesh 2010-2021. General Economics Division. Planning Commission. Government of the People's Republic of Bangladesh. April 2012.

123. *Ibid.*

3.5 Options for tax policy reform on the mobile sector in Bangladesh

The high tax burden and the complexity of the tax system in Bangladesh is preventing further investment in the mobile sector and greater affordability of mobile services. This is ultimately restricting the digital

connectivity and productivity of Bangladesh. To make the business environment friendlier, in particular for the mobile market, Bangladesh should embrace the principles outlined above, which should result in:

- **Greater affordability of mobile technology**
- **A simpler, fairer and more competitive tax system (both in terms of structure and administration) encouraging more investment in the mobile market in Bangladesh.**
- **A faster realisation of the Digital Bangladesh priorities.**

Based on this analysis, we have identified three options in line with these principles of taxation:

- **Option 1** – Reducing corporation tax for non-public mobile companies from 45% to 40% and for public mobile operators from 40% to 35%
- **Option 2** – Removal of the supplementary duty of 35% and VAT of 15% on SIM cards.
- **Option 3** – Removal of the supplementary duty of 5% levied on mobile services provided through SIM cards of mobile phones.

These three proposals will likely increase both the investment in the mobile market and the affordability of mobile products and services, reducing the tax burden on consumers. As a result, the productivity of Bangladesh is expected to increase thanks to a better connectivity, leading to greater digital inclusion.

3.5.1 Reducing corporation tax for non-public mobile companies from 45% to 40% and for public mobile operators from 40% to 35%

Mobile phone operating companies are subject to the highest rate of corporation tax of 40% and 45% for publicly traded companies and non-publicly traded companies respectively, whereas all other companies outside of the financial and cigarette industries are subject to a maximum tax rate of 35%. Furthermore, these top rates are higher than in any other country in South Asia. This undermines the competitiveness of Bangladesh's telecommunications sector to attract investment.

Tax competition for Foreign Direct Investment ("FDI") is a reality in today's global environment. Investors routinely compare tax burdens in different locations with comparisons typically made across countries that are similar in terms of location and market size.¹²⁴ Since firms' investment decisions are driven by the cost of and the expected return to investment projects, corporate taxes can have a negative effect on corporate investment by reducing after-tax profits.¹²⁵

Indeed, the effect of corporate taxes on capital formation through FDI can also depend on the size of the economy, with larger economies able to attract FDI aimed at supplying their large markets even if they maintain relatively high tax rates. This suggests the effect of corporate tax rates on FDI may be larger for developing countries.¹²⁶

In the case of Bangladesh, the natural distortions of corporate taxation are exacerbated by the application of different rates across different sectors of the economy. Despite the positive externalities generated by the industry, mobile operators are subject to the highest corporate tax rate. The high and uneven tax burden on telecommunications companies discourages investment relative to other sectors.

A reduction of the corporate tax rate for both non-public and public mobile companies from 45% to 40% and from 40% to 35% respectively would bring their tax burden closer to the other sectors in the economy. In this way, the tax system would be more uniform and more competitive, attracting investment into the mobile industry.

124. *A Tax Effects on Foreign Direct Investment*. Policy Brief. OECD. February 2008.

125. *Tax and economic growth*. Economics department. Working paper. No.620. OECD. 11 July 2008.

126. *Ibid*.

The rationale for change

- Mobile industry is positive for the economy and therefore should not be taxed at the same level of other industries, such as the tobacco industry.
- A reduction of the corporate tax burden of mobile services would increase the uniformity of the system.
- A more competitive corporate tax rate would incentivise investment into the industry.
- More investment would lead to a more efficient provision of mobile services, and this would ultimately increase their affordability.

3.5.2 Removal of the supplementary duty of 35% and VAT of 15% on SIM cards

Typically, special taxes are levied on specific products and services like cigarettes, beer, soft-drinks, and spirits due to the negative externalities associated with them. However, in Bangladesh there is a supplementary duty on SIM cards of 35%. In addition, unlike other products which are either exempted or subject to reduced rates of VAT, the supply of SIM cards is taxed at the standard rate of 15%. The elimination of the supplementary duty 35% and the 15% VAT exemption on SIM cards would help to alleviate the tax burden on the consumption of mobile services.

The rationale for change

- The removal of these taxes would help to reduce the level of mobile specific taxation, which is already high.¹²⁷
- Mobile services have positive externalities and therefore should not be taxed on the same basis as “sin” products like cigarettes or alcohol based drinks. The reduction of this tax on mobile services would increase the fairness of the system.
- The reduction of this tax would still increase the affordability of mobile services, minimising the distortions to mobile subscribers.

3.5.3 Removal of the supplementary duty of 5% levied on mobile services through SIM cards

Mobile services provided through SIM cards are taxed with an additional supplementary duty of 5%. This increases the tax burden on mobile products which are already subject to various taxes.

The rationale for change

- The reduction of this tax would reduce the level of mobile specific taxation, which is already very high.
- Mobile services have positive externalities in terms of financial inclusion and therefore should not be taxed on the same basis as other “sin” products like cigarettes or alcohol based drinks. The elimination of this duty would increase the fairness of the system.
- The reduction of this tax would increase the affordability of mobile services, minimising the distortions to mobile subscribers.

Section 4 presents detailed economic modelling to show the impacts delivered by these options.¹²⁸ These policy options would be revenue neutral in the medium term. In addition, we recognise further measures to improve the efficiency of the tax administration may also lead to greater revenue in the long term. As noted above, Bangladesh is ranked 152 out of 190 countries when it comes to the ease of paying taxes, according to the World Bank. Therefore, the scope for improvement is significant in this area. If Bangladesh is able to minimise the administrative burden for taxpayers and to find more efficient mechanisms of tax collection, this will likely result in a better tax administration and greater revenues in the long-term.

127. The taxes on internet usage through SIM cards also decreases the affordability of mobile services. Currently consumers pay a 21.75% rate in the form of VAT, supplementary duty and a surcharge. In Bangladesh 93% consumers are accessing internet through mobile, while the rest uses internet through BWA or fixed broadband connectivity. This tax could also compromise the realisation of the *Digital Bangladesh's* agenda.

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

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

4.1 Recommended options for tax reform

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

1. A reduction in corporation tax from 45% to 40% for privately owned mobile operators and from 40% to 35% for publicly owned mobile operators. This will incentivise further investment in the sector, as operators reinvest a significant share of profits;
2. The elimination of both the supplementary duty of 35% applied on the supply of SIM cards and the VAT of 15% on SIM cards. This is expected to result in a lower cost of ownership

for both households and business subscribers, and to increase mobile penetration (and technology migration) as a result; and

3. The elimination of the 5% supplementary duty levied on mobile services. This will result in lower prices and will encourage increased usage levels among consumers.

These options for tax reform have been modelled separately in order to isolate the effects of each option on the mobile sector and the wider economy. While we analyse the implications of these tax scenario reforms, we note that alternative scenarios and combinations of these reforms are also possible.¹²⁹

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

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

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

The wider economic impacts of each tax policy scenario are assessed via a ‘Computable General

¹²⁹ The economic impacts of each option for tax reform have been modelled separately, and therefore cannot be simply aggregated to determine the benefits of combined reductions in various taxes



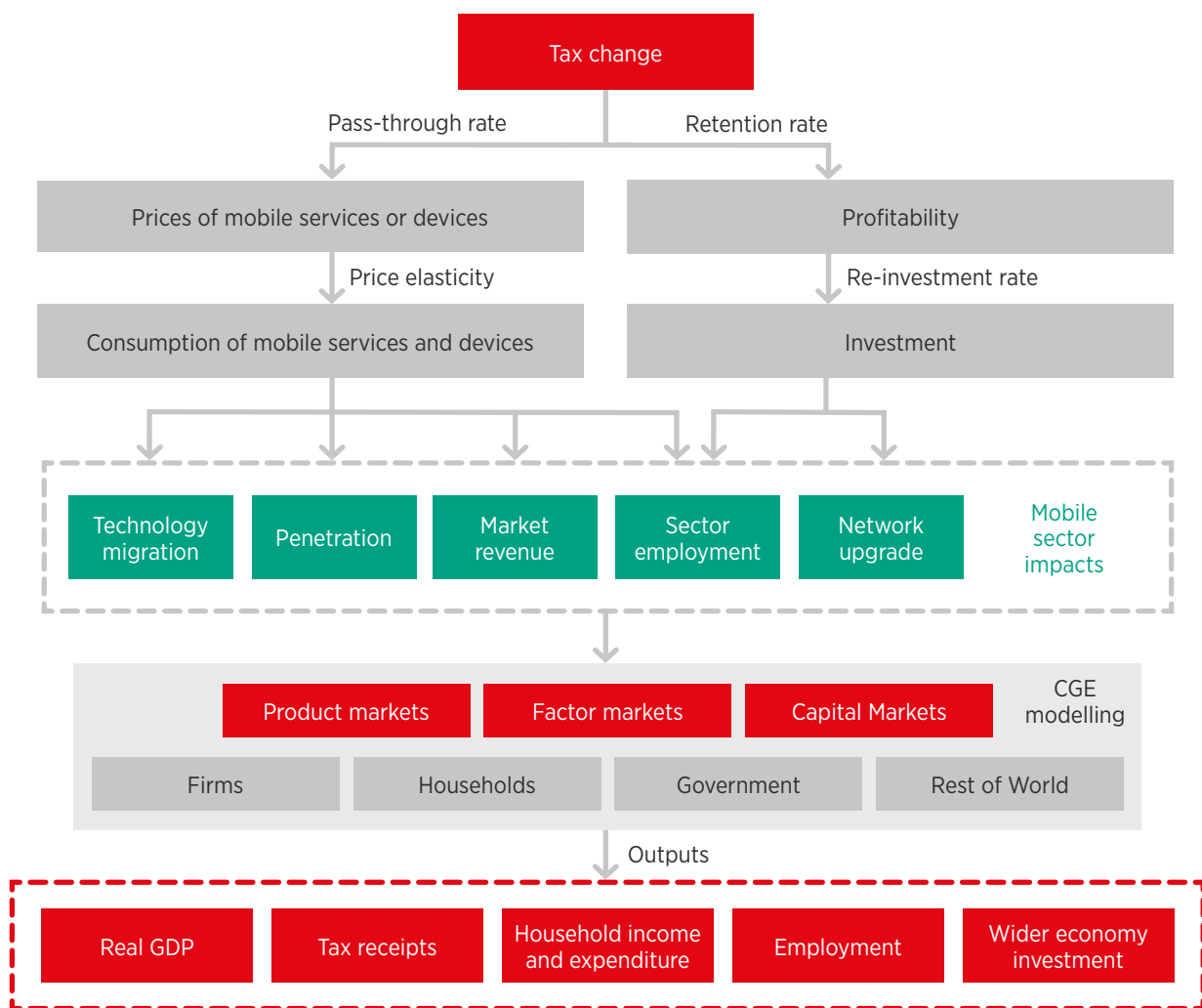
Equilibrium' (CGE) model, namely the standard version of the Global Trade Analysis Project (GTAP) model and its associated dataset.¹³⁰ The GTAP model is contributed to, and widely used, by government agencies, international institutions, the private sector and academia to model policy changes within countries and cross-border effects of trade policies. Some examples include the World Bank, the

World Trade Organization (WTO), the Directorate General for Trade of the European Commission, the Asian Development Bank, and the Organisation for Economic Co-operation and Development (OECD).¹³¹

A schematic of the modelling approach used in this study is shown in Figure 29 below.¹³²

Figure 29

Overview of the modelling approach



Source: EY analysis

130. Global Trade Analysis Project (<https://www.gtap.agecon.purdue.edu/>)

131. GTAP Consortium (<https://www.gtap.agecon.purdue.edu/about/consortium.asp>)

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

4.3 Reducing corporation tax for mobile operators

The reduction in corporation tax from 45% to 40% for private mobile operators and from 40% to 35% for public mobile operators would generate additional investment in the mobile sector, while also reducing consumer prices and improving affordability. As shown in Section 1, investment in mobile infrastructure is needed to support the growth of the market, and the wider economy, particularly in rural areas. It will allow for greater levels of technology migration, as Bangladesh has thus far been slow to adopt new generation technologies.

In general, the extent to which taxes ultimately fall on mobile operators or consumers depends on the type of tax and market conditions. Some taxes and regulatory fees may be absorbed by operators in the form of lower profits, whilst others may be passed through to consumers through higher prices, or there may be a combination of the two. The reduction in corporation tax will lead to a direct tax saving for operators, a portion of which is passed through to subscribers, leading to an effective change in price of 0.5% from 2019 onwards.¹³³ The remainder of the tax saving to mobile operators will be allocated to profits or reinvested in the sector in order to upgrade and/or build new base stations.¹³⁴ This will facilitate significant technology migration, as consumers increasingly adopt new-generation services.

This price decrease would benefit both households and business subscribers. For household subscribers, the tax reform would lead to an increase in real disposable incomes, while it will also improve the affordability of mobile services. For business users, lower prices reduce their input costs, increasing demand and freeing up resources which can be invested elsewhere.

This tax scenario would have the following impacts compared to a “baseline” scenario¹³⁵ of no change in current levels of taxation:

- **New connections:** an additional 0.5 million unique subscribers, or 0.8 million mobile connections by 2023. This is equivalent to an increase of around 0.3% in unique subscriber penetration (0.5% in total connections). Of these new connections, 96% would be prepay and approximately 57% would be classified as low-income;
- **Mobile market revenue:** total mobile sector revenue would increase by \$42 million (1.2%) by 2023. This would be driven by additional revenues from the increased number of connections, and higher overall usage, which offset the reduction in pricing from the tax reform;
- **Technology migration:** the reduction in the price of data would lead to the migration of around 7.9 million additional 2G connections to mobile broadband enabled services. This significant increase in technology migration is facilitated by the surge of investment in 3G coverage by mobile operators, which results from the reinvestment of increased profits;
- **Usage:** the reduction in the price of mobile services would lead to a 2.2% increase in total data usage compared to the baseline, while usage of voice and message services would both increase by 0.9%. Among low-income customers, data usage per connection would increase by an estimated 751MB per month;
- **Additional investment by operators:** there would be additional annual investment of over \$12 million as a result of the increased revenue from the tax reform (equivalent to 113 new 3G base stations, or 444 upgrades from 2G to 3G stations, per year).
- **Productivity gain:** the increase in unique subscriber penetration of 0.3% would lead to a 0.05% gain in productivity across the economy, leading in turn to further increases in output, incomes and expenditure;
- **GDP increase:** total GDP would increase by \$131 million (0.06%) by 2023 compared to the baseline, as the price and productivity effects lead to a chain reaction of expansion across the economy;
- **Employment increase:** as a result of the increased economic activity in the economy, employment would increase by approximately 7,900 jobs (0.01%);
- **Wider investment in the economy:** as a result of the decrease in intermediate costs for businesses that use mobile, additional resources are made

133. Due to the nature of the corporation tax, which is levied on profits rather than sales, a lower pass-through rate (37%) is endogenously generated in GTAP, as companies are typically able to retain a higher share of the tax gain. This is the product of dividing the effective price change (0.09%) by the effective tax change (0.24%)

134. A base station, according to the International Telecommunication Union (ITU), is a land station in the land mobile service. 3G base stations have an estimated population coverage of 9,400, while 2G base stations have an estimated coverage of 5,300

135. Please see Appendix A for more detail on the modelling assumptions used in this study and see Appendix B for detailed estimated impacts



available for investment across the economy. By 2023, this scenario would lead to an annual gain in investment of \$180 million;

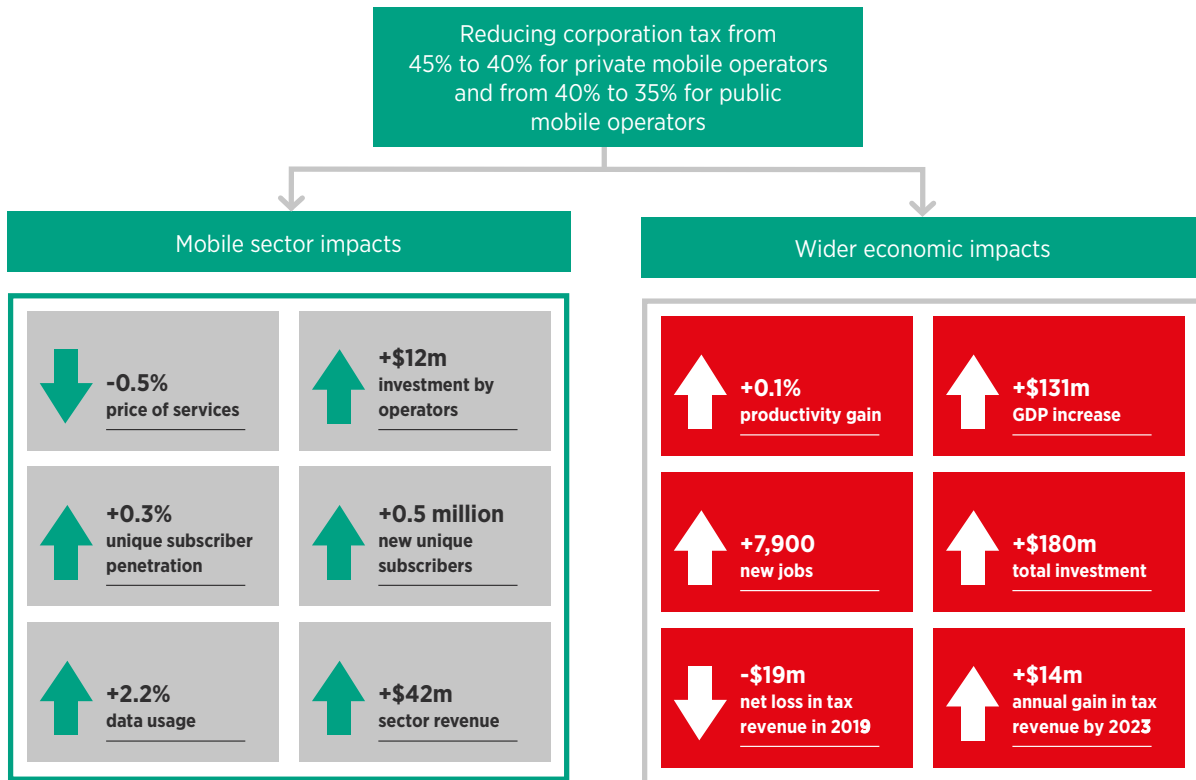
- Benefits to other sectors:** as a result of the increased level of economic activity, the majority of sectors within the economy (11 out of 12) will increase their level of output. Output in the communications sector rises the most (0.5%), while trade (0.3%), and business services (0.1%) also make relatively strong gains; and

- Tax revenue impact:** this scenario would have an initial net cost to the Bangladesh Exchequer of \$19 million in 2019. However, the subsequent expansion of the mobile sector, and significant growth in the wider economy, mean that, by year 3, both the annual impact and cumulative impact are positive. The gain in tax revenue is approximately \$14 million per annum by 2023.

The summary of the sector-specific and economic impacts in 2023 is shown in Figure 30.

Figure 30

Annual impacts of reducing corporation tax for mobile companies, 2023



Source: EY analysis

4.4 Eliminating the supplementary duty and VAT on SIM cards

In this scenario, the supplementary duty of 35% applied on the supply of SIM cards and VAT of 15% on SIM cards are both eliminated. This would translate into a net reduction in taxation on operators of 1.7%, of which it is assumed that all of the reduction is passed through to subscribers¹³⁶ in the form of lower prices for mobile services.¹³⁷

This price decrease would benefit both households and business subscribers. For household subscribers, the tax reform would lead to an increase in real disposable incomes, while it will also improve the affordability of mobile services. For business subscribers, the reduction in the cost of SIM cards would reduce input costs for all sectors that use mobile, increasing demand and freeing up resources which can be invested elsewhere.

This tax scenario would have the following impacts compared to the baseline scenario:¹³⁸

- **New connections:** an additional 2.3 million unique subscribers, or 3.8 million mobile connections by 2023. This is equivalent to an increase of around 1.3% in unique subscriber penetration (2.1% in total connections). Of these new connections, 96% would be prepay and approximately 57% would be classified as low-income;
- **Mobile market revenue:** total mobile sector revenue would increase by \$75 million (2.1%) by 2023. This would be driven by additional revenues from the increased number of connections and higher overall usage, which offset the reduction in pricing from the tax reform;
- **Usage:** the reduction in the price of mobile services would lead to a 2.1% increase in total data usage compared to the baseline, while usage of voice and message services would also both increase by approximately 2.1%.¹³⁹ Among low-income customers, data usage per connection would increase by an estimated 702MB per month;
- **Productivity gain:** the increase in unique subscriber penetration of 1.3% would lead to a 0.2% gain in productivity across the economy, leading in turn to further increases in output, incomes and expenditure;

- **GDP increase:** total GDP would increase by \$535 million (0.2%) by 2023 as the price and productivity effects lead to a chain reaction of expansion across the economy;
- **Employment increase:** as a result of the increased economic activity in the economy, employment would increase by 22,100 (0.04%) by 2023;
- **Wider investment in the economy:** as a result of the decrease in intermediate costs for businesses that use mobile, additional resources are made available for investment across the economy. By 2023, this scenario would lead to an annual gain in investment of \$468 million;
- **Benefits to other sectors:** as a result of the increased level of economic activity, the majority of sectors within the economy (11 out of 12) will increase their level of output. Output in the trade sector rises the most (0.7%), while communication (0.3%), transport (0.3%) and electronics (0.2%) make relatively strong gains; and
- **Tax revenue impact:** this scenario would have an initial net cost to the Bangladesh Exchequer of \$28 million in 2019. However, the subsequent expansion of the mobile sector, and significant growth in the wider economy, mean that, by year 2, both the annual impact and cumulative impact are positive. The gain in tax revenue is approximately \$123 million per annum by 2023.

The summary of the sector-specific and economic impacts in 2023 is shown in Figure 31.

136. The pass-through rate is endogenously generated from the GTAP model, and for this scenario it reflects the highly visible nature of the tax, and the level of price competition in the Bangladesh communications sector

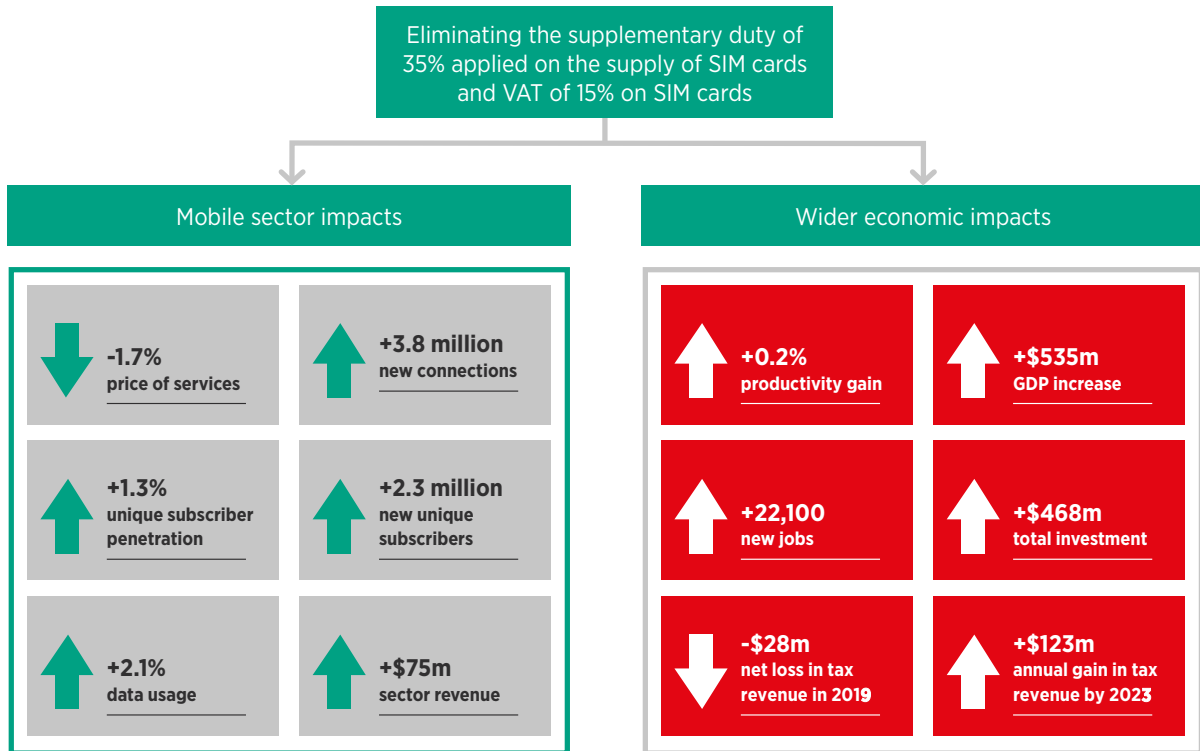
137. The reduction in SIM taxes will lead to a lower price of connection, however operators are likely to bundle such a price decrease with offers for mobile services such as data, voice and SMS

138. Please see Appendix A for more detail on the modelling assumptions used in this study and see Appendix B for detailed estimated impacts.

139. The increased level of usage, compared to the baseline, is similar for data, voice and SMS services (approximately 2.1%), but not identical. In our modelling, we have assumed that the price reduction is applied equally across data, voice and SMS services. Any increase in data usage (as in scenario 1) can therefore be attributed to technology migration.

Figure 31

Annual impacts of eliminating the supplementary duty and VAT on SIM cards, 2023



Source: EY analysis

4.5 Eliminating the supplementary duty on mobile usage

In this scenario the 5% supplementary duty levied on mobile services would be eliminated, reducing consumer prices and therefore improving the affordability of mobile services. The proposed elimination of the supplementary duty on mobile usage would translate into an effective reduction in the price of all mobile services of 3.3%, all of which would be passed through to subscribers.¹⁴⁰

This price decrease would benefit both households and business subscribers. For household subscribers, the tax reform would lead to an increase in real disposable incomes,

and will improve the affordability of mobile services. As shown in Section 1.5, this is particularly relevant for Bangladesh, as the cost of mobile ownership represents a significant share of monthly income, particularly for those at the bottom of the income pyramid. Absent behavioural effects, this tax reform would reduce the cost of a 1GB data basket from 11.4% of monthly income to 10.9%, for the poorest 20% of the population. For business subscribers, the reduction in supplementary duty would reduce input costs for all sectors that use mobile, increasing demand and freeing up resources which can be invested elsewhere.

140. The pass-through rate is endogenously generated from the GTAP model, and for this scenario it reflects the highly visible nature of the tax, and the level of price competition in the Bangladesh communications sector



This tax scenario would have the following impacts compared to the baseline scenario:¹⁴¹

- **New connections:** an additional 3.2 million unique subscribers, or 5.2 million mobile connections by 2023. This is equivalent to an increase of around 1.8% in unique subscriber penetration (3.0% in total connections). Of these new connections, 96% would be prepaid and approximately 57% would be classified as low-income;
- **Mobile market revenue:** total mobile sector revenue would increase by \$82 million (2.3%) by 2023. This would be driven by additional revenues from the increased number of connections, and higher overall usage, which offset the reduction in pricing from the tax reform;
- **Usage:** the reduction in the price of mobile services would lead to a 5.8% increase in total data usage compared to the baseline, while usage of voice and message services would also both increase by approximately 5.8%.¹⁴² Among low-income customers, data usage per connection would increase by an estimated 725MB per month;
- **Productivity gain:** the increase in unique subscriber penetration of 1.8% would lead to a 0.3% gain in productivity across the economy, leading in turn to further increases in output, incomes and expenditure;
- **GDP increase:** total GDP would increase by \$749 million (0.4%) compared to the baseline, as the price and productivity effects lead to a chain reaction of expansion across the economy;
- **Employment increase:** as a result of the increased economic activity in the economy, employment would increase by approximately 33,500 jobs (0.06%);
- **Wider investment in the economy:** as a result of the decrease in intermediate costs for businesses that use mobile, additional resources are made available for investment across the economy. By 2023, this scenario would lead to an annual gain in investment of \$687 million;

- **Benefits to other sectors:** as a result of the increased level of economic activity, the majority of sectors within the economy (11 out of 12) will increase their level of output. Output in the trade sector rises the most (1.0%), while communications (0.6%), and business services (0.4%) also make relatively strong gains; and
- **Tax revenue impact:** this scenario would have an initial net cost to the Bangladesh Exchequer of \$70 million in 2019. However, the subsequent expansion of the mobile sector, and significant growth in the wider economy, mean that by year 2 both the annual impact and cumulative impact are positive. The gain in tax revenue is about \$135 million per annum by 2023.

The summary of the sector-specific and economic impacts in 2023 is shown in Figure 32.

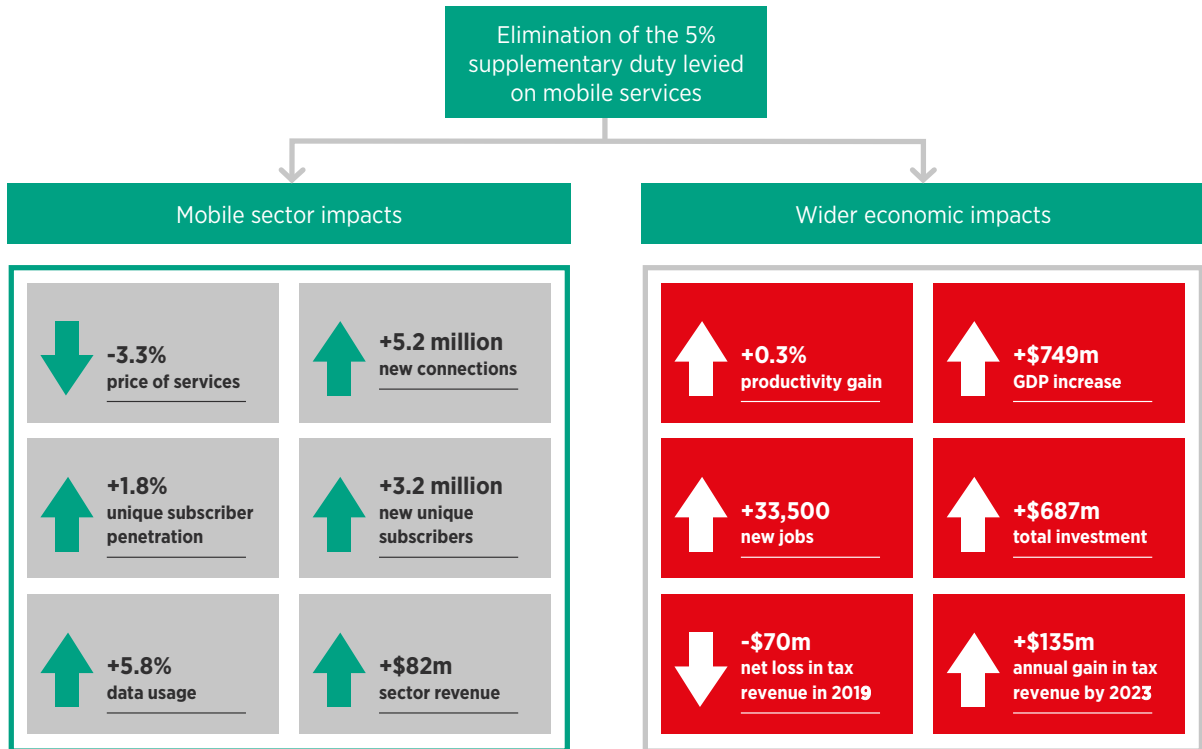
141. Please see Appendix A for more detail on the modelling assumptions used in this study and see Appendix B for detailed estimated impacts

142. The increased level of usage, compared to the baseline, is similar for data, voice and SMS services (approximately 5.8%), but not identical. In our modelling, we have assumed that the price reduction is applied equally across data, voice and SMS services. Any increase in data usage (as in scenario 1) can therefore be attributed to technology migration.



Figure 32

Annual impacts of eliminating the supplementary duty on mobile usage, 2023



Source: EY analysis



5. Conclusion: Reforming mobile sector taxation in Bangladesh

The mobile industry has the potential to play an increasingly important role in achieving Bangladesh's economic and social development goals, including those set out in Vision 2021. The sector has grown rapidly over the past decade, with the number of subscribers increasing by 57 million between 2007 and 2017.

However, with just under half of the population unconnected to mobile services in Bangladesh, there is still significant scope to further develop the sector. The introduction of 3G technologies has been slow, and has hampered the migration of customers to new-generation technologies. By promoting investment, reducing the cost of mobile ownership and incentivising usage, the tax reforms outlined in this paper will help to connect individuals, particularly those in low-income groups, to mobile services.

Reforming taxation applied on the mobile sector towards a more balanced and efficient structure has the potential to provide significant economic benefits. Furthermore, it would support Bangladesh in achieving its *Vision 2021* plan for a *Digital Bangladesh*, by bringing socio-economic benefits to the population through transformative information and communications technology (ICT).

This paper has demonstrated that there would be considerable socio-economic benefits of reforming some of the most distortive taxes on the mobile economy in Bangladesh. A summary of the impacts is provided in Table 6.

Table 6

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

Indicator	Reducing corporation tax from 45% to 40% for private mobile operators and from 40% to 35% for public mobile operators	Eliminating the supplementary duty of 35% applied on the supply of SIM cards and VAT of 15% on SIM cards	Eliminating the 5% supplementary duty levied on mobile services
New unique subscribers	+0.5m	+2.3m	+3.2m
Sector revenue	+\$42m	+\$75m	+\$82m
GDP increase	+\$131m	+\$535m	+\$749m
Wider investment	+\$180m	+\$468m	+\$687m
Annual gain in tax revenue	+\$14m	+\$123m	+\$135m

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

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

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



Appendix A

Methodology

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

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

Mobile sector modelling

Design of the telecoms market model

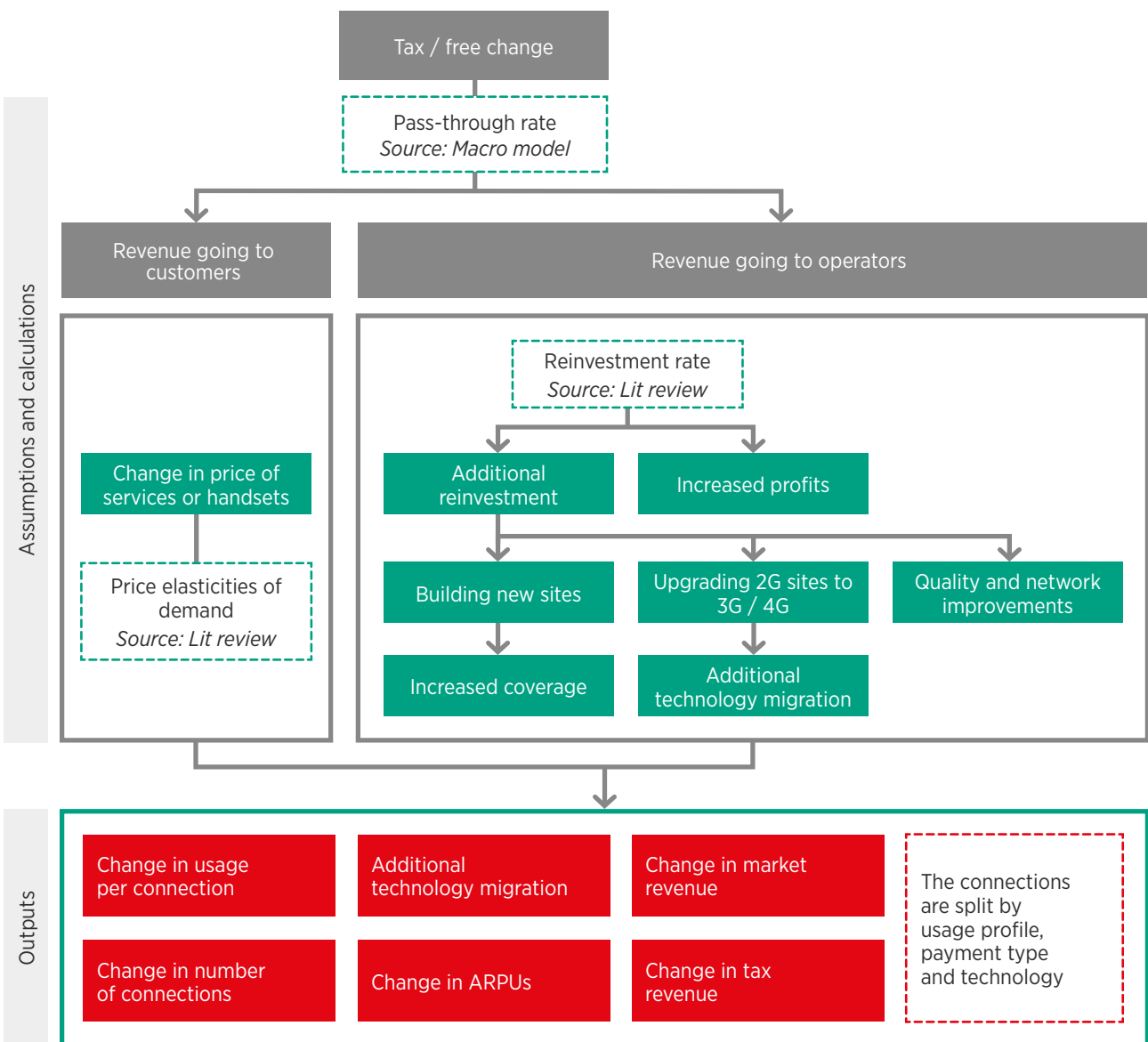
The telecoms market model covers the period 2017–2023, and uses data from local mobile operators and the GSMA Intelligence database. For modelling the scenarios, it has been assumed that the first phase of tax changes becomes

effective in 2018. The telecoms market model then calculates separate forecasts for each tax policy scenario. The difference between the scenario forecasts and the baseline is effectively the additional impact resulting from the tax policy reform.¹⁴³

A schematic of this model is presented in Figure 33 below.

Figure 33

Overview of mobile sector modelling approach



Source: EY analysis

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

As illustrated in Figure 29, the telecoms market model captures the impact on consumer demand and operators' profits and investment as a consequence of a mobile taxation reform. The model allows for the estimation of the additional connections, technology migration and mobile penetration generated across different usage profiles (categorised by low, medium and high-income groups), and across 2G, 3G and 4G services.

Mobile market impacts

For consumers, a reduction in the tax rate leads to a decrease in the effective price of mobile services or handsets. The relationship between the size of the tax reduction and the related decrease in prices is dependent on the level of "pass-through".¹⁴⁴ The resulting reduction in the effective price of mobile services is modelled to have the following impacts:

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

For operators the proportion of the tax reduction that is not passed through in the form of lower prices would either be retained as increased profit or reinvested. The decision between these two options depends on an assumption made on the reinvestment rate.¹⁴⁵ The following effects of additional investment are estimated using the telecoms market model:

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

Key outputs

The key outputs of the telecoms market model include changes to the baseline forecast (based on the GSMA Intelligence forecast) in respect of:

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

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

Macroeconomic modelling

Macroeconomic modelling approach

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

The macro-economic impacts are modelled in two stages:

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

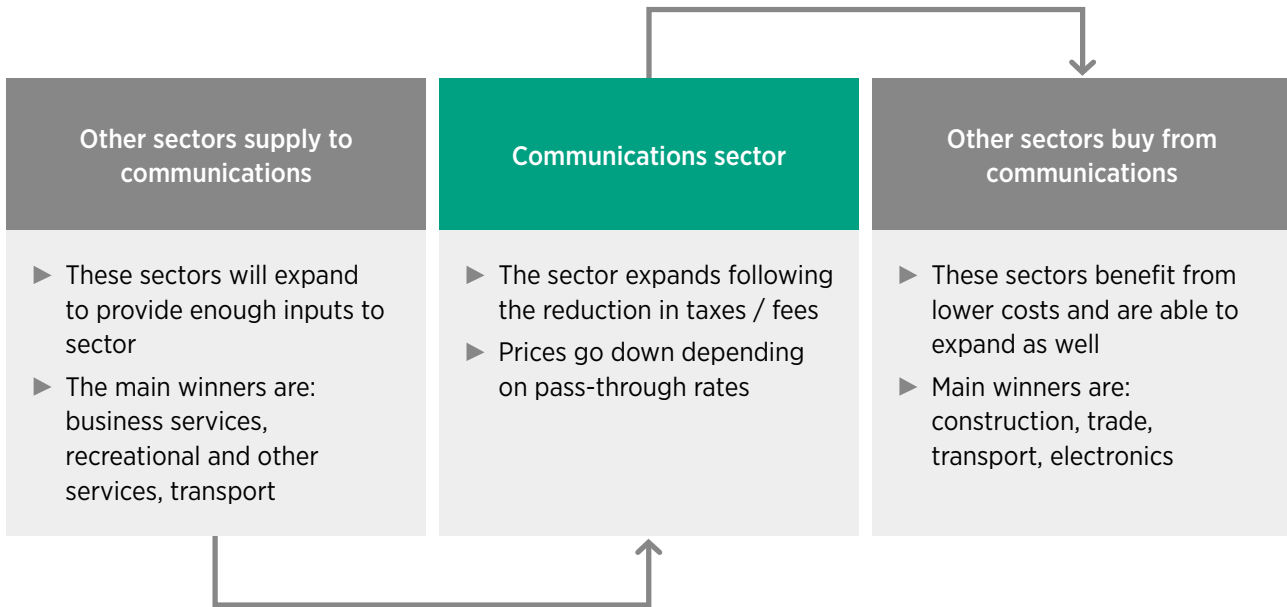
The impact of the mobile sector on the wider economy starts from its supply chain linkages. In particular, telecommunications is an important input to businesses right across the Bangladesh economy. As lower taxes and consequent lower prices are passed on, many businesses will benefit and be able to expand their own outputs. Businesses that supply the mobile sector will also benefit from its expansion (see Figure 34).

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

145. The percentage of the tax / fee change not passed through to subscribers which is reinvested by operators

Figure 34

Supply chain linkages



Source: EY analysis

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

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

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

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

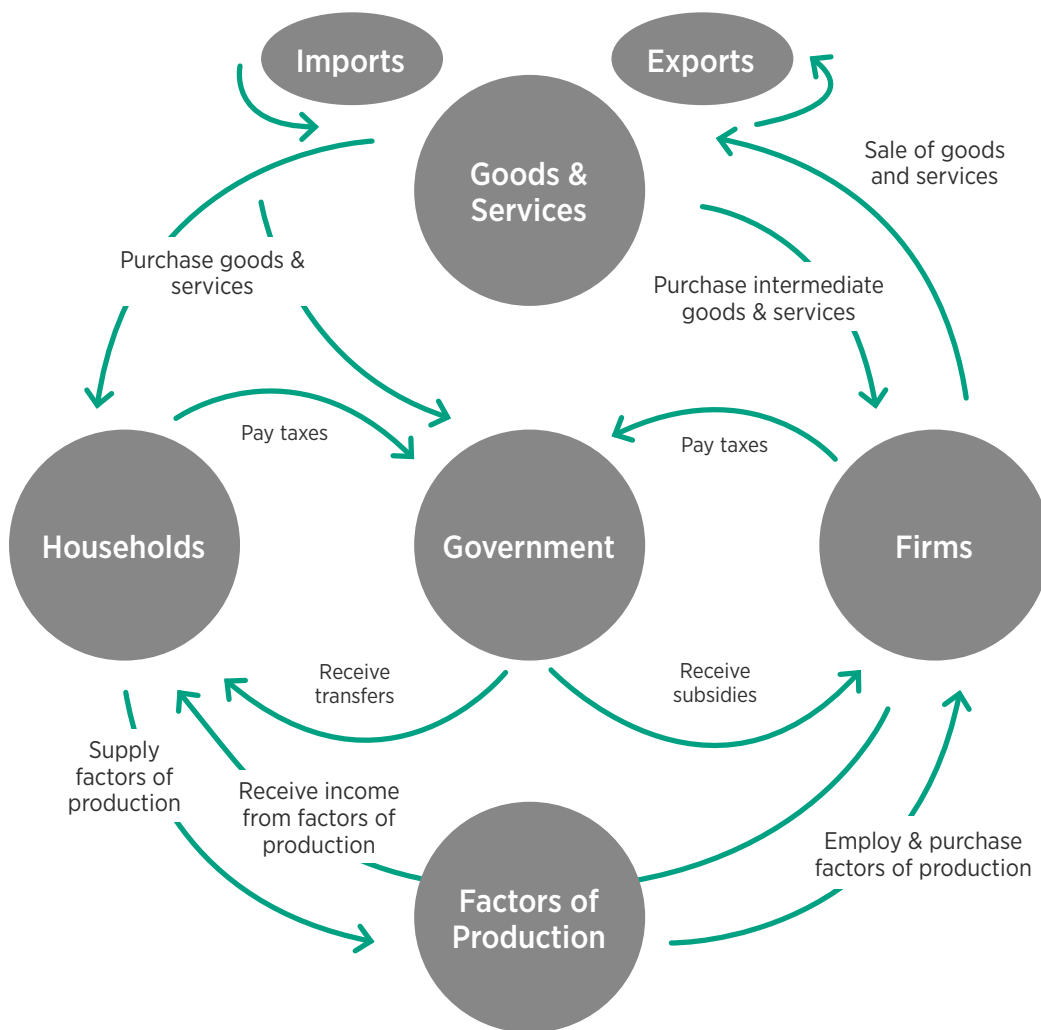
The CGE model

CGE models reproduce the structure of the whole economy by mapping all existing economic transactions among diverse economic agents (e.g. households, firms). They are large-scale numerical models that simulate the core economic interactions in the economy, and replicate the circular flow of the economy (see Figure 35). They are based on the economic theory of general equilibrium; i.e. that

supply and demand for goods, services and factors of production in the economy must be balanced. Economic relationships in CGE models are based on theory and empirical evidence from the academic literature. The prices of goods, services and factors of production adjust until all markets clear, that is, until they are simultaneously in equilibrium.

Figure 35

Circular flow of the economy



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

Central in CGE modelling is the choice of closure rules. This relates to the specification of endogenous (those determined by the model) and exogenous (those determined externally). In the standard GTAP model prices, quantities of all non-endowment commodities (e.g. produced and

traded commodities) and regional incomes are endogenous variables, while policy variables, technical change variables and population are exogenous to the model.¹⁴⁶ This standard closure is amendable with a wide range of alternative options available depending on modelling assumptions adopted.

146. Hertel, T.W. (ed.), (1997), Global Trade Analysis: Modelling and Applications, Cambridge University Press

Scenario modelling

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

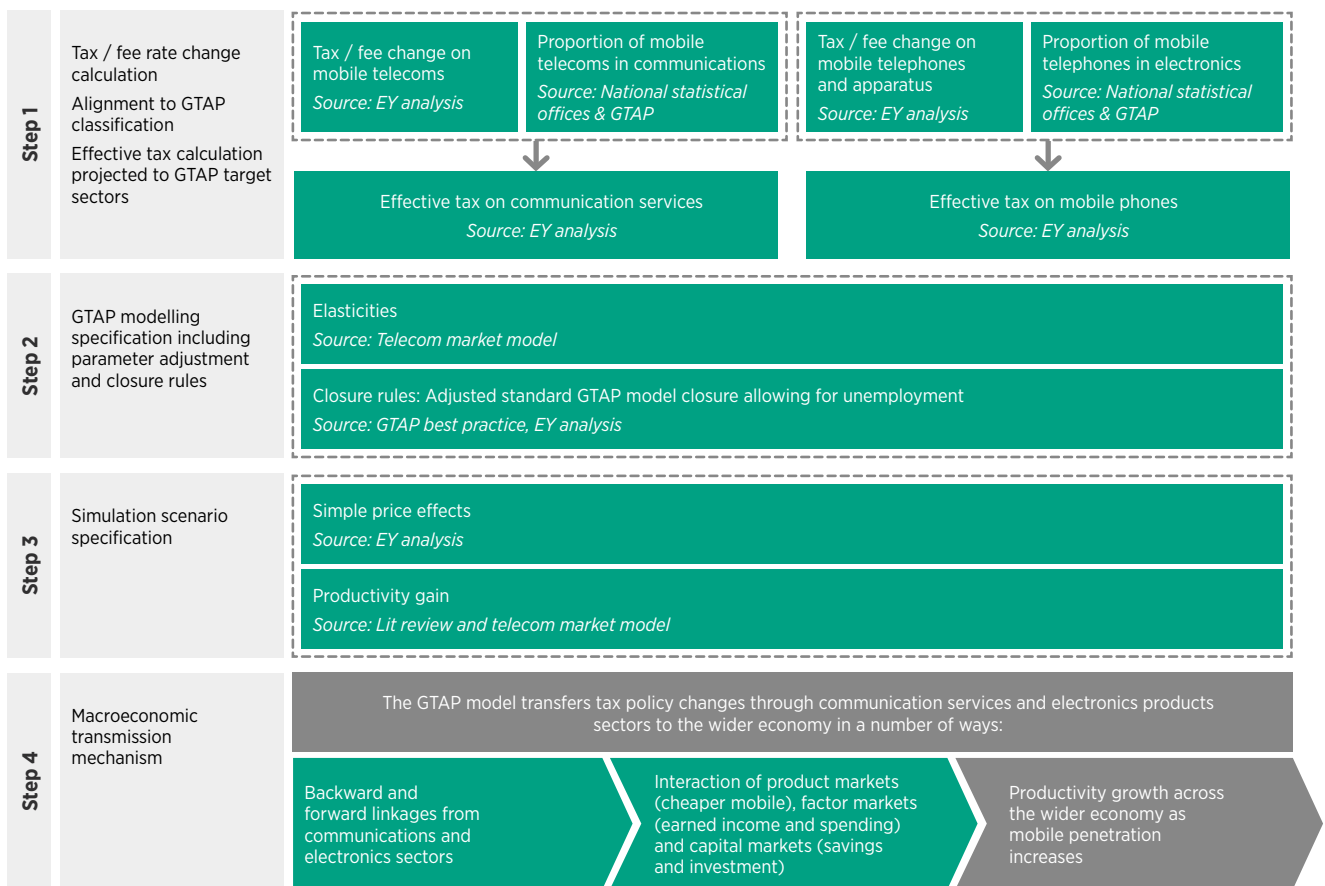
- First, the effective tax on Communication Services (which includes mobile services) is calculated;¹⁴⁷
- Second, GTAP model parameters (e.g. own-price and cross-price elasticities) and closure rules (e.g. related to employment assumptions)

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

- Third, simulation scenarios are run that account for the direct effect of taxes and tariffs on prices and a productivity improvement from any increase in mobile penetration (see Figure 36); and
- Finally, simulations are performed estimating the new equilibrium following the policy shocks introduced.

Figure 29

Overview of macro-economic modelling approach



Source: EY analysis

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

The impact of changes in tax policy on pricing

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

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

on consumption and/or production in the sector.

Therefore, the change in price in any country is determined by the specific market conditions in the communications sector and the relationships in the wider economy of that country, as these are reflected in the underlying data (demand and supply flows) and parameters (elasticities and other estimated coefficients) of the economy under analysis. Specifically, the extent of pass-through is determined by the assumed elasticity of both demand and supply in the market.¹⁴⁸ The elasticity of supply depends on the competitive environment and degree of market power within the industry, and reflects the profitability, input costs and usage of natural resources in production. The elasticity of demand is determined by consumer preferences, and will vary depending on the underlying behavioural relationships in the Bangladesh economy.

Table 7 provides the pass-through rates derived in the GTAP model for each scenario.

Table 7

Pass-through rates for modelled scenarios

Indicator	Reducing corporation tax for mobile companies	Removal of SIM card taxes	Removal of the supplementary duty on mobile usage
Pass-through rate	31%	100%	100%

The level of the pass-through rate for the reduction in the corporation tax (scenario 1) is lower than in the other scenarios, which instead consider reductions in consumption taxes. This is due to the nature of the corporation tax, which is levied on profits rather than sales. In this scenario, companies are typically able to retain a higher share of the tax gain and are therefore able to allocate it to an increase in profits and/or reinvest the profits in business development projects.

In respect of scenarios 2 and 3, the derived pass-through rate is 100% i.e. complete pass-through of the tax reduction. This outcome is driven by highly competitive market dynamics in the sector, combined with the high visibility of the tax to the end-consumer. The competitive intensity may be explained by the significant potential for subscriber and penetration growth in the market, which incentivises operators to maintain share through price competitiveness.

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

Key assumptions for Bangladesh

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

Price elasticity of demand

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

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

For purposes of this study, we define three sets of PEDs

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

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

To establish relevant price elasticities for Bangladesh, we have used a set of studies pertaining to low-income countries (Bangladesh is defined as a lower middle-income economy by the World Bank).¹⁴⁹

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

- Usage elasticities: from -0.7 to -0.8 for voice and from -1.0 to -1.3 for data;
- Ownership elasticities: from -0.8 to -1.0 for mobile services and from -1.1 to -1.4 for handsets; and

- Technology migration elasticities: from -0.2 to -0.3 for data and from -0.3 to -0.5 for handsets.

Reinvestment Rate

The exact reinvestment rate depends on a range of factors, including the cash flow of a specific company. In the modelling, it is assumed that operators re-invest 60% of the portion of the tax reduction that they retain (i.e. the proportion that is not passed onto subscribers). The remaining 40% is retained as increased profit. This assumption is based on a review of previous studies of the economic impacts of mobile taxation reforms.¹⁵⁰

Of the reinvestment amount, it is assumed that operators' investment is directed towards upgrading 2G sites into 3G. This is based on EY's analysis of the mobile market in Bangladesh, which suggests that there is significant scope to migrate customers from 2G to 3G technology in the region.

The equivalent of additional investment expressed in the number of upgraded base stations per year is based on the assumption that transformation of a 2G site into a 3G site requires around \$27,000 of capital expenditure.¹⁵¹

Total factor productivity impact

The benefits of mobile connectivity – and how they translate to the macro economy – have been widely studied in the literature. The effects of mobile connectivity on the economy are largely delivered through their impact on productivity, one of the main measures being total factor productivity (TFP).¹⁵²

We have assumed that a 1% increase in unique subscriber penetration leads to a 0.16% increase in total factor productivity. This value is based on a review of the literature, and with reference to previous studies conducted by the GSMA. This impact has been adjusted from previous studies to account for mobile penetration and infrastructure in Bangladesh.¹⁵³

In this study, the shock to TFP is modelled as a change in the productivity of all primary factors (of equal proportions) in the Bangladesh economy. This productivity change enters as a variable into the constant elasticity of substitution (CES) value-added

149. World Bank (<https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups>)

150. See, for example, Gilchrist and Himmelberg (1995): "Evidence on the role of cash flow for investment" and Katz (2012): "Assessment of the economic impact of taxation on communications investment in the United States"

151. GSMA

152. TFP is a measure for how efficiently an economy uses inputs during its production process

153. This calculation is based on previous GSMA analysis which outlines the relationship between mobile penetration rates, infrastructure and productivity



production function.¹⁵⁴ The TFP shock works in the Bangladesh model as the sum of two effects:

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

Timing of macro-economic impacts

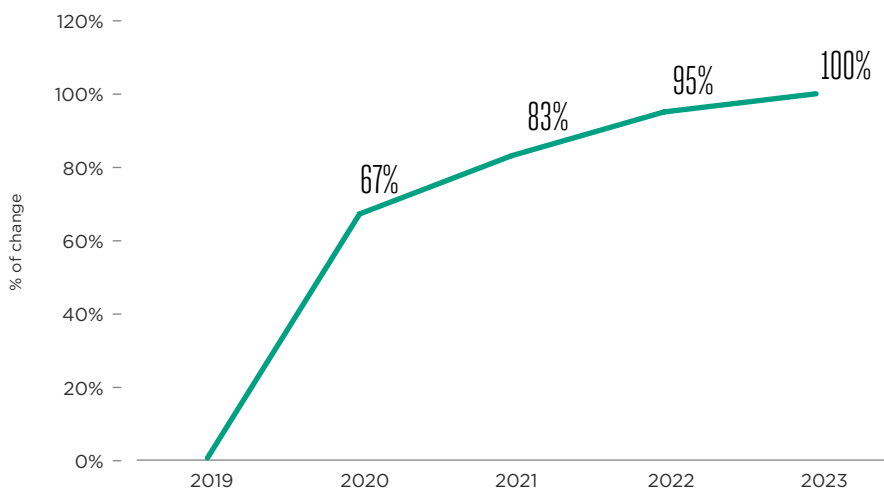
The standard GTAP model seeks to calculate differences in key economic variables between different possible states of the economy – a baseline case and a policy scenario – at a fixed point in time. This means that the standard model is a comparative static model and does not model year-by-year changes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

The CGE literature on the dynamic impacts of tax policy on a country’s GDP suggests that the transition to a new equilibrium takes on average 5-10 years with the annual impact on GDP increasing at a diminishing rate.¹⁵⁵

Using this evidence from the literature, we have formed assumptions on the transition path between the baseline case and the policy change. We assumed that 67% of the steady state impact is felt in 2020 (the next year following the policy is implemented), 83% in 2021, 95% in 2022 and 100% in 2023 (five years after the policy implementation). The productivity effects are assumed to come into effect from 2019. The assumed path is illustrated in Figure 37 below.

Figure 37

Time path for the transition to the new equilibrium



Source: EY analysis

154. The factor substitution effect is zero, as the productivity of all factors changes in the same proportions

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

Closure rules in the macro-economic model

In order to account for specific labour market conditions in Bangladesh, a specific closure rule has been applied in GTAP in relation to employment and wages. The standard approach in CGE models is to assume that the supply of labour is fixed, and hence an increase in the demand for labour results in an increase in wages and prices, rather than employment. However, in Bangladesh, it can be observed that there is some significant unemployment in the skilled workforce.^{156, 157}

Therefore, the modelling approach allows for employment to increase amongst skilled labour in Bangladesh, specifically in the “Technicians/ Associate Professional” category. This means that an expansion of demand in the economy leads to both an increase in employment and an increase in wages for skilled workers.

Corporation tax modelling

In modelling scenario 1, a number of assumptions were required in order to estimate the impact of reducing corporation tax on the mobile market:

- **Price impact:** For modelling purposes, it has been assumed that in a competitive market all operators will have to reduce their prices to avoid losing their market share, even if they do not pay corporation tax in any given year. However, for the calculation of tax savings, the available profitability data provided by the mobile operators for 2016 has been used;
- **Reinvestment:** The reduction in the rate of corporation tax leads to only a small decrease in prices due to a low pass-through rate, but to a significant increase in profits, 60% of which are reinvested. An assumption that a high share of tax savings is allocated to reinvestment is based on the existence of a significant potential for expansion of the mobile operations in Bangladesh, which requires operators to invest in their market share. The reinvestment is assumed to go to upgrading existing 2G sites to 3G technology, which leads to a significant amount of consumers migrating to newer mobile technology.

SIM tax modelling

For scenario 2, it is possible that mobile operators choose to pass-through the tax reduction in the form of lower SIM prices and/or prices for mobile services. The reduction in taxes on SIM cards has therefore been modelled as a composite price change for mobile services. This assumes that operators offer enhanced data/voice/SMS packages, by price or by volume, in combination with new SIM card purchases. Such consumption baskets currently exist in the Bangladesh mobile market,¹⁵⁸ and are likely to continue in the medium-term.

156. Unemployment by education level, ILOSTAT labour force survey

157. Ahmed and Khan, 2015, *Employment and unemployment situation in Bangladesh: a dismal picture of development*

158. See, for example, Airtel's connection price and startup features – <http://www.bd.airtel.com/personal/products-services/prepaid/get-a-new-connection>

Appendix B

Scenario estimations



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

Scenario 1: Reducing corporation tax for mobile companies

This scenario models a reduction of the corporation tax for private mobile operators from 45% to 40% and for public mobile operators – from 40% to 35%.¹⁵⁹

Table 8

Annual impact of reducing corporation tax for mobile companies

Indicator	2019	2020	2021	2022	2023
MOBILE SECTOR IMPACTS					
Change in price of services vs baseline	-0.5%				
Incremental connections (total)	369,000	766,000	789,000	812,000	835,000
Incremental unique subscribers (total)	226,000	467,000	480,000	494,000	507,000
Incremental connections (3G and 4G)	792,000	2,388,000	4,085,000	6,128,000	8,443,000
<i>of which technology migration</i>	645,000	2,018,000	3,643,000	5,621,000	7,872,000
Incremental connections by low income subscribers	210,000	435,000	450,000	463,000	476,000
ARPU (total) vs baseline	-0.3%	0.1%	0.3%	0.5%	0.7%
Increase in mobile penetration (connections)	0.2%	0.4%	0.5%	0.5%	0.5%
Increase in mobile penetration (unique subscribers)	0.1%	0.3%	0.3%	0.3%	0.3%
Data usage vs baseline	0.7%	1.4%	1.7%	1.9%	2.2%
Increase in market revenue (total)	-\$0.2m	\$20m	\$27m	\$35m	\$42m
Increase in market revenue (total) vs baseline	0.0%	0.6%	0.8%	1.0%	1.2%
Additional investment ¹⁶⁰	\$11m	\$12m	\$12m	\$12m	\$12m
Static tax impact ¹⁶¹	-\$56m	-\$58m	-\$59m	-\$61m	-\$61m
Impact on mobile sector taxation	-\$56m	-\$51m	-\$51m	-\$49m	-\$47m
WIDER ECONOMIC IMPACTS¹⁶²					
Full impact on communications sector taxation	-\$31m	-\$23m	-\$28m	-\$32m	-\$34m
Receipts from all other sectors	\$13m	\$32m	\$40m	\$45m	\$48m
Total tax receipts	-\$19m	\$9m	\$12m	\$13m	\$14m
<i>Cumulative total receipts</i>	<i>-\$19m</i>	<i>-\$9m</i>	<i>\$2m</i>	<i>\$15m</i>	<i>\$29m</i>
Real GDP	\$13m	\$88m	\$109m	\$124m	\$131m (0.06%)
Employment		Impact estimated for 2023 only.			7,858 (0.01%)
Household income		Impact estimated for 2023 only.			\$137m (0.07%)
Household expenditure		Impact estimated for 2023 only.			\$109m (0.07%)
Investment		Impact estimated for 2023 only.			\$180m (0.27%)

Source: EY analysis

159. The tax cut is calculated on the effective base which is the total revenue from services. While the headline rate goes down from 40% to 35%, the effective rate decreases from 13.7% to 12%

160. The reinvestment is assumed to be used to upgrade 2G sites to a 3G level. The assumptions involved include:

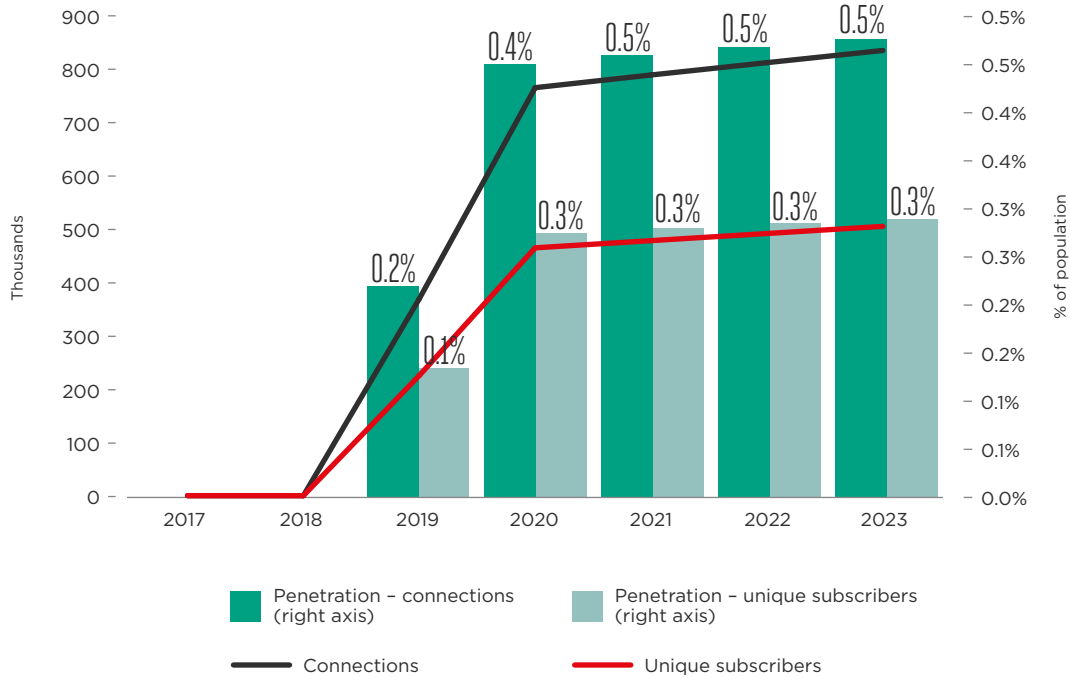
- \$27,000 of capex required to upgrade 1 site (Source: GSMA data);
- Average 3G site covering 9,300 people at the current level of penetration (Sources: GSMA and operators' data); and
- The average 3G penetration in the newly covered areas is achieved in 2 years' time.

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

162. The evidence on the time path of some of the variables to the new equilibrium is not available

Figure 38

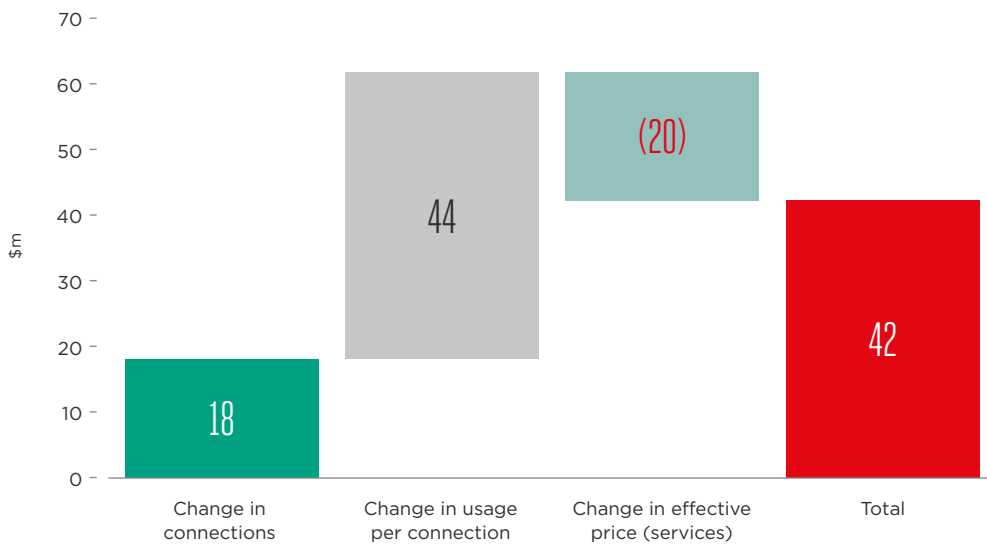
Connections and penetration impacts from reducing corporation tax for mobile companies



Source: EY analysis

Figure 39

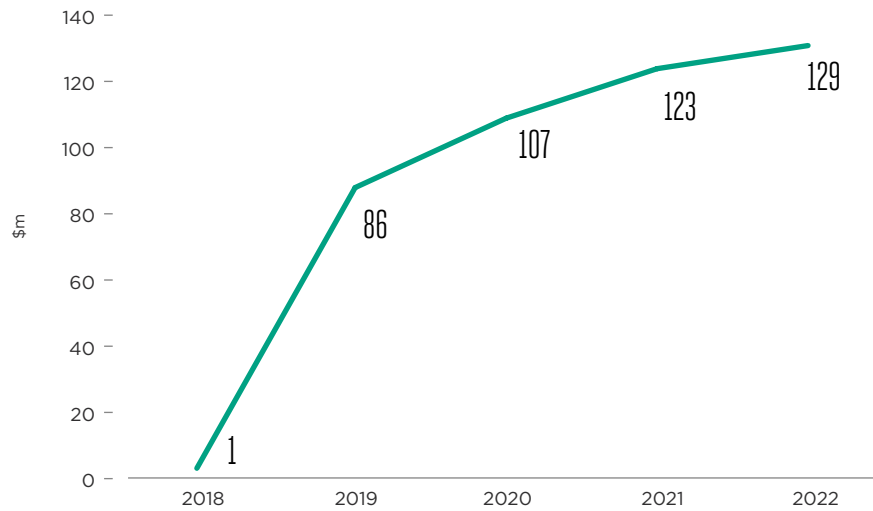
Main drivers of the market revenue change following the reduction in corporation tax for mobile companies



Source: EY analysis

Figure 40

Reducing corporation tax for mobile companies – annual GDP effects compared to baseline, \$m



Source: EY analysis

**Scenario 2: Removal of SIM card taxes**

This scenario models a removal of two SIM card taxes: supplementary duty of 35% applied on the supply of SIM cards and VAT of 15% on SIM cards.

Table 9

Annual impact of the removal of SIM card taxes on selected variables

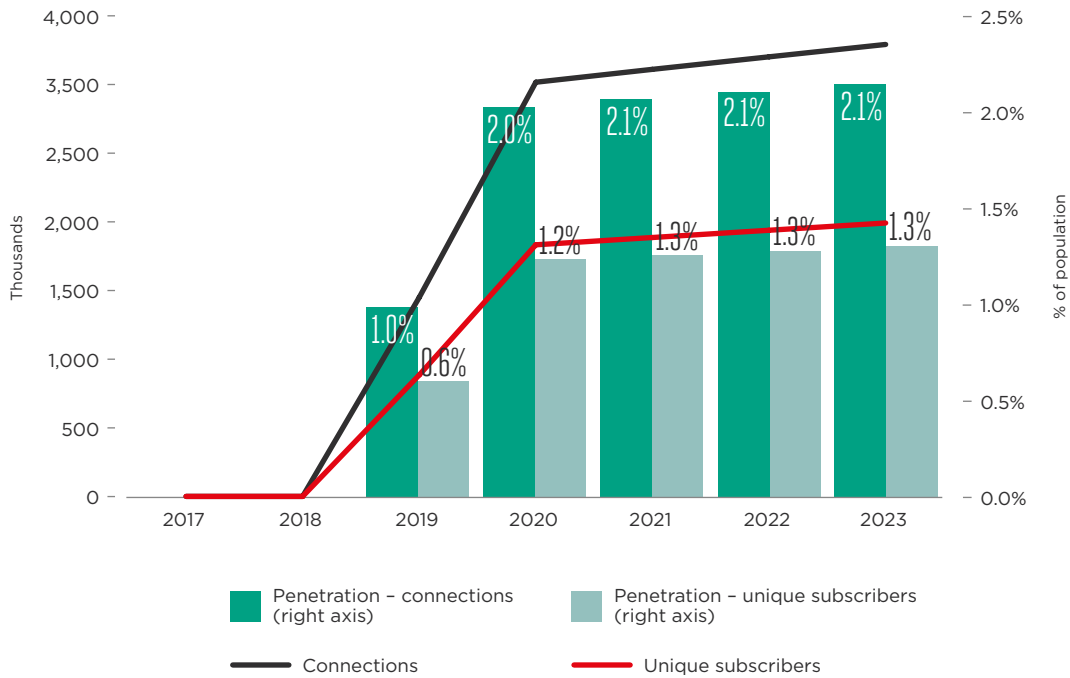
Indicator	2019	2020	2021	2022	2023
MOBILE SECTOR IMPACTS					
Change in price vs baseline	-1.7%				
Incremental connections (total)	1,659,000	3,452,000	3,560,000	3,664,000	3,767,000
Incremental unique subscribers (total)	1,016,000	2,105,000	2,166,000	2,226,000	2,287,000
Incremental connections (3G and 4G)	871,000	1,934,000	1,995,000	2,287,000	2,577,000
<i>of which technology migration</i>	211,000	265,000	0,000	0,000	0,000
Incremental connections by low income subscribers	943,000	1,964,000	2,031,000	2,090,000	2,149,000
ARPU (total) vs baseline	0.0%	-0.1%	-0.2%	-0.2%	-0.2%
Increase in mobile penetration (connections)	1.0%	2.0%	2.1%	2.1%	2.1%
Increase in mobile penetration (unique subscribers)	0.6%	1.2%	1.3%	1.3%	1.3%
Data usage vs baseline	1.2%	2.2%	2.0%	2.1%	2.1%
Increase in market revenue (total)	\$36m	\$73m	\$72m	\$73m	\$75m
Increase in market revenue (total) vs baseline	1.1%	2.1%	2.1%	2.1%	2.1%
Additional investment	\$0.0m	\$0.0m	\$0.0m	\$0.0m	\$0.0m
Static tax impact	-\$56m	-\$58m	-\$59m	-\$60m	-\$61m
Impact on mobile sector taxation	-\$44m	-\$33m	-\$35m	-\$36m	-\$36m
WIDER ECONOMIC IMPACTS					
Full impact on communications sector taxation	-\$35m	-\$23m	-\$29m	-\$33m	-\$35m
Receipts from all other sectors	\$7m	\$106m	\$131m	\$150m	\$158m
Total tax receipts	-\$28m	\$82m	\$102m	\$117m	\$123m
<i>Cumulative total receipts</i>	-\$28m	\$55m	\$157m	\$274m	\$397m
Real GDP	\$9m	\$358m	\$444m	\$508m	\$535m (0.24%)
Employment					22,086 (0.04%)
Household income					\$540m (0.28%)
Household expenditure					\$424m (0.28%)
Investment					\$468m (0.71%)

Source: EY analysis



Figure 41

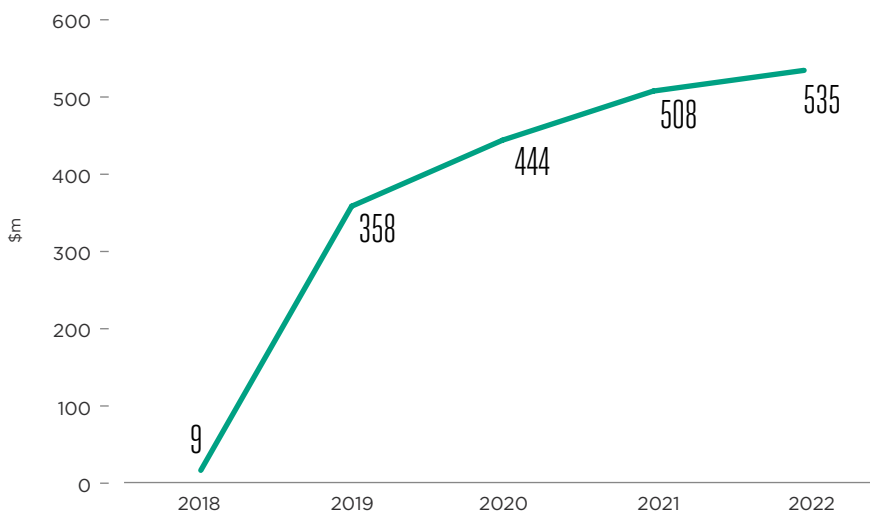
Connections and penetration impacts from the removal of SIM card taxes



Source: EY analysis

Figure 42

Removal of SIM card taxes - annual GDP effects compared to baseline, \$m



Source: EY analysis

**Scenario 3 – Removal of the supplementary duty on mobile usage**

This scenario models the elimination of the 5% Supplementary Duty levied on mobile services.

Table 10

Annual impact of the removal of the supplementary duty on mobile usage on selected variables

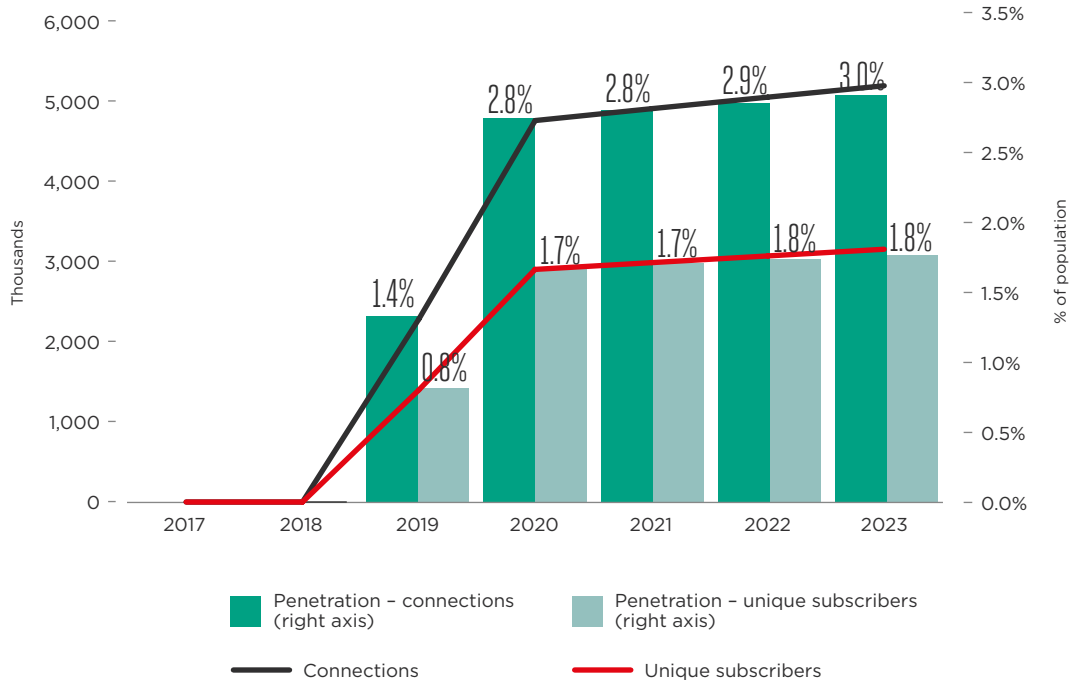
Indicator	2019	2020	2021	2022	2023
MOBILE SECTOR IMPACTS					
Change in price of services vs baseline	-3.3%				
Incremental connections (total)	2,280,000	4,755,000	4,903,000	5,047,000	5,189,000
Incremental unique subscribers (total)	1,396,000	2,899,000	2,983,000	3,067,000	3,150,000
Incremental connections (3G and 4G)	1,197,000	2,663,000	2,748,000	3,150,000	3,549,000
<i>of which technology migration</i>	290,000	365,000	0,000	0,000	0,000
Incremental connections by low income users	1,297,000	2,706,000	2,797,000	2,879,000	2,961,000
ARPU (total) vs baseline	-2.0%	-0.7%	-0.8%	-0.8%	-0.8%
Increase in mobile penetration (connections)	1.4%	2.8%	2.8%	2.9%	3.0%
Increase in mobile penetration (unique subscribers)	0.8%	1.7%	1.7%	1.8%	1.8%
Data usage vs baseline	3.0%	6.0%	5.7%	5.8%	5.8%
Increase in market revenue (total)	-\$16m	\$80m	\$79m	\$81m	\$82m
Increase in market revenue (total) vs baseline	-0.5%	2.4%	2.3%	2.3%	2.3%
Additional investment	\$0.0m	\$0.0m	\$0.0m	\$0.0m	\$0.0m
Static tax impact	-\$109m	-\$112m	-\$115m	-\$117m	-\$119m
Impact on mobile sector taxation	-\$114m	-\$87m	-\$90m	-\$92m	-\$93m
WIDER ECONOMIC IMPACTS					
Full impact on communications sector taxation	-\$88m	-\$62m	-\$77m	-\$88m	-\$92m
Receipts from all other sectors	\$19m	\$153m	\$189m	\$216m	\$228m
Total tax receipts	-\$70m	\$91m	\$112m	\$129m	\$135m
<i>Cumulative total receipts</i>	-\$70m	\$21m	\$133m	\$262m	\$397m
Real GDP	\$24m	\$502m	\$622m	\$712m	\$749m (0.34%)
Employment		Impact estimated for 2023 only.			33,515 (0.06%)
Household income		Impact estimated for 2023 only.			\$759m (0.40%)
Household expenditure		Impact estimated for 2023 only.			\$596m (0.39%)
Investment		Impact estimated for 2023 only.			\$687m (1.05%)

Source: EY analysis



Figure 43

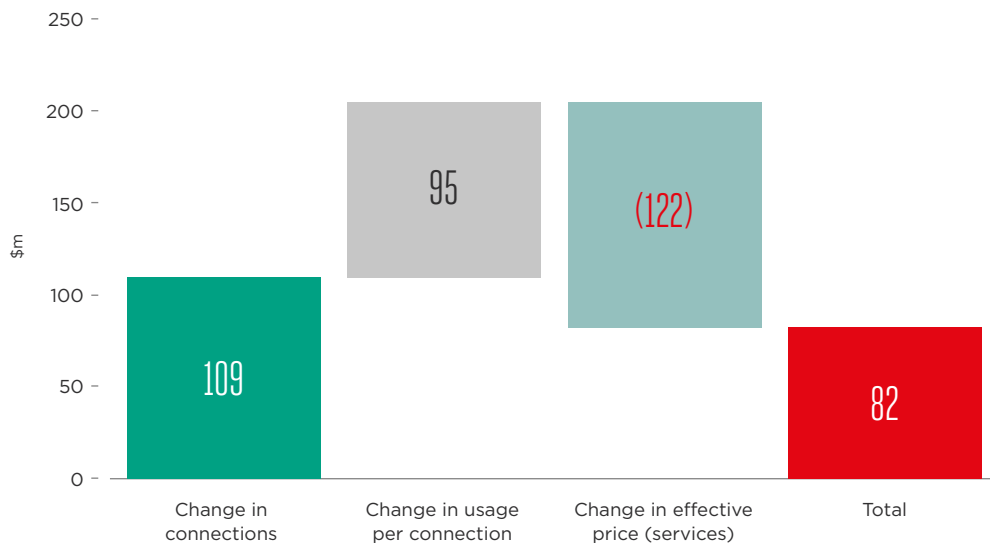
Connections and penetration impacts from the removal of the supplementary duty on mobile usage



Source: EY analysis

Figure 44

Main drivers of the market revenue change following the removal of the supplementary duty on mobile usage

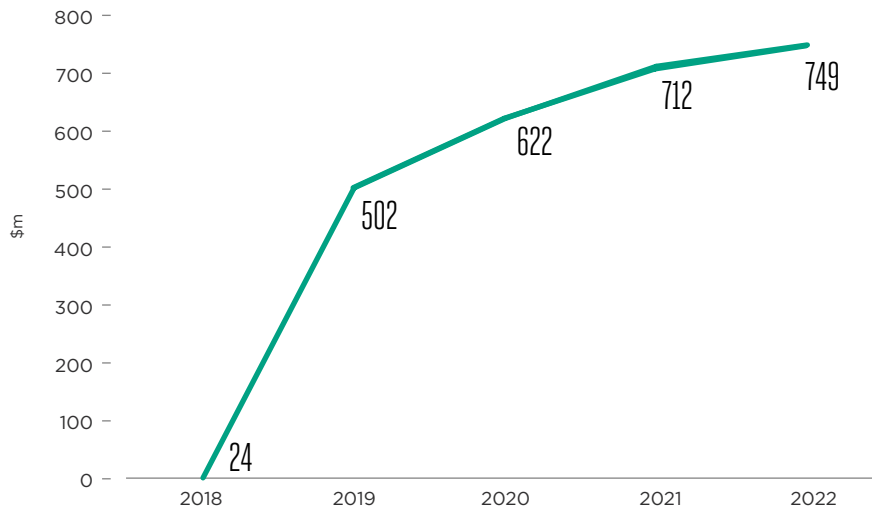


Source: EY analysis



Figure 45

Removal of the supplementary duty on mobile usage - annual GDP effects compared to baseline, \$m



Source: EY analysis



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