Taxing mobile connectivity in Asia Pacific

A review of mobile sector taxation and its impact on digital inclusion

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Executive summary

Mobile connectivity is a key enabler of digital inclusion and economic and social development. In 2016 the mobile industry in Asia Pacific contributed more than $1.3 trillion to the regional economy via direct, indirect and productivity impacts. This represents 5% of the region's total GDP and supports more than 16 million jobs. There are over 1.7 billion mobile internet subscribers in the region – more than half the global total.

The countries of the region differ in the extent of their digital development: citizens in some countries have been engaged in digital services for a long time, whereas others are only now starting to realise the potential that mobile services can bring to businesses and society.

Sector-specific taxes can hold back the mobile industry in emerging digital societies

Despite the positive contribution of the mobile sector to economic growth, countries do not always align their sector-specific taxes with best-practice principles of taxation, thereby distorting the industry's continued development. Faced with short-term revenue needs, some governments in the region are driven to apply additional sector-specific taxes on mobile operators. In 2014 and 2015, the mobile sector in eight studied Asian countries paid, on average, 30% of revenue in the form of taxes and regulatory fees.

Sector-specific taxes and fees often drive the high tax burden: for instance, governments levy sector-specific consumer taxes, excluding customs duties, in seven of 20 countries examined across the region. Five of these are at an emerging stage of their digital development. A reduction or elimination of sector-specific taxes could boost growth in markets with the highest tax burdens. For example, we estimate that the elimination of such taxes in Pakistan, Bangladesh, Laos, Afghanistan and Nepal would reduce the tax burden from an average of 19% to 12% of a customer's total cost of owning a mobile phone, lowering the expense and bringing it more in line with more digitally engaged, transition digital societies.

Taxes targeted specifically at mobile services make usage more costly, especially for the poor

In 2011, the United Nations Broadband Commission recommended that internet access for all should amount to no more than 5% of monthly income by 2015. Our analysis shows that the total cost of mobile ownership (TCMO), based on the price of an average handset and 1 GB of data per month, exceeds 5% for all income groups in Asia's emerging digital societies. In contrast, for advanced digital societies, the figure is less than 1%.

Across Asia Pacific, the level of consumer taxes varies widely but amounts to an average of 14% of TCMO, compared to 10% in North America. In Pakistan and Sri Lanka, such taxes exceed 30% of TCMO. Sector-specific consumer taxes are most prevalent in emerging digital societies, where such levies alone exceed 5% of the income of the poorest 40% of consumers. This does not meet the UN's affordability recommendation for 2015 – without even including the cost of the service and price of the device.

In 2018, the UN implemented a new affordability target of 2% of monthly income. Governments should consider whether sector-specific taxes hinder the ability to achieve this by the UN's target date of 2025.

Excessive and volatile taxes on the sector restrict investment in next-generation networks and coverage

Investment in Asia Pacific has continued to grow, with more than 200 4G networks launched between 2011 and 2016. This investment has occurred during a challenging time for operator revenues, as average revenue per connection dropped more than 20% over the same period. The sector needs further investment over the coming years as operators expand 4G coverage and prepare for 5G and the Internet of Things (IoT). Uncertainty about future changes to tax regimes, discriminatory sector-specific taxes, import duties on network equipment, and excessive spectrum fees will all reduce the likelihood of successful investments as societies approach the next wave of mobile technologies.

Governments have been keen to develop digital plans and initiatives to expand infrastructure and inclusion. Universal service funds (USFs), in particular, are prevalent in Asia Pacific, with many funded by levies on operator revenues that can reach as high as 5% of gross revenue. However, as a tax on revenue, USF contributions cause distortions in the market, making services less affordable if taxes are passed on to consumers, or stifling investment if taxes are absorbed by operators. Moreover, governments fail to disburse collected USF taxes in a timely manner. In India, for example, more than 50% of funds collected since 2002 remain unspent.

Government efforts to bring about a digital transformation include the aim of internet access for all. However, countries must match such ambition with tax policies that do not discourage the mobile industry's needed investment.

Rebalancing sector-specific taxes and regulatory fees promotes connectivity, economic growth, investment and fiscal stability

Analysis undertaken for the GSMA shows that the removal of sector-specific taxes, including SIM card taxes, and the reduction of licence fees would result in increased demand for mobile services and more investment, while boosting tax revenues over the medium term. For example, eliminating the taxes on SIM cards in Bangladesh would increase, five years after the intervention, the number of connections by 3.8 million, which would raise Bangladesh's GDP by $535 million, generate a $468 million increase in investment, and raise overall tax receipts by $123 million as a result of the larger base of taxable revenue.

1 The mobile industry in Asia Pacific

1.1 Connectivity and digital inclusion are transformative for societies

By promoting digital inclusion, mobile connectivity can improve the delivery of healthcare, education and financial services, and improve gender equality. The mobile sector has therefore become a key part of the international development agenda to achieve the UN's Sustainable Development Goals, a 17-point plan to end poverty, combat climate change, and fight injustice and inequality by 2030.

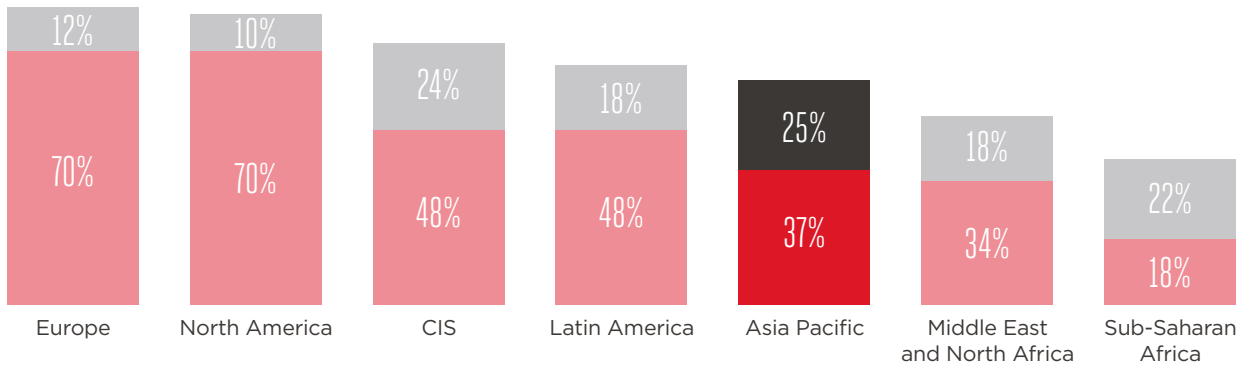
Mobile services are transforming society by redefining the way people interact with each other, with communities and with businesses. With more than 5 billion unique subscribers worldwide, mobile phones are the most widely used form of personal technology.

In recent years, the number of mobile internet subscribers in Asia Pacific has surged from less than 800 million subscribers at the start of 2012 to more than 1.7 billion today, accounting for over half of the world's current mobile users of the internet.

As shown in Figure 1, in 2016, the region's rate of mobile internet penetration reached 37%, a figure well below that for Europe and North America. Mobile internet penetration in Asia Pacific is expected to grow, but will still be lower than 70% in 2025.

Figure 1

Penetration of unique mobile internet subscribers



Source: GSMA Intelligence

1.2 Levels of digital development vary widely in Asia Pacific

Asia Pacific is characterised by diversity in terms of levels of access and use of digital services through the internet.

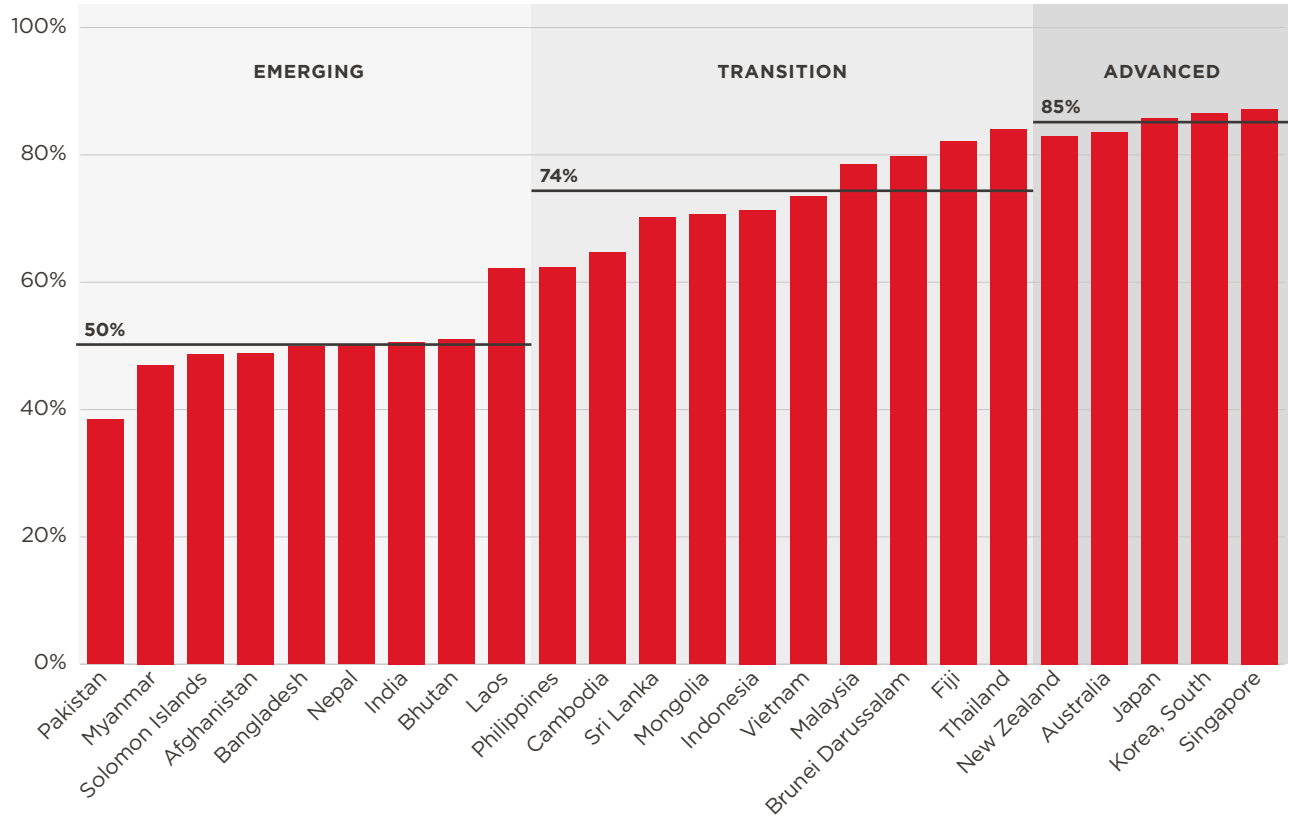
As set out in *Advancing Digital Societies in Asia*,[1] we categorise countries into three groups, based on the level of engagement by citizens with connected devices and online services, spanning finance, utilities, education, health and transport:

- **Emerging:** countries with limited mobile infrastructure and low penetration of mobile devices, resulting in a low level of digital engagement. Nevertheless, these countries have a high potential for expanding digital services – for example, via mobile money, which can transform societies that lack widespread, traditional banking infrastructure.
- **Transition:** countries undergoing rapid improvement in mobile infrastructure, high penetration and more citizens using online services than those in emerging nations.
- **Advanced:** countries with widespread, high-quality mobile infrastructure, with most people owning mobile devices. These countries are focusing more on next-generation mobile services, such as further developments in IoT.[2]

Figure 2 shows how a country's mobile penetration corresponds to its level of digital development. Around 50% of the population in emerging digital societies subscribe to mobile services; in advanced digital societies, more than 80% of people have a mobile service; and transition digital societies are in between.

Figure 2

Unique subscribers as a percentage of population, Q1 2017



Black line = average across each digital society group

Source: GSMA Intelligence

1 Advancing digital societies in Asia, GSMA Intelligence, 2016
2 The Internet of Things describes the coordination of multiple machines, devices and appliances connected to the Internet through multiple networks.

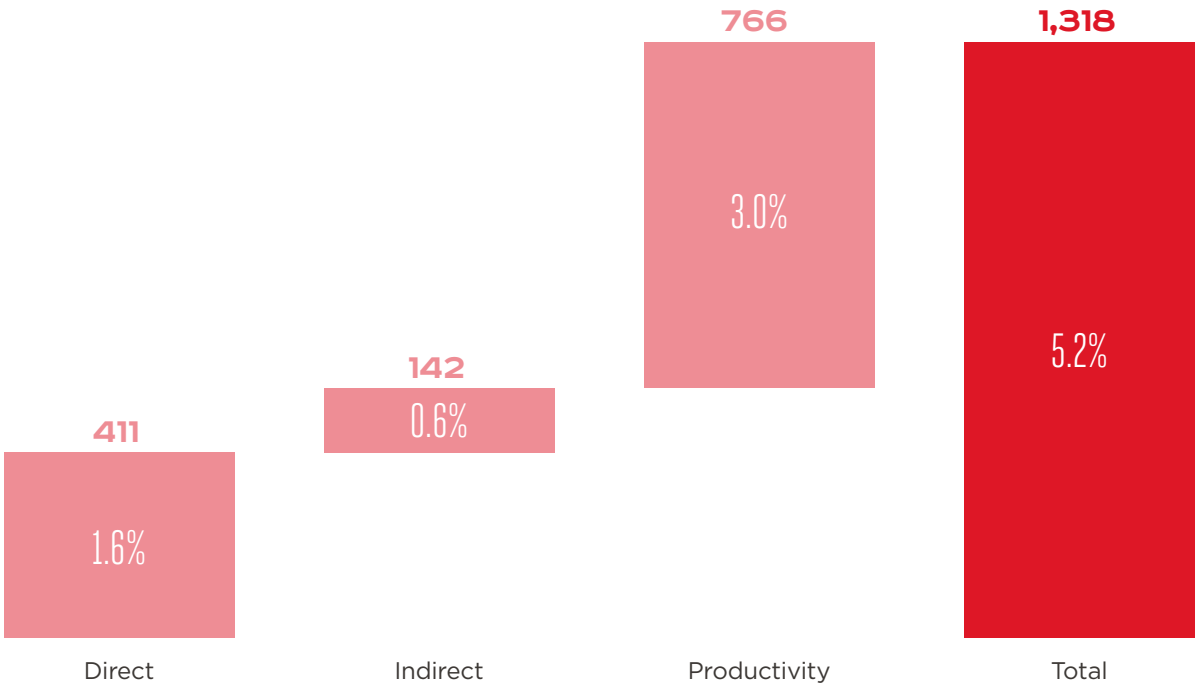
1.3 The mobile industry makes a significant contribution to national economies in Asia Pacific

The mobile sector in Asia Pacific makes a significant contribution to the region's economy of more than $1.3 trillion, equivalent to 5% of total GDP in 2016, when accounting for direct, indirect and broader productivity effects. The mobile ecosystem directly contributes $411 billion, of which $246 billion comes from mobile operators, with the rest reflecting expenditure on infrastructure, device manufacturing, distribution, retail and content services.

The mobile ecosystem generates additional growth through its indirect impact on the wider economy ($142 billion). Improvements to productivity ($766 billion) come from increased use of mobile telephony, mobile internet and machine-to-machine (M2M) connections.

Figure 3

Contribution of the mobile ecosystem to GDP ($ billion, % 2016 GDP)



Source: GSMA Intelligence

The mobile ecosystem directly supports more than 6.4 million jobs, including 1.6 million in device manufacturing and 2.6 million in distribution across Asia Pacific, as well as a further 9.7 million jobs resulting from the indirect impact of the industry on other sectors.

The mobile industry also helps fund the public sector in Asia Pacific. In 2016, the region's governments raised more than $166 billion in tax revenue from the mobile industry, which equates to 40% of the direct economic contribution of the mobile ecosystem to Asia-Pacific economies.

1.4 Sector-specific taxes on mobile economy hinder connectivity and development of the mobile industry

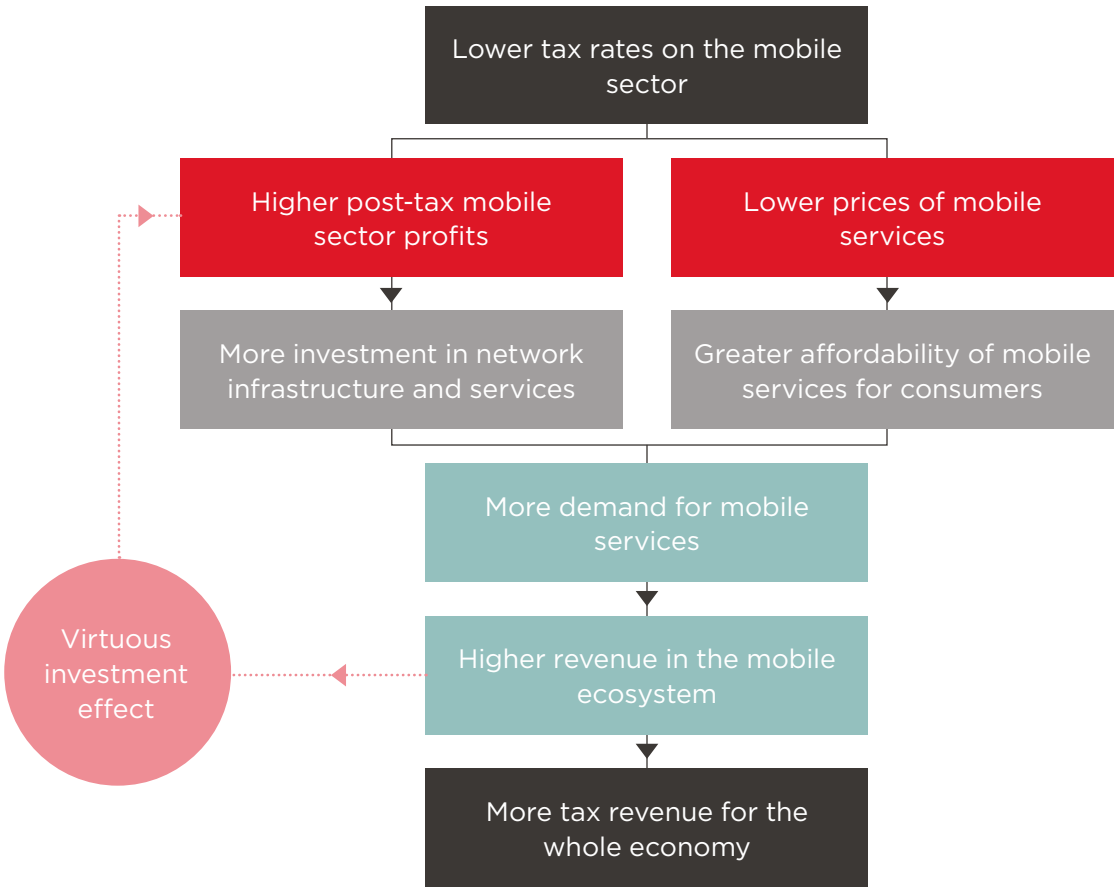
Sector-specific taxes on the mobile economy have a negative impact on the industry's consumers and its operators. These special taxes on the consumption of mobile services make mobile services more expensive, widening the digital divide when usage becomes too costly for those on low incomes.

High and volatile sector-specific taxes on operators also deter investment by making operators less inclined to undertake riskier investments in mobile services and infrastructure. The negative impact on both consumers and operators can become self-reinforcing as a drag on both the consumption and supply of mobile services.

By contrast, lowering sector-specific taxes on the mobile sector can improve take-up of mobile services and mobile connectivity. More affordable mobile services stimulate greater demand, and lower sector-targeted taxes on operators encourage them to invest more in network infrastructure, which leads to better services and greater demand, via a virtuous circle of reinforcement. As shown in Figure 4, a combination of reduced taxes on consumption and supply leads to higher demand in the medium term, greater revenues for the sector, and more funds for re-investment in mobile networks and services, not to mention higher overall tax receipts for the government from an enhanced economy.

Figure 4

How lower tax rates can lead to higher overall tax revenues



Source: GSMA Intelligence

2 Taxation on the mobile industry in Asia Pacific

2.1 Overview of mobile taxes and fees in the region

Governments worldwide tax most goods and services at standard rates that apply across their respective economies. They tend to raise the level of taxes on a particular good or service beyond the standard rate in order to reduce its personal consumption, such as with tobacco or alcohol, or to curb other negative externalities on society – to reduce, for example, pollution and environmental damage.

However, some Asian governments apply a number of different and often special taxes to the mobile industry over and above the general taxation applied to other sectors of the economy, despite the positive externalities of mobile goods and services – i.e. the larger societal and economic benefits arising from mobile usage, such as higher levels of growth and productivity. Moreover, in some countries, governments consider mobile use a luxury and implement sector-specific taxation on that basis.

These governments have resorted to sector-specific taxation on the mobile industry as a key source of tax revenue for their current budget needs. A low rate of formal, trackable and taxable employment characterises underdeveloped economies. This may change in the future as more workers become identifiable through banking and identity services provided by the mobile sector. According to the UN's International Labour Organization (ILO),[3] informal employment across emerging Asian economies accounts for more than 70% of workers in countries such as Pakistan and India. The mobile industry's high profile in the country and transparent billing systems make its economic activity easier to target for taxes and fees.

Table 1 summarises taxes and fees on the mobile industry in Asia Pacific.

3 Women and Men in the Informal Economy: A Statistical Picture, second edition, ILO, 2013

Table 1

Overview of taxes and fees in the region

CONSUMERS		OPERATORS		
Tax base	**Tax type**	**Tax base**		**Tax type**
Handsets	VAT	General taxes	Profits	Corporation tax
				* Additional corporate tax
	Customs duty		Revenue	Turnover tax
	* Additional VAT			Other revenue taxes
	* Excise taxes		Network equipment	Customs duty
Activation	VAT	Regulatory fees and other payments	Revenue or fixed amounts (one-off or recurring)	* Universal service contributions
	* Activation fees			* Licence and regulatory fees
	* Connection fees			* Spectrum fees
Usage	VAT			
	* Additional VAT			
	* Excise taxes			
	* Withholding taxes			

* Sector-specific

Source: GSMA Intelligence

Users of mobile services are taxed when buying a mobile device, when activating a service and when using their mobile phones.

- **Devices** are subject to general taxes such as value-added tax (VAT) and customs duties. Some markets have also introduced additional sector-specific taxes such as excise taxes on the handset value or higher VAT rates for more expensive handsets considered luxury goods.
- In some countries, on **activation** of their mobile services, consumers also pay general taxes such as VAT on the sale of a SIM card and sector-specific taxes such as activation fees on SIM cards or connection charges.
- Finally, the **usage** of mobile services is subject to general taxes, such as VAT and a General Service Tax (GST), and in some countries sector-specific taxes, withholding taxes, or higher VAT rates when governments classify certain mobile services as a "luxury".

Operators also face various taxes on the provision of mobile services. Aside from general taxes, such as corporate tax, operators contribute to public funding through a number of sector-specific taxes and fees. They typically pay one-off and recurring licence and spectrum fees, as well as additional taxes on revenue or profits in some countries. One-off spectrum fees, in particular, can amount to hundreds of millions of dollars per year. In Asia, many operators also contribute to universal service funds from their gross revenues via annual taxes or fees.

2.2 Sector-specific taxation is not aligned with best practices in taxation

An effective tax policy has to balance a number of competing factors, including the government's need for revenue, support for key economic sectors, the practicalities of enforcement and collection, and the desire to minimise any distorting impact on the wider economy.

International organisations such as the World Bank,[4] the International Monetary Fund (IMF),[5] the International Telecommunications Union (ITU)[6] and the Organisation for Economic Cooperation and Development (OECD)[7] acknowledge a number of established and accepted principles for an effective tax system. Such principles seek to minimise distortions from taxation and account for informal activity or limited institutional capabilities.

Table 2 shows a framework of best practice, drawing on economic principles of efficiency, equity (or fairness), simplicity, predictability and transparency. The six best-practice principles outline specific steps for implementing effective taxation.

Table 2

General tax principles in sector-specific taxes

CONCERN	BEST-PRACTICE PRINCIPLE
Efficiency	
Taxes raise prices for consumers and costs for firms – hence they may reduce levels of consumption and production as well as divert investments.	An efficient tax system should rely on **low rates and wide bases** to minimise the impact on consumption and production, while raising the required revenue.
Different taxes across sectors are distorting in that they change the relative prices of goods and services.	Taxation should be **broad-based across sectors**. Adopting the same tax rates across firms and sectors and minimising the use of tax exemptions could reduce distortions in the economy.
Taxes encourage positive externalities and discourage negative ones.	Taxes should **account for product and sector externalities**, by encouraging, via lower specific tax rates, the consumption and production of goods and services that generate positive, broader economic impacts. Higher rates of taxation should apply to products or services that cause negative externalities.
Equity	
Vertical equity – taxpayers' ability to pay should be taken into account.	Taxes should be **progressive**, in line with a taxpayer's income or wealth. Taxes at the same level for all, and especially taxes on necessity goods, are regressive.
Horizontal equity – taxpayers with the same characteristics should face comparable taxes.	Similar taxpayers should have **similar tax treatment**, particularly across firms in similar or competing sectors.
Simplicity and transparency	
Complex and unpredictable tax policy increases compliance costs and discourages investment.	A **simple and transparent tax system** reduces the number of taxes with which firms must comply, promotes fair treatment and reduces the risk of evasion. A stable, predictable tax design also generates less cost for businesses and creates more certainty for investment.

Source: GSMA Intelligence based on IMF, ITU and OECD.

4 Introduction to Tax Policy Design & Development, Bird and Zolt, 2003
5 Taxing Principles, IMF, 2014
6 Taxing Telecommunication/ICT services: an overview, ITU, 2013
7 Fundamental principles of taxation in Addressing the Tax Challenges of the Digital Economy, OECD, 2014

SECTOR-SPECIFIC TAXES TEND TO CREATE INEFFICIENCY

Mobile-specific taxes typically raise the selling price of mobile services and devices, which reduces their consumption and production across the economy. In the long run, decreased production and consumption result in lower tax revenue.

When special tax rates apply only to the mobile sector, they distort the functioning of the mobile market compared to the rest of the economy. For instance, by increasing prices for consumers and raising costs for firms, these taxes may lead to lower profitability in the mobile market compared to other industries and mobile markets in lower-tax countries. This mismatch can make investing relatively less attractive in a high-tax sector and high-tax country, leading to underinvestment by domestic and foreign investors in the country's mobile industry and an inefficient allocation of capital across the economy.

Finally, sector-specific taxes are not aligned with best-practice taxation in terms of accounting for the positive externalities of mobile connectivity. The use of mobile services boosts productivity and facilitates access to information – the modern digital economy's raw material. As such, the mobile industry becomes a platform for a wider range of services. Sector-specific taxes, by inducing lower consumption and production of mobile services, can limit these positive, broader impacts. The OECD, in particular, has highlighted the problems of introducing taxes in sectors with positive externalities such as the telecoms sector.

SECTOR-SPECIFIC TAXES DISPROPORTIONATELY AFFECT THE POOREST SEGMENTS OF THE POPULATION

Consumer taxes and fees in the mobile market tend to have a greater impact on the poorest households, thereby exacerbating income inequality, as shown in the analysis in Section 4. Applying sector-specific taxes on mobile services means a large section of the population is subject to additional taxes, with the poorest paying the highest percentage share of their income or savings. Unlike a typical graduated and progressive income tax, where high earners pay a higher rate of tax compared to those earning less, mobile taxes are often the same for all people, regardless of their income levels.

In some countries, mobile taxes alone amount to as much as 6% of income for the poorest 20% of mobile users: this is particularly the case for taxes imposed as one-off or upfront charges, such as taxes on connections. Even for recurring consumption taxes levied as a percentage of the price of mobile services, low earners are affected more than high earners. Such taxes will still have a regressive effect, as any tax on the consumption of widely consumed goods is inherently regressive.

Since governments do not levy additional taxes on most other sectors, the mobile industry and its consumers suffer disproportionately compared to the wider economy. At the corporate level, this inequity violates the principle of horizontal equity – of fairness in similar tax treatment for similar firms – set out as a best-practice principle by leading international organisations.

SECTOR-SPECIFIC TAXES TEND TO INTRODUCE COMPLEXITY

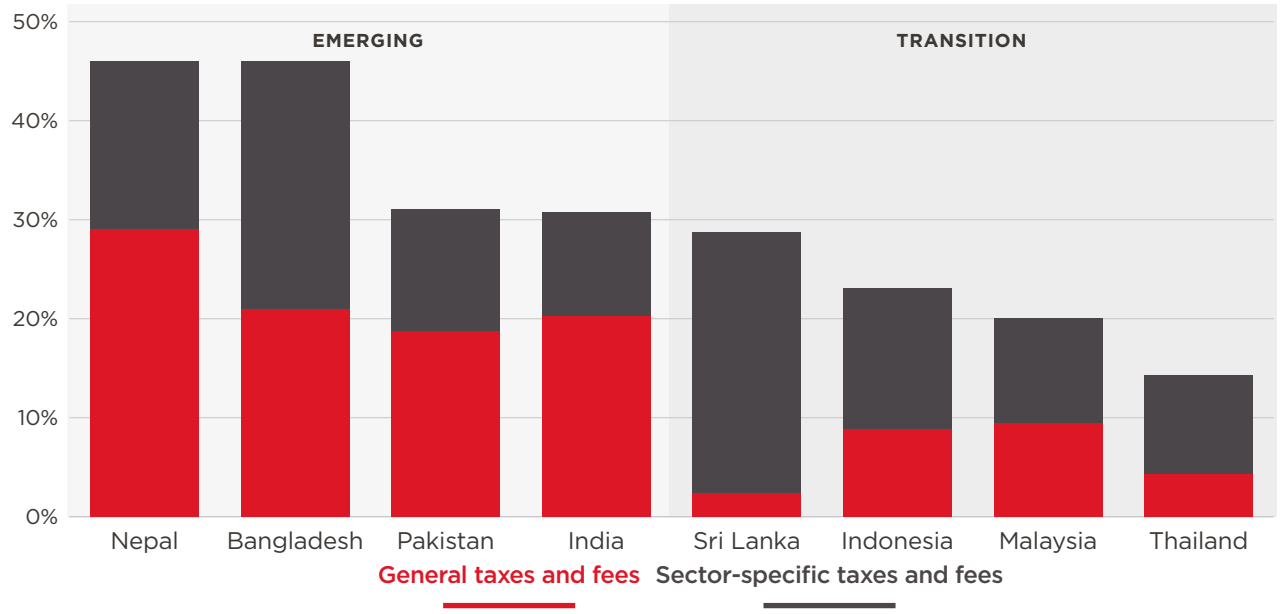
The range of sector-specific taxes paid by operators does not typically align with the best-practice principles of encouraging simplicity, predictability and transparency in tax design. This misalignment can raise operators' compliance costs, create barriers for new firms in the market, or lead to slower investment and innovation, as explained further in Section 4.

SECTOR-SPECIFIC TAX PAYMENTS REPRESENT A SIGNIFICANT PART OF THE MOBILE SECTOR'S TAX PAYMENTS

Figure 5 shows total tax payments and fees in Asian countries for which we have data. These include general and sector-specific taxes paid by consumers and operators. In these eight countries, taxes represent on average 30% of market revenue.

Figure 5

Total tax payments and fees, proportion of market revenue



2015 data for Pakistan, Sri Lanka and Thailand. 2014 data for the remaining countries. Data for 2014 does not include spectrum fees.

Source: GSMA Intelligence

Across the sample of eight Asian countries, sector-specific taxes account for on average half of the mobile sector's total tax payments, with the mobile industry and its consumers contributing an average of 10–20% of market revenues in tax.

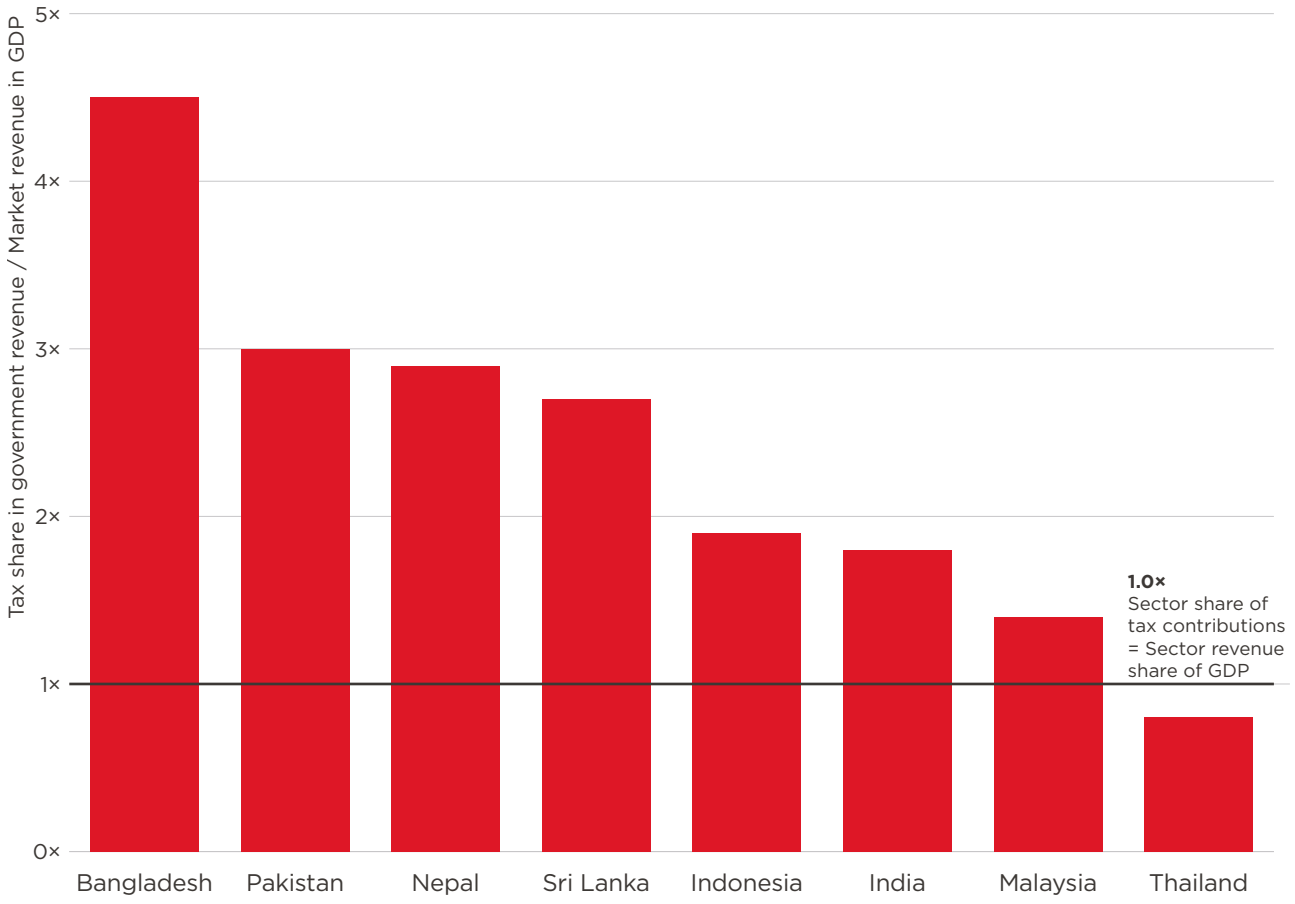
In Sri Lanka, operators pay more than 90% of their tax as sector-specific taxation: this is the highest percentage in our sample of 33 countries across Asia Pacific, Sub-Saharan Africa and Latin America.[8] However, as Sri Lanka re-introduced VAT on mobile services in 2016, we expect the payments by the country's operators for general taxes to increase.

As a result of sector-specific taxation, the relative contribution of the mobile sector in tax and fee payments as a share of total government tax revenues is usually much higher than the sector's share of GDP. Within the sample of countries for which we have data, we found that the mobile sector's average contribution to government tax revenue was more than double the industry's share of GDP. With the exception of Thailand, operators in all the sampled countries face a greater tax share than their sector's relative contribution to GDP.

8 For tax payments as a proportion of sector revenue, see *Taxing mobile connectivity in Sub-Saharan Africa* and *Taxing mobile connectivity in Latin America* reports.

Figure 6

Sector share of tax contributions as a proportion of sector share of GDP



2015 data for Pakistan, Sri Lanka and Thailand. 2014 data for the remaining countries. Data for 2014 does not include spectrum fees.

Source: GSMA Intelligence

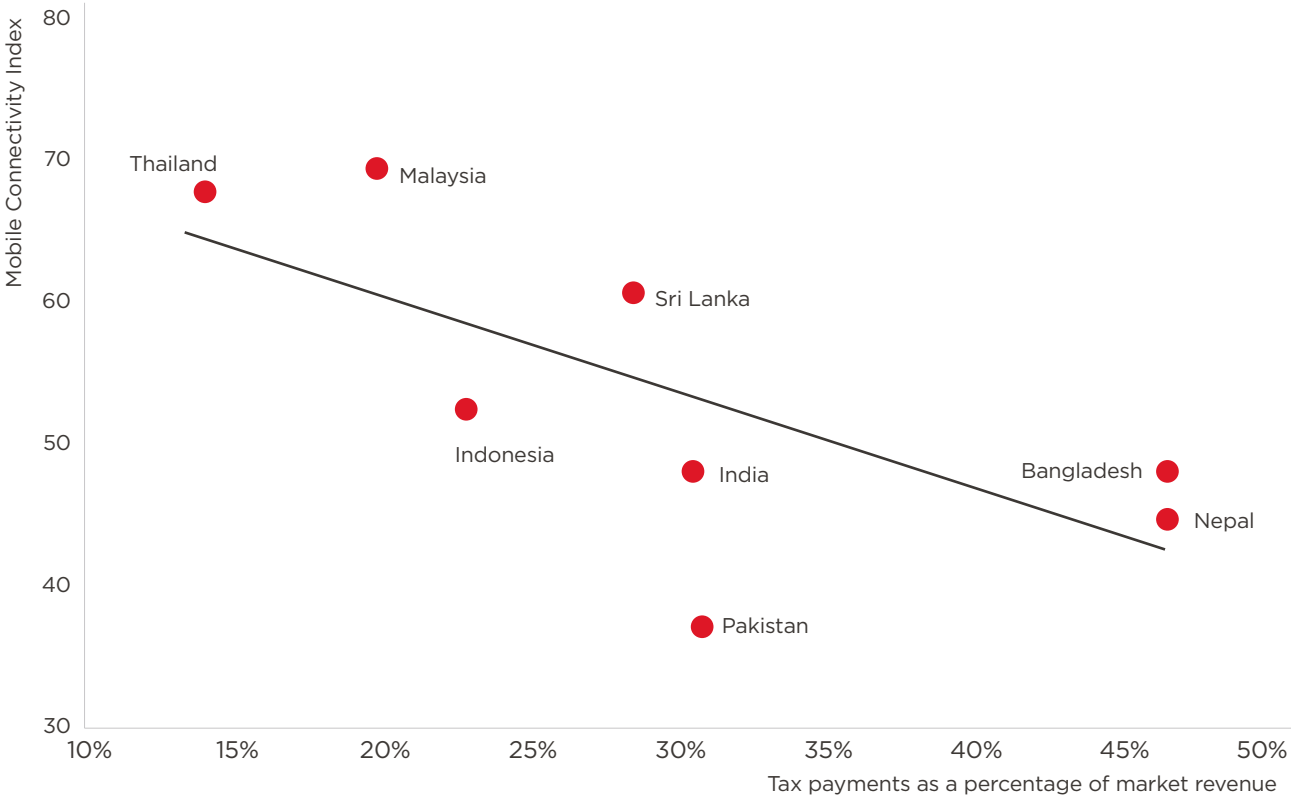
Bangladesh stands out in this regard. In 2014, its operators directly contributed 1.6% of the country's GDP. Yet the operators paid 7.2% of Bangladesh's total governmental tax revenue in the same year, or 4.5 times the share of their contribution to GDP.

As shown in Figure 7, such large diversions of revenue from operators to governments can have a negative impact on connectivity. Within the Asia-Pacific region, mobile connectivity[9] is lower in countries where operators make higher tax payments. When operators retain a higher percentage of their revenue, mobile connectivity in the country is higher because the operators have more funds to spend on investment in better infrastructure, which in turn promotes increased penetration of mobile services.

9 The GSMA Mobile Connectivity Index measures a country's level of connectivity and takes into account infrastructure, affordability, consumer readiness and content. Available at www.mobileconnectivityindex.com

Figure 7

Tax payments as a proportion of revenue (2014/15) and mobile connectivity (2016)



Source: GSMA Intelligence

A recent survey by the Asia Internet Coalition drew a similar conclusion. Some 83% of executives in 300 digital start-ups, investment firms and multinational businesses across 11 Asia Pacific countries said that adopting the correct tax approach acts as an important policy lever for a country to become a digital nation. The respondents highlighted the following as their top concerns about tax policies that would lead to delayed or cancelled investment:[10]

- inconsistent or unpredictable treatment by tax authority
- special taxes that discriminate against the digital sector
- over-complexity in the tax laws.

10 Digital Nation: Policy Levers for Investment and Growth, AlphaBeta for the Asia Internet Coalition, 2017

3 Taxes imposed on consumers and operators in Asia Pacific

3.1 Consumer taxes and fees

As shown in Table 3, all sector-specific consumer taxes are problematic in terms of both efficiency and equity.

- Sector-specific taxes on activation, usage and handsets distort consumption in the mobile market compared to other sectors in the economy and decrease the amount of mobile devices and services that the economy would otherwise produce and consume. Moreover, taxes on activation, usage and handsets are not efficient in that they tend to have narrow tax bases, and constrain the positive social and economic externalities that arise from mobile connectivity.
- Sector-specific consumer taxes do not align with best practice in terms of vertical and horizontal equity because they represent a higher share of income for poorer consumers (i.e. vertical inequality), and they discriminate against consumers in the mobile sector compared to consumers in other markets (i.e. horizontal inequality).
- Governments tend to enact VAT and customs duties as standard rates across the economy, characterised by a wide tax base, with fairness to all sectors (horizontal equity). However, they discourage the positive externalities of mobile connectivity (which would require a reduced tax treatment). Like all taxes on the consumption of general goods, high VAT and customs duties are also regressive in that they take away a greater share of income from poorer households.

Table 3

Alignment of consumer taxes with best-practice taxation principles

	EFFICIENCY			EQUITY		SIMPLICITY, PREDICTABILITY AND TRANSPARENCY
	Wide base	Broad-based across sectors	Accounts for externalities	Vertical equity (not regressive)	Horizontal equity (even tax treatment)	
Sector-specific taxes						
Sector-specific tax on activation	✗	✗	✗	✗	✗	○
Sector-specific tax on usage	✗	✗	✗	✗	✗	○
Sector-specific tax on handset	✗	✗	✗	✗	✗	○
General taxes						
VAT	✓	✓	✗	✗	✓	✓
Customs duties	✓	✓	✗	✗	✓	✓

✗ Taxes do not follow the best-practice principle

✓ Taxes are typically consistent with the best-practice principle

○ Impact on simplicity and transparency depends on the specific design of the tax

Source: GSMA Intelligence

We analysed the consumer tax rates and fees, applicable in 2016, of a sample of 24 countries from across Asia Pacific:

- **Of the 24 nations, 13 have sector-specific consumer taxes in addition to a general sales tax or VAT.** All five advanced digital societies and the transition digital societies of Malaysia, Thailand, Vietnam and the Philippines have no sector-specific taxes. India and Bhutan are the only emerging digital societies with no sector-specific taxes on consumers, and notably both countries have a higher level of mobile internet penetration than any other country in the group of emerging digital societies.
- **Customs duties on handsets are prevalent across the region:** for six of the 13 countries with consumer taxation on mobile users, such import duties are the only tax imposed on top of VAT; the other seven nations have sector-specific taxes on usage and activation in addition to VAT.

Figure 8 shows, by country, the types of taxes on mobile consumers in the seven Asian nations with a range of sector-specific domestic taxes: four one-off levies and two on continuing usage.

- Pakistan has the most complex mobile tax structure – a consumer pays six different taxes just for using a mobile phone: four times when starting service with a new phone and twice more every time they use their phone.
- Bangladesh and Sri Lanka also have three or more mobile consumer taxes. Sri Lankan consumers pay tax twice on mobile services, and three times if the phone comes from abroad. Moreover, as outlined in the case study below, Sri Lankans pay three other general taxes for mobile services on top of these mobile-specific taxes.

Figure 8

Overview of consumer taxes and fees in Asia Pacific (2016), excluding VAT

Source: GSMA Intelligence

CASE STUDY
Sri Lanka's complex taxes

Sri Lanka's tax policy on mobile services has changed significantly over the last 15 years. Before 2004, services were only subject to 12% VAT. In 2004, the government introduced a sector-specific tax of 2.5% of the price of mobile services, which increased the effective tax rate to 15%. Sri Lanka currently taxes users at almost 50% of the price of their voice calls. As detailed below, where we assess three periods of tax policy on the Sri Lankan mobile sector, the growth in subscribers faltered from 2007 coinciding with increasingly complex taxes:

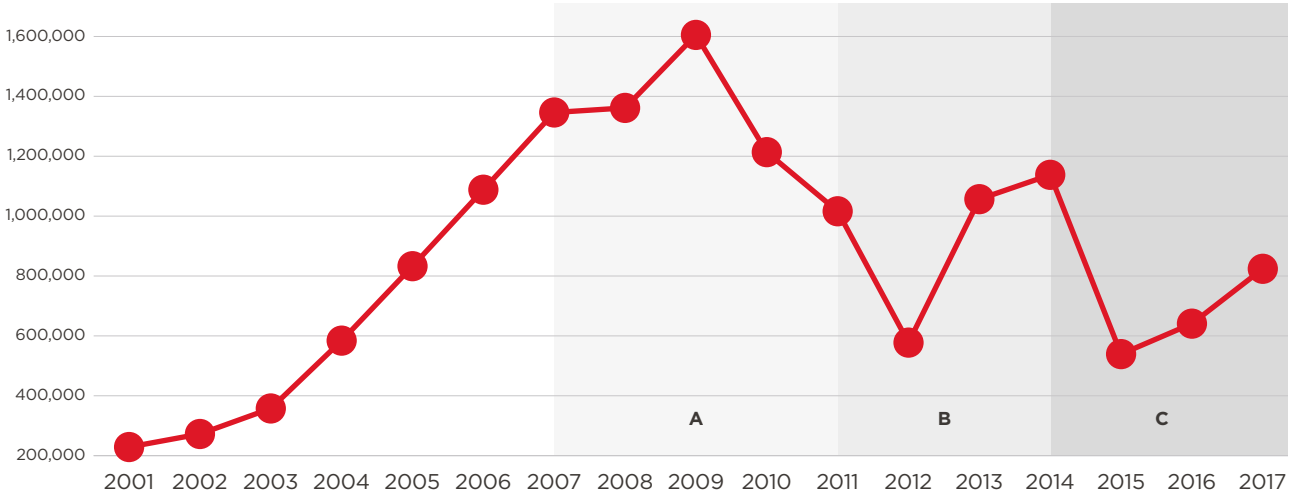
A **2007–2011: Tax increase and build-up of other general taxes.** The government increased the sector-specific tax to 10%, which raised the effective tax rate to 23% and then introduced further taxes across the economy (a 2% CESS – an additional tax – and 3% Nation-Building Tax), bringing the effective tax rate to 29% by 2011. The initial rapid growth of subscribers in this period slowed compared to the years prior to 2007.

B **2011–2014: Tax consolidation and broadband-specific tax cuts.** Following the recommendation from Sri Lanka's Telecommunications Regulatory Commission, the government introduced a single sector-specific tax at 20% of prices to replace the compounding of four different sector-specific and general taxes. In addition, in 2013, the government cut the sector-specific tax on broadband services to 10%. This action accompanied an acceleration in the increase in number of mobile subscribers.

C **2014–present: Increase in voice-specific taxes, re-introduction of compounding taxes and elimination of data-specific tax.** The government announced that the 2016 budget would re-introduce general taxes on the mobile sector – most notably 15% VAT. This VAT, along with an increase in the voice-specific tax to 25% in 2014, created an effective tax rate of almost 50% for voice services and 32% for data services. As shown in Figure 9, net additions were lower in this period than before, although the removal of the broadband-specific tax on data services in 2017 (reducing the effective tax rate to 20% for data) will help boost take-up of mobile data services.

Figure 9

Annual net additions of subscribers in Sri Lanka



Source: GSMA Intelligence

ACTIVATION TAXES AND FEES

In some countries, mobile consumers pay taxes when activating their service, through general taxes (for instance, VAT on the sale of a SIM card), sector-specific taxes (such as activation fees on SIM cards) or connection charges. These can be either one-off (at the beginning of using mobile services) or recurring, annual payments (such as with SIM taxes in Brazil).

As in most developed markets, such as those of Europe or North America, activation and connection taxes appear infrequently in Asia Pacific. Such taxes are more common in less developed regions such as Sub-Saharan Africa.[11]

Two countries impose activation and connection taxes in Asia Pacific:

- Pakistan has a nominal numbering fee of PKR0.5 ($0.005) but also continues to charge PKR250 ($2.49) per SIM. This tax remained unchanged in Pakistan's 2017 mobile-tax reforms.
- In Bangladesh, customers buying new or replacement SIM cards paid a flat-rate tax of BDT100 ($1.27) and a 25% supplementary duty on the cost of the SIM. The flat rate was eliminated in 2017, but the supplementary duty on the SIM rose to 35%.

Globally, Pakistan is now one of only three countries, in addition to Brazil and Chad, that apply a double tax on activating a new service. As well as Bangladesh, Niger recently ended double taxation of SIMs.[12]

Table 4

Activation taxes in 2016

	Activation tax (LCU)	Activation tax (USD)
Pakistan	PKR0.5 numbering fee + PKR250 per SIM	$0.005 numbering fee + $2.49 per SIM
Bangladesh	BDT100 per new and replacement SIM + 25% supplementary duty	$1.27 per new and replacement SIM + 25% supplementary duty

Source: GSMA Intelligence

Some reform has occurred as governments in both Pakistan and Bangladesh reduced SIM taxes after 2000.

In Pakistan, the tax changed from PKR2,000 ($19) to PKR1,000 ($9.60) in 2004, followed by another 50% decrease in 2005 to PKR500 ($4.80). These cuts led to rapid growth in the number of mobile connections in Pakistan.

The government in Bangladesh reduced its SIM tax three times between 2011 and 2016, reducing the tax from BDT800 ($10.10) to BDT100 ($1.27).

The continued presence of such taxes in both countries still restricts access for the poorest and unconnected. Imposing additional costs to access mobile services risks dampening the widespread benefits of broader mobile penetration in society.

USAGE TAXES

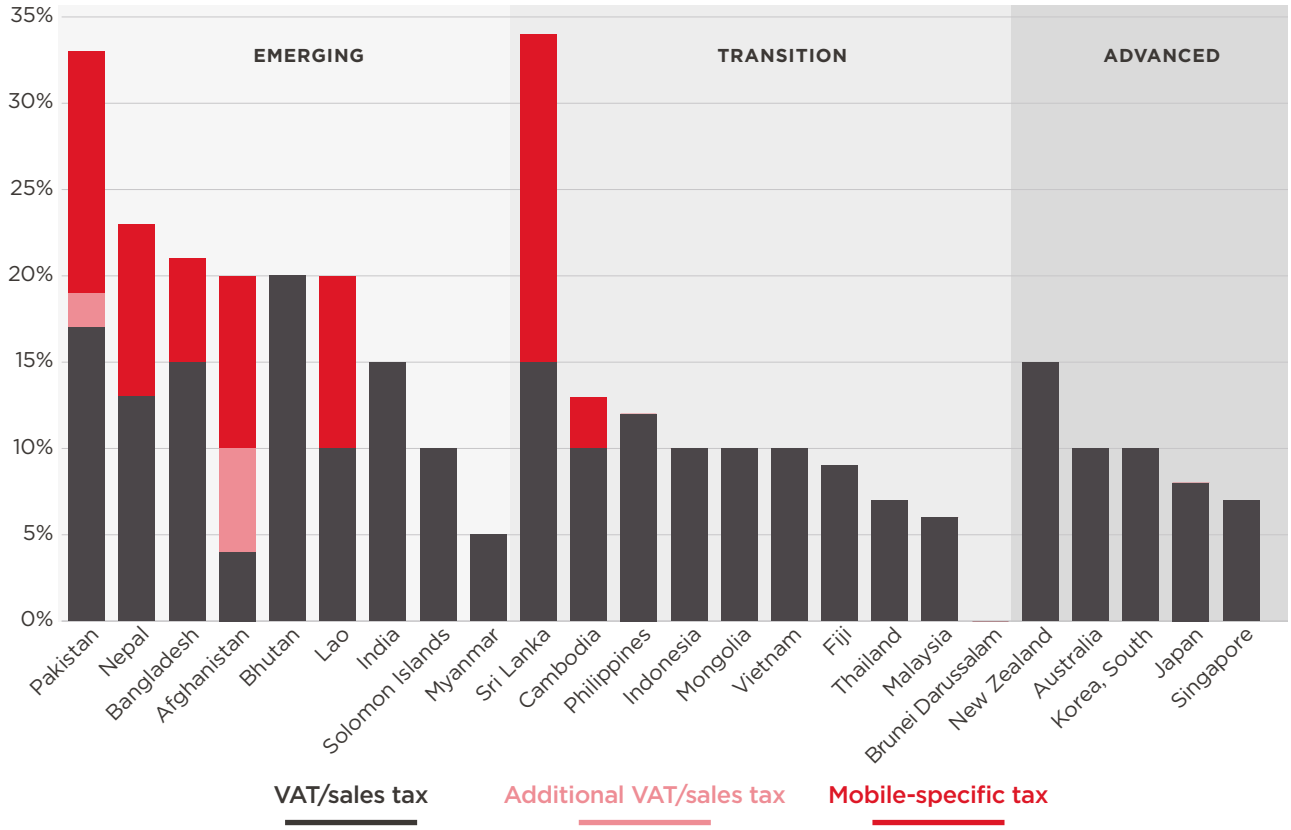
Mobile users pay additional, mobile-specific taxes or additional VAT rates for the use of voice, SMS and data in seven of the 24 sample countries analysed. These seven have excise taxes and, among them, Afghanistan and Pakistan also have additional specific sales-tax rates for mobile services. In 2016, Sri Lanka and Pakistan had effective usage-based tax rates above 30% that apply to both data and voice services, although data taxes in Sri Lanka have since declined.[13] Myanmar's tax rate is the lowest in the emerging group, which reflects the drive there towards mobile sector development.

11 Taxing Mobile Connectivity in Sub-Saharan Africa, GSMA, 2017.
12 A positive outlook – Niger's digital inclusion and economy set to rise as a result of mobile tax reductions, GSMA, 2017.
13 This figure assumes the use of a "medium" basket of mobile services, consisting of 1 GB of data per month, 250 minutes of voice calls and 100 SMS.

Countries in Asia Pacific that have introduced sector-specific forms of taxation on mobile usage tend to have higher overall tax rates (i.e. the sum of general and sector-specific taxes). This is especially true in emerging digital societies, where sector-specific usage taxes add, on average, an extra 10% to the cost of using mobile phones. As shown in Figure 10, no advanced digital society in the region has sector-specific taxes.

Figure 10

Tax rates applying to usage in Asia Pacific in 2016



Source: GSMA Intelligence

Because taxes on mobile usage are regressive, these additional taxes have likely limited the growth and adoption of mobile and mobile internet services, particularly among the poor.

- For mobile-usage taxes, Sri Lanka had a combined rate of 34% in 2016, consisting mainly of a 25% tax on voice calls. In 2017, the Sri Lankan government reduced this tax rate by removing the specific data-usage tax of 10%, which brought the overall data-usage tax burden below 20%. However, voice and SMS taxes amount to almost 50% after accounting for all general taxes applied to those services.
- India introduced a general sales tax (GST) across the country in 2017 and now taxes mobile services nationwide at 18%. With the exception of the highest tax band of 28%, reserved for harmful products such as alcohol and tobacco, this is the highest GST band of the five currently in force.
- In late 2017, the parliament in Afghanistan voted to remove an additional 10% mobile specific tax on prepaid services, which reduced Afghanistan's usage tax burden to 10%.
- Also in 2017, Pakistan reduced the sales tax in federally administered territories from 18.5% to 17.0%. However, the provincial government of Punjab instead removed the exemption on sales tax for mobile broadband (as detailed in the case study below). The country's withholding tax on mobile services also declined from 14.0% to 12.5%. This was the highest rate applied across the country's sectors.

CASE STUDY

The return of mobile sector taxation in the Punjab province of Pakistan

Pakistan's tax system has relied on provincial sales taxes or federal excise taxes where provincial taxes do not apply. In 2015, the country's most populated province of Punjab, home to more than half the country's population, enacted a 19.5% provincial sales tax on internet services, including mobile internet services. It did so despite strong opposition to the tax. The Punjab government soon after reversed its decision to impose the tax by granting an exemption to internet services in the province but retaining the sales tax on other services.

In 2017, however, only two years after granting an exemption to internet services, the Punjab government announced that it would remove the exemptions for internet, apart from student services priced below PKR1,500 ($14.30) per month.

The reinstated provincial sales tax threatens to stall the steady growth of mobile internet penetration in Pakistan, which has increased from 18% in 2012 to 34% today. The regressive tax on mobile consumption makes use of the internet more expensive, particularly among the poor, who potentially would benefit the most.

HANDSET TAXES

Handsets are sometimes subject to a high tax burden compared to taxes on usage of mobile services. Some markets in the region levy customs duties, while others (such as Sri Lanka, Bangladesh and Pakistan) have introduced special taxes on handsets.

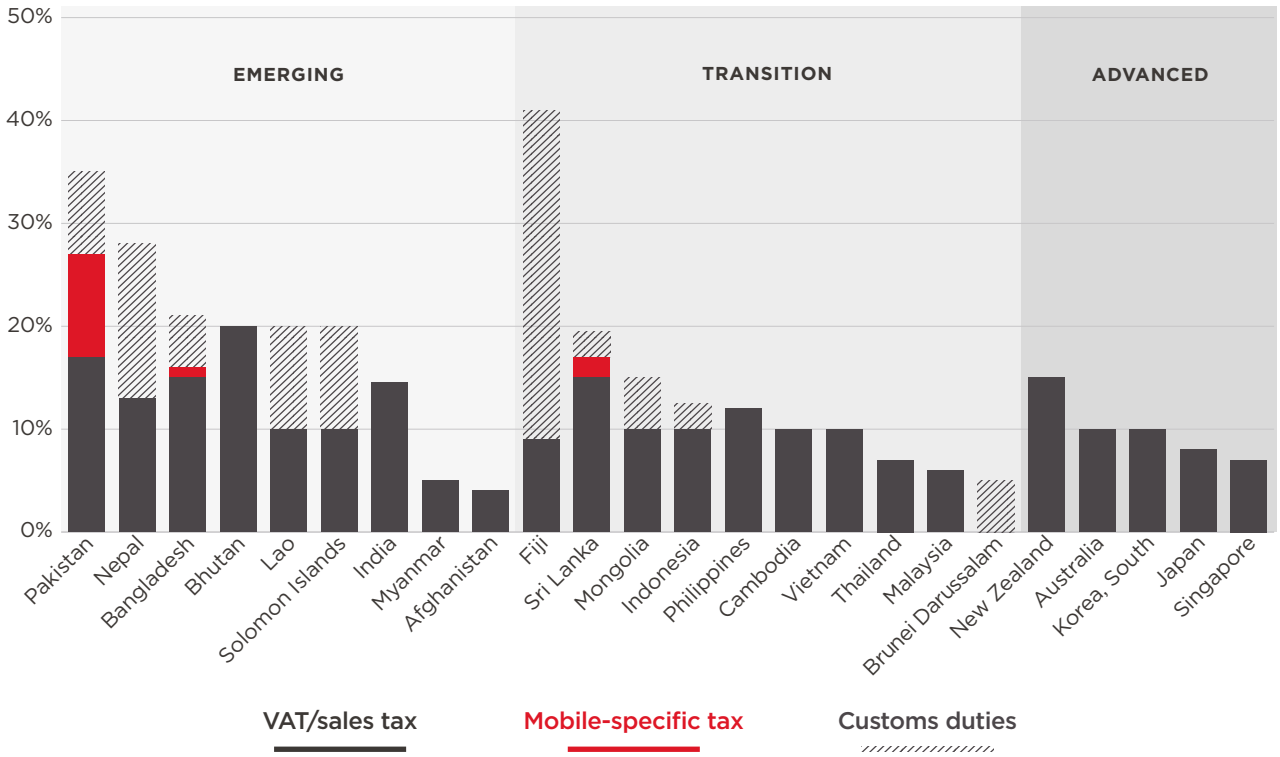
Pakistan has high fixed-rate taxes on mobile handsets, which initially varied according to handset type. The most expensive handsets had a "luxury" tax of PKR1,500 ($14.30) in 2016. The example in Figure 11 shows the impact of a PKR300 ($2.90) tax on a phone worth PKR2,999 ($28.60), which is an effective 10% sector-specific tax. Pakistan's handset tax became more regressive in 2017 when the government consolidated the graduated rate, varying with handset price, into a single PKR650 ($6.20) charge. Such consolidation simplified the tax system but at the expense of the poor, who tend to buy lower cost phones.

Customs duties can also add to the cost of buying handsets. As shown in Figure 11, Fiji is an outlier and imposes a hefty 32% duty on imported mobile phones. The rates of import duties in other countries vary according to whether imported handsets come from free-trade partners in the region. Figure 11 reflects the effective tax rates on handsets after applying customs duties.

Governments across the world sometimes impose customs duties to protect the domestic production of devices. For example, in 2017, India added a 10% customs duty on smartphones and accessories to encourage the manufacture of high-value smartphones within the country. Such customs duties are a barrier to trade and affect local consumers, who must pay higher prices, particularly in countries where local handset manufacturing remains an infant industry or confined to low-end models.

Figure 11

Tax rates for handsets and mobile devices in Asia Pacific in 2016



Customs duties are applicable to handsets imported from outside free-trade agreements

Source: GSMA Intelligence

TAXES ON INTERNATIONAL CALLS

Some consumers in Asia also face additional taxes on outgoing and incoming international call traffic. Taxes on outgoing international calls resemble usage taxes for domestic calls: the domestic operator has to pay a certain amount of, for example, a fixed fee per minute. More common globally, and especially in Sub-Saharan Africa, are surtaxes on international incoming traffic whereby the government sets a termination charge on incoming international calls and then collects a portion of this fixed charge for its revenues. Although aimed at, and paid by, operators, they are based on the volume of international traffic and result in higher prices for consumers.

Our analysis[14] shows that these taxes raised prices of terminating international calls by an average of 97% and decreased the volume of international calls by 14–36% in Sub-Saharan Africa. Higher international call prices mean consumers without access to the internet can lose out on connecting with the rest of the world – particularly important to many poorer communities that rely on internationally transmitted remittances from friends or relatives to survive.

In Asia Pacific, taxes on international calls are uncommon but, as shown in Table 5, do exist in several countries in South Asia. For example, Sri Lanka imposes taxes on both incoming and outgoing international calls.

Table 5

A sample of taxes paid by operators or consumers on international outgoing and incoming calls in Asia Pacific

	Taxes on international calls
Nepal	25% of operators' incoming revenue and 25% of outgoing revenue
Sri Lanka	LKR3 ($0.02) per minute per outgoing call, $0.06 per incoming call
Bangladesh	40% of operators' incoming net revenue and 30% of outgoing net revenue

Source: GSMA Intelligence

14 Mobile taxation: Surtaxes on international incoming traffic, GSMA, 2011

3.2 Mobile operator taxes and fees

Besides paying corporate taxes on profits, mobile operators are subject to industry-specific fees. Governments impose recurring spectrum, regulatory and licence fees to recover the cost of providing operators with a certain service, such as spectrum management. However, governments often set these fees above cost or levy them without providing a service in return. Mobile operators must also contribute as much as 5% of annual revenues (in the case of India) to universal service funds (USFs), created to develop telecommunications infrastructure. However, some governments tend to administer and disburse these collected funds ineffectively.

Recurring spectrum fees, other regulatory fees and USF contributions act as further forms of sector-specific taxation and, as shown in Table 6, do not align with best practice in, for example, not extending across a broad tax base, discriminating against one particular sector and creating tax complexity.

Table 6

Alignment of operator taxes with best-practice taxation principles

	EFFICIENCY			EQUITY		SIMPLICITY, PREDICTABILITY AND TRANSPARENCY
	Wide base	Broad-based across sectors	Accounts for externalities	Vertical equity (not regressive)	Horizontal equity (even tax treatment)	
General tax						
Corporation tax[15]	✓	✓	×	○	✓	✓
Sector-specific tax						
Corporation tax for a specific sector	×	×	×	○	×	×
Recurring spectrum fees (if they represent double taxation)	×	×	×	○	×	×
Regulatory fees (if used as a means of revenue generation for the government)	×	×	×	○	×	×
Universal service contributions (if fund is underutilised)	×	×	×	○	×	×

× Taxes do not follow the best-practice principle

✓ Taxes are typically consistent with the best-practice principle

○ Impact on simplicity and transparency depends on the specific design of the tax

Source: GSMA Intelligence

15 Corporate taxes in the mobile industry do not account for the wider positive impact from mobile connectivity, which would require preferential treatment to encourage use of mobile devices and services.

RECURRING SPECTRUM AND REGULATORY FEES

Mobile operators typically pay a one-off fee to gain access to radio spectrum, often allocated through auctions. Some countries, such as Bangladesh and India, have also introduced recurring spectrum fees on top of this one-off charge (Table 7). Governments often justify the payments as a tool to recover the regulatory cost of spectrum management.

Unless regulators calibrate spectrum auction prices and recurring fees to encourage healthy competition in bidding rather than maximising tax revenue, recurring fees and excessive auction reserve prices can be inefficient and represent double taxation of the same resource. Raising spectrum fees unexpectedly after the competitive award of spectrum creates unnecessary uncertainty, which can limit investment and participation in future auctions. This can inadvertently reduce, rather than increase, overall revenues available from auctions.

Table 7

Examples of recurring spectrum and regulatory fees

	Regulatory and licence fees	Recurring spectrum fees
Australia	AUD1.18 per AUD1,000 of eligible revenue = 0.118% rate	
Bangladesh	BDT50 million ($630,000) per operator + 15% VAT for 2G or 5% VAT for 3G Regulatory fee of 5.5% of gross revenue	Based on the following formula: Spectrum Tariff Unit (BDT per MHz per Sq KM) × Contribution Factor × Bandwidth × Area Factor × Band Factor
India	3% of gross revenue (8% of gross revenue with USF contribution)	Based on spectrum bands: • 2012 awards: 3–8% • 2014/15 awards: 5% • 2016 awards: 3%
Indonesia	0.5% of revenue	
Pakistan	0.5% of revenue	

Source: GSMA Intelligence

Governments have created additional, separate regulatory fees and in some cases have introduced them without an aim of recovering any clear regulatory cost, instead using regulatory fees as a means to generate tax revenue. Such additional fees are an added tax on operators, with a negative impact on their ability to invest and reduce prices for consumers.

Regulators often base their fees on revenue rather than profits, which is problematic because taxes on revenues do not change even when the operators record a financial loss rather than a profit for the year. By contrast, taxing profits, rather than revenue, can motivate operators to reduce accounting profits by spending more on network investment and product innovation.

CONTRIBUTIONS TO UNIVERSAL SERVICE FUNDS

Despite operators' progress in extending coverage in the region to 85% for 3G and 75% for 4G, many people remain unconnected because they have no network available. Universal service funds (USFs) are one approach to extend connectivity via rural infrastructure to unprofitable, remote or scarcely populated areas.

USFs are popular in Asia Pacific. Governments fund USFs through central budgets, but in most cases do so via a tax on operators' gross revenues. Table 8 shows the tax rates of USFs in a sample of Asia-Pacific countries.

Table 8

Tax rates on operators by USFs in Asia Pacific

	USF contribution as a proportion of gross revenue
Bangladesh	1.0%
Fiji	0.5%
India	5% (as part of 8% licence fee)
Indonesia	1.25%
Malaysia	4.0%*
Nepal	2.0%
Pakistan	1.5%
Thailand	4.0%
Vietnam	1.5%

*6% of weighted net revenue; gross margin estimated at 70%

Source: GSMA Intelligence

USFs require careful design: they should target least-cost subsidies to roll out infrastructure, an independent and transparent management structure and measurable targets. It is particularly important to ensure the timely and complete disbursement of collected funds. For instance, India's USF collected billions of dollars over 15 years but has spent only 44% of its levies.

OTHER OPERATOR TAXES

Governments also target other taxes at mobile operators merely to support the central budget.

Mobile operators pay higher corporate income taxes than other companies in Bangladesh – the only country in the region where this occurs. The Bangladeshi government imposes the higher tax rate on top of an already complicated set of spectrum fees. Publicly traded companies in the country usually pay a 25% rate, or 35% if unlisted and privately held. However, mobile operators pay a 45% rate (or 40% if listed), higher than any other comparable rate apart from the tax on cigarette manufacturers.

The Sri Lankan government announced provisional plans in its 2018 budget for taxing cellular towers on the unfounded claim of health risks and unsightliness of such towers for the environment. This levy would tax operators LKR200,000 per month ($1,300) for each tower owned.

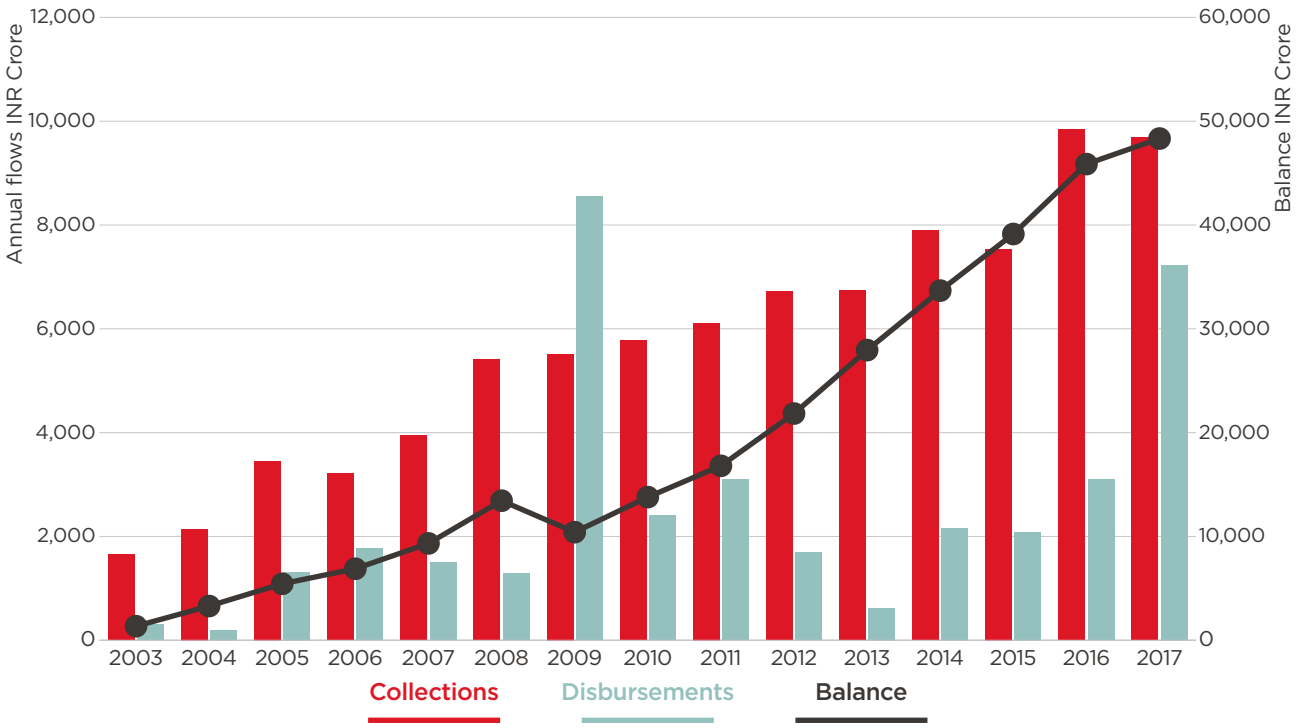
CASE STUDY
The underutilisation of India's USF

India inaugurated its Universal Service Obligation Fund (USOF) in 2002, to provide universal telecommunications services to all areas lacking coverage. From the outset, India's New Telecom Policy of 1999 mandated the USOF's funding via a percentage levy on revenue earned by telecoms licensees. The fund administrator decides on the tax rate for the USOF in consultation with the Telecom Regulatory Authority of India (TRAI).

For 15 years, the fund has consistently been underused. Annual disbursements during that time exceeded annual USOF tax collection in only one year (2009). While INR88,000 crore (approximately $14 billion) has been collected, only 44% of this has been spent to date.

Figure 12

Collections and disbursements of USOF, India



Source: USOF, India

In 2017, long-delayed USOF expenditure started to materialise, as infrastructure projects such as BharatNet, a national broadband network, got under way. Yet even in 2017, collections exceeded disbursements. Such delays in disbursements from the USOF are one of the reasons why the 5% of annual gross revenue from operators could have been better deployed by the operators themselves for new investment and infrastructure.

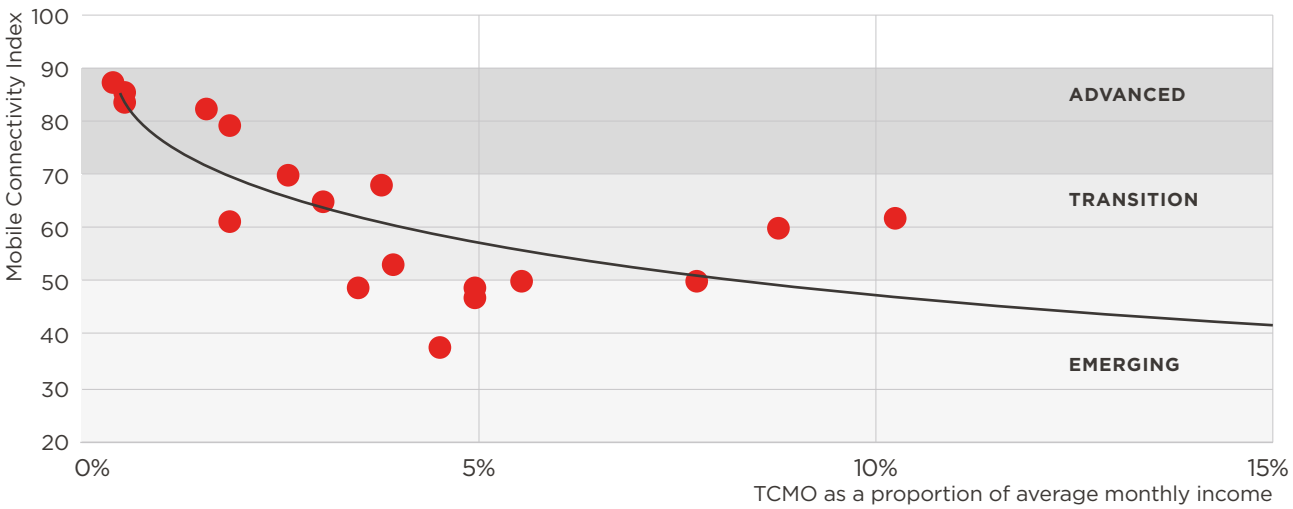
4 Mobile sector taxation and its impact on affordability and investment

4.1 Affordability of mobile services is key to expanding connectivity

Affordability of mobile services and devices is a key determinant of mobile service adoption, particularly among the poor. Figure 13 shows that in Asia Pacific, countries have lower levels of connectivity where mobile usage constitutes a higher share of income, as measured by the total cost of mobile ownership (TCMO). The GSMA Mobile Connectivity Index[16] measures a country's level of connectivity and takes into account infrastructure, affordability, consumer readiness and content.

Figure 13

TCMO vs connectivity, as measured by GSMA Mobile Connectivity Index



Source: GSMA Intelligence

16 www.mobileconnectivityindex.com

The TCMO, measured in monthly terms, takes into account the mobile handset's purchase price, the cost of activating and connecting the phone, and the price of one month's usage. The three factors are standardised to a monthly figure, based on the expected lifecycle of the phone:

- **handset price:** the cost of the mobile device required for the use of mobile services, which represents an upfront, fixed cost that the user pays
- **activation and connection price:** any charges incurred to connect to the operator's network, which often depend on whether contracts are prepaid or postpaid
- **usage charges:** the monthly price of voice, SMS and data charges, which can be prepaid or postpaid.

Table 9

Summary of monthly usage basket profiles used in calculating TCMO

	Basic	Low	Medium	High
Usage allowance	100 MB data	500 MB data	250 voice minutes 100 SMS 1 GB data	5 GB data
Tariff	Prepaid	Prepaid or post-paid	Prepaid or post-paid	Prepaid or post-paid
Technology	2G, 3G or 4G	3G or 4G	3G or 4G	3G or 4G

Source: GSMA Intelligence

We estimate median usage of 1 GB of data across Asia Pacific and therefore focus on the "medium" basket, which has a 1 GB data allowance. Average monthly data use, however, varies widely across Asia Pacific: from an average of 350 MB in emerging digital societies to 2.4 GB in advanced digital societies such as Japan and New Zealand.

We therefore also assess "basic" and "low" baskets, which are useful to understand the minimum cost for unconnected consumers to access the internet. The "high" usage basket shows the costs for market segments that use mobile services more intensively, such as in advanced digital societies.

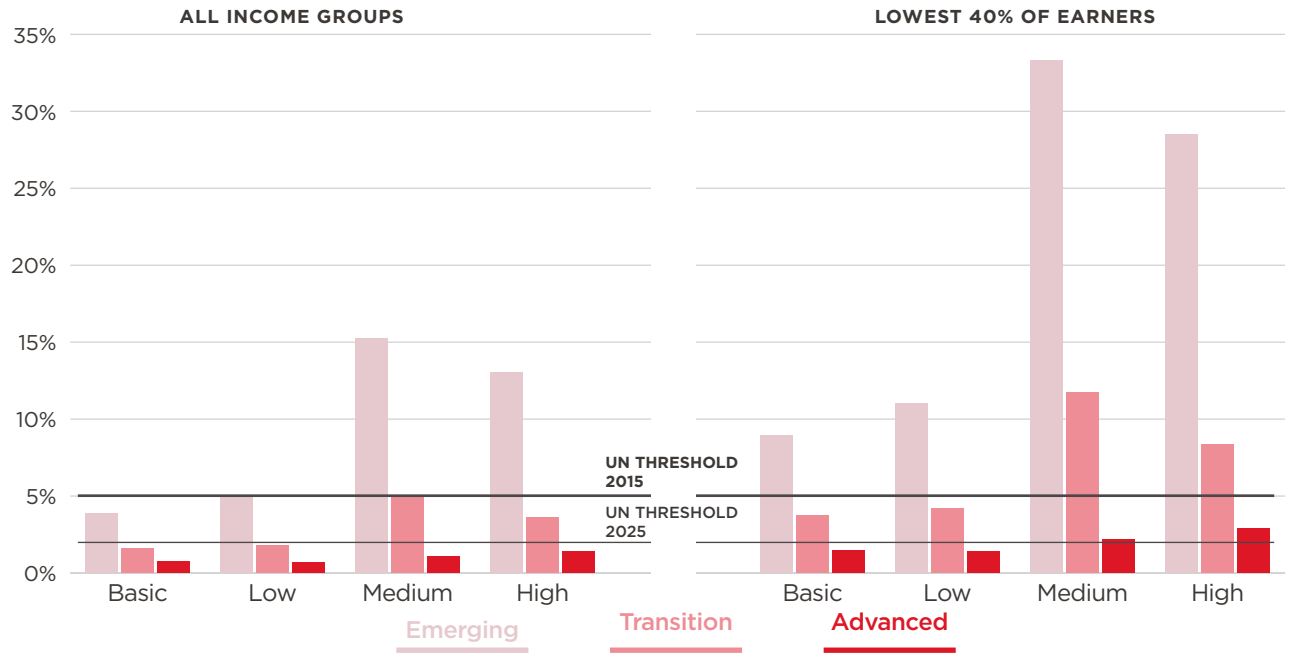
LACK OF AFFORDABILITY CREATES BARRIERS FOR THE UNCONNECTED

One metric for affordability is the proportion of monthly income represented by TCMO. According to the UN Broadband Commission for Sustainable Development, a country's broadband service is affordable if a 500 MB data plan costs less than 5% of an individual's monthly income. The UN set an aim for countries to meet this threshold by 2015. In 2018, the UN revised the threshold to 2% of an individual's monthly income, and set countries the challenge of meeting this by 2025.

For the average emerging digital society in Asia, even the low basket of 500 MB data per month equals 5% of monthly income. By contrast, the high basket users, with 5 GB data per month, would pay less than 1% of their income in Europe and advanced digital societies in Asia Pacific.

Figure 14

TCMO as a share of income in Asia Pacific across all income groups and for the lowest 40% of earners



Source: GSMA Intelligence

None of the four usage baskets are below 5% of monthly income for the bottom 40% in the income distribution of Asia Pacific's emerging digital societies. Under the UN's new 2% threshold, the basic basket is unaffordable for the average earner in emerging digital societies. The picture contrasts with the estimates for advanced digital societies, where TCMO is no more than 3% across all baskets, although even this percentage is twice as high as in Europe, where no basket is more expensive than 1.6% of the average income for the bottom 40% of earners.

Transition digital societies show a mixed picture. The basic and low baskets cost less than 5% of the income of the lowest 40% of earners, but medium and high baskets are much higher, at 12% and 9% respectively of the average income for the lowest 40% of earners. Such a big difference in cost compared to basic and low baskets makes it hard for operators in such countries to shift customers to more advanced, data-intensive service packages.

MOBILE SERVICES ARE UNAFFORDABLE IN SOME EMERGING DIGITAL SOCIETIES

Figure 15 shows the breakdown of affordability for sampled countries in the region:

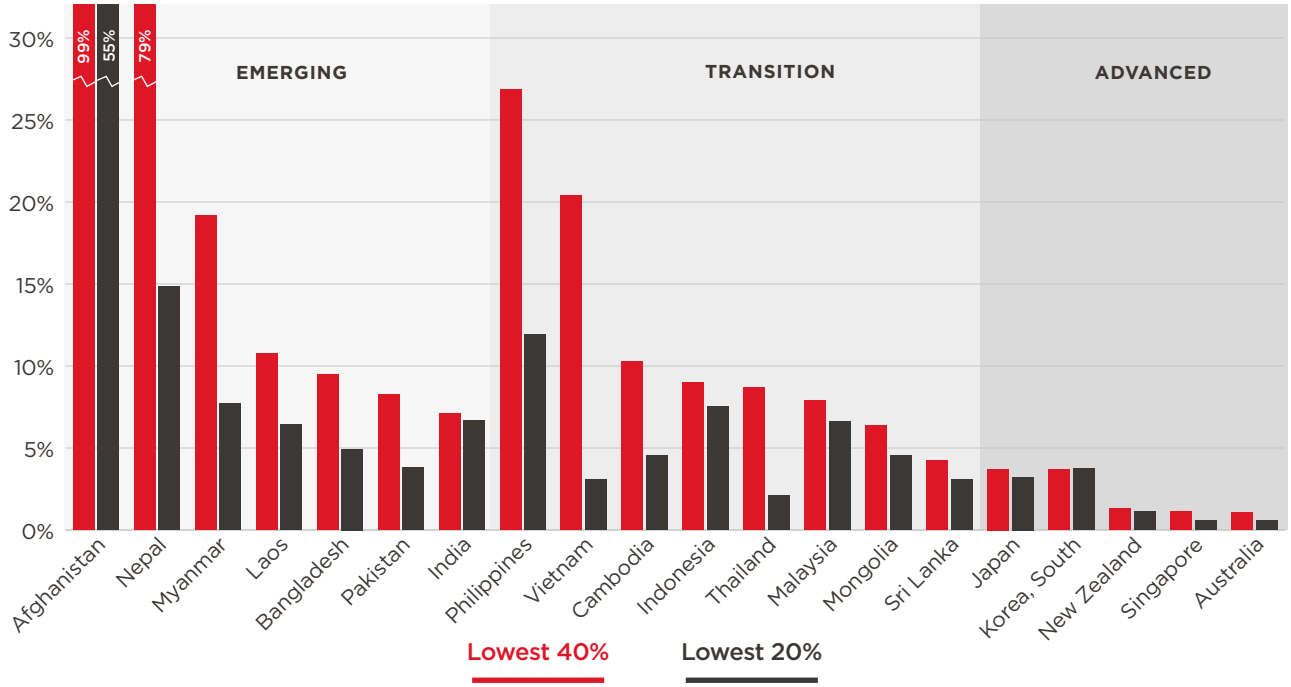
- The low basket of services costs more than 5% of income for the lowest 20% of earners in all but one of the countries in the emerging economies group.
- By contrast, users in the lowest 40% of earners in all of the advanced digital societies have a cost of using the medium basket that is less than the 5% threshold.

Afghanistan and Nepal have a high total cost of mobile ownership given the relatively low incomes earned in those countries. The medium basket costs consumers in the bottom 40% of earners in Afghanistan almost their entire monthly income and amounts to 79% of monthly income in Nepal. For the lowest 20% of earners in Afghanistan, even the cost of a low basket of services would represent 55% of their monthly income.

The TCMO is relatively low in some emerging and transition countries because of the high levels of price competition in those mobile sectors. However, for some of these countries, such as Sri Lanka and Bangladesh, the combination of low prices and high mobile-specific taxes can lead to unsustainable levels of low profits and potentially market exits.

Figure 15

TCMO – medium basket (1 GB) as a share of income for lowest 40% of earners; low basket (500 MB) as a share of income for lowest 20% of earners



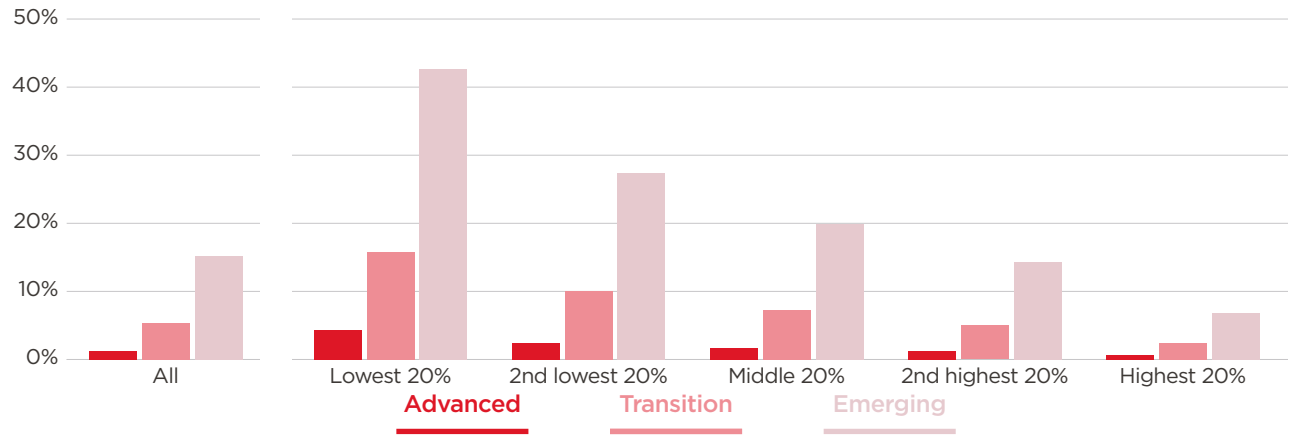
Source: GSMA Intelligence

A BIG AFFORDABILITY GAP EXISTS BETWEEN EMERGING AND ADVANCED DIGITAL SOCIETIES

The TCMO in advanced digital societies is low but varies between income groups, with the wealthiest 20% paying less than 1% of their income on a medium basket of services compared to 4% for the poorest 20%. In emerging societies, this gap is much larger in absolute terms. Even the wealthiest 20% are paying 7% of their income for a medium basket of services. For the poorest 20%, this figure is more than 40%. Such a large gap exacerbates the digital divide in these countries.

Figure 16

TCMO of a medium (1 GB) basket as a share of income, by income quintile



Source: GSMA Intelligence

4.2 Taxes paid by consumers reduce affordability

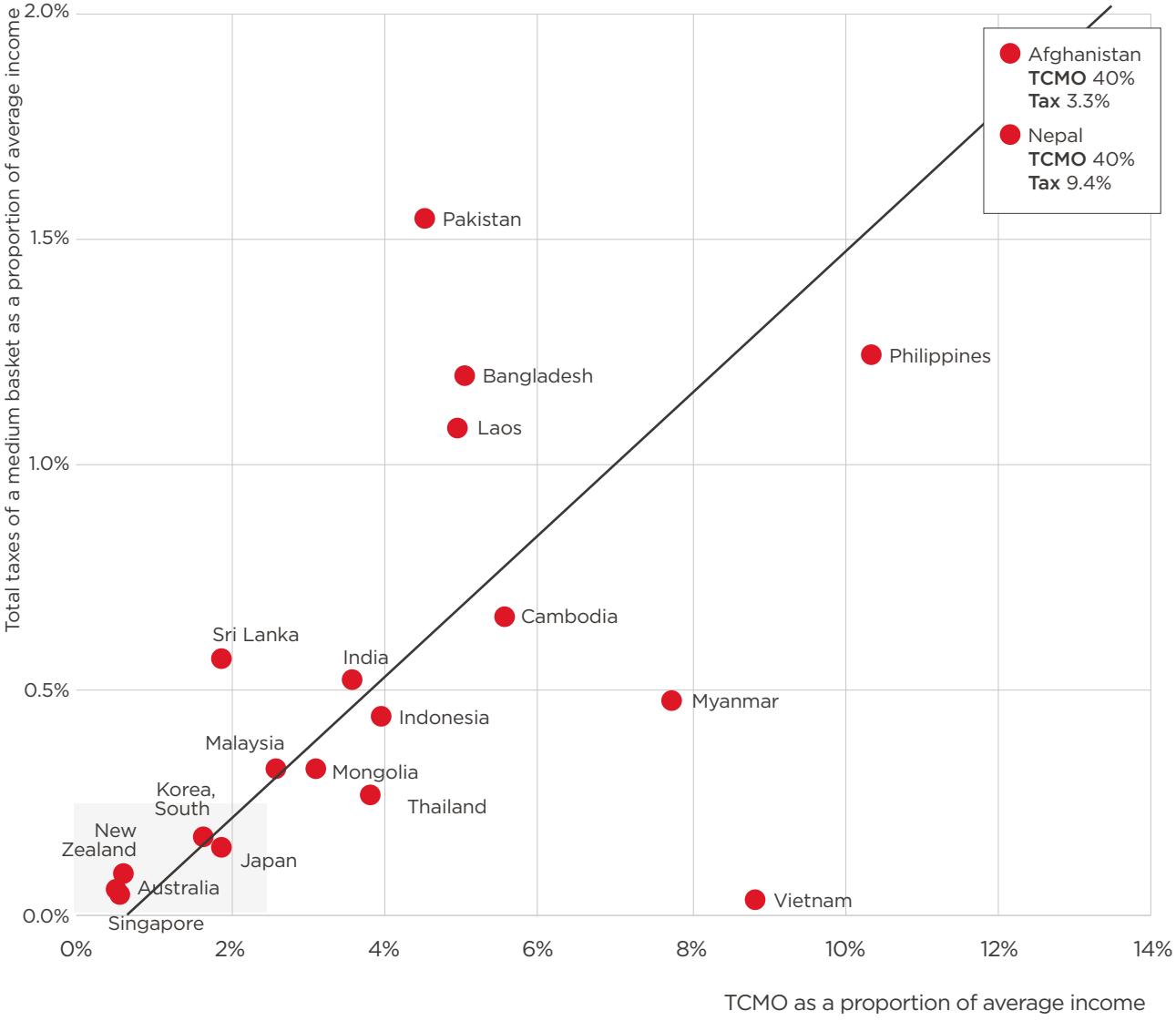
Taxation on the mobile sector adds to the TCMO and acts as a barrier to the affordability of mobile services. Our analysis of 20 markets in Asia Pacific includes the taxes paid directly by consumers when using mobile services. Consumers may incur more taxes indirectly, depending on whether operators can pass on taxes aimed at them. However, we have not included these potentially passed-on tax costs in this analysis.

Countries with higher taxes tend to have higher TCMO levels. Figure 17 shows the latter for the medium basket (250 minutes of voice, 100 SMS and 1 GB of data) for the countries analysed in Asia Pacific.

- Countries with the highest tax rates as a percentage of income, such as the Philippines, Bangladesh, Laos and Cambodia, tend to have the highest TCMOs.
- Most notably, advanced digital societies are grouped in the bottom-left corner of the chart, where taxes and TCMO are both low.

Figure 17

The relationship between TCMO and taxes for the medium basket (1 GB)



Source: GSMA Intelligence

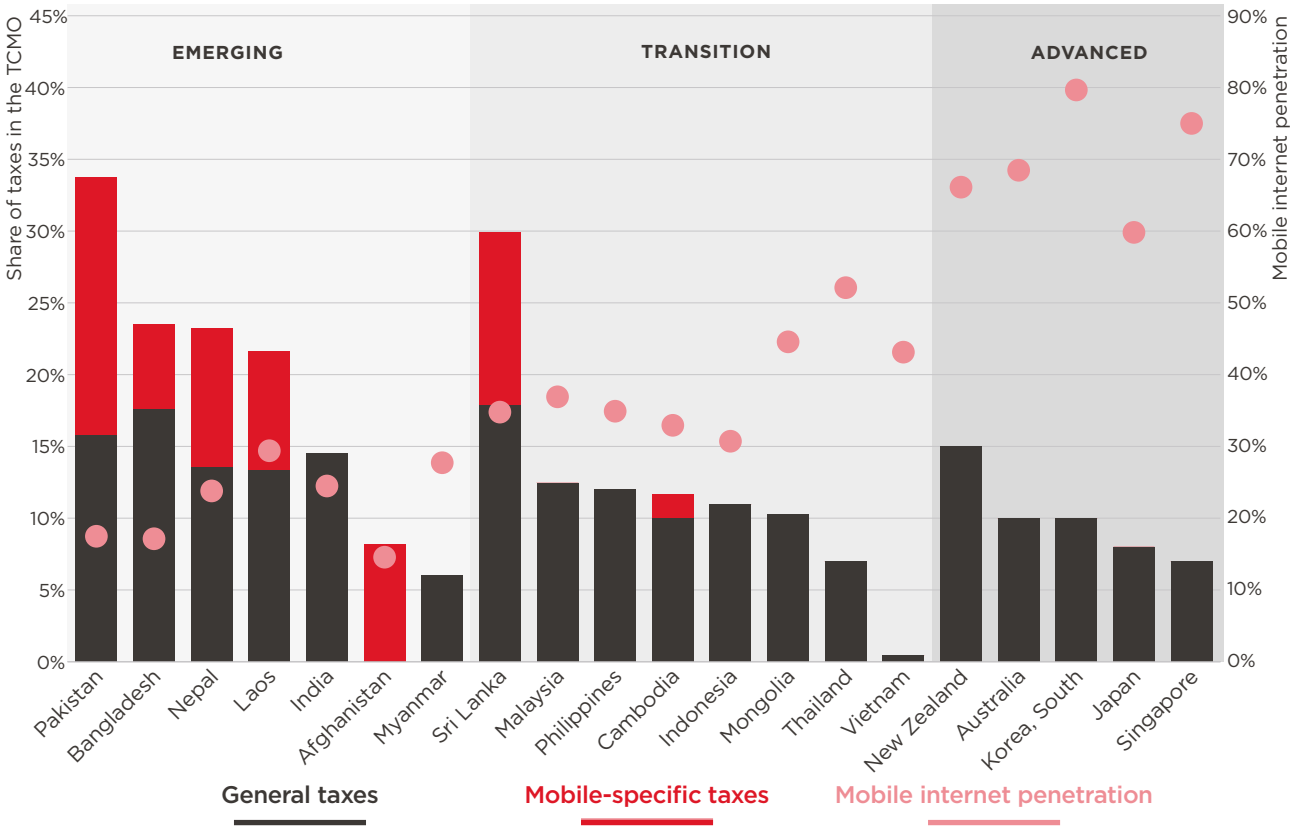
LIMITING SECTOR-SPECIFIC TAXATION WOULD BRING TAX RATES IN EMERGING COUNTRIES IN LINE WITH BETTER-PERFORMING TRANSITION COUNTRIES

Total taxes represent on average 14% of the TCMO in the analysed countries. This varies across the three levels of digital society. Emerging digital societies have an average 19% tax burden on TCMO, compared to 12% for transition digital societies and 10% for advanced digital societies.

Mobile-specific taxes are the cause of the higher tax burden in emerging digital societies and therefore the cause of higher costs of mobile ownership in these countries. Had there been no mobile-specific taxation, the average tax burden in emerging digital societies would be 12% instead of 19% – in line with that of the transition digital societies. Such a change would help bridge the connectivity gap and help emerging digital societies develop into transition digital societies, where mobile internet penetration is higher (as shown in Figure 18).

Figure 18

Share of taxes in the TCMO (medium basket) and mobile internet penetration

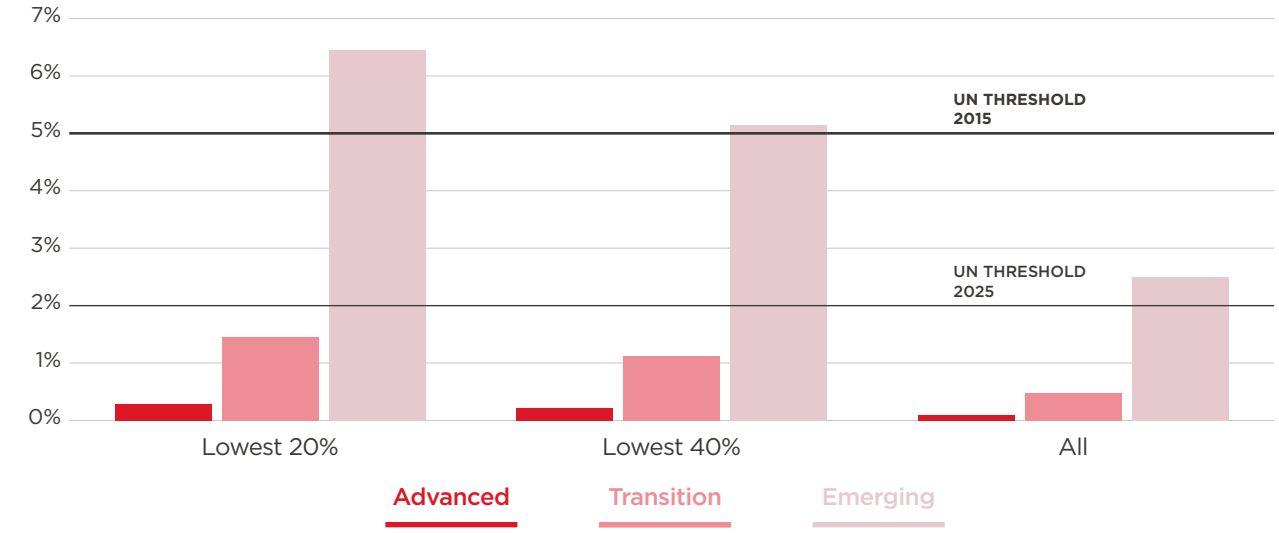


Source: GSMA Intelligence

The large share of taxes in TCMO reduces affordability. Total taxes on mobile ownership in Asia Pacific range from 0.1% of average monthly income in advanced digital societies to 2.5% in emerging digital societies. For poorer consumers in emerging digital societies, however, the 5% affordability threshold is exceeded by tax payments even before considering other elements of TCMO. Taxes alone represent 6.4% and 5.1% of the income for the poorest 20% and 40% of earners, respectively.

Figure 19

Taxes on mobile use as a percentage of average monthly income, by income group



Source: GSMA Intelligence

SECTOR-SPECIFIC TAXES ARE A KEY CONTRIBUTOR TO TOTAL TAXES

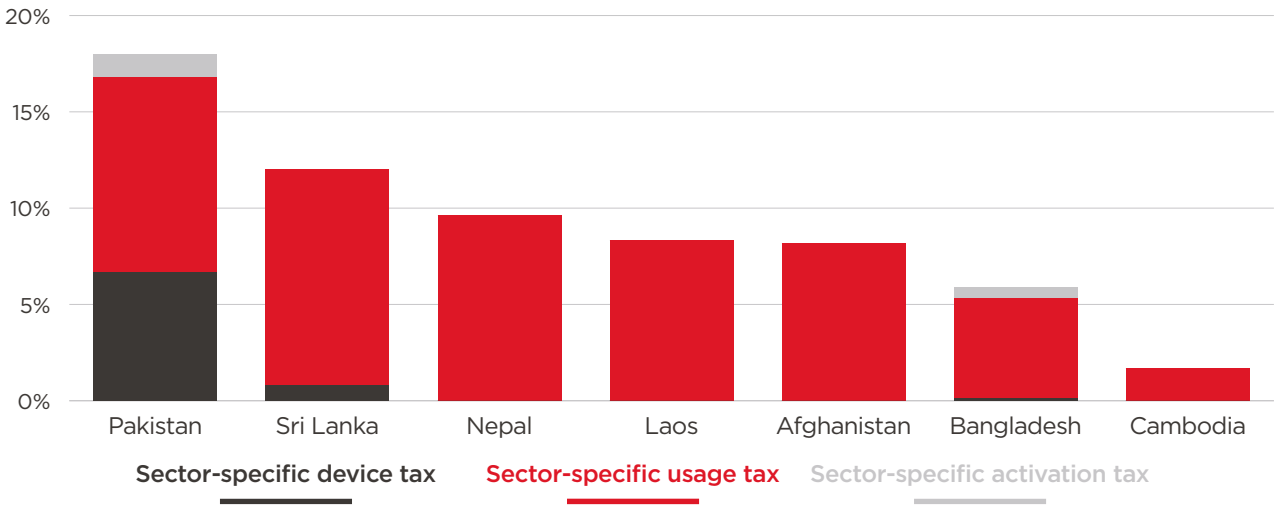
Seven of the 20 countries that we analysed have domestic sector-specific taxes, of which five are emerging digital societies and two are transition digital societies. Consumers in the advanced digital societies pay no sector-specific taxes.

On average, sector-specific taxes represent 9% of the TCMO of a medium basket.

- Most of these taxes relate to usage taxes, which are the most frequent sector-specific tax in the region.
- Device taxes also cause a heavy tax burden in Pakistan, adding 7% to the TCMO in addition to other sector-specific taxes.

Figure 20

Share of sector-specific taxes in the TCMO (medium basket)



Source: GSMA Intelligence

4.3 Certain types of tax regime can affect investment and infrastructure development

Companies in the mobile ecosystem undertake large amounts of upfront investment to maintain and improve mobile services via new infrastructure, network equipment, spectrum licences and retail points of sale. In Asia Pacific, we estimate mobile operators have invested more than $400 billion in the five years to 2016 and over $60 billion in 2016 alone to launch 80 3G networks and more than 200 4G networks between 2011 and 2016. Over this time, the average proportion of the Asia-Pacific population covered by a 3G mobile network increased from 35% to 85%, and coverage for 4G increased from 2% to 75%.

A tax regime that supports investment helps ensure that mobile infrastructure develops at a rate in line with the needs of the region's population. The wrong type of tax regime can disturb the investment environment via four mechanisms:

- tax uncertainty and complexity
- revenue taxation
- equipment taxation
- revenue-maximising spectrum auctions and fees.

TAX UNCERTAINTY AND COMPLEXITY CREATES POOR INVESTMENT CONDITIONS, PARTICULARLY FOR FOREIGN INVESTORS

Regulatory fees and payments for the mobile sector can represent a high burden on operators and can vary substantially and unexpectedly from one year to another in some countries, which creates uncertainty for market players. The high upfront investment required for mobile infrastructure and long repayment cycle present a number of risks to operators: in particular, once they have made an investment, any unexpected changes in taxation and regulatory fees may impact a company's profitability, lowering returns.

The evolving nature of technology in the telecoms sector makes ongoing investment essential to increase data speeds. Increased uncertainty lowers expected returns and affects the development of the sector and services.

The introduction of new or higher fees after, for example, a spectrum auction or during a licence period impacts an operator's business case for further investment. A riskier investment climate will have adverse effects on consumers if some operators delay investing or go elsewhere due to uncertainty in a country's policies on taxes and fees.

Academic studies have found a negative relationship between tax uncertainty and investment.[17] The World Bank's Global Investment Competitiveness Report highlights the following:

- Transparency and predictability in the conduct of public agencies is the most important factor for investment, with 82% of investors identifying it as either critically important or important.
- A sudden change in laws and regulations that has negatively affected a company has occurred for 49% of investors, with almost half of these delaying investment, cancelling planned investment or completely withdrawing existing investments.

The complexity of a tax system is also a key concern of investors. Companies incur compliance costs in handling a large number of different rates, bases and payments. These additional costs worsen the prospects of choosing to invest in a particular sector or country. Academic studies have found that investment is lower in countries that have more complex tax regimes.[18]

Complexity and uncertainty have a particularly adverse effect on foreign direct investment (FDI). FDI is important to many Asia Pacific countries, but especially emerging digital societies that lack adequate domestic sources for infrastructure financing. Major global and regional companies invest across the region; their commitments to any one country are not necessarily open-ended. According to UNESCAP[19] greenfield[20] FDI in communications in Asia Pacific accounted for $42 billion between 2013 and 2015, making it a top-10 industry for FDI. Large mobile groups seek to invest

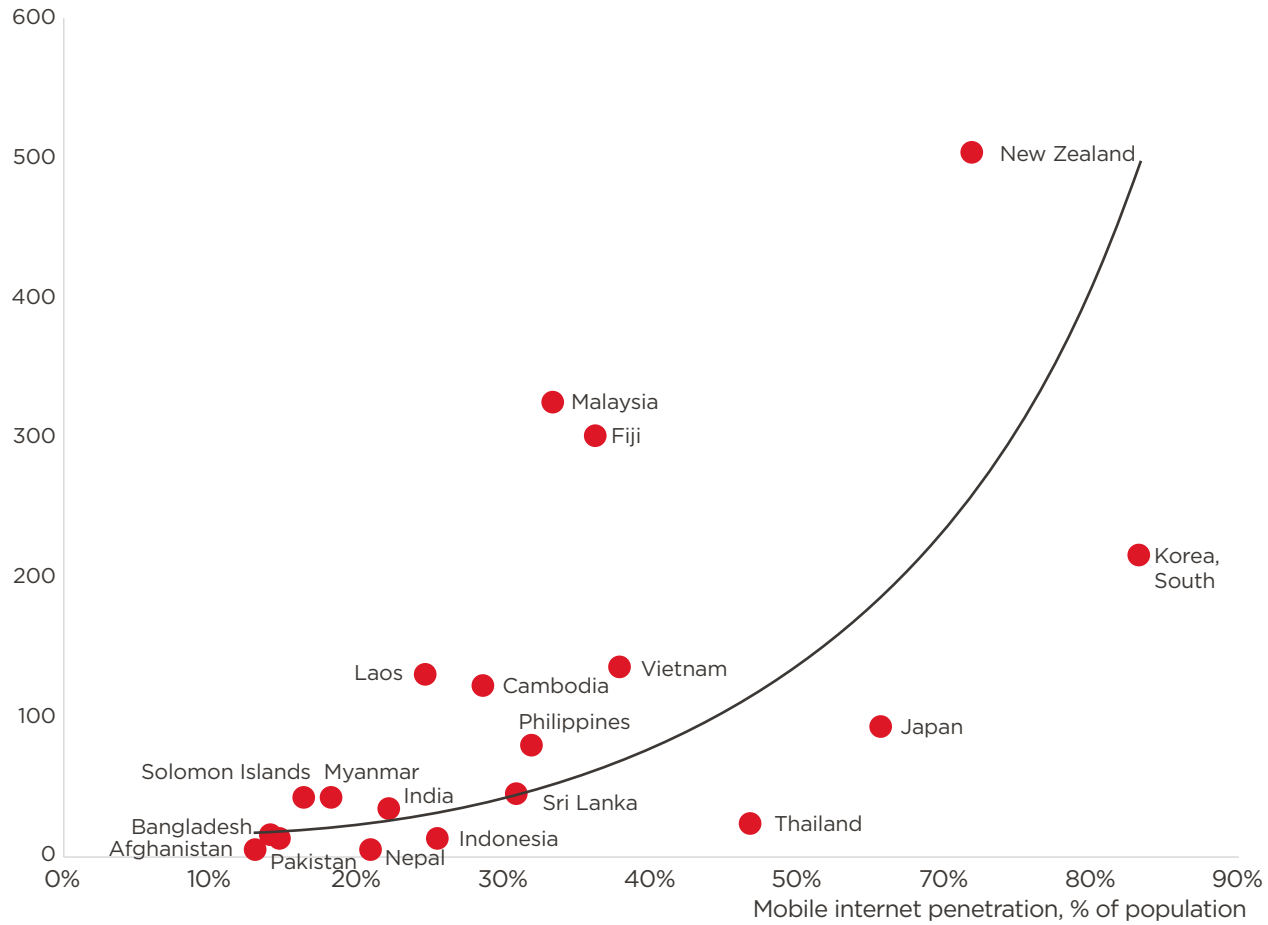
17 Policy Uncertainty and Corporate Investment, Huseyin Gulen and Mihai Ion, 2016; Tax Uncertainty and Investment: A Cross-Country Empirical Examination, Kelly D. Edmiston, 2004
18 For example, Tax Complexity and Foreign Direct Investment, Cornelius Mueller and Johannes Voget, 2012
19 United Nations Economic and Social Commission for Asia and the Pacific
20 Greenfield refers to brand new investment in the country, as opposed to acquiring and re-using existing assets.

in countries with the highest potential for growth and where doing business is uncomplicated.

In turn, as investing in mobile infrastructure improves connectivity and digital inclusion, foreign investors from industries outside telecommunications are more inclined to invest in countries that have well developed mobile services and a digitally engaged consumer market. A study of FDI patterns in the early 2000s[21] found that FDI is greater in countries that have better mobile networks. Figure 21 shows this relationship in Asia Pacific by comparing penetration of mobile internet in 2015 with total FDI inflows per capita in 2016.

Figure 21

FDI per capita (2016) versus mobile internet penetration (2015)



Source: GSMA Intelligence

Tax regimes that burden foreign investors and complicate the process of doing business stifle foreign direct investment into the mobile sector. Additionally, complicated tax regimes that restrict the development of the mobile economy make investment in the region less attractive and have further negative impacts on the overall level of FDI.

TAXATION ON REVENUE DISCOURAGES INVESTMENT, ESPECIALLY AS ARPU CONTINUES TO DECREASE

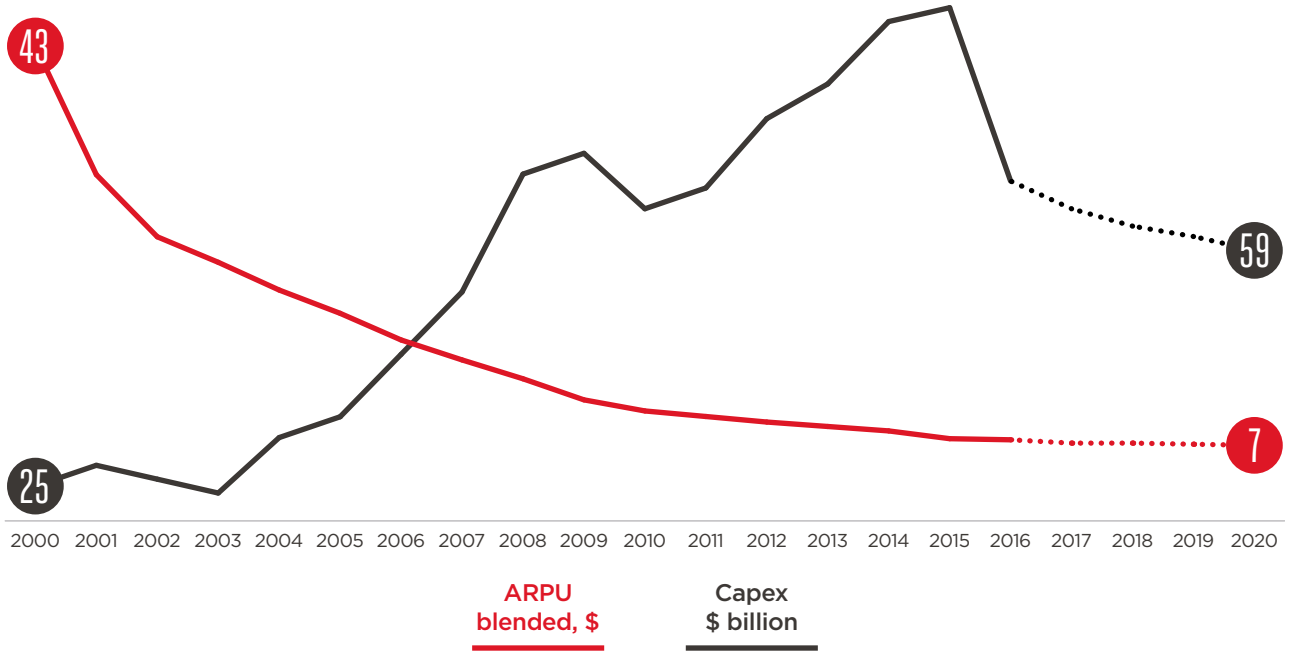
Fees and taxes on a company's revenue discourage investment and innovation because operators pay the same amount of tax regardless of whether they make a profit or loss, repatriate profits, pay them out as dividends, or re-invest the earnings into new infrastructure and services.

21 Communications Networks and Foreign Direct Investment in Developing Countries (2005) by Reamonn Lydon and Mark Williams

Asia-Pacific operator ARPU has declined, from $43 in 2000 to $7 in 2016. Despite this decline, operators have continued to increase capital expenditure to ensure the rollout of new networks.

Figure 22

Capex by mobile operators and average revenue per user (by connection), Asia Pacific



Source: GSMA Intelligence

With declining ARPU levels and reduced operating margins, operators face a challenging commercial environment for investment. Higher taxes on revenue, regardless of profit or losses, are likely to restrict the ability of mobile operators to continue to invest in high-quality mobile networks.

TAXATION ON NETWORK EQUIPMENT INCREASES THE COST OF NEW INVESTMENT

Duties on the import of telecommunications equipment increase costs of investing in new infrastructure and services, which reduces the attractiveness of potential investment. Pakistan imposes a customs duty on telecoms network equipment, and increased the duty from 5% to 10% in 2014/15. As a result, the import of telecoms equipment was reported to have dropped by 46% in the following year.

Similarly, taxes levied by local authorities on the rental of sites for mobile infrastructure also increase the cost of investment and therefore reduce the attractiveness of investing.

REVENUE-MAXIMISING SPECTRUM AUCTIONS AND FEES OFTEN LEAD TO DELAYED INVESTMENT

When operators pay too much for spectrum in the auction and via ongoing fees, there can be a negative impact on investment. Firms with such high sunk costs may also shy away from price competition, so payment of high auction fees is likely to signal a future increase in prices to recoup the cost. Additionally, expensive spectrum can weaken operators' balance-sheet liquidity and thus delay investments for that reason. Such an impact can occur even in a robust market with high levels of ARPU, so in the current environment of declining ARPU and returns on investment, these added costs have an even bigger negative effect on operators.

Governments trying to maximise revenue from auctions can find themselves with cancelled (i.e. failed) auctions. Even if the auctions proceed, overpricing can end in unsold, and therefore unused, spectrum – a wasted resource and thus a non-recoverable cost to society. The setting of high reserve prices to participate in auctions has delayed new network investment across Asia Pacific. We list just a few examples of the effect of over-pricing below:

- Between 2012 and 2014, India failed to fully allocate its 1800 MHz spectrum at auction.
- Australia's auction in 2013 of the Digital Dividend spectrum of 700 MHz ended with one-third of the spectrum unsold. The remaining spectrum did not sell until four years later, and only some of that went for more than the 2013 reserve price. Thus, Australians missed out on more than three years of beneficial use and investment from the unused spectrum resource.

5 How tax reforms can enable connectivity and deliver growth

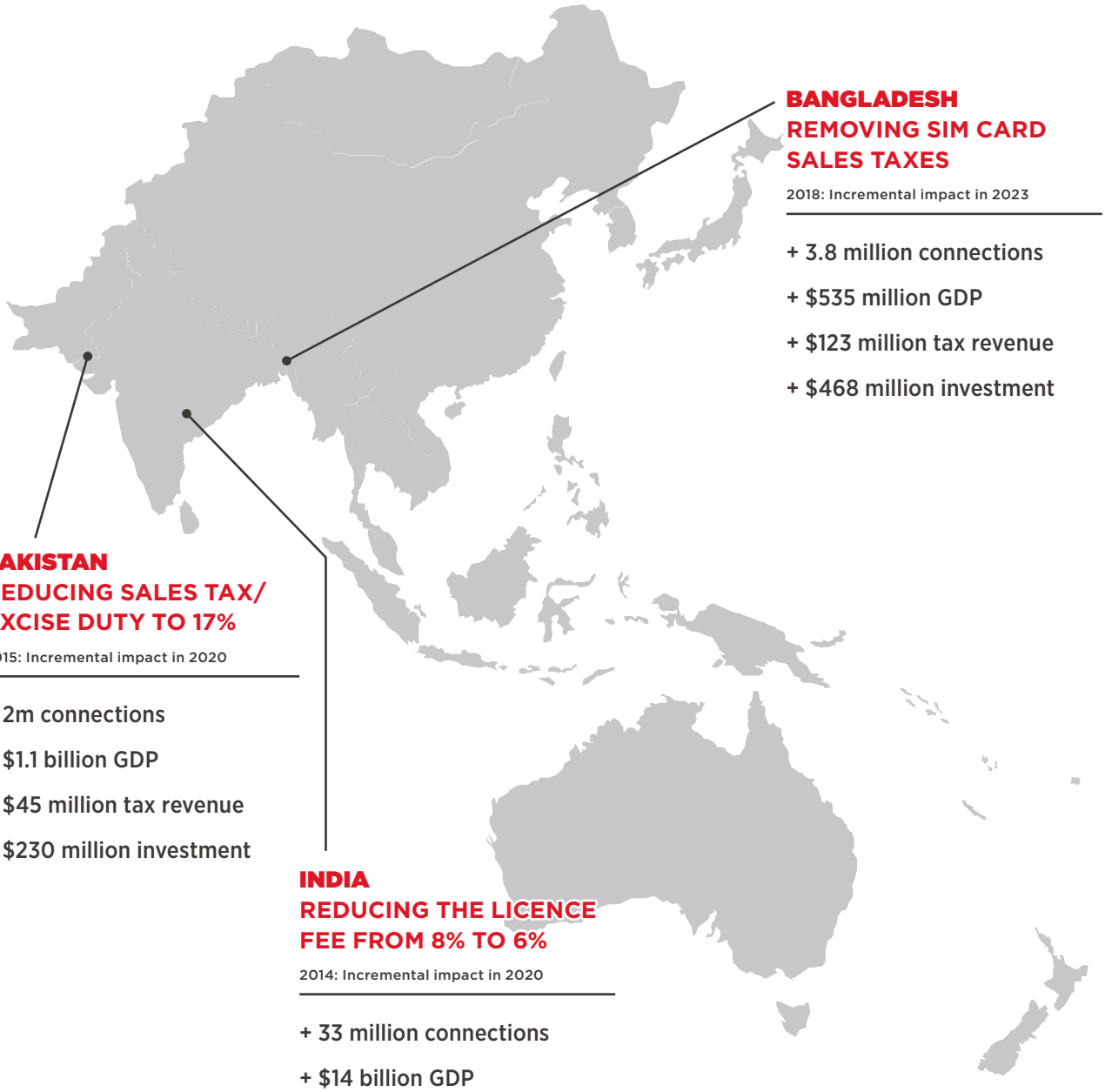
Like elsewhere, governments in Asia Pacific want to grow their economies and achieve the UN's Sustainable Development Goals by increasing access to broadband and fostering the development of information and communication technologies and sectors in their countries. In doing so, the region's governments have to balance the competing objectives of maximising tax revenues to finance public spending while minimising tax burdens on individuals and companies to encourage consumption and private sector investment. How the effects of tax policies manifest over time complicates these trade-offs: while raising tax rates might provide higher revenues for the government in the short term, the economy and sector development may suffer as a result in the medium to long term.

Reductions in sector-specific taxes boost demand for mobile services, which add value to the economy through the knock-on impact on other industries and the increased productivity of workers with mobile connections. The wider mobile industry is able to support more jobs and increase investment in infrastructure, which has a further positive impact on the economy. Finally, depending on how much demand for mobile usage rises, tax revenues can increase in the medium term, compared to a scenario where mobile-specific taxes remain high.

According to studies undertaken for the GSMA on the impact of changes to specific tax rules and rates in various countries, the removal and reduction of mobile-specific taxes increase the number of connections, the levels of GDP and investment, and crucially – despite the reduction in tax rates – actually increase tax revenues in the medium term. Some of these impacts are shown in Figure 23.

Figure 23

How tax reforms can produce economic benefits



BANGLADESH
REMOVING SIM CARD SALES TAXES

2018: Incremental impact in 2023

+ 3.8 million connections
+ $535 million GDP
+ $123 million tax revenue
+ $468 million investment

PAKISTAN
REDUCING SALES TAX/ EXCISE DUTY TO 17%

2015: Incremental impact in 2020

+ 2m connections
+ $1.1 billion GDP
+ $45 million tax revenue
+ $230 million investment

INDIA
REDUCING THE LICENCE FEE FROM 8% TO 6%

2014: Incremental impact in 2020

+ 33 million connections
+ $14 billion GDP
+ $2.2 billion tax revenue
+ $4.5 billion investment

Source: GSMA

As shown in Table 10, a number of types of reform support the growth of the mobile sector and the region.

Table 10

Reduce sector-specific taxes and fees	Taxes and fees on the sector beyond general taxes distort markets and affect levels of pricing and investment. Reducing these sector-specific taxes leads to increases in the adoption and use of mobile services. By extending the user and tax base, reductions in taxation have a neutral or positive impact on government revenues in the medium to long term. Phased reductions of sector-specific taxes and fees represent an effective way for governments to signal their support of the digital connectivity agenda, to benefit from economic growth resulting from the reductions while limiting heavy short-term fiscal costs.
Reduce complexity and uncertainty of taxes and fees on the mobile sector	Uncertainty over future taxation reduces investment as investors price the risk of future tax rises into investment decisions. In addition, numerous sector-specific fees levied on different tax bases raise compliance costs for mobile operators. Governments should seek to limit unpredictable tax and fee changes, and streamline their levies of taxes and fees.
Reduce or remove import duties	Like any other tax that targets access, import duties applied to handsets restrict access to mobile services. Additionally, import duties on network equipment increase the cost of network rollout and restrict coverage. As reducing tariffs on mobile handsets and network equipment can have a wide economic impact, governments should align their tax policies with the WTO´s Information Technology Agreement, aimed at the elimination of import duties on technology and IT products.
Remove consumer taxes that target access to mobile services	One of the surest ways to lower the take-up of mobile services is to tax access to the market. Luxury taxes on handsets, SIM cards and other activation or connection charges create a direct barrier for consumers to connect and access mobile broadband, especially in developing markets and for the poorest. To enable more users to gain access to the mobile market, governments should choose to address affordability barriers caused by taxes on devices and connections. Removing these taxes has the potential to increase the taxable base for the government.
Avoid excessive regulatory fees and taxes on revenues	Taxes on revenues are particularly distortive as they continue at the same level regardless of whether the operator makes a profit or loss, or whether it is investing in new innovative networks. Moreover, when used to set up or replenish USFs, the frequent delayed or lack of disbursement of collected levies wastes operators' financial resources.
Support effective pricing of spectrum to facilitate better quality and more affordable services	The approach to awarding spectrum needs to balance *ex-ante* and *ex-post* fees in a transparent way to ensure operators do not pay twice for access to the same resource as this would discourage investment. By adopting a long-term perspective, setting modest reserve prices and prioritising spectrum allocation, governments and regulators can support operators in the delivery of high-quality and affordable mobile services to consumers.
Remove taxes on international incoming calls	Surtaxes on international incoming calls impact business and consumers in the countries that impose them. Removing these taxes eases barriers to regional and international trade and remittances, and can improve affordability, thereby enabling more consumers to realise the benefits of mobile services.
Implement supportive taxation for emerging services such as IoT	Emerging services such as mobile data, mobile money and IoT applications boost economic productivity and financial inclusion throughout the economy. Disproportionate taxation of these services puts a wide range of positive externalities at risk; whereas, implementing supportive tax policies can play a key role in developing these services.

CASE STUDY
Tax uncertainty for the mobile sector – foreign direct investment in Bangladesh

Tax certainty and transparency are important for investment as empirical studies find a negative relationship between tax uncertainty and levels of investment.

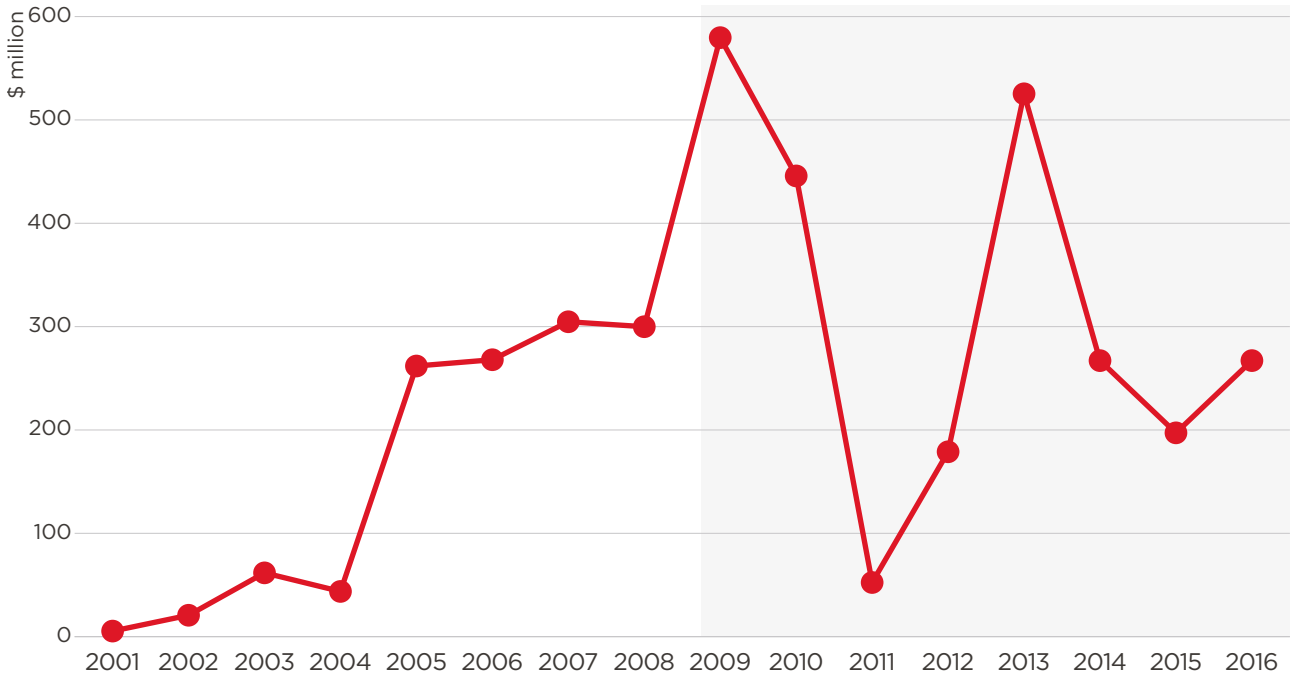
- Gulen and Ion (2016) conducted a study on the effect of uncertainty in governmental policies on US firms during the 2007–2009 financial crisis and found a strong negative relationship between capital investment and overall policy uncertainty, of which tax-related uncertainty was an important part. During the period, corporate investments dropped by 32% in the US. The study estimated that policy uncertainty alone caused two-thirds of that drop in corporate investments – an indication of how policy-related uncertainty depresses economic growth.
- Edmiston (2004) studied the impact on investment of volatility in effective tax rates (on profits) in 15 European Union countries, the US and Japan. The results showed that volatility in effective tax rates has a significant negative impact on investment per worker.

In Bangladesh, operators have previously reported[22] that the high taxation rates they face, when coupled with unexpected changes in taxation and falling ARPU, create instability and uncertainty in the sector and make them reluctant to commit to large investment programmes.

Such volatility in the tax regime, therefore, has had a negative impact on FDI in Bangladesh's telecoms sector. As shown in Figure 24, after strong growth to 2009, the amount of foreign funds entering the country for telecoms exhibited increasing volatility. A tax dispute that started in 2011 and a subsequent delay of spectrum auctions may also have destabilised the level of foreign investment in the country's telecoms sector.

Figure 24

Foreign direct investment: net inflows into telecommunications



Source: Bangladesh Bank

22 Mobile Telephony and Taxation in Bangladesh, A report for the GSM Association, Deloitte, 2012

CASE STUDY
Development of OTT taxes across Asia Pacific

The growth in digital services provided by over-the-top (OTT) service and content[23] providers has challenged analogue tax systems, since the local impact of OTTs typically means governments must try to collect taxes from companies that do not have a legal presence or facilities in the country, but instead sell or provide intangible cross-border services. This nebulous jurisdiction of many OTTs makes it difficult for governments to raise taxes such as VAT and creates a tax asymmetry compared to taxation on local firms providing similar services.

According to the OECD[24] the appropriate approach to the issue is to require non-resident OTTs to register locally and account for VAT on any services or products they sell in the country. However, OTTs do not always follow this OECD recommendation.

As shown in Table 11, in the past three years across Asia Pacific, various countries have begun applying local taxes on OTT and e-commerce services.

Table 11

Tax rates applied on OTTs in Asia Pacific

	Tax rate	Year of introduction
Japan	Consumption Tax 8%	2015
South Korea	VAT 10%	2015
New Zealand	GST 15%	2016
India	Total Tax 15%	2016
Australia	GST 10%	2017

Source: Quaderno

Other countries in the region are now considering their own OTT taxes to level the playing field with local firms and operators:

- Bangladesh is considering 15% VAT on foreign digital businesses
- Thailand is considering 5% VAT on e-commerce goods and services and a requirement for permanent presence in Thailand to enable the collection of corporate income tax
- Singapore is considering 7% VAT on goods and electronic services provided by non-resident companies
- Indonesia has been considering a requirement that OTT providers must establish a permanent presence in the country. As in the case of Thailand, a permanent presence will require the payment of local taxes, including local corporate taxes.

23 In broadcasting, over-the-top (OTT) content refers to the delivery of audio, video and other media over the internet without the involvement of a multiple-system operator in the control or distribution of the content. The internet provider may be aware of the contents of the Internet Protocol packets but is not responsible for, nor able to control, the viewing abilities, copyright and/or other redistribution of the content.

24 Addressing the Tax Challenges of the Digital Economy, OECD, 2014

Methodology Appendix 1 Data sources

For the purposes of this study, we collected data on bundled prices, tax rates, tax payments, macroeconomic data and mobile market indicators for handsets and mobile services.

Table A1 summarises the specific variables used.

Table A1

Summary of variables and sources

Area	Variable	Time	Source
Prices	Tariff price for Basic basket	2017 Q1	Tarifica
	Tariff price for Low basket	2017 Q1	Tarifica
	Tariff price for Medium basket	2017 Q1	Tarifica
	Tariff price for High basket	2017 Q1	Tarifica
	Device price	2017 Q1	Tarifica
Tax rates	General tax rates	2016	Mobile operators and public sources
	Sector-specific tax rates	2016	Mobile operators and public sources
Tax payments	Tax payments (general, sector-specific)	2014–2015	Deloitte and GSMA analysis of mobile operator data
Macroeconomic	Nominal GDP	2016	IMF World Economic Outlook[25]
	Population	2016	World Bank
	Income distribution	2003–2013	World Bank[26]
	Exchange rates	2014–2016	Oanda[27]
	Tax revenue as a proportion of GDP	2014	IMF Government Finance Statistics[28]
Mobile market	Mobile operator revenue	2014–2016	GSMA Intelligence
	Market share by operator	2014–2015	GSMA Intelligence

25 See IMF WEO Database imf.org/external/pubs/ft/weo/2017/01/weodata/index.aspx
26 See World Bank data.worldbank.org/indicator/SI.DST.FRST.20
27 See Oanda oanda.com
28 See IMF Government Finance Statistics data.imf.org/GFS

A1.1 Prices

Pricing data for devices and tariffs was provided by Tarifica. It captured retail prices as of the first quarter of 2017, including all relevant taxes.

Based on analysis by GSMA Intelligence, we defined four baskets according to different levels of allowable usage amounts, type of contract and technology. The analysis took the following aspects into account:

- Historic average trends in data consumption across countries, sourced from GSMA Intelligence, Ofcom,[29] Tefficient[30] and Opera.[31] We also took into account future data requirements, which are likely to increase, and carried out the analysis of average values by correcting for the skewness (i.e. asymmetry in the data) introduced by intensive users of mobile services.
- A selection of allowances currently offered by operators in developed and emerging markets, provided by Tarifica.
- Baskets used in existing benchmarking studies from OECD,[32] Ofcom,[33] EC[34] and Tarifica which represent basket designs that economic studies often use when analysing pricing in the mobile industry.[35]

Table A2 shows the baskets that resulted from this analysis.

Table A2

Usage basket profiles

	Basic	Low	Medium	High
Usage allowance	100 MB data	500 MB data	250 voice minutes 100 SMS 1000 MB data	5000 MB data
Tariff	Prepaid	Prepaid or postpaid	Prepaid or postpaid	Prepaid or postpaid
Technology	2G, 3G or 4G	3G or 4G	3G or 4G	3G or 4G

Source: GSMA Intelligence and Tarifica

29 The Communications Market Report, Ofcom, 2016 https://www.ofcom.org.uk/__data/assets/pdf_file/0026/95642/ICMR-Full.pdf
30 Unlimited pushes data usage to new heights, Tefficient, 2016 http://media.tefficient.com/2016/12/tefficient-industry-analysis-5-2016-mobile-data-usage-and-pricing-1H-2016-ver-2.pdf
31 State of the Mobile Web Africa 2016, Opera, 2016 https://blogs.opera.com/news/wp-content/uploads/sites/2/2016/11/SMWAfrica-Opera-report-2016-01-WEB-1.pdf
32 Digital Economy Outlook 2015, OECD, 2015 oecd.org/sti/oecd-digital-economy-outlook-2015-9789264232440-en.htm
33 The Communications Market Report, Ofcom, 2016 ofcom.org.uk/__data/assets/pdf_file/0026/95642/ICMR-Full.pdf
34 Mobile Broadband Prices in Europe 2016, European Commission, 2016 ec.europa.eu/digital-single-market/en/news/mobile-broadband-prices-europe-2016
35 For instance, OECD and Tarifica's benchmarking has been extensively used in studies such as: "Evaluating market consolidation in mobile communications", CERRE, 2015; "Ex-post analysis of two mergers: T-Mobile/tele.ring in Austria and T-Mobile/Orange in the Netherlands", DG Comp 2015; "The impact of competition on the price of wireless communications services", Hogunbonon, G.V, 2015; "Supersonic: European telecoms mergers will boost capex, driving prices lower and speeds higher", HSBC Global Research, 2015.

To capture all costs that consumers face when consuming mobile services (handset price, activation and connection fees, and usage price), Tarifica collected two variables for each country: the retail price of a device and the tariff price, which included activation and connection fees, as well as the price of the service.

We obtained device prices from mobile operators' websites for the cheapest handset with internet-browsing capability that was available in the market – a smartphone[36] or feature phone.[37] Given that the performance for basic mobile-internet applications, such as basic video or social networking, functions only with 3G and 4G, this analysis excluded devices with 2G and WAP connectivity. We analysed device prices from retailers other than mobile operators for the countries where mobile operators did not offer handsets, which means that in some markets there may be cheaper devices available.

Our analysis measured mobile tariffs for each country by the cheapest available plan for each basket across all mobile operators in the market. The plans and prices available for each market were obtained from the websites of mobile operators. Tariffs from mobile virtual network operators (MVNOs) were not taken into account.[38] We applied a number of restrictions to ensure that prices represent regular usage and consumption patterns:

- exclusion of postpaid plans that required a commitment of more than 24 months
- inclusion of prepaid plans lasting less than one month and where this was the case, scaling up usage allowance and prices to one month's worth
- for promotional offers, including only those that appear to be permanent
- exclusion of plans targeted or restricted to certain profiles such as youths, students and seniors.

A1.2 Tax rates

We sourced tax rates from mobile operators and from the following public sources:

- VAT rates from PwC Tax Summaries,[39] KPMG[40] and OECD's Tax Database[41]
- sector-specific consumer tax rates and fees from PwC Tax Summaries, IBFD[42] and from desktop research of, for example, government budget laws and mainstream media.
- customs duties on handsets from the World Trade Organisation's website and, specifically, the Harmonised System code 851712: 'Telephones for cellular networks, mobile telephones, or for other wireless networks'
- previous Deloitte and GSMA global[43] reports.

A1.3 Tax payments

We based tax payments on GSMA and Deloitte's analysis of data from mobile operators for 2014 and 2015,[44] defining total tax and fee payments applicable to the mobile sector as total recurring tax and regulatory fee payments. Spectrum taxes and fees include recurring spectrum and licence fees but exclude one-off payments.

36 A smartphone is a device that has an open operating platform that permits the development and installation by users of new applications.
37 A feature phone is a device with a closed platform that allows the installation of non-native applications.
38 The presence of low-cost MVNOs in some markets means that cheaper consumer alternatives for mobile service could be available.
39 PwC Tax Summaries, 2016 pwc.com/gx/en/services/tax/worldwide-tax-summaries.html
40 Indirect tax rates studies, KPMG, 2017 home.kpmg.com/xx/en/home/services/tax/tax-tools-and-resources/tax-rates-online/indirect-tax-rates-table.html
41 OECD Tax Database oecd.org/tax/tax-policy/tax-database.htm
42 IBFD Database ibfd.org
43 Digital inclusion and mobile sector taxation 2016, GSMA and Deloitte, 2016; Digital inclusion and mobile sector taxation 2015, GSMA and Deloitte, 2015; Global Mobile Tax Review 2011, GSMA and Deloitte, 2011.
44 We retrieved tax payments for 2014 from Digital Inclusion and Mobile Sector Taxation 2016, GSMA and Deloitte, 2016.

Appendix 2 Calculation of the total cost of mobile ownership (TCMO) and its tax component

A2.1 Calculation of TCMO

We define the total cost to a consumer of owning and using a mobile phone by using the concept of TCMO, which we calculate in monthly terms, on the basis of three factors:

- The handset price, i.e. the cost of the mobile device required for the use of mobile services. This represents a one-off cost that can be spread over the average three-year lifecycle of the device, after which we assume the consumer replaces the device. The TCMO calculation converts the handset prices to a monthly price based on the assumption of a three-year handset lifecycle for developing markets and two years for developed markets. The different expected lifecycle takes into account differences in usage patterns, disposable income and willingness to pay in developing versus developed markets.[45]
- The activation and connection price or any other charges incurred to connect to the operator's network. For prepaid customers this cost usually consists of an initial charge for activating the SIM card. Postpaid customers may have additional upfront costs, such as an initial charge for activating the number. Like the one-off handset price, we converted activation and connection prices into monthly prices according to the assumed lifecycle of the device for the respective type of market: developing or developed.
- The monthly price for usage, comprising voice, SMS and data charges, which can be prepaid or postpaid.

To account for differences in the handset, activation and connection, and usage prices across consumption profiles, we calculated the TCMO for the baskets in Table A2. Since these two baskets have different usage characteristics in allowed amount of usage, type of contract and technology, they can have different prices in the usage block of the TCMO as well as in the activation and connection component. With regards to the device component, we used the same device for both baskets, based on the assumption that these two profiles use the handset with a similar purpose and services,[46] and hence require a similar technology.

45 See Global Mobile Tax Review, GSMA and Deloitte, 2011
46 This assumption is based on the fact that the data allowance is not substantially different, which should to a certain extent drive similar usage patterns.

The calculation of the TCMO for basket *b* of country *i* is as follows.

$$TCMO_{bi} = \frac{Handset\ price_i}{Handset\ lifecycle_i} + \frac{Activation\ and\ connection\ price_{bi}}{Handset\ lifecycle_i} + Usage\ price_{bi}$$

To account for income differences across countries, we express the TCMO as a proportion of income per capita across different income quintiles,[47] using the most recent information on income distribution from the World Bank.[48] We estimate the TCMO measure presented in this report for 2016 – i.e. using pricing and income data as of 2016. Since our analysis uses data on prices as of the first quarter of 2017, for countries experiencing high inflation, we made adjustments to better estimate 2016's mobile service prices, recorded in local currencies and converted to US dollars using exchange rates from Oanda in 2017.

Apart from the Asia Pacific countries included in the analysis, we also carried out calculations for European[49] and North American[50] samples as benchmarks.

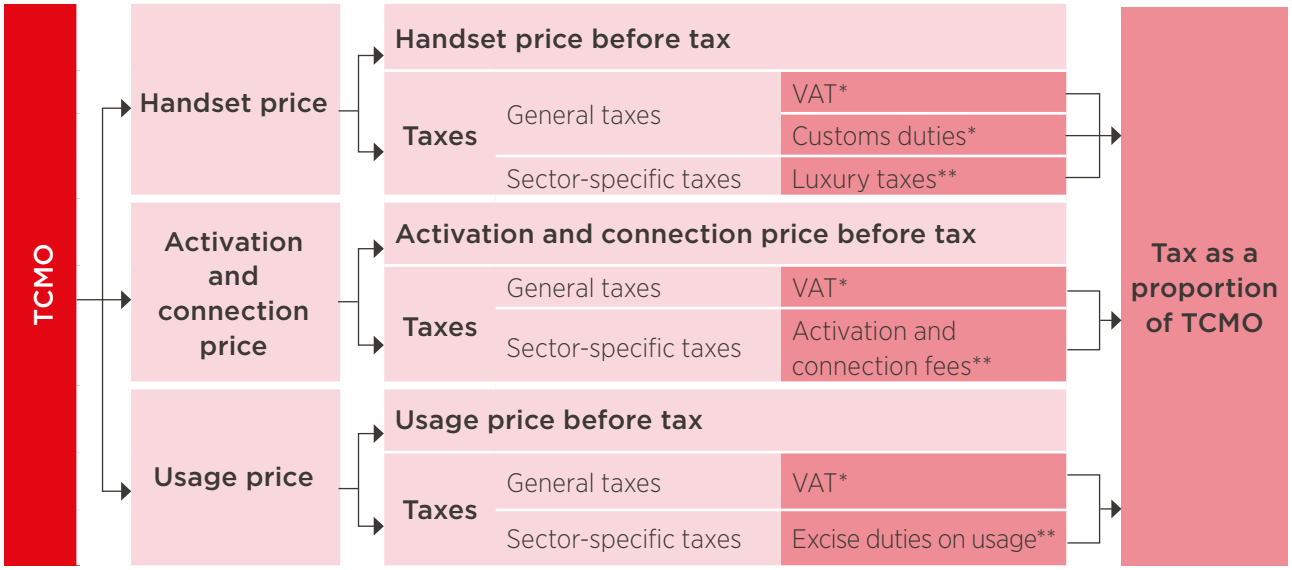
A2.2 Estimation of tax as a proportion of TCMO

We can further break down the price of the three factors in TCMO, presented above, into the price before tax, which covers costs and profits, and taxes. The latter can vary between general consumer taxes and sector-specific taxes. Table A3 presents the tax rates that we considered for this analysis.[51]

Note that this study only covers consumer taxes. The analysis did not consider any potential pass-through to consumers of taxes levied on operators due to the complexities involved in modelling the latter.[52] The conclusions from our analysis are therefore conservative, and likely underestimate tax as a proportion of TCMO.

Table A3

Calculation of the proportion of tax in TCMO



* Ad valorem tax rates

**Tax rates can either be ad valorem or fixed fees

Source: GSMA Intelligence

47 This results from estimating the share of nominal GDP across different income deciles and then distributing this between the number of individuals in each decile.
48 The most recent year is 2013 and, for some countries where 2013 data is unavailable, 2003.
49 Markets in Europe include: Austria, Belgium, Bulgaria, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, UK and Ukraine.
50 The North America region only includes the US.
51 Due to lack of data, the analysis of tax rates excludes rates on international traffic (hence, we assume no international calls) and additional tax rates related to importing devices such as processing fees.
52 Estimating the percentage of an operator tax or fee that is reflected in the retail price of mobile services depends on the type of tax, the prevailing market conditions of competition and the price elasticity of demand across different groups of consumers, among other factors.

We calculated taxes in the TCMO by applying tax rates to the appropriate tax base:

- In the case of ad valorem taxes (VAT and excise duties), the relevant tax base is the retail price of the TCMO's relevant component or factor.
- In the case of customs duties, the selected tax base is the retail price of the device in the TCMO. A more accurate calculation of customs duties would have involved using the cash, insurance and freight (CIF) price of goods as the tax base since retail prices incorporate a number of additional factors such as transport costs from the port of entry or retailer costs and margins. No data is, however, available on import prices, so we use retail prices as a proxy.[53]
- For fixed-amount taxes, we made a number of assumptions. For activation and connection fees on the value of the SIM card, we assumed an average retail price of $1.20 for the SIM[54] and, for general fixed fees, converted tax payments to monthly figures.[55] Rare cases of fixed fees per day of usage assumed that the average consumer uses mobile services for 20 days per month.[56]

53 Note that the difference between retail and import prices is likely to be country-specific (i.e. due to differences in transport and logistic costs and/or different market structures at the retail level, for instance).
54 This is an illustrative assumption, based on $1 wholesale price plus illustrative costs and margins that add to retail. Wholesale prices retrieved from www.budgetelectronics.cat
55 Yearly fees divided by 12 equal the monthly charge. Conversion of one-off fees into monthly equivalents divides by the number of assumed months in the lifecycle of the device, consistent with the approach for fixed fees when measuring the TCMO.
56 This is an illustrative assumption.

Appendix 3 Analysis of mobile tax payments

The analysis divides total tax and fee payments into the two categories of standard taxation and sector-specific taxes and fees based on information from mobile operators, according to the following categorisation:

- General taxation includes sales taxes, such as VAT or GST, and import duties on devices, as well as corporate taxes, import duties on network equipment, and general revenue-based taxes.
- Sector-specific taxes for consumers include excise duties on usage, luxury taxes on handsets, and connection and activation fees. For operators, these taxes included regulatory taxes and fees and other revenue-based, sector-specific taxes. For those countries where the mobile sector pays special rates of corporate tax or VAT, we did not classify the differential between standard rates and sector-specific rates as sector-specific, due to data limitations.

Where operator-level data was insufficient to derive an estimate of total payments for the country, we applied a market "uplift": aggregating from the one or several operators with data to cover all of the operators within a country, based on the mobile operators' market shares sourced by GSMA Intelligence. We converted local currency units into US dollars based on average exchange rates for 2014 and 2015 as sourced from Oanda.

For the analysis of the mobile industry's relative contribution to taxes, we divided mobile-sector tax payments by the total tax revenue, as sourced by the IMF for 2014. The IMF provides total tax revenues as a proportion of GDP, which we used with nominal GDP data and then compared the result of this analysis to the broader economic contribution of mobile operators to the economy, after calculating the share of operators' revenue in GDP, as sourced from GSMA Intelligence.

When presenting tax payments as a proportion of total revenue for the mobile market, we used data from GSMA Intelligence for 2014 and 2015, depending on the year of the tax payments data.

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