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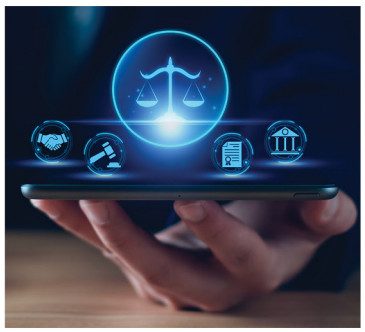
An overview of digital service taxation

April 2025









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Foreword

In an era where digital services have become an integral part of our daily lives, the approaches to their taxation are as diverse as the countries that impose them. This report seeks to demystify the complex world of digital service taxation, offering a comprehensive comparative analysis across countries and regions. The study examines taxes imposed on operators in the digital economy, as well as those affecting the consumption of digital services by enterprises and consumers.

From generic taxes like profit tax and value-added tax to sector-specific taxes and contributions, the report provides an in-depth look at the different ways telecommunication/information and communication technology (ICT) services and operators are taxed. In an effort to analyse the discrepancies in digital service taxation, the report presents an overview of the regional differences in taxation, highlighting the wide variance across countries and the lack of consistent patterns, pointing to the need for a more harmonized approach.

In terms of the impact of taxation on the digital economy, the report elucidates how various forms of taxation can affect enterprise capital spending, investment, consumer behaviour and the affordability of digital services and devices. It concludes with key findings and recommendations aimed at reducing the impact of taxation on the digital economy.

I hope that this report will provide a comprehensive understanding of the varied landscape of digital service taxation around the world and its impact on the economy. The insights provided here will be instrumental in informing governments, policy-makers, regulators and other stakeholders in shaping a more equitable and inclusive digital future.

Dr Cosmas Luckyson Zavazava
Director of the Telecommunication Development Bureau
International Telecommunication Union

Executive summary

The objective of this report is to provide a comparative analysis of approaches to digital services taxation across countries and regions. In doing so, the study differentiates between taxes imposed on operators involved in the provision of digital services and the levies imposed on their consumption by enterprises and consumers.[1]

A taxonomy of taxation in the digital economy

Telecommunication/information and communication technology (ICT) operators pay taxes and contributions like those paid by any other corporation. Typical examples of generic taxes are the profit tax, the value-added tax (VAT) and labour contributions. In addition, telecommunication/ICT operators are subject to VAT impositions when purchasing electronic equipment. Finally, labour taxes and contributions refer to the social charges that enterprises must pay for each employee, such as social security contributions.

Beyond general taxes, sector-specific taxes can be imposed on telecommunication/ICT operators to raise funds for specific public purposes. First, regulatory fees are impositions required to fund the activities of the national regulatory authority. While operators in some countries are not required to pay a recurrent fee, annual payments are imposed in most cases, typically at 1 per cent or above. While not considered to be a tax, the assignment for private use of wireless spectrum frequencies is subject to a financial contribution from telecommunication/ICT operators to the government. In some countries, operators are also required to pay custom duties for the import of electronic equipment and network components. In addition, a portion of the contributions imposed on operators is usually collected through the Universal Service Fund with the stated purpose of addressing the digital divide. Finally, there are other sector-specific contributions that are imposed in some countries, such as activation taxes or numbering fees, and taxes on deployment of infrastructure such as wireless towers.

Many countries have enacted a digital service tax to address perceived gaps in corporate income-tax systems. This approach imposes a tax on gross receipts derived from digital advertising, data mining and other types of digital platform revenue. The digital service tax also affects advertising services offered by video streaming platforms. More particularly, taxation of video streaming services can vary significantly depending on the countries involved, their tax laws, and the specific business model of the service (i.e. whether it is subscription based, or advertising based). Beyond taxation of digital services, new approaches have been developed to address levies on crypto currencies.

Several types of tax also apply to the consumption of digital services. End consumers are subject to VAT payments for the services they subscribe (e.g., the monthly subscription fee for broadband services). Beyond these, certain countries have introduced other specific obligations affecting the acquisition or use of telecommunication/ICT services. Examples of these are service connection fees and excise taxes (such as a specific amount per minute of voice or per level

[1] The concept of digital services used in this study includes not only telecommunication/ICT, but also digital platforms, such as video streaming and digital advertising, although differences are highlighted when applicable.

of data consumption). Some countries also tax international telephony traffic, establishing a termination charge for international calls. In addition to these levies, other countries have implemented specific taxes with the objective of funding other activities, such as the emergency call service, or public safety calling.

Regional differences of taxation in the digital economy

Taxation of digital services is not consistent around the world. A comparison across countries indicates a wide variance, with no clear distinction between regions or between developed and developing countries. For example, there is a significant disparity in terms of the profit tax rate. In some countries the burden is very low (10 per cent of profits), while it is at least 30 per cent in other countries. Profit tax rates are important since research indicates that, all things being equal, marginal and average tax rates have a negative effect on investment decisions.

Spectrum licence fees include initial payments and, in certain cases, recurring ones related to the use of this scarce resource. Fees are generally driven by the prices paid at auction and the duration of the licence. When normalized by spectrum allocation, the payment amount is usually equivalent to a range between 0.6 per cent and 3 per cent of mobile market revenue.

Regulatory fees are usually charged as a percentage of companies' gross income, though they can also be calculated based on the regulator's administrative costs and distributed across licensed operators as per their adjusted market share of revenue. International experience indicates that, when used to recover only administrative costs, this type of rate is usually close to 0.1 per cent of gross income. However, there are important exceptions that deviate from this norm, reaching up to 4.5 per cent and even 7.5 per cent of income in some countries.

The most common approach used to finance network deployment in rural and isolated areas is the imposition of a contribution, based on a specified rate of the gross income of each licensed operator, labelled the Universal Service Fund (USF). There are cases in which the fund is financed exclusively by the government without contributions from private operators. In general terms, in advanced economies there is no USF levy, though this also occurs in selected middle-income countries and a few low-income countries. In other countries, the contribution is voluntary, and the operator can choose whether to contribute to the fund or carry out universal service projects on their own. While the international USF benchmark is on average 1 per cent of gross income, the contribution can reach 4 per cent in some developing countries.

End consumers are also subject to VAT payments for the digital services they subscribe (e.g., the monthly subscription fee for broadband services). This is a general tax, though some countries charge an expanded VAT or an additional sales tax for the acquisition of certain telecommunication services. Beyond the taxes mentioned above, certain countries have introduced other specific obligations affecting the acquisition or use of telecommunication/ICT services.

Impact of taxation on the digital economy

Taxation can have an impact on enterprise capital spending and consumer behaviour. USF levies, profit taxes, regulatory fees, import duties and spectrum fees reduce the amount of capital earmarked by telecommunication/ICT operators for investment in network coverage. In general terms, leaving aside the positive effect taxes play in terms of funding the delivery of public services, they tend also to affect the incentives of companies to make investments and

reduce the supply of funds available to finance them. In industries such as telecommunications/ICTs that provide broadband services, a critical platform to deliver information and public services and ensure economic growth, taxation tends to reduce the level of capital investment for network deployment.

There is no consistent segmentation of countries imposing general taxes for telecommunication/ICT equipment and duties applied to network equipment. In general, the group of countries exempting equipment purchases from taxation include both developed and developing countries. This would indicate that this group is composed not only of countries that do not require equipment taxation to increase revenues but also of countries that prioritize maximization of network coverage (stimulated by lower equipment taxes) over tax collection. That said, there appear to be countries, mostly concentrated in the developing world, with some middle-income economies, that still prioritize tax collection from import duties on equipment.

On the consumer side, VAT and sales taxes on handsets and services, excise taxes and handset import duties increase the price of acquiring broadband and potentially reduce affordability for disadvantaged populations. Contrary to the case of network equipment, no countries were identified in this study that exempt consumer devices from both import duty and device-specific taxes. Furthermore, several developing countries were found to tax the import of devices at an extremely high rate. However, some countries have provided for the exemption of consumers from device taxation with the aim of reducing purchasing cost. At the other end, some countries appear to have imposed high taxation on consumer devices. In addition to the imposition of taxes on devices, affordability of telecommunications/ICTs for consumers is affected by VAT paid on mobile telecommunication/ICT services, a fairly common practice across countries. Of services to which VAT is applied, the most prevalent is outgoing international traffic, where rates range between 5 per cent and 25 per cent.

Key conclusions

The analysis of taxation trends and approaches applicable in digital services have yielded the following findings:

- Taxes imposed both on telecommunication/ICT operators and consumers continue to be in place in many countries around the world. At least 84 countries impose some form of sector-specific taxes on service providers, whether environmentally related, import duties on equipment or VAT on equipment purchases. Similarly, 145 countries impose VAT on mobile services, while 74 apply import duties on mobile devices, affecting the price of consumer acquisition.
- Among the services subject to VAT, the most common ones are outgoing and incoming international traffic, national communication voice and data services, and Internet services. The VAT rates for these services range from 5 per cent to 25 per cent.
- Taxation of digital services is not consistent across countries. No clear patterns have been identified among developed and developing countries. In some countries, the profit tax rate is 3 per cent, while it is at least 20 per cent in other countries.
- Payments for spectrum licences, which include initial payments and, in certain cases, recurring ones, range between 0.6 per cent and 3 per cent of mobile operator revenue.
- Regulatory fees, charged as a percentage of the gross income of the licensed operators, range between 0.1 per cent and 7.5 per cent of income.
- While the international USF benchmark is 1 per cent of gross income on average, the contribution can reach 4 per cent in some developing countries.

Leaving aside the positive effects taxes play in terms of their contribution to the delivery of public services, they tend also to affect the incentives of companies to make investments and reduce the supply of funds available to finance them. On the consumer side, VAT and sales taxes on handsets and services, excise taxes and handset import duties increase the price of acquiring broadband and potentially reduce affordability for disadvantaged populations. Unlike with network equipment, many countries exempt consumer devices from import duty or device-specific taxes. However, several developing countries were found to tax the import of devices at an extremely high rate.

If countries are keen to maximize deployment of telecommunication/ICT networks and adoption of digital services to address inequalities affecting the digital divide, it is imperative to examine approaches to taxation. In the light of this concern, it is relevant to mention that the 9th ITU Economic Experts Roundtable, convened in May 2022, recommended reducing telecommunication/ICT regulatory fees, designing tax frameworks and incentives at the sub-national level to address the specific needs of rural deployment, reducing/eliminating equipment and consumer device import duties, removing sector-specific taxes and reducing spectrum licence fees.[2]

[2] International Telecommunication Union (2022). Economic and fiscal incentives to accelerate digital transformation: 9th ITU Economic Experts Roundtable Outcome Report (https://www.itu.int/en/ITU-D/Regulatory-Market/Pages/Events2022/EconomicRoundTable2022.aspx)

Abbreviations

DST	Digital service tax
GSR	Global Symposium for Regulators
GST	Goods and services tax
ICT	Information and communication technologies
ISP	Internet service providers
ITU	International Telecommunication Union
NRA	National regulatory authority
USF	Universal Service Fund
VAT	Value-added tax
WTO	World Trade Organization

1 INTRODUCTION

The most important function of taxes is to raise revenue to fund government activities, ensure delivery of public goods, such as education, health and security, and deploy public infrastructure, although they can also be applied to protect local products from foreign competition. Taxes are typically raised on both net income of enterprises and consumption of goods and services, though this is not necessarily done in all countries. In the former case, tax is collected on income generated in a fiscal year, while in the latter case, tax is linked to the acquisition of a good or service (e.g., retail sales tax, value-added tax (VAT), and import duties).

The application of taxes, charges and fees on digital services is not consistent worldwide. In determining levies on digital services, governments may have "conflicting objectives" regarding their treatment. On the one hand, they are aware of the whole range of positive externalities that these industries create for the economy, while, on the other, they perceive them to be a good source of revenue. Another consideration in determining tax approaches is that governments can choose to impose levies on imports to protect local industries (e.g., audiovisual production). In light of these considerations, it is no surprise that there are multiple approaches to taxation of digital services around the world. To make matters more complex, a single country can modify its approach to digital service taxation over time because of changes in its economic and public policy priorities. For example, if a government recognizes the need to reduce the digital divide by improving the affordability of mobile broadband, it might choose to eliminate relevant taxes imposed on such services, such as handset import duties or service VAT or other taxes that raise the service's total cost of ownership.

The purpose of this report is to provide a comparative analysis of approaches to digital service taxation across countries and regions. In doing so, the study differentiates between taxes imposed on consumers and enterprises involved in the provision of digital services. The concept of "digital services" used in this study includes not only telecommunications/information and communication technologies (ICTs), but also digital platforms, such as video streaming and digital advertising.

Chapter 2 presents a general framework of taxes affecting the behaviour of consumers and enterprises in the digital economy. **Chapter 3** provides an assessment of current approaches to digital service taxation around the world. **Chapter 4** analyses countries' approaches to taxation over the past decade. **Chapter 5** provides an assessment of the impact of taxation on the behaviour of consumers and producers of digital services. The conclusion in **Chapter 6** highlights the evidence and draws policy implications**.**

2 A TAXONOMY OF DIGITAL SERVICE TAXATION

This chapter begins by reviewing the fundamental differences between taxes imposed on enterprises versus consumers. On this basis, it describes the different tax regimes applied in the digital service industries.

2.1 Taxation of enterprises versus consumers

Taxes are typically raised on both the net income of producing enterprises and the consumption of goods and services. In the specific case of enterprises, the corporate income tax is assessed either from the firm's income statement (profits after expenses) or the value of the net assets in the balance sheet of the corporation. Taxes on consumption may include sales taxes, usually based on a percentage of the sale amount, and VAT. VAT is the primary form of consumption tax for most countries around the world. While similar to sales tax in that it is imposed on consumption, it differs from the single-stage levy imposed on the final consumer by collecting the tax through a staged-process, whereby each entity in the production chain is responsible for collecting the tax on its output.

Most macroeconomic research literature has found that tax regimes play an important role in driving an enterprise's approach to investment and consumers' behaviour. On the enterprise side, taxes affect both the incentives of companies to make investments and reduce the supply of funds available to finance them. Several empirical studies indicate that, all things being equal, marginal and average tax rates have a negative effect on investment decisions. Since taxes tend to raise the required pre-tax rate of return of capital invested, the aggregate capital stock in a given economy depends on the effective tax rate. Research has shown that a reduction of corporate income taxation over time determines an increase in the level of gross fixed capital formation (Talpos and Vancu, 2009). These effects can be expected to be more significant in emerging market economies, where investment needs are greater. However, taxes are just one of the many factors driving capital investment decisions. For example, Beatty et al (1997) showed that high net equity financing activity (access to low-cost funds) and high stock returns (market signalling) are also important variables in explaining high future net capital expenditures. Similarly, as expected, the authors found that high net income and low dividend pay-outs are important predictors of capital investment. Nevertheless, when controlling for these factors, the authors also found that, for instance, changes in the tax code may have a real effect on firms' investment behaviour.

Taxes on consumption are also important because they can affect the behaviour of users with regards to purchasing and use of goods and services. Sales taxes are collected by retailers when a good or service is sold to its final consumer. The amount of tax collected varies, although it is usually based on a percentage of the sale amount. Sales taxes are typically collected at the national, state and local levels. Since there can be several jurisdictions charging a sales tax, the retailer must add the amount of tax for each of them to calculate the combined sales tax rate.

From a policy standpoint, sales taxes are considered as an alternative way of collecting revenue, as many governments rely primarily on this approach to avoid income taxes. In addition to the general sales tax rate, governments can enact taxes that affect the sale of specific goods and services (e.g., beer, wine, tobacco, luxury cars). In such cases, the objective may be to discourage consumption, in addition to raising revenue. Conversely, sales taxes can be exempted in the case of ordinary clothing and food to give low income segments a slight benefit.

While stores can simply incorporate the tax into the price of their goods, most stores add the levy onto the bill after the initial sale is calculated, to make the consumer aware of it. As a result of adding the tax to the product price, consumption taxes raise the acquisition price of a good and may have an impact on price-sensitive consumers. Because the burden of the sales tax depends on the price elasticity of the good, consumers will tend to assume the burden if demand is inelastic (in other words, if they cannot change their behaviour if a sales tax is imposed). Alternatively, if consumers shift their behaviour as a result of the tax (i.e., they stop purchasing the good once the tax is assessed because it is unaffordable on their budget), the burden of taxation is borne by the supplier. In fact, while there are goods for which demand is inelastic (e.g., cigarettes) or completely elastic (e.g., luxury cars), the burden of taxation is, in most cases, shared between suppliers and consumers based on the relative elasticities of supply and demand.

Other taxes that are like the sales tax are the excise tax (charged on goods or sales produced within the country) and the gross receipt tax (charged on the gross revenues of a business or company). The fundamental difference in these cases is that both are charged to the firm producing the goods rather than the consumer, although ICT operators transfer them to consumers if taxes are part of their cost of capital.

Beyond sales taxes, VAT and other consumption taxes are also designed to be indirect taxes because they are collected from suppliers rather than consumers. The third category of consumption tax comprises levies on specific goods and services, consisting primarily of excise taxes, customs and import duties and taxes on specific services (e.g., tax on purchase of mobile handsets).

2.2 Taxes applied to telecommunication/ICT operators

Telecommunication/ICT operators pay taxes and contributions like those paid by any other corporation. Typical examples of generic taxes are profit tax, VAT and labour contributions. Profit taxes (commonly known as corporate income taxes) are typically applied as a percentage of commercial profits. In addition, telecommunication/ICT operators are subject to VAT when purchasing electronic equipment (Ebrill et al, 2001; Matheson and Petit, 2017). Labour taxes and contributions refer to the social charges that telecommunication/ICT enterprises must pay for each employee, such as social security contributions. These obligations, again, should not disincentivize investment, as the burden of labour taxes does not usually fall on profits (Brittain, 1971).

Beyond general taxes, sector-specific taxes can be imposed on profitable sectors, such as telecommunications/ICTs, to raise funds for specific public purposes. To start with, some countries impose higher corporate income taxes in digital industries than in other sectors, an asymmetric approach that has been found to be distortive, thereby creating incentives for multinational companies to shift profits across borders (Matheson and Petit, 2017; Heckemeyer and Overesch, 2013).

Among industry specific contributions, there are several examples imposed on the telecommunication/ICT sector. First, regulatory fees are those impositions required to fund the activities of the national regulatory authority. While operators in some countries are not required to pay a recurrent fee, annual payments are imposed in most cases. When these payments are based on a fixed amount, the purpose is exclusively to finance the administrative costs associated with sector regulation. In contrast, other countries choose to establish the fee

as a percentage of the operator's gross income, typically at 1 per cent or above (rather than a fixed amount to recover costs). While this option is easier to calculate and collect, it results in a larger transfer of resources from industry to the government.

While not considered to be a tax, the assignment for private use of wireless spectrum frequencies is subject to a financial contribution from telecommunication/ICT operators to the government. This contribution can include one-off payments at the allocation or renewal period, and in some cases, include recurring payments. Initial payments are associated with acquiring the private rights to use this resource, and its imposition depends largely on the allocation mechanism followed. For example, if the spectrum has been assigned through an auction, interested parties bid to acquire frequencies by offering an amount over the base price set by the authorities. On the other hand, if the allocation mechanism involves a "beauty contest", applicants receive the spectrum licence in exchange for a network deployment plan. Recurring payments, when imposed, can be established under different schemes, for example, as a percentage of the operator's income, or as a fixed amount to be paid per megahertz or per radio base station. They are normally justified to fund the regulatory administrative expenses associated with spectrum management or as a contribution to funding network deployment in rural or isolated areas.

In some countries, operators are also required to pay customs duties for the import of electronic equipment and network components.[1] In theory, customs duties are put in place as a measure to limit imports in order to protect nascent industries until they develop comparative advantage, protect declining industries in order to slow down their rate of decline, protect strategic industries (e.g., energy, steel, armaments, and food), protect non-renewable resources, and deter unfair competition (e.g., dumping by foreign firms). However, this is not always the case since duties are conceived as another way of collecting revenues for the Treasury. Customs duties are usually imposed *ad valorem*, meaning a percentage increase on the price of the imported product. Most advanced countries have eliminated these duties, with the objective of reducing the purchase price of equipment and therefore stimulating telecommunication/ICT network deployments, although in some cases they have been reinstituted to protect the development of specific digital industries, such as audiovisual production.

In addition, a portion of the contributions imposed on operators is usually collected through Universal Service Funds (USF) with the stated purpose of addressing the digital divide. If properly administered, USFs have the potential to address market failures. USFs are usually used to fund network deployments in geographic areas where market supply is scarce (or null), and to stimulate demand through aid or subsidies for disadvantaged populations. The most common model used to finance these funds involves the imposing of a contribution, based on a specified rate on the gross income of each licensed operator (typically 1 per cent). In some countries, operators can voluntarily choose whether to contribute to the fund or carry out universal service projects on their own. There are also cases in which the fund is financed exclusively by the government (e.g., without contributions from private operators).

Finally, there are other sector-specific contributions that are imposed in some countries, such as activation taxes or numbering fees. These contributions can be applied as a fixed amount by SIM card, or by mobile number, or as a percentage of revenues. Beyond contributions imposed at the national level, network deployment can also be subject to municipal permits and fees,

[1] The World Trade Organization (WTO) classifies import duties within the code HS 8517 equipment such as base stations (HS 851761), data reception, conversion, or regeneration (HS 851762), or parts (HS 851770).

which can be one-off or recurrent, and relate to the use of public space by network facilities (e.g., wireless towers), property taxes, renting costs or environmental fees.

In some countries, telecommunication operators can also be subject to a tax payment on interconnection revenues, where double taxation raises the prices of telecommunication services, diminishing demand and additionally affecting tax revenues.

2.3 Taxes applied to digital platforms

Digital platforms offer a wide variety of services, ranging from audiovisual and music distribution (e.g., video-streaming) to e-commerce and even services delivered through the Internet (e.g., food delivery or transportation). So far, there is no consensus among policy-makers as to what category digital goods should fall into, or whether a digital good should be taxed at all. The primary concern is that traditional methods of corporate taxation are based on the notion that profits should be taxed at the location where they are generated, a concept challenged by "profit shifting" approaches implemented by digital platforms.

Many countries have enacted a digital service tax to address perceived gaps in corporate income-tax systems.[2] This approach imposes a tax on gross receipts derived from digital advertising, data mining and other types of digital platform revenue. Some countries have already implemented national mechanisms aimed at tackling profit shifting by digital platforms. For instance, a tax rate of 3 per cent applies to revenues generated from online intermediation services and the sale of targeted digital advertising in France. It applies to large Internet companies with worldwide taxable revenue exceeding EUR 750 million, and French taxable revenues of over EUR 25 million.[3] The same tax rate will be levied in Austria and is imposed in Italy, albeit with a lower domestic revenue threshold. In April 2020, the United Kingdom announced the introduction of a 2-per-cent tax on the revenues of search engines, social media platforms and online marketplaces, which generate value from United Kingdom users.[4] Similarly, India introduced the Equalization Levy, also known as the Google Tax, which is a tax of 2 per cent on online advertising and related services provided by non-resident companies. Brazil has also imposed a tax on digital services, at a rate of 2 per cent.

The digital service tax also concerns advertising services offered by video streaming platforms. More particularly, taxation of video streaming services can vary significantly depending on the countries involved, their tax laws, and the specific business model of the service (i.e., whether it is subscription based, or advertising based). In general terms, international services such as Netflix and Amazon Live may be subject to corporate income tax in the countries where they have a significant physical presence or where they generate revenue. As in corporate taxation, the tax is applied to the profits earned by the company within the jurisdiction. In addition, if the service has a physical presence in a particular country, it results in a "permanent establishment", which triggers tax liabilities. Finally, many countries impose VAT or a goods and services tax (GST) on platforms, which requires the service to charge and collect taxes from consumers. For example, in 2017, Australia enacted a GST on video streaming subscriptions, which requires the services to collect taxes on their sales. Similarly, Japan introduced a consumption tax on

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2 This approach is considered to be temporary until a more permanent framework in enacted under the auspices of the OECD pillar 1.

3 Köthenbürger, M. 2020). *Taxation of Digital Platforms*, EconPol Working Paper, No. 41, ifo Institute – Leibniz Institute for Economic Research at the University of Munich, Munich

4 OECD (2018), Tax Challenges Arising from Digitalisation – Interim Report, Paris.

digital services, including video streaming, which is collected from non-resident companies that provide digital services to Japanese consumers.

Beyond taxation of digital services, new approaches have been developed to address levies on crypto currencies.[5] Since 2020, 29 countries have developed guidance relevant to the taxation of crypto assets. The most common areas covered include the calculation of capital gains derived from buying/selling crypto assets, VAT/sales tax related to trading payment tokens, and sales tax on mining income. Most countries treat crypto assets as a form of property, although the constant innovation in terms of business models and innovations in digital assets means that tax rules are constantly falling behind industry developments.[6]

2.4 Taxes applied to consumers of digital and telecommunication/ICT services

Consumption in the telecommunication/ICT industry is subject to several types of tax. As mentioned above, some taxes are directly borne by the consumer (e.g., fees attached to the acquisition of devices), while others, such as sales tax on services, while included in the subscriber bill, are shared by providers and consumers.

End consumers are subject to VAT payments for the services they subscribe (e.g., the monthly subscription fee for broadband services). This is a general tax, though some countries charge an expanded VAT or an additional sales tax for the acquisition of certain telecommunication services. Charging telecommunication services with taxes higher than those for average goods reduces affordability for certain segments of the population. In addition, in some countries, consumers must pay customs duties for the acquisition of imported devices, such as smartphones.

Beyond the taxes mentioned above, certain countries have introduced other specific obligations affecting the acquisition or use of telecommunication/ICT services. Examples of these are service connection fees (e.g., a certain percentage of the connection cost), or excise taxes (e.g., a specific amount per minute of voice or per level of data consumption). Some countries have also proceeded to tax international voice traffic, establishing a termination charge for international calls (through a fixed amount per minute or a VAT rate). In addition to these levies, other countries have established specific taxes with the objective of funding other activities, such as the emergency call service, or taxes imposed to finance public safety calling. The application of such taxes differs remarkably in their magnitude and scope depending on the country.

In most countries, wireless users pay taxes when acquiring a service (generally linked to handset activation) and on an ongoing basis (linked to service delivery). For example, three types of tax exist in the wireless-service sector:

- **Value-added or sales tax**: most countries impose some form of value-added tax, general sales tax or similar consumption tax as a percentage of the total monthly bill.
- **Telecommunication-specific taxes**: some countries charge an additional special communications tax as a percentage of the service bill.
- **Fixed taxes**: in addition to the tax as a percentage of use, some countries charge a fixed tax that could be either driven by general communications or wireless use.

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[5] Baer, K., Mooji, R., Hebous, S., Keen, M. (2023). *Taxing cryptocurrencies*. IMF Working Paper WP/23/144. Washington, DC.

[6] PricewaterhouseCoopers (2021). PwC Annual Global Crypto Tax Report.

In addition to service-based taxes, other levies can be imposed on handset acquisition (related to activation):

- **Value-added or sales tax**: these are the taxes paid directly by the consumer when purchasing a subscription or handset, as well as when exchanging a device.
- **Customs duty**: this tax is already included in the retail price of the handset.
- **Other taxes**: telecommunication-specific taxes on handsets (e.g., royalties calculated on the cost of handset).
- **Fixed taxes on devices**: special fixed duties on handset devices, personal computers, such as ownership fees and fees for recycling.

Finally, broadband consumption taxes, generally referred to as Internet access taxes, are not uniformly applied across countries. They take the form of taxation on Internet service providers (ISP), which in turn impose these charges on consumers. In some cases, since broadband is considered to be a critical socio-economic need, regulators have chosen to exempt broadband service from any consumption tax. In other cases, governments consider the ever-growing Internet access as an attractive source of revenue and, therefore, subject to taxation.

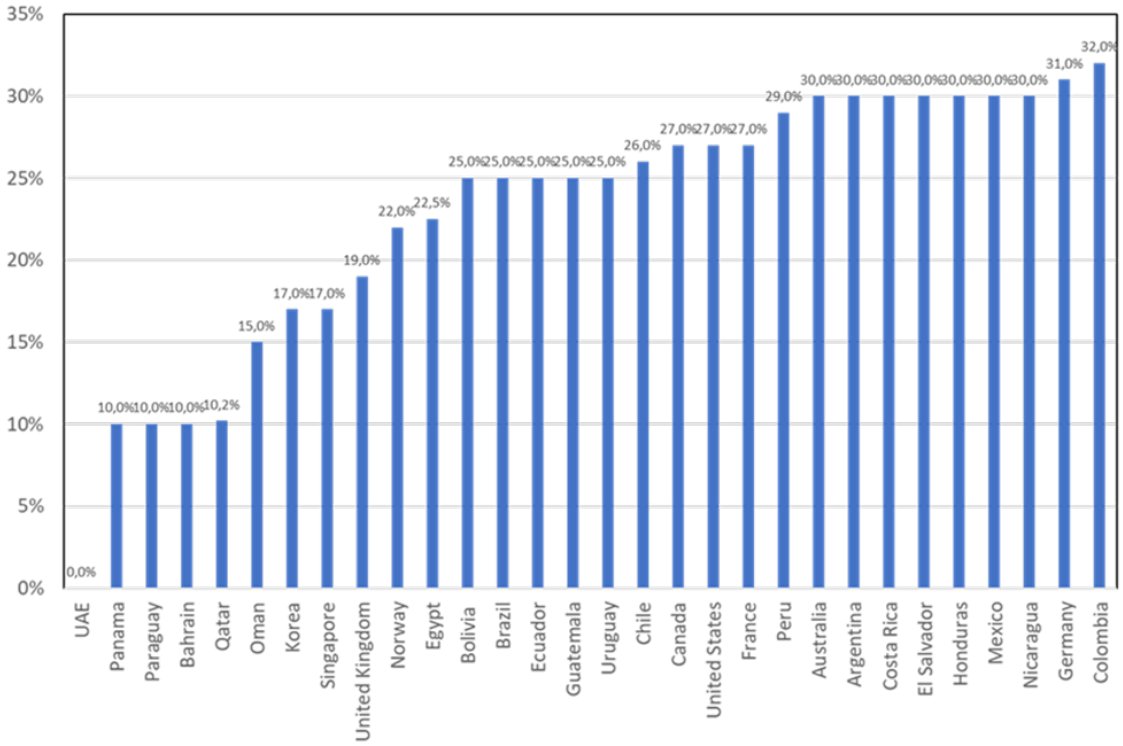
3 A REGIONAL VIEW OF DIGITAL SERVICE TAXATION

As anticipated in the introduction, taxation of digital services is not consistent across geographies. The following analyses were conducted to document the differences among countries. In addition to the taxation data compiled from the ITU tariff policies survey, data sources used were operators' annual reports, public databases such as the World Trade Organization (WTO) duties database, GSMA Intelligence, World Bank statistics and Cullen International.[7]

3.1 Profit taxes

Profit taxes, which are measured as a percentage of commercial profits, on telecommunication/ ICT operators mirror those applied to other corporations. A comparison across 30 countries indicates a wide variance, with no clear patterns identified among developed and developing countries (see Graphic 1).

Graphic 1. Profit taxes (per cent of commercial profits) (2022)



Source: World Bank; Telstra; WTO; Deutsche Telekom; Verizon; SK telecom; Singtel

As data in Graphic 1 indicates, there is a significant disparity across countries in terms of the profit tax rate. For example, in Bahrain, Qatar, Paraguay and Panama, the burden is very low (10 per cent of profits), while the rate is at least 30 per cent in other countries, such as Australia, Argentina, Costa Rica, Colombia, El Salvador, Honduras, Mexico, Nicaragua and Venezuela. Profit tax rates are important since, as explained in the prior chapter, empirical studies indicate that, all things being equal, marginal and average tax rates have a negative effect on investment decisions.

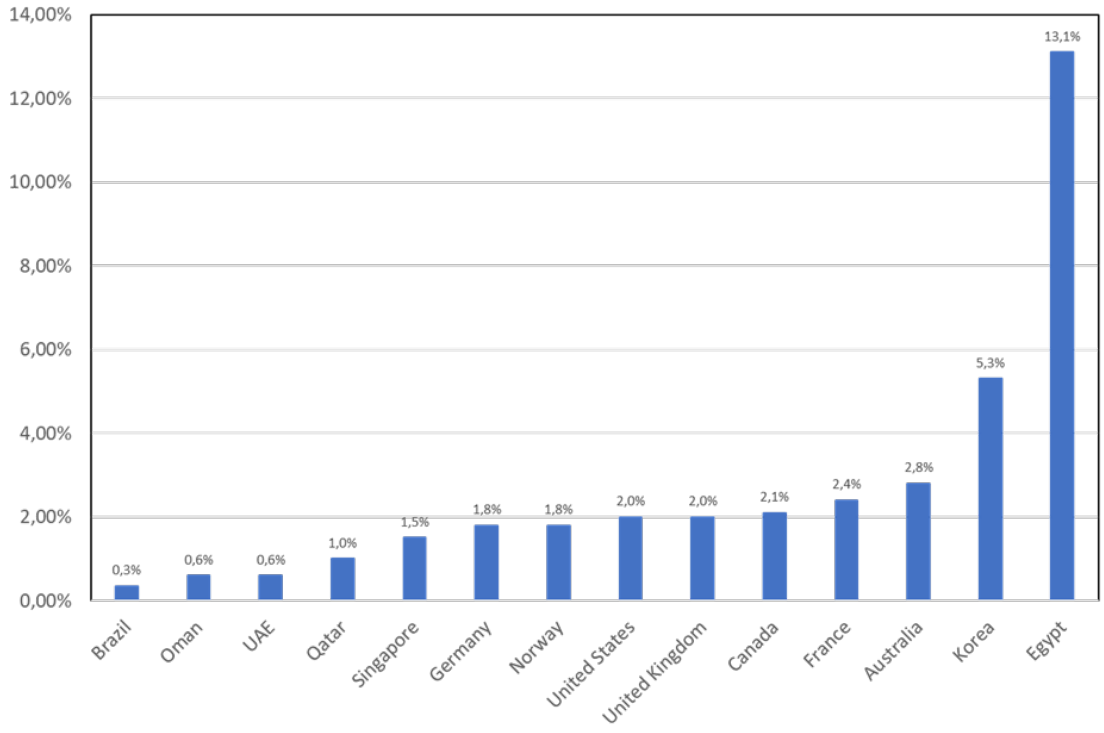
[7] As a word of caution, taxes and rates in a given country might change year to year as a result of shifting policy priorities and budgetary constraints.

That being said, when discussing the effect of taxes on investment, an important distinction should be made between statutory tax rates (the legal percentage established by law) and the *effective tax rate*. This last metric reflects the percentage of the operator's overall accounting income actually paid in taxes, thereby capturing situations where income at lower brackets gets taxed at a lower rate, in part driven by tax deferral strategies that shift income into future periods. As suggested by Liu and Altshuler (2013), the effective marginal tax rate is what captures how tax incentives for investment differ across industries or countries.

3.2 Payments for spectrum licences

Payments for spectrum licences include initial payments and, in certain cases, recurring ones related to the use of this scarce resource. While difficult to calculate for comparative purposes, a brief assessment serves to highlight differences in spectrum licence payments across countries. Spectrum licence fees are generally driven by the prices paid at auction and the length of licence duration. Based on the data for various countries depicted in Graphic 2, when normalized by spectrum allocation, the payment amount is usually equivalent to a range between 0.6 per cent and 3 per cent of mobile market revenue, with some outliers.

Graphic 2. Spectrum payments (per cent of market revenue)



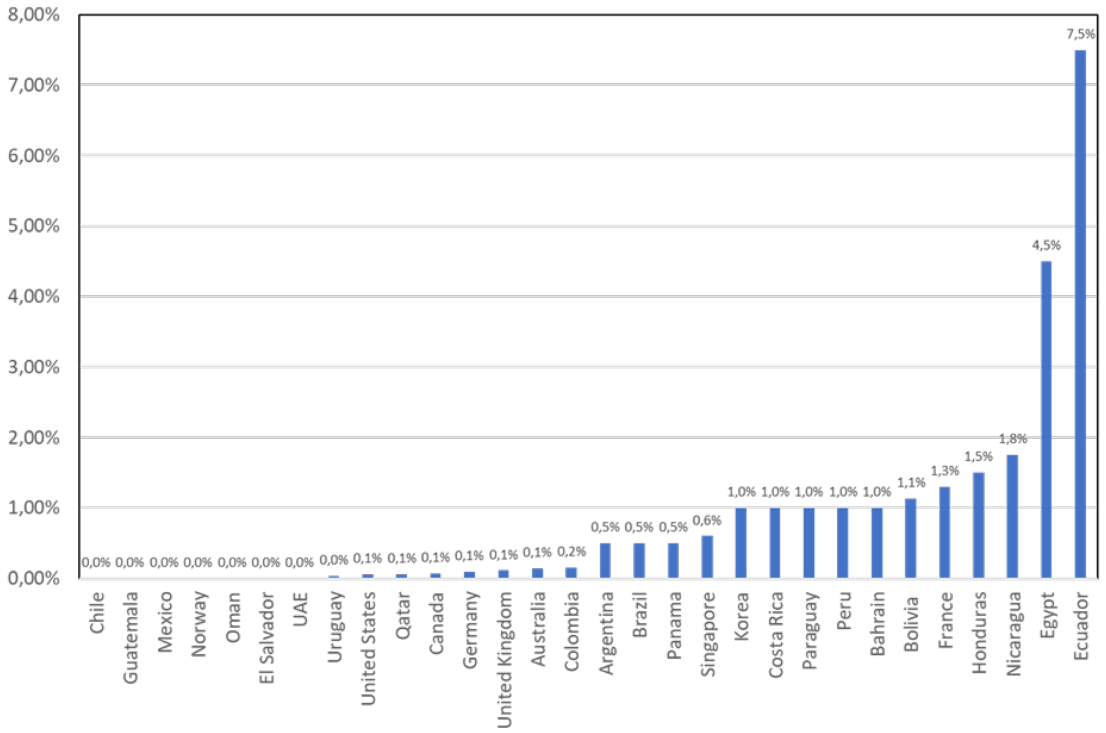
Source: OMDIA; analysis by the authors

3.3 Regulatory fees

As mentioned above, regulatory fees or licensing charges are mainly intended to fund the administrative costs associated with sector regulation. These payments are usually charged as a percentage of the gross income of telecommunication/ICT companies (gross proportional approach), although they can also be calculated based on the regulator's administrative costs and distributed to licensed operators as per their adjusted revenue market share (administrative

approach).[8] International experience indicates that, when used to recover only administrative costs, these usually equate to close to 0.1 per cent of gross income;[9] in some regions, however, there are important exceptions that deviate from this norm (see Graphic 3).

Graphic 3. Regulatory fees (per cent of gross income)



Sources: GSMA Intelligence; Cullen International; operator interviews; Telecommunications Advisory Services analysis

In Ecuador, a case of high taxation, the rate varies depending on the operator's market share and can represent up to 7.5 per cent of income, which is well above international best practice. Another country with a high tax burden is Nicaragua, where the applicable percentage of income varies by service segment. It is also worth noting that in some countries this type of contribution does not exist, e.g., in Chile, El Salvador, Guatemala, Mexico, Norway, Oman, and the United Arab Emirates.

3.4 USF levies

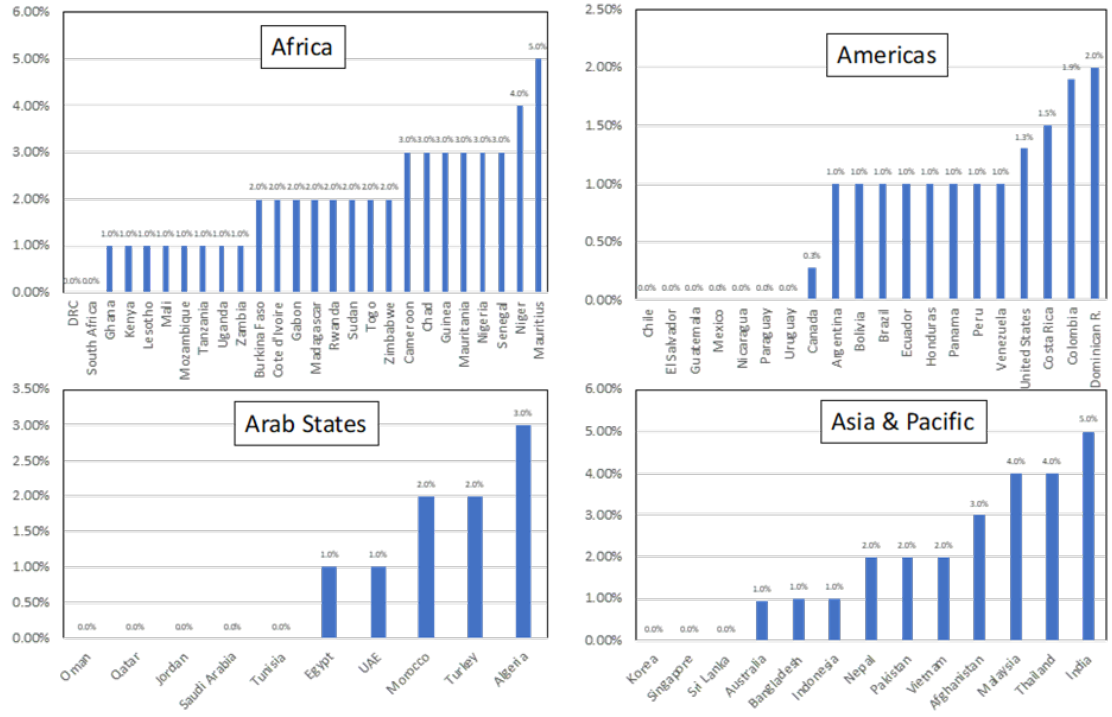
In most countries, a portion of the fiscal contribution is assigned to USFs aimed at generating resources to extend telecommunication/ICT service to the unserved population. If properly administered, USFs have the potential to fund network deployments in geographic areas where market supply is limited, and to stimulate demand through aids or subsidies for the most disadvantaged families. The most common model used to finance these funds is by imposing a contribution, based on a specified rate of the gross income of each licensed operator (e.g.,

[8] While the gross proportional approach is based on simple fee calculation, it is easier to administer, and provides a high degree of certainty over time, it represents a pure collection mechanism with no rational estimation, which could result in excess burden. On the other hand, the administrative approach rationalizes fees with a breakdown of regulatory costs, does not allow for excess charges, it is transparent, albeit more complex to manage and can fluctuate year-on-year.

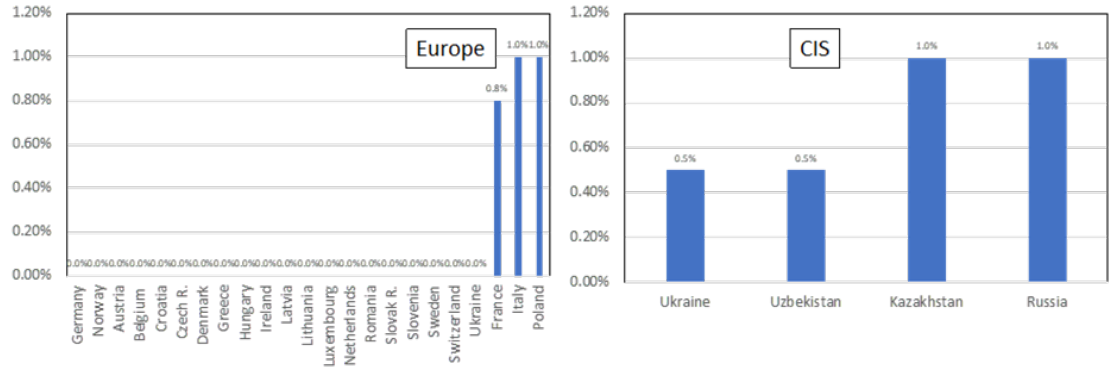
[9] Threshold based on the charges imposed in digitally advanced countries such as Australia, Germany, Canada, and United States.

1 per cent). In other countries, operators can voluntarily choose whether to contribute to the fund or carry out universal service projects on their own. There are also cases in which the fund is financed exclusively by the government (without contributions from private operators) (see Graphic 4).

Graphic 4. Contributions to Universal Service Funds (per cent of gross income)



Sources: ITU; GSMA Intelligence; Telstra, WTO, Deutsche Telekom, Verizon, SK telecom, Singtel; Operator interviews



Sources: ITU; GSMA Intelligence; Telstra, WTO, Deutsche Telekom, Verizon, SK telecom, Singtel; Operator interviews

There tends to be no USF levy in developed countries, as is the case for most countries in the Europe region and for some countries in the Asia and the Pacific and the Arab States regions, though this is also true for selected developing countries (Chile, Guatemala, Mexico, Nicaragua, Paraguay, Sri Lanka and Uruguay). In other countries (Germany and El Salvador), the contribution is voluntary. While the international USF benchmark is 1 per cent of gross income on average, the contribution is higher in some countries (3 per cent in Cameroon, Chad, Guinea, Mauritania, Nigeria, Senegal, Algeria and Afghanistan; and 4 per cent in Niger, Malaysia and Thailand).

3.5 Additional taxation on telecommunication/ICT operators

Beyond taxes and contributions of a general nature and the sector-specific ones mentioned above that are ultimately associated with the very nature of the industry (regulatory fees, spectrum payments and USF contributions), countries impose other types of taxes on telecommunication/ICT companies. These additional taxes or contributions in many cases are municipal in nature (e.g., for public lighting, antenna installation permits or licences) and are difficult to quantify and compare since each tax normally varies by municipality. There are also countries that apply additional regulatory fees to those already mentioned above, such as the "supervision fee" imposed in Honduras, or the Inspection Fund (FISTEL) applicable in Brazil. In addition to these levies, many countries have introduced taxes that bear little or no relationship to the telecommunication/ICT industry. Examples include contributions for security or emergency systems (Costa Rica, Ecuador, Honduras and Panama), for the Red Cross (Costa Rica) or to combat cancer (Ecuador).

3.6 Taxes applied to the consumption of telecommunications/ICTs

End consumers are subject to VAT payments for the digital services that they subscribe (e.g., the monthly subscription fee for broadband services). This is a general tax, though some countries charge an expanded VAT or an additional sales tax for the acquisition of certain telecommunication/ICT services. Charging telecommunication services with taxes higher than those for average goods reduces affordability for certain segments of the population. In addition, in some countries, consumers must pay customs duties for the acquisition of imported devices, such as smartphones.

Beyond the taxes mentioned above, certain countries have introduced other specific obligations affecting the acquisition or use of telecommunication/ICT services. These impositions are normally associated with a distortion that makes ICT services more expensive and, thus, less affordable to the population. Examples of this are service connection fees (e.g., a certain percentage of the connection cost), or excise taxes (e.g., a specific amount per minute of voice or per level of data consumption). These impositions have been identified in the literature as being highly distortive (Matheson and Petit, 2017). Some countries have also proceeded to tax international traffic, establishing a termination charge for international calls (through a fixed amount per minute). In addition to these levies, other countries have established taxes on the sector with the objective of financing other activities, such as the emergency call service, or taxes imposed to finance public safety. The application of such taxes differs remarkably in their magnitude and scope depending on the country, as will be reviewed in the next chapter.

4 ASSESSMENT OF TAX REGIMES BY COUNTRY

The following analyses are based on the 2024 edition of the ITU Tariff Policies Survey.[10] Survey data is structured across four categories (see Table 1).

Table 1. Taxation answers in the ITU Tariff Policies Survey, 2024

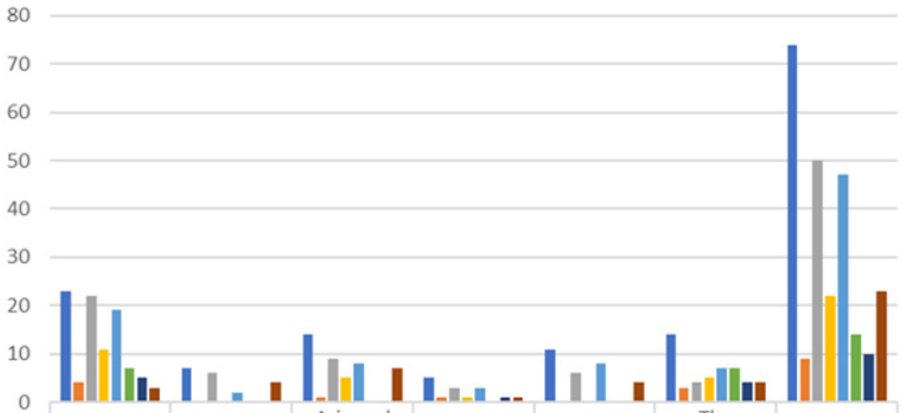
Category	Taxation
Telecommunication/ICT operator taxes	• Import duty taxes that are applied to network equipment and devices • Taxes on telecommunication equipment (ICT hardware) paid by operators in addition to VAT and import duties • Spectrum licence fees • Sales taxes • Ownership fees • Property tax • VAT • Sector specific taxes
Generic taxes imposed on telecommunication/ICT consumers	• VAT applied to fixed services • VAT applied to mobile services • Import duty taxes that are applied to network devices • Other taxes applied to general goods and services
Sector-specific taxes imposed on telecommunication/ICT consumers	• Sector taxes applied to fixed services and devices for consumers (outgoing international traffic, incoming international traffic, national communication (voice), national communication (data), Internet services, end-user equipment) • Sector taxes applied to mobile services and devices for consumers (outgoing international traffic, incoming international traffic, national communication (voice), national communication (data), Internet services, end-user equipment)
Digital service taxes	• Digital service taxation • Taxation of virtual currencies (crypto currencies, crypto assets)

Source: ITU Tariff Policies Survey, 2024

At least 84 countries provided a response to the question on the existence of some form of sector-specific taxes on telecommunication operators, with the most prevalent form being a tax imposed on the import of telecommunication/ICT equipment. It was also noted that no country reported about the application of environmental taxes for telecommunication/ICT operators and consumers.

[10] The survey presents data for the last year for which it is available. Some country data was last reported in 2012. Moreover, not all countries have provided responses to the survey. The results from this survey are available at the ITU DataHub: https://datahub.itu.int/.

Graphic 5. Taxes that apply to the telecommunication/ICT sector by region, 2024



	Africa	Arab States	Asia and Pacific	CIS	Europe	The Americas	Total
Spectrum License Fees	23	7	14	5	11	14	74
Rent Taxes	4	0	1	1	0	3	9
Corporate Income Tax	22	6	9	3	6	4	50
Excises	11	0	5	1	0	5	22
Value added Tax	19	2	8	3	8	7	47
Input Taxes	7	0	0	0	0	7	14
User Fees	5	0	0	1	0	4	10
Other	3	4	7	1	4	4	23

Source: ITU Tariff Policies survey, 2024

As the positive and negative answers to the existence of telecommunication/ICT sector-specific taxes indicate, no clear geographic patterns emerge.

In addition, an analysis was conducted on specific taxes applied to telecommunication/ICT consumption (see Table 2).

Table 2. Assessment of tax profiles

Analyses	Items considered
Taxes affecting the cost of devices acquired by mobile consumers	• Sector taxes applied to mobile devices for consumers • Import duty taxes that are applied to network equipment and devices
Taxes affecting mobile services	• VAT applied to mobile services • Sector taxes applied to mobile services for consumers (outgoing international traffic, incoming international traffic, national communication (voice), national communication (data), Internet services)

Source: Developed by the author

In this case, the most prevalent sector-specific taxes imposed on consumers are VAT applied to telecommunication services and then import duty on devices (see Table 3).

Table 3. Answers from countries to the application of telecommunication/ICT sector-specific taxes

	Africa	Arab States	Asia and Pacific	CIS	Europe	Americas	Total
ICT Sector specific taxes	11	1	3		1	4	**20**
Import duty applied to ICT devices	4		1		1	3	**9**
VAT	33	10	15	5	32	22	**117**
Sales taxes	4	2	6	1		11	**24**
Ownership fees	1	1					**2**

Source: ITU Tariff Policies Survey, 2024

In the case of taxes and duties applied to the telecommunication/ICT sector, no clear regional patterns emerge. Country data reported in the 2024 edition of the ITU Tariff Policies Survey was used to position countries along three scales: (i) taxes exempted, (ii) taxed between 1 per cent and 19 per cent (low rate) and (iii) above 19 per cent (high rate)[11] (see Table 4). Regarding corporate taxes, the results of the survey indicate that most countries–both developed and developing–impose high tax rates exceeding 19 per cent, only two countries reported low rates (Rep. of Korea and Ireland). In contrast, sector-specific taxes remain relatively low, typically ranging between 3 per cent and 5 per cent as reported by 4 countries (Madagascar, Haiti, Tunisia and Cambodia), with 48 countries reporting no imposition of such taxes.

A similar trend is observed with property taxes, where 34 countries reported not applying them to the telecommunication sector. Among those that do, tax rates range from 1 per cent to 20 per cent.

Table 4. Other taxes applied to the telecommunication/ICT sector

Other taxes applied to the telecommunication sector			
	No applying	Low rate (1-19%)	High rate (>19%)
Corporate tax	**Africa**: Lesotho **Americas**: Bahamas, Cuba, Guatemala, Nicaragua, Venezuela **Arab States**: Kuwait, Libya **Asia and Pacific**: Iran, Sri Lanka, Vanuatu **CIS**: Armenia **Europa**: Estonia, Latvia, Montenegro, Portugal	**Asia and Pacific**: Korea (Rep. of) (10%) **Europe**: Ireland (12.50%)	**Africa**: Kenya (30%), Mali (30%), Rwanda (28%) **Americas**: Mexico (30%) **Asia and Pacific**: Afghanistan (20%), Pakistan (29%), Viet Nam (20%) **CIS**: Russian Federation (20%) **Europe**: Albania (20%), Czech Republic (21%), Slovenia (19%), Spain (25%)

[11] Some countries report one of the two taxes.

Table 4. Other taxes applied to the telecommunication/ICT sector (continued)

Other taxes applied to the telecommunication sector			
	No applying	Low rate (1-19%)	High rate (>19%)
Sector specific tax	**Africa**: Angola, Eswatini, Kenya, Lesotho, Malawi, Mauritius, Rwanda, Sao Tome and Principe **Americas**: Barbados, Cuba, Dominica, Grenada, Guatemala, Guyana, Trinidad and Tobago **Arab States**: Kuwait, Qatar, Saudi Arabia **Asia and Pacific**: Brunei Darussalam, Iran (Islamic Republic of), Japan, Malysia, Maldives, Papua New Guinea, Vanuatu **CIS**: Armenia, Azerbaijan, Kyrgyzstan, Uzbekistan **Europa**: Austria, Croatia, Czech Republic, Estonia, Finland, Iceland, Ireland, Israel, Latvia, Liechtenstein, Montenegro, Norway, Portugal, Serbia, Sweden, Switzerland	**Africa**: Madagascar (3%) **Americas**: Haiti (3%) **Arab States**: Tunisia (5%) **Asia and Pacific**: Cambodia (3%)	
Property tax	**Africa**: Equatorial Guinea, Eswatini, Gabon, Lesotho, Malawi, Mozambique, Tanzania **Americas**: Brazil, Cuba, Dominica, El Salvador, Saint Vincent and the Grenadines, Trinidad and Tobago **Arab States**: Kuwait, Libya, Mauritania, Qatar, Saudi Arabia, Tunisia, United Arab Emirates **Asia and Pacific**: Bangladesh, Mongolia, Myanmar, Sri Lanka, Viet Nam **CIS**: Kyrgyzstan **Europe**: Austria, Croatia, Ireland, Liechtenstein, Montenegro, Norway, Portugal, Sweden	**Africa**: Angola (15%) **CIS:** Azerbaijan (1%), Uzbekistan (1.5%) **Europe**: Cyprus (12.5%)	**CIS**: Russian Federation (20%)

Source: ITU Tariff Policies Survey, 2024

4.1 Taxes affecting the cost of operators' network equipment

While, as mentioned above, operator capital spending is affected by multiple taxes and contributions, it is relevant to examine the approaches followed by countries with regard to two taxes that have a direct impact on investment: (i) general taxes and fees paid for telecommunication/ICT equipment in addition to VAT; and (ii) import duties that are applied to network equipment.[12] Country data reported in the 2024 edition of the ITU Tariff Policies Survey was used to position countries along import duties that are exempted for network equipment or taxed between 1 per cent and 19 per cent (low rate) or above 19 per cent (high rate) as showed in Table 5.

Table 5. Taxes on the purchasing of telecommunication/ICT network equipment

Taxes on telecommunication/ICT network equipment – Import duties		
No taxes	Low rate (1-19%)	High rate (>19%)
Africa: Benin, Ethiopia, Rwanda **Americas**: Cuba, Guyana, Mexico, Trinidad and Tobago, Venezuela **Arab States**: Kuwait, Libya, Qatar **Asia and Pacific**: Australia, Japan, New Zealand **CIS:** Kyrgyzstan **Europe**: Austria, Czech Republic, Denmark, France, Ireland, Italy, Malta, Norway, Portugal, Slovakia, Sweden	**Africa**: Angola (14%), Liberia (10.5%), Sao Tome and Principe (10%), Seychelles (15%), Uganda (10%) **Americas**: Honduras (15%) **Arab States**: Oman (5%), Palestine (15%), United Arab Emirates (5%) **Asia and Pacific**: Afghanistan (14%), Cambodia (15%), China (17%), Iran (1.5%), Mongolia (5%), Republic of Nepal (5%), Papua New Guinea (10%), Viet Nam (10%) **CIS**: Azerbaijan (3%) **Europe**: Andorra (5%), Armenia (10%), Bosnia and Herzegovina (10%), Georgia (12%), Liechtenstein (8.1%), Lithuania (9%), Moldova (5%)	**Africa**: Kenya (25%), Republic of the Congo (23%), Lesotho (36%), Malawi (20%), Mali (20%), Namibia (30%), Sierra Leone (31%), Zimbabwe (25%) **Americas**: Bahamas (25%), Haiti (20%), Suriname (28%) **Arab States**: Algeria (35%), **Asia and Pacific**: Bangladesh (25%) **Europe**: Estonia (20%)

Note: The figure by country indicates the equipment import duty.

Source: ITU Tariff Policies Survey, 2024; analysis by the author.

As indicated in Table 5, 26 countries reported no imposition on the purchasing of network equipment by telecommunication/ICT operators (this does not mean that taxes are not imposed). Of countries that do report on these taxes, a view by region indicates no consistent segmentation, with a prevalence of no imposition in countries in Europe (Austria, Czech Republic, Denmark, France, Ireland, Italy, Malta, Norway, Portugal, Slovakia, Sweden), followed by the Americas (Cuba, Guyana, Mexico, Trinidad and Tobago and Venezuela) and also some countries in Africa (Benin, Ethiopia, Rwanda), the Arab States (Kuwait, Libya and Qatar), Asia and the Pacific (Australia, Japan and New Zealand) and only one in CIS (Kyrgyzstan). In general, the group of countries exempting taxes on equipment acquisition include advanced economies and some developing countries. This would indicate that this group is not only composed of

[12] While the ITU survey reports that some countries tax equipment imports, the exact rate of duty is not reported for all countries.

countries that do not require taxation of equipment to increase revenues but also countries that prioritize maximization of network coverage (stimulated by lower equipment taxes) over tax collection.

That said, there appears to be countries that still prioritize tax collection from high import duties on equipment. These are mostly concentrated among developing countries, with some middle-income economies (Kenya (25%), Lesotho (36%), Malawi (20%), Mali (20%), Namibia (30%), Sierra Leone (31%), Zimbabwe (25%), Algeria (35%), Bangladesh (25%), Estonia (20%), Bahamas (25%), Haiti (20%) and Suriname (28%)).

4.2 Taxes affecting the cost of devices acquired by mobile consumers

A similar analysis was conducted to determine the tax regimes that can have an impact on the cost of mobile consumer handset acquisition. As mentioned above, in addition to taxes on services, consumers must pay duties on imported equipment, such as feature and smartphones. This amount is initially paid as a duty by the operator and later included in the purchase price of the device; in some cases, it is included as a recurring payment (explicit or implicit) in the monthly bill.

Import duty data for smartphones has been compiled from the WTO database and cross-referenced against answers in relation to handset taxation from the ITU Tariff Policies Survey.

The WTO data indicates a worldwide prevalence of handset duty exemption, although a number of countries in the Americas and Africa regions still tax handset imports. Data reviewed reflects an important regional diversity, where countries more open to foreign trade (applying a 0-per-cent tariff to these products) coexist alongside more protectionist ones. Beyond regional diversity, there is also an important difference with most advanced countries, where this type of tax is not imposed. In general terms, since high taxation increases the total cost of ownership of wireless services, it is correct to consider that higher wireless consumption taxes will raise the affordability barrier and reduce adoption.

Table 6 presents the distribution of countries, based on the WTO and ITU survey, regarding two tax approaches that affect the cost of device acquisition: (i) handset import duty; and (ii) sector-specific taxes applied to end-user equipment (handsets, computers, etc.).

Table 6. Handset taxes (2022)

		Import duty application (with rate in first %)	
		No	Yes
Sector tax applied to handsets	**Africa**	Botswana (0%), South Africa (0%)	Cameroon (10%), Republic of the Congo (30%, 60%), Kenya (1.4%), Tanzania (1.4%), Uganda (1.4%), Zambia (2.1%), Angola (5.1%), Benin (9.3%), Cote d'Ivoire (9.3%), Mozambique (7.5%), Namibia (30%, 30%), Nigeria (9.3%), Senegal (9.3 %), Zimbabwe (5.9%), Burundi (10.2%), Madagascar (12.1%), Rwanda (0%, 10%), Sao Tome and Principe (10%), Sierra Leone (31%, 0%)
	Americas	Canada (0%), Colombia (0%), Costa Rica (0%), El Salvador (0%), Guatemala (0%), Haiti (0%), Honduras (0%), Nicaragua (0%), Panama (0%), Peru (0%)	Antigua (15%, x), Brazil (12.9%, x), Jamaica (4.3%), Mexico (4.2%), Paraguay (2.9%), Trinidad and Tobago (1.4%), Argentina (7.9%), Barbados (6.1%), Bolivia (9.8%), Chile (6%), Cuba (10%), Dominican Republic (6.9%), Ecuador (7.6%), Haiti (28%, 5%), Uruguay (8.5%), Venezuela (12.9%)
	Arab States	Bahrain (0%), Egypt (0%), Jordan (0%), Kuwait (0%), Oman (0%), Qatar (0%), Saudi Arabia (0%), United Arab Emirates (0%)	Morocco (2.5%), Algeria (7.7%), Tunisia (11.4%)
	Asia and Pacific	Australia (0%), Japan (0%), Korea (0%), Malaysia (0%), New Zealand (0%), Philippines (0%), Singapore (0%), Sri Lanka (0%), Thailand (0%)	China (0.1%, x), Indonesia (0.3%), Viet Nam (0.2%), India (7.1%), Bangladesh (17.8%), Pakistan (12.7%)
	CIS	Kazakhstan (0%), Belarus, Russia (0%)	
	Europe	Armenia (0%), Austria (0%), Belgium (0%), Croatia (0%), Cyprus (0%), Czech Republic (0%), Denmark (0%), Estonia (0%), Finland (0%), France (0%), Germany (0%), Greece (0%), Hungary (0%), Iceland (0%), Ireland (0%), Italy (0%), Latvia (0%), Lithuania (0%), Luxembourg (0%), Malta (0%), Netherlands (0%), Norway (0%), Poland (0%), Portugal (0%), Romania (0%), Slovakia (0%), Slovenia (0%), Spain (0%), Sweden (0%), Switzerland (0%), United Kingdom (0%)	Bulgaria (21.5%), Israel (0.9%), North Macedonia (5%, 0%), Türkiye (0.3%), Ukraine (0.7%, 20%),

Note: The first value by country indicates the consumer equipment import duty and the second figure indicates tax on consumer devices. (x) Tax charged in the country, but rate is not reported.

Source: WTO; ITU Tariff Policies Survey, 2022; analysis by the author.

Unlike with network equipment, many countries were identified that exempt consumer devices from import duty or device-specific taxes. Furthermore, several developing countries were found to tax the import of devices at an extremely high rate. However, some countries have established consumer device taxation approaches aimed at reducing the purchasing acquisition cost (Colombia, Italy, North Macedonia, Rwanda and Spain). At the other end, some countries appear to have imposed high taxation on consumer devices (Republic of the Congo, Namibia and Ukraine).

4.3 Taxes affecting mobile services

In addition to the taxes on devices, affordability of telecommunications/ICTs for consumers is affected by VAT paid on mobile telecommunication/ICT services, which is a fairly common practice across countries. Among the services subject to VAT, the most common are outgoing and incoming international traffic, national communication voice and data services, and Internet services. The VAT rates for these services range from 5 per cent to 25 per cent (see Table 7).

Table 7. VAT applied to mobile services

Country	Outgoing international voiceservices	Incoming international voice services	National communication voice services	National Data services	Internet services
Angola	14% (2021)	14% (2020)	14% (2021)	14% (2021)	14% (2021)
Burundi	18% (2024)	18% (2024)	18% (2024)	18% (2022)	18% (2024)
Benin	18% (2024)		18% (2024)	18% (2024)	18% (2024)
Burkina Faso			18% (2023)		
Botswana	14% (2024)	14% (2024)	14% (2024)	14% (2024)	14% (2024)
Congo (Rep. of the)	18% (2024)		18% (2024)	18% (2024)	18% (2024)
Cabo Verde	15% (2021)	15% (2021)	15% (2021)	15% (2021)	15% (2021)
Côte d'Ivoire	18% (2022)	18% (2022)	18% (2022)	18% (2022)	18% (2022)
Ghana	15% (2024)	17.5% (2019)	15% (2024)	15% (2024)	
Gambia		15% (2024)	20% (2018)		15% (2024)
Guinea-Bissau	19% (2024)	19% (2024)	19% (2024)	19% (2024)	19% (2024)
Equatorial Guinea	15% (2023)	15% (2023)	15% (2023)	15% (2023)	15% (2023)
Kenya	16% (2021)	16% (2021)	16% (2021)	16% (2021)	16% (2021)
Lesotho	15% (2023)	15% (2023)	15% (2023)	15% (2023)	15% (2023)
Mauritius	15% (2024)	15% (2024)	15% (2024)	15% (2024)	15% (2024)
Madagascar	20% (2024)	20% (2024)	20% (2024)	20% (2024)	20% (2024)
Mali		18% (2023)	18% (2023)	18% (2023)	18% (2023)
Mozambique	17% (2021)	17% (2021)	17% (2021)	17% (2021)	17% (2021)
Malawi	17% (2021)	16.5% (2021)	16.5% (2021)	16.5% (2021)	16.5% (2021)
Namibia	15% (2024)	15% (2024)	15% (2024)	15% (2024)	15% (2024)
Rwanda	18% (2015)	18% (2024)	18% (2024)	18% (2024)	18% (2024)
Seychelles	15% (2024)	15% (2024)	15% (2024)	15% (2024)	15% (2024)
Sierra Leone	15% (2022)	15% (2022)	15% (2022)	15% (2015)	15% (2022)
Eswatini	15% (2024)	15% (2024)	15% (2024)	15% (2024)	15% (2024)

Table 7. VAT applied to mobile services (continued)

Country	Outgoing international voiceservices	Incoming international voice services	National communication voice services	National Data services	Internet services
Togo	18% (2024)	18% (2022)	18% (2024)	18% (2024)	18% (2024)
Tanzania	18% (2024)	18% (2015)	18% (2024)	18% (2024)	18% (2015)
Dem. Rep. of the Congo	16% (2024)	16% (2024)	16% (2024)	16% (2024)	16% (2024)
Zambia	16% (2024)		16% (2024)	16% (2024)	16% (2024)
Zimbabwe	15% (2024)	15% (2024)	15% (2024)	15% (2024)	15% (2024)
Algeria	19% (2024)	19% (2024)	19% (2024)	19% (2024)	19% (2024)
Saudi Arabia	15% (2023)	15% (2023)	15% (2023)	15% (2023)	15% (2023)
Bahrain	10% (2024)	10% (2024)	10% (2024)	10% (2024)	10% (2024)
Egypt	14% (2021)		14% (2024)	14% (2021)	14% (2024)
Lebanon	11% (2021)	11% (2021)	11% (2021)	11% (2021)	11% (2021)
Oman	5% (2024)	5% (2024)	5% (2024)	5% (2024)	5% (2024)
Sudan	40% (2022)		40% (2022)	40% (2022)	40% (2022)
Somalia	5% (2021)	5% (2021)	5% (2021)	5% (2021)	5% (2021)
Tunisia	19% (2024)	19% (2024)	19% (2024)	19% (2024)	19% (2024)
United Arab Emirates	5% (2024)		5% (2024)	5% (2024)	5% (2024)
Australia	10% (2024)	10% (2024)	10% (2024)	10% (2024)	10% (2024)
Bangladesh	15% (2022)		15% (2022)	5% (2022)	5% (2022)
Myanmar	5% (2022)	5% (2022)	5% (2022)	15% (2022)	15% (2022)
Cambodia	10% (2024)	10% (2024)	10% (2024)	10% (2024)	10% (2024)
China	9% (2023)	9% (2023)	9% (2023)	6% (2023)	6% (2023)
Sri Lanka			8% (2020)	8% (2020)	8% (2020)
Iran (Islamic Republic of)			9% (2024)	9% (2024)	9% (2024)
Korea (Rep. of)	10% (2020)	10% (2020)	10% (2020)	10% (2020)	10% (2020)
Lao P.D.R.		10% (2023)	10% (2023)	10% (2023)	10% (2023)
Mongolia	10% (2024)	10% (2024)	10% (2024)	10% (2024)	10% (2024)
Nepal (Republic of)	13% (2022)	13% (2022)	13% (2022)	13% (2018)	13% (2022)
New Zealand	15% (2024)	15% (2024)	15% (2024)	15% (2024)	15% (2024)
Samoa	15% (2024)	15% (2024)	15% (2024)	15% (2024)	15% (2024)
Tonga	15% (2019)			15% (2019)	15% (2022)

Table 7. VAT applied to mobile services (continued)

Country	Outgoing international voiceservices	Incoming international voice services	National communication voice services	National Data services	Internet services
Viet Nam	10% (2021)		10% (2021)	10% (2021)	10% (2021)
Armenia	20% (2024)	20% (2024)	20% (2024)	20% (2024)	20% (2024)
Azerbaijan	18% (2024)	18% (2024)	18% (2024)	18% (2024)	18% (2024)
Belarus	20% (2015)	20% (2015)	25% (2024)	20% (2015)	25% (2024)
Russian Federation	20% (2023)	20% (2019)	20% (2023)	20% (2023)	20% (2023)
Uzbekistan	12% (2024)	12% (2024)	12% (2024)	12% (2024)	12% (2024)
Kazakhstan	12% (2023)		12% (2023)	12% (2023)	12% (2023)
Kyrgyzstan	12% (2019)	12% (2019)	12% (2019)	12% (2019)	12% (2019)
Albania	20% (2021)	20% (2021)	20% (2021)	20% (2021)	20% (2021)
Andorra	5% (2024)	4.5% (2024)	4.5% (2024)	4.5% (2024)	4.5% (2024)
Austria	20% (2024)	20% (2024)	20% (2024)	20% (2024)	20% (2024)
Cyprus	19% (2024)	19% (2024)	19% (2024)	19% (2024)	19% (2024)
Spain	21% (2024)	21% (2024)	21% (2024)	21% (2024)	21% (2024)
Estonia	20% (2021)	20% (2021)	20% (2021)	20% (2021)	20% (2021)
France	20% (2024)	20% (2024)	20% (2024)	20% (2024)	20% (2024)
Finland	24% (2024)	24% (2024)	24% (2024)	24% (2024)	24% (2024)
Greece	24% (2024)	24% (2024)	24% (2024)	24% (2024)	24% (2024)
Hungary	27% (2023)	27% (2023)	27% (2023)	27% (2023)	5% (2023)
Croatia	25% (2024)	25% (2024)	25% (2024)	25% (2024)	25% (2024)
Ireland	23% (2024)	23% (2024)	23% (2024)	23% (2024)	23% (2024)
Iceland	24% (2024)	24% (2024)	24% (2024)	24% (2024)	24% (2024)
Israel			17% (2023)	17% (2023)	17% (2023)
Liechtenstein	8% (2024)	8.1% (2024)	8.1% (2024)	8.1% (2024)	8.1% (2024)
Lithuania	21% (2024)	21% (2024)	21% (2024)	21% (2024)	21% (2024)
Malta	18% (2024)	18% (2024)	18% (2024)	18% (2024)	18% (2024)
Norway	25% (2024)	25% (2015)	25% (2024)	25% (2024)	25% (2024)
Portugal	23% (2024)	23% (2024)	23% (2024)	23% (2024)	23% (2024)
Romania	19% (2024)	19% (2018)	19% (2024)	19% (2024)	19% (2024)
Sweden	25% (2020)	25% (2015)	25% (2020)	25% (2020)	25% (2020)
Switzerland	8% (2024)	8%.1 (2024)	8%.1 (2024)	8%.1 (2024)	8%.1 (2024)

Table 7. VAT applied to mobile services (continued)

Country	Outgoing international voiceservices	Incoming international voice services	National communication voice services	National Data services	Internet services
Slovenia	22% (2024)	22% (2024)	22% (2024)	22% (2024)	22% (2024)
Czech Republic	21% (2024)	21% (2024)	21% (2024)	21% (2024)	21% (2024)
Türkiye			20% (2024)		20% (2024)
Ukraine	20% (2024)	20% (2024)	20% (2024)	20% (2024)	20% (2024)
Serbia		20% (2020)	20% (2020)	20% (2020)	20% (2020)
Moldova	20% (2024)		20% (2024)	20% (2024)	20% (2024)
Bosnia and Herzegovina	17% (2024)	17% (2024)	17% (2024)	17% (2024)	17% (2024)
Georgia	18% (2022)	18% (2018)	18% (2022)	18% (2022)	18% (2022)
Slovakia	20% (2024)	20% (2024)	20% (2024)	20% (2024)	20% (2024)
North Macedonia	18% (2018)	18% (2018)	18% (2018)	18% (2018)	18% (2018)
Montenegro	21% (2024)	21% (2024)	21% (2024)	21% (2024)	21% (2024)
Argentina	21% (2024)	21% (2024)	21% (2024)	21% (2024)	21% (2024)
Brazil			22% (2022)		5% (2022)
Bolivia (Plurinational State of)	13% (2024)	13% (2024)	13% (2024)	13% (2024)	13% (2024)
Barbados	17.5% (2018)		17.5% (2023)	17.5% (2018)	17.5% (2023)
Canada	5% (2024)	5% (2024)	5% (2024)	5% (2024)	5% (2024)
Chile	19% (2024)	19% (2024)	19% (2024)	19% (2024)	19% (2024)
Colombia	19% (2024)	19% (2024)	19% (2024)	19% (2024)	19% (2024)
Costa Rica	13% (2024)	13% (2024)	13% (2024)	13% (2024)	13% (2024)
Dominica	15% (2024)	15% (2024)	15% (2024)	15% (2024)	15% (2024)
Dominican Rep.	18% (2024)	18% (2024)	18% (2024)	18% (2024)	18% (2024)
Ecuador	12% (2019)	12% (2019)	12% (2019)	12% (2019)	12% (2019)
Grenada	15% (2022)	15% (2022)	15% (2022)	15% (2022)	15% (2022)
Guatemala	12% (2024)	12% (2024)	12% (2024)	12% (2024)	12% (2024)
Guyana	14% (2021)				14% (2021)
Saint Lucia	13% (2024)	12.5% (2024)	12.5% (2024)	12.5% (2024)	12.5% (2024)
Mexico	16% (2019)	16% (2019)	16% (2019)	16% (2019)	16% (2019)
Nicaragua	15% (2024)	15% (2024)	15% (2024)	15% (2024)	15% (2024)
Panama	7% (2023)	7% (2023)	7% (2023)	7% (2023)	7% (2023)

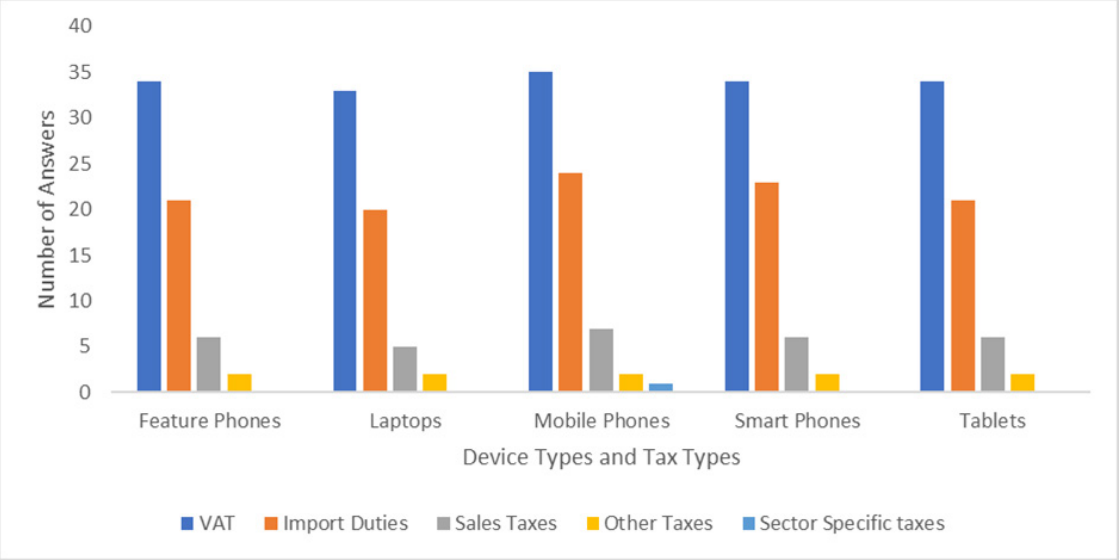
Table 7. VAT applied to mobile services (continued)

Country	Outgoing international voiceservices	Incoming international voice services	National communication voice services	National Data services	Internet services
Paraguay	10% (2023)	10% (2023)	10% (2023)	10% (2023)	10% (2023)
El Salvador	13% (2023)	13% (2023)	13% (2023)	13% (2023)	13% (2023)
Trinidad and Tobago	12.5% (2024)	12.5% (2024)	12.5% (2024)	12.5% (2024)	12.5% (2024)
Uruguay	22% (2023)	22% (2023)	22% (2023)	22% (2023)	22% (2023)
Saint Vincent and the Grenadines	16% (2024)	16% (2024)	16% (2024)	16% (2024)	16% (2024)
Venezuela	16% (2019)	16% (2019)	16% (2019)	12% (2015)	16% (2023)

Source: ITU Tariff Policies Survey, 2024

Additionally, the ITU Tariff Policies survey gathered information on other taxes applied to ICT mobile devices. These include, in order of significance, VAT, import duties, sales taxes, other taxes, and sector-specific taxes. The summary of this information is presented in the Graphic 6.

Graphic 6. Specific taxes applied to ICT mobile devices



4.4 Digital service taxes

As detailed above, many countries have enacted a digital service tax (Internet services) to address perceived gaps in corporate income tax systems. This approach imposes a tax on gross receipts derived from digital advertising, data mining and other types of digital platform revenue. A few countries have already implemented national approaches aimed at tackling profit shifting by digital platforms. While many countries did not report the application of digital service taxes to the ITU survey, of the 115 countries that provided a response, only 17 reported applying a digital service tax (see Table 8).

Table 8. Application of digital service tax: responding countries (2024)

Region	Country	YES	NO	%
Africa	Angola		No (2024)	
	Burundi	Yes (2023)		
	Benin		No (2024)	
	Burkina Faso		No (2023)	
	Botswana		No (2024)	
	Congo (Rep. of the)		No (2023)	
	Guinea-Bissau	Yes (2024)		19% (2022)
	Equatorial Guinea		No (2023)	
	Kenya	Yes (2021)		
	Liberia		No (2023)	
	Lesotho		No (2023)	
	Mauritius		No (2024)	
	Mali		No (2023)	
	Mozambique		No (2021)	
	Malawi		No (2021)	
	Namibia		No (2024)	
	Rwanda		No (2024)	
	Senegal	Yes (2024)		
	Seychelles		No (2024)	
	Sierra Leone		No (2021)	
	Sao Tome and Principe		No (2022)	
	Eswatini		No (2024)	
	Togo		No (2024)	
	Tanzania		No (2024)	
	Uganda	Yes (2023)		12% (2023)
	Dem. Rep. of the Congo		No (2024)	
	Zambia		No (2024)	
	Zimbabwe	Yes (2024)		

Table 8. Application of digital service tax: responding countries (2024) (continued)

Region	Country	YES	NO	%
Arab States	Algeria		No (2024)	
	Saudi Arabia		No (2023)	
	Egypt	Yes (2023)		14% (2023)
	Jordan		No (2024)	
	Kuwait		No (2024)	
	Lebanon		No (2021)	
	Oman		No (2024)	
	Qatar		No (2024)	
	Sudan		No (2022)	
	Somalia		No (2024)	
	Tunisia		No (2024)	
	United Arab Emirates		No (2024)	
Asia and Pacific	Australia		No (2024)	
	Myanmar		No (2024)	
	Brunei Darussalam		No (2024)	
	Cambodia	Yes (2024)		10% (2024)
	China		No (2023)	
	Sri Lanka		No (2022)	
	Micronesia		No (2023)	
	Hong Kong, China		No (2024)	
	Malaysia	Yes (2023)		6% (2023)
	Maldives		No (2024)	
	Mongolia		No (2024)	
	Nepal (Republic of)		No (2022)	
	New Zealand		No (2021)	
	Pakistan	Yes (2022)		Different tax rates apply on different services (2022)
	Samoa		No (2024)	
	Tonga		No (2022)	

Table 8. Application of digital service tax: responding countries (2024) (continued)

Region	Country	YES	NO	%
CIS	Armenia		No (2024)	
	Azerbaijan		No (2024)	
	Russian Federation		No (2023)	
	Uzbekistan		No (2024)	
	Kazakhstan		No (2023)	
Europe	Andorra		No (2024)	
	Austria		No (2024)	
	Spain	Yes (2024)		3% (2024)
	Estonia		No (2021)	
	France	Yes (2024)		3% (2024)
	Finland		No (2024)	
	Greece		No (2024)	
	Netherlands		No (2021)	
	Croatia		No (2024)	
	Ireland		No (2024)	
	Iceland		No (2024)	
	Israel		No (2023)	
	Liechtenstein		No (2024)	
	Lithuania		No (2024)	
	Norway		No (2024)	
	Portugal		No (2024)	
	Romania		No (2024)	
	Switzerland		No (2024)	
	Slovenia	Yes (2024)		
	Czech Republic		No (2024)	
	Türkiye	Yes (2024)		10% (2024)
	Moldova		No (2022)	
	Bosnia and Herzegovina		No (2024)	
	Slovakia		No (2024)	
	Montenegro		No (2024)	

Table 8. Application of digital service tax: responding countries (2024) (continued)

Region	Country	YES	NO	%
The Americas	Argentina	Yes (2024)		21% (2024)
	Brazil		No (2022)	
	Bahamas		No (2024)	
	Belize		No (2023)	
	Bolivia (Plurinational State of)		No (2024)	
	Barbados		No (2023)	
	Canada		No (2024)	
	Chile			
	Colombia		No (2024)	
	Costa Rica	Yes (2024)		13% (2024)
	Cuba		No (2024)	
	Dominica		No (2024)	
	Dominican Rep.		No (2024)	
	Ecuador			
	Grenada		No (2022)	
	Guatemala		No (2024)	
	Guyana		No (2021)	
	Honduras		No (2024)	
	Haiti		No (2022)	
	Jamaica		No (2023)	
	Saint Lucia		No (2024)	
	Mexico	Yes (2024)		
	Nicaragua		No (2024)	
	Panama		No (2023)	
	Paraguay		No (2023)	
	Suriname		No (2024)	
	Trinidad and Tobago		No (2024)	
	Uruguay		No (2023)	
	Saint Vincent and the Grenadines		No (2024)	
	Venezuela		No (2023)	

Source: ITU Tariff Policies Survey, 2024

4.5 Taxation of virtual currencies

Virtual currencies are gaining popularity worldwide. The Tariff Policies survey explored the taxation of these currencies, including cryptocurrencies and crypto assets. Of the 115 countries that responded, only 17 reported applying specific taxes to virtual currencies. European nations led in taxation, with nine countries imposing taxes, followed by three countries in the Asia-Pacific region. However, no clear geographical trend has emerged yet.

Table 9. Virtual currencies tax: responding countries (2024)

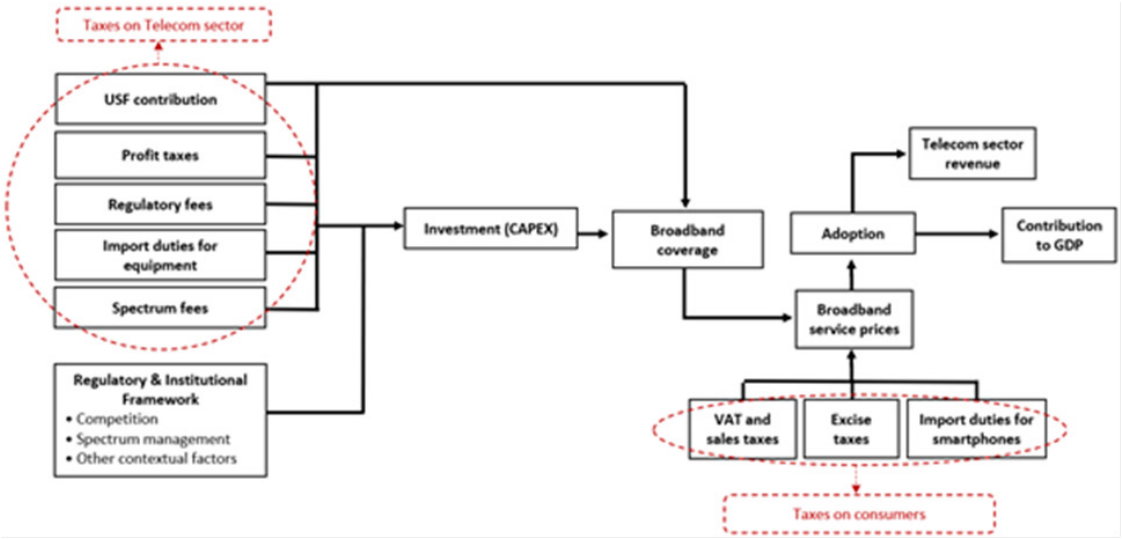
Number of countries applying taxation of virtual currencies		
	Yes	No
Africa	1	30
Americas	2	26
Arab States	0	12
Asia and Pacific	3	13
CIS	2	3
Europe	9	14
Total	**17**	**98**

Source: ITU Tariff Policies Survey, 2024

5 EFFECT OF TAXES ON THE DIGITAL ECONOMY

As anticipated above, taxation is likely to have an impact on enterprise capital spending and consumer behaviour. The various levies discussed above have an impact on specific stages of the telecommunication/ICT sector value chain. Figure 1 presents details of taxes that formally affect operators and consumers.

Figure 1. Causal flows and value creation in the telecommunication/ICT sector – with tax detail



Source: Katz and Jung (2023)

As depicted in Figure 1, USF levies, profit taxes, regulatory fees, import duties and spectrum fees reduce the amount of capital earmarked by telecommunication/ICT operators for investment in telecommunication/ICT network coverage. Similarly, VAT and sales taxes on handsets and services, excise taxes and handset import duties increase the cost of broadband devices and services and potentially reduce their affordability for vulnerable consumers.

5.1 Impact of taxes on providers of digital and telecommunication services

The mechanisms by which taxes affect technology (particularly telecommunication/ICT) investment are complex. In general terms, Devereux (2006) considers that taxation first affects two binary decisions: in which business to invest (e.g., wireless, broadband or other)?; and in which geographic location to invest (e.g., a specific country)? In addition, taxes also influence a continuous choice: once a business and locations are agreed upon based on taxation attractiveness, levies affect their capital expenditure allocation process. In other words, taxes will influence how much investment will favour certain locations to the detriment of others.

It should be noted that changes in tax regimes may not affect investment decisions instantaneously. Investment decisions are partially driven by variables that only change gradually (e.g., changes in the cost of capital). As a result, a modification of tax regimes (e.g., a change in the sales tax rate affecting the initial purchase of network equipment) might affect the incentive to invest immediately but translate into investment decisions only gradually (Auerbach, 2005). An implication of this is that countries that constantly change tax policies introduce another layer of complexity for companies planning future investment. In other words, by the time the

company is ready to adjust to the tax regime imposed previously, a new change imposed by the government modifies the underlying conditions for future investment. This situation makes it very complex for firms to plan future multi-year capital investments required for the deployment of new infrastructure.

The factors outlined above are especially important in capital-intensive industries such as telecommunications/ICTs. Typical capital planning processes in this sector comprise decisions in three domains:

- maintenance of existing plant (e.g., replacement of depreciated equipment);
- network modernization (e.g., deployment of 5G networks, deployment of fibre in the access network); and
- capacity upgrades (e.g., investment to accommodate sudden growth in demand).

Each investment domain is driven by different time constraints. For example, maintenance capital investment is typically multi-year and mostly non-discretionary; therefore, it is largely predictable and relatively less subject to taxation effects. Network modernization capital, while also being multi-year, could be affected by capital allocation decisions influenced by taxation (in other words, if taxation reduces the supply of funds, it could have an impact on investment and thereby affect the rate of network modernization). On the other hand, capacity upgrades have a long-term component driven by demand forecast, but also a very short-term component focused on surgical infrastructure upgrades (e.g., to accommodate spikes in demand in certain portions of the network). This area of capital investment might be less affected by tax regimes since it is directly linked to revenue generation opportunities.

As mentioned above, the research literature to date provides evidence that taxes tend to raise the required pre-tax rate of return of capital invested. In general terms, leaving aside the positive effects taxes play in terms of their contribution to the delivery of public services, they tend also to affect the incentivization of companies to make investments and reduce the supply of funds available to finance them. In industries such as telecommunications/ICTs that provide broadband services, a critical platform to deliver information and public services and ensure economic growth, taxation tends to reduce the level of capital investment.

In a study by Katz et al (2019) on the impact of state and local taxes on the purchasing of broadband investment by telecommunication/ICT service providers in the United States, an econometric model tested the impact of sales taxes on telecommunication investment. Considering that the telecommunication/ICT industry enjoys different tax exemptions by state in the United States, the model indicated that investment in telecommunication/ICT equipment is sensitive to sales taxes: every decrease of 1 per cent in the average weighted state and local sales tax rate affecting initial equipment purchase results in an increase in total investment of 1.97 per cent.[13]

5.2 Impact of taxes on consumption of telecommunication/ICT and digital services

Research on consumer response to taxation changes varies according to the policy under consideration. For example, under a tax reduction policy, consumers are expected to increase

[13] Katz, R., and Callorda, F. (2019). Assessment of the Economic Impact of Taxation on Communications Investment in the United States. New York: Telecom Advisory Services LLC, November

consumption. Research has also found that they will increase spending if the reduction in tax liabilities becomes permanent. In addition, consumers will wait to increase spending until a tax reduction affects their take-home pay, not before (Steindel, 2001).

On the other hand, an increase in taxes, even a small change, can have an impact on prices and consumer behaviour, by eliciting a reduction in consumption. This has been shown to be the case with fuel taxes (Fowler and Muehlegger, 2011), and it may also be the case for telecommunication/ICT services. In another study, it was also found that the imposition of a sales tax on products purchased online in the United States (known as the Amazon tax) had an impact on consumer behaviour: consumers that face a tax on Amazon purchases tend to partly shift back to local "brick and mortar" retailers or increase purchasing from competing non-taxed online retailers (Baugh et al, 2014).

VAT paid by telecommunication/ICT operators on electronic equipment purchases is generally the same as the one applied to consumers when purchasing ICT services or devices. This indicator highlights the low amount that operators must pay in countries such as Panama (7 per cent) or Paraguay (10 per cent), where investment in this type of equipment faces a low tax burden. In other countries, however, equipment purchases are taxed at a VAT higher than 20 per cent.

Beyond the formal economic agent being taxed (operator or consumer), it is important to consider the impact of taxes in relation to the elasticity of demand (Matheson and Petit, 2017). For instance, if demand for a consumer service such as mobile broadband is elastic, a tax borne by consumers will likely reduce operators' revenues, thus limiting the funds available for investment. Similarly, impositions on the operators' side may be partially translated to the consumers through increased end-prices. Evidence on the level of demand elasticity for telecommunication/ICT services is still inconclusive. The estimated price elasticity for telecommunication/ICT services varies according to the market, time-period and service involved. Some authors have found evidence of elastic demand, such as Garbacz and Thomson (2007) for penetration with respect to monthly service prices and Caves (2011), Hakim and Neaime (2014) and Koutroumpis et al (2011) for traffic with respect to price; while the findings of other authors suggest inelastic demand, such as Karacuka et al (2011) and Dewenter and Haucap (2008) for the case of traffic and Garbacz and Thomson (2007) for penetration with respect to connection charges.

6 CONCLUSION

The purpose of this report has been to provide a comparative analysis of approaches to digital service taxation across countries and regions. In that analysis, the study has differentiated between taxes imposed on enterprises involved in the provision of digital services and consumers of such services. The concept of digital services used in this study included not only telecommunications/ICTs, but also digital platforms, such as video streaming and digital advertising.

The study's first major conclusion is that taxes imposed both on operators and on consumers remain in place in many countries around the world. At least 74 countries impose taxes on service providers, whether environmentally related, import duties on equipment or VAT on equipment purchases. Similarly, 145 countries impose VAT on mobile services, while 74 apply import duties on mobile devices.

Secondly, some nuanced geographic patterns in terms of taxation approaches can be teased out from the data. The group of countries exempting equipment purchases from taxation include advanced economies and some less developed countries. This would indicate that this group is not only composed of countries that do not require equipment taxation to increase revenues but also countries that prioritize maximization of network coverage (stimulated by lower equipment taxes) over tax collection. That said, there appears to be countries, mostly concentrated in the developing world, with some middle-income economies, that still prioritize tax collection from import duties on equipment.

Thirdly, unlike with network equipment, many countries were identified that exempt consumer devices from import duty or device-specific taxes. Furthermore, several developing countries were found to tax the import of devices at an extremely high rate. However, some countries have established consumer device taxation approaches aimed at reducing the purchasing acquisition cost. At the other end, some countries appear to have imposed high taxation on consumer devices. In addition to taxes on devices, affordability of telecommunications/ICTs for consumers is affected by VAT paid on mobile telecommunications services, a fairly common practice across countries. Of all services to which VAT is applied, the most prevalent service is outgoing international traffic, where rates range between 2.75 per cent and 20 per cent.

Finally, many countries have enacted a digital service tax to address perceived gaps in corporate income-tax systems. This approach imposes a tax on gross receipts derived from digital advertising, data mining and other types of digital platform revenue. A few countries have already implemented national approaches aimed at tackling profit shifting by digital platforms. While many countries did not report the application of digital service taxes in the ITU Tariff Policies Survey, of the 115 nations that provided a response, only 17 reported applying a digital service tax, and the percentage applied varies from 3% (Fance) to 21% (Argentina). This limited evidence prevents us from understanding what the current trend is in this domain.

In this context, research has provided evidence that taxation is likely to have an impact on telecommunication/ICT enterprise capital spending and consumer behaviour. The various levies discussed above have an impact on specific stages of the telecommunication/ICT sector value chain. USF levies, profit taxes, regulatory fees, import duties and spectrum fees reduce the amount of capital earmarked by telecommunication/ICT operators for investment in telecommunication/ICT network coverage. Similarly, VAT and sales taxes on handsets and

services, excise taxes and handset import duties increase the cost of broadband devices and services and potentially reduce their affordability for vulnerable consumers.

Regulators participating in the 22nd and 23rd Global Symposiums for Regulators (GSR-23 and GSR-24)[14] recognized the importance of defining regulatory and economic incentives to stimulate the deployment of digital infrastructure everywhere, in particular in rural, unserved and underserved areas. To support access, adoption and use, policy-makers and regulators are encouraged to implement regulatory and financial incentives to bring the benefits of meaningful connectivity to everyone, everywhere, including through:

- Lowering of barriers to access digital devices and equipment: policy-makers and regulators could consider measures to encourage and facilitate cost reduction in the manufacture, purchase and import of hardware equipment and devices to achieve universal service goals, in particular for open-source hardware and for green technologies.
- Incentives for digital service and device adoption: policy-makers and regulators could consider introducing incentives for the provision of affordable digital services and devices at special rates for local communities and low-income populations.
- Regulatory incentives: foster regulatory and economic incentives as well as innovative financing mechanisms that encourage investment and competitive pricing.

If countries are keen to maximize deployment of telecommunication/ICT networks and adoption of digital services to address inequalities affecting the digital divide, it is imperative that they examine their approaches to taxation. In the light of this concern, the 9th ITU Economic Experts Roundtable, convened in May 2022, recommended reducing telecommunication/ICT regulatory fees, designing tax frameworks and incentives at the sub-national level to address the specific needs of rural deployment, reducing/eliminating import duties on equipment and consumer devices, removing sector-specific taxes and reducing spectrum licence fees.[15]

[14] ITU GSR-23 Best Practice Guidelines: Regulatory and economic incentives for an inclusive sustainable digital future: https://www.itu.int/en/ITU-D/Regulatory-Market/Documents/GSR23/GSR-23_Best%20Practice%20Guidelines-E.pdf

[15] International Telecommunication Union (2022). Economic and fiscal incentives to accelerate digital transformation: 9th ITU Economic Experts Roundtable Outcome Report

BIBLIOGRAPHY

Auerbach, A.J. (2005). *Taxation and capital spending*. Paper prepared for the Academic Consultants Meeting of the Board of Governors of the Federal Reserve System. University of California and NBER, September.

Baer, K., Mooji, R., Hebous, S. and Keen, M. (2023). *Taxing cryptocurrencies*. IMF Working Paper WP/23/144. Washington, DC.

Beatty, R., Riffe, S. and Welch, I. (1997). How Firms make capital expenditures decisions: financial signals, internal cash flows, income taxes and the Tax Reform Act of 1986. *Review of Quantitative Finance and Accounting*, 9: 227- 250.

Brittain, J. A. (1971). The incidence of social security payroll taxes. *The American Economic Review*, 61(1), 110-125.

Caves, K. W. (2011). Quantifying price-driven wireless substitution in telephony. *Telecommunications Policy*, 35(11), 984-998.

Devereux, M. (2006). *The impact of taxation on the location of capital, firms and profit: a survey of empirical evidence*. Oxford University Centre of Business Taxation. Working paper WP 07/02.

Dewenter, R. and Haucap, J. (2008). Demand elasticities for mobile telecommunications in Austria. *Jahrbücher für Nationalökonomie und Statistik*, 228(1), 49-63.

Ebrill, M. L. P., Keen, M. M. and Perry, M. V. P. (2001). *The modern VAT*. International Monetary Fund.

Fowler, J., Li, S. and Muehlegger, E. (2011). *Gasoline taxes and consumer behavior*, John F. Kennedy School of Government, Harvard University.

Garbacz, C. and Thompson Jr, H. G. (2007). Demand for telecommunication services in developing countries. *Telecommunications policy*, 31(5), 276-289.

Hakim, S. and Neaime, S. (2014). The demand elasticity of mobile telephones in the Middle East and North Africa. *Research in international business and finance*, 32, 1-14.

Heckemeyer, J. H. and Overesch, M. (2017). Multinationals' profit response to tax differentials: Effect size and shifting channels. *Canadian Journal of Economics/Revue Canadienne d'économique*, 50(4), 965-994.

International telecommunication Union *(ITU) DataHub, the world's richest source of ICT statistics and regulatory and tariff policies information*, https://datahub.itu.int/

International Telecommunication Union (ITU) Global Symposium for Regulators, GSR-24 *Best Practice Guidelines: on Charting the course of transformative technologies for positive impact*, available at https://www.itu.int/itu-d/meetings/gsr-24/wp-content/uploads/sites/24/2024/08/GSR-2024_BestPracticeGuidelines.pdf

International Telecommunication Union (ITU) Global Symposium for Regulators, GSR-23 *Best Practice Guidelines: Regulatory and economic incentives for an inclusive sustainable digital future*, available at https://www.itu.int/en/ITU-D/Regulatory-Market/Documents/GSR23/GSR-23_Best%20Practice%20Guidelines-E.pdf

International Telecommunication Union (2022). *Economic and fiscal incentives to accelerate digital transformation: 9th ITU Economic Experts Roundtable Outcome Report*, available at https://www.itu.int/en/ITU-D/Regulatory-Market/Pages/Events2022/EconomicRoundTable2022.aspx

Karacuka, M., Haucap, J. and Heimeshoff, U. (2011). Competition in Turkish mobile telecommunications markets: Price elasticities and network substitution. *Telecommunications Policy*, 35(2), 202-210.

Katz, R., Flores-Roux and Callorda, F. (2014). *The impact of sales tax on equipment purchasing in the United States*. NY: Broadband Tax Institute.

Katz, R. and Callorda, F. (2019). *Assessment of the Economic Impact of Taxation on Communications Investment in the United States*. New York: Telecom Advisory Services LLC, November

Katz and Jung (2023). The impact of taxation in the telecommunications industry", *Information Economics and Policy 62*

Koutroumpis, P., Lekatsas, A., Giaglis, G. and Kourouthanasis, P. (2011). Between a rock and a hard place: Recession and telecoms taxation. *Telecommunications Policy*, 35(7), 681-688.

Köthenbürger, M. 2020). *Taxation of Digital Platforms*, EconPol Working Paper, No. 41, ifo Institute - Leibniz Institute for Economic Research at the University of Munich, Munich

Liu, L. and Altshuler, R. (2013). Measuring the burden of the corporate income tax under imperfect competition. *National Tax Journal*, 66(1), 215-237.

Matheson, M. T. and Petit, P. (2017). *Taxing telecommunications in developing countries*. International Monetary Fund.

OECD (2018), *Tax Challenges Arising from Digitalisation – Interim Report*, Paris

PricewaterhouseCoopers (2021). *PwC Annual Global Crypto Tax Report*.

Steindel, C. (2001). "The effect of tax changes on consumer spending", *Federal Reserve Bank of New York. Current Issues in Economics and Finance*, volume 7, number 11.

Talpos, I. and Vancu, I. (2009). Corporate Income Taxation Effects on Investment Decisions in the European Union, *Annales Universitatis Apulensis Series Oeconomica*, 11 (1): 513-518.

Office of the Director
International Telecommunication Union (ITU)
Telecommunication Development Bureau (BDT)
Place des Nations
CH-1211 Geneva 20
Switzerland

Email: bdtdirector@itu.int
Tel.: +41 22 730 5035/5435
Fax: +41 22 730 5484

Office of Deputy Director and Regional Presence
Field Operations Coordination Department (DDR)
Place des Nations
CH-1211 Geneva 20
Switzerland

Email: bdtdeputydir@itu.int
Tel.: +41 22 730 5131
Fax: +41 22 730 5484

Digital Networks and Society (DNS)
Email: bdt-dns@itu.int
Tel.: +41 22 730 5421
Fax: +41 22 730 5484

Digital Knowledge Hub Department (DKH)
Email: bdt-dkh@itu.int
Tel.: +41 22 730 5900
Fax: +41 22 730 5484

Partnerships for Digital Development Department (PDD)
Email: bdt-pdd@itu.int
Tel.: +41 22 730 5447
Fax: +41 22 730 5484

Africa

Ethiopia
International Telecommunication Union (ITU) Regional Office
Gambia Road
Leghar Ethio Telecom Bldg. 3rd floor
P.O. Box 60 005
Addis Ababa
Ethiopia

Email: itu-ro-africa@itu.int
Tel.: +251 11 551 4977
Tel.: +251 11 551 4855
Tel.: +251 11 551 8328
Fax: +251 11 551 7299

Cameroon
Union internationale des télécommunications (UIT)
Bureau de zone
Immeuble CAMPOST, 3e étage
Boulevard du 20 mai
Boîte postale 11017
Yaoundé
Cameroon

Email: itu-yaounde@itu.int
Tel.: + 237 22 22 9292
Tel.: + 237 22 22 9291
Fax: + 237 22 22 9297

Senegal
Union internationale des télécommunications (UIT)
Bureau de zone
8, Route du Méridien Président
Immeuble Rokhaya, 3e étage
Boîte postale 29471
Dakar - Yoff
Senegal

Email: itu-dakar@itu.int
Tel.: +221 33 859 7010
Tel.: +221 33 859 7021
Fax: +221 33 868 6386

Zimbabwe
International Telecommunication Union (ITU) Area Office
USAF POTRAZ Building
877 Endeavour Crescent
Mount Pleasant Business Park
Harare
Zimbabwe

Email: itu-harare@itu.int
Tel.: +263 242 369015
Tel.: +263 242 369016

Americas

Brazil
União Internacional de Telecomunicações (UIT)
Escritório Regional
SAUS Quadra 6 Ed. Luis Eduardo Magalhães,
Bloco "E", 10º andar, Ala Sul (Anatel)
CEP 70070-940 Brasilia - DF
Brazil

Email: itubrasilia@itu.int
Tel.: +55 61 2312 2730-1
Tel.: +55 61 2312 2733-5
Fax: +55 61 2312 2738

Barbados
International Telecommunication Union (ITU) Area Office
United Nations House
Marine Gardens
Hastings, Christ Church
P.O. Box 1047
Bridgetown
Barbados

Email: itubridgetown@itu.int
Tel.: +1 246 431 0343
Fax: +1 246 437 7403

Chile
Unión Internacional de Telecomunicaciones (UIT)
Oficina de Representación de Área
Merced 753, Piso 4
Santiago de Chile
Chile

Email: itusantiago@itu.int
Tel.: +56 2 632 6134/6147
Fax: +56 2 632 6154

Honduras
Unión Internacional de Telecomunicaciones (UIT)
Oficina de Representación de Área
Colonia Altos de Miramontes
Calle principal, Edificio No. 1583
Frente a Santos y Cía
Apartado Postal 976
Tegucigalpa
Honduras

Email: itutegucigalpa@itu.int
Tel.: +504 2235 5470
Fax: +504 2235 5471

Arab States

Egypt
International Telecommunication Union (ITU) Regional Office
Smart Village, Building B 147,
3rd floor
Km 28 Cairo
Alexandria Desert Road
Giza Governorate
Cairo
Egypt

Email: itu-ro-arabstates@itu.int
Tel.: +202 3537 1777
Fax: +202 3537 1888

Asia-Pacific

Thailand
International Telecommunication Union (ITU) Regional Office
4th floor NBTC Region 1 Building
101 Chaengwattana Road
Laksi,
Bangkok 10210,
Thailand

Email: itu-ro-asiapacific@itu.int
Tel.: +66 2 574 9326 – 8
+66 2 575 0055

Indonesia
International Telecommunication Union (ITU) Area Office
Gedung Sapta Pesona
13th floor
Jl. Merdeka Barat No. 17
Jakarta 10110
Indonesia

Email: bdt-ao-jakarta@itu.int
Tel.: +62 21 380 2322

India
International Telecommunication Union (ITU) Area Office and Innovation Centre
C-DOT Campus
Mandi Road
Chhatarpur, Mehrauli
New Delhi 110030
India

Email:
Area Office: itu-ao-southasia@itu.int
Innovation Centre: itu-ic-southasia@itu.int
Website: ITU Innovation Centre in New Delhi, India

CIS

Russian Federation
International Telecommunication Union (ITU) Regional Office
4, Building 1
Sergiy Radonezhsky Str.
Moscow 105120
Russian Federation
Email: itu-ro-cis@itu.int
Tel.: +7 495 926 6070

Europe

Switzerland
International Telecommunication Union (ITU) Office for Europe
Place des Nations
CH-1211 Geneva 20
Switzerland

Email: eurregion@itu.int
Tel.: +41 22 730 5467
Fax: +41 22 730 5484

International Telecommunication Union
Telecommunication Development Bureau
Place des Nations
CH-1211 Geneva 20
Switzerland

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