

REGULATION OF OTT COMMUNICATIONS SERVICES

JUSTIFIED CONCERN OR EXAGGERATED FEAR?



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I. INTRODUCTION

Telecom service providers (TSPs) have been pushing for the regulation of over-the-top (OTT) service providers in Indiaⁱ since 2015. Meanwhile, OTT firms maintain that their services are not comparable with telecom. The debate centres on two issues in particular: same service, same rules and infrastructure cost sharing. The merits of the TSPs' demands and counterarguments are explored in this paper.

On 22 September 2022, the Department of Telecommunications (DoT) published the draft Indian Telecommunications Bill, 2022. The Bill aims to consolidate and update the laws governing the provision, development and operation of telecommunication services in India. The government says that the Bill provides a modern and future-ready legal framework attuned to the complexities posed by emerging technologies such as 5G, the Internet of Things, M2M communications and others.¹ A key change proposed in the Bill is to extend the scope of telecommunications services to include OTT. Specifically, Clause 2(21) of the Bill expands the definition of 'telecommunication services' to include new-age communication services (IoT, OTT communication services, interpersonal communication services, internet and broadband services) in its purview. The move cements TSPs' consistent demands to regulate OTT service providers. TSPs argue that existing regulatory disparities give OTT firms privileges but not responsibilities and that OTTs should be subject to similar rules as other telecom companies.²

Additionally, the Cellular Operators Association of India (COAI, which includes all three privately owned TSPs, Reliance Jio, Bharti Airtel and Vodafone Idea as members) has demanded that OTT platforms pay TSPs charges in proportion to the traffic carried by them on their networks.³ The association has written to the DoT asking for a mechanism to levy a usage charge on OTTs that would level the playing field with telecom. For TSPs to make OTTs pay for network usage would not be unique to India. France, Italy and Spain have been exerting pressure on the European Commission to formalise legislation that would require OTT players to partly finance their telecommunications infrastructure.⁴ Similar sentiments have been expressed by representatives of the United States Federal Communications Commission

i. The term OTT (over-the-top) implies that content from OTT providers is delivered to the consumer directly over an internet connection without any third party controlling the delivery. Using OTT applications, anyone using an internet-enabled device (phone, tablet, laptop) can access content over the public internet.

(FCC), and in Australia a law the first of its kind was passed in February 2022 that aims to make tech giants pay publishers for the news content carried on their digital platforms.⁵

Part 1 of this paper outlines the demands raised by TSPs and the merits of these from a historical and legal perspective.

Part 2 of the paper compares OTT regulation trends across some jurisdictions. The aim is to trace the changes made to telecom regulations internationally in response to emerging technologies and ask whether OTTs have been brought under the regulatory regime for TSPs.

Finally, in Part 3 of the paper, through insights from historical and legal analysis and from a comparative standpoint, we recommend the approach the government should adopt.

TSPs ARGUE THAT EXISTING REGULATORY DISPARITIES GIVE OTT FIRMS PRIVILEGES BUT NOT RESPONSIBILITIES AND THAT OTTS SHOULD BE SUBJECT TO SIMILAR RULES AS OTHER TELECOM COMPANIES.

II. WHAT EXACTLY ARE THE TSPs DEMANDING?

Before analysing the demands raised by TSPs, we note that while the arguments made by TSPs tend to concentrate on communications OTTs, they sometimes refer to all OTT services. This is exemplified by the changing scope of the demands for regulation made by TSPs, as elaborated below.

	DEMANDS FOR OTT REGULATION	SCOPE AND COVERAGE OF THE DEMANDS
1.	COAI <i>pitched</i> for regulating all OTT players, including communication over the top (OTT) players such as WhatsApp, and those such as Netflix that consumed huge bandwidth.	All OTT services
2.	Any person (OTTs) using telecommunication services/ infrastructure/ network set-up/ provided by an authorised entity (TSPs) must pay reasonable usage charges to such provider (<i>statement</i> of SP Kochhar, director of COAI).	All OTT services
3.	COAI <i>called</i> for regulation of OTT communication apps seeking level playing field among all technologies and equal applicability of same rules for offering same services. The body has argued that OTT communication apps should be brought under the ambit of the new draft telecom bill.	Communications OTT services

	DEMANDS FOR OTT REGULATION	SCOPE AND COVERAGE OF THE DEMANDS
4.	Telcos have <i>demande</i> d that OTT messaging services be regulated, and the government levy a licence fee on OTT communication apps on par with telcos and that carriers should be compensated for all OTT data consumed on their networks.	Communications OTT services
5.	We will regulate only communication OTTs. It will be a light touch (statement of Minister Ashwini Vaishnaw).	Communications OTT services

This makes any analysis of the true TSP position harder than it would be if the arguments were consistent. For ease of understanding, this paper is restricted to the relevant comparisons between telecom and communications OTT services, since the Government itself has previously narrowed the scope of the debate.

A. Same Services, Same Rules

TSPs have long demanded a level playing field for all technologies – i.e. same service, same rules for OTT communication services⁶ (refer to Image 1 for TRAI's response to these demands).

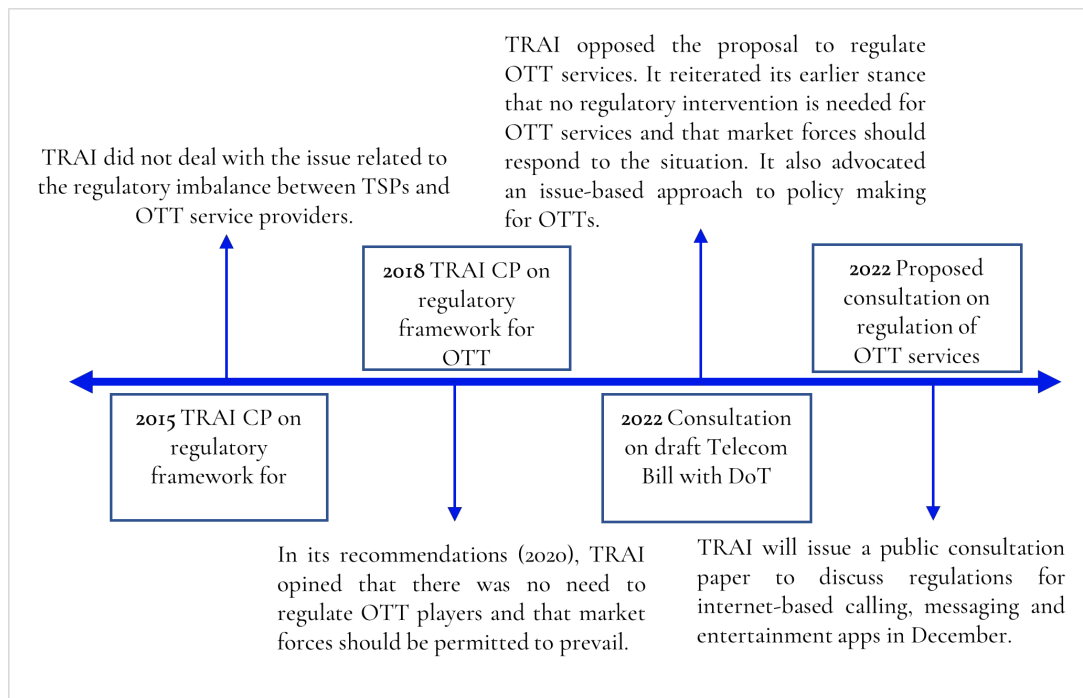


Image 1: A brief timeline of TRAI's response to TSP demands for OTT regulation (Source: Author's own)

TSPs argue that OTT communication services provide the same services as they do, without being subject to the same regulatory obligations – which include licensing, interconnection, rollout obligations, consumer protection, quality of service compliances and other requirements. As a result, the heavily regulated telecom industry which has incurred significant costs in terms of licence fees, spectrum charges, telecom equipment and security apparatus is on unequal footing with OTTs which offer similar services without incurring similar regulatory cost. Therefore, a level playing field in terms of regulatory requirements/restrictions and payment of taxes should be evolved for both TSPs and OTT service providers offering the same services.

The argument is based on three assumptions: 1) the services offered by OTT communication services are perfect substitutes for TSP services, 2) there is a regulatory imbalance as OTT services are not subject to any regulation/

compliance requirements and there is no real policy to govern them, and 3) OTT services are eating away the profits of TSPs and eroding their market share. Each of these assumptions is addressed in the next section.

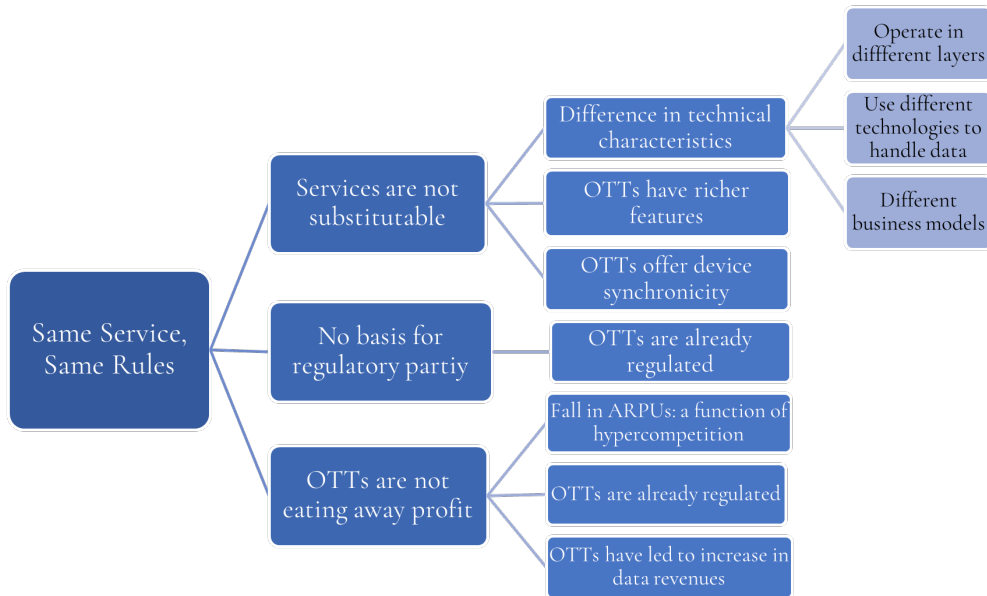


Image 2: Same Service, Same Rules: Reasons why the argument does not stand
(Source: Author's own)

1. OTT communication services are NOT substitutes for services offered by TSPs

OTT communication services are not a substitute for the traditional voice and messaging services offered by TSPs as they cannot connect to a traditional PSTN/switched voice network. In fact, OTT providers depend on the physical infrastructure created by TSPs to deliver services to their consumers. All broadband access is controlled by the TSPs alone and OTTs are a dependent industry and not equal. A consumer cannot even access OTT services without first purchasing internet access from a network provider.⁷ The substitutability argument of the TSPs is misleading also because most traditional telecom users, who don't have access to smart devices, cannot use OTT applications. According to data recorded by the Ministry of Communications in 2021, over 25,000 villages still lack mobile or internet connectivity,⁸ while smartphones account for only 38% of all networked devices in India.⁹ Additionally, OTT services require more expensive equipment like smartphones or tablets and can be technically demanding to use as they need more advanced skills to

operate than ordinary mobile phones.¹⁰ Thus, OTT communication services cannot be treated as substitutes for TSP services.

Further, OTT communication services and the services provided by TSPs lack similarity in all three aspects: technical, functional and operational. From a technical point of view, telecom networks differ from OTT apps as they operate in different layers, have distinct business models and means of operating and use different technologies to handle data. From a functional standpoint, OTT communication apps provide a different set of features than TSP services.¹¹ And from an operational perspective, unlike the services provided by TSPs, OTT apps provide device synchronicity,¹² i.e. they can be accessed through multiple internet-enabled devices simultaneously. Thus, OTT communication services and traditional telecom services cannot be considered substitutes for each other. The reasons outlined above are elaborated in the next sections.

i. OTT apps and TSP services have fundamentally different technical and economic characteristics

a. OTT services and TSP services operate in different layers

Telecom networks and OTT applications operate in different layers. TSPs are responsible for the network layer consisting of the network infrastructure. They control and operate the critical infrastructure for telecommunication services. OTT services function only in the application layer, which is user facing. They offer applications accessed by the public for the exchange of content over the public internet.

The distinction is important as functioning on the network layer requires the use of a public resource: spectrum. Spectrum refers to the range of radio frequencies used for communicating. It is a scarce resource because at any given time and place one use of a portion of the spectrum precludes any other use of that portion. It is therefore crucial to ensure its efficient management and use. This is done through licensing, quality of service and other compliance requirements applicable to the network layer. On the other hand, OTT services do not make use of a scarce public resource and do not provide access to a network, so the need for a licensing regime does

not arise.¹³ It is therefore conceptually flawed to treat them on par with TSP services in terms of regulatory oversight.

Further, the Telecom Regulatory Authority of India (TRAI) has acknowledged the difference between the network layer and the application/service layer in its Recommendations on Regulatory Framework for Internet Telephony (2017).¹⁴ The Authority stated that: “*The separation of network and service layers of telecom service offerings is the natural progression of the technological changes in this domain. It is now possible to separate provision of service contents, configuration and modification of service attributes regardless of the network catering to such service.*” It is evident from this that the two layers are materially separate and distinct, both technically and in terms of the nature of the services provided. For these reasons, they must be categorised and regulated differently.

b. OTT SPs and TSPs have distinct business models and means of operation

TSPs facilitate access to various communication services by facilitating the transmission of data from point to point. Their business is primarily concerned with the transmission of voice and data. They also provide internet connectivity as a service and facilitate the provision of other services through the internet. To this extent, TSPs are gatekeepers of the internet and therefore OTTs themselves. The business of OTT services, on the other hand, concerns data generation or the creation of data. They are the business customers of TSPs and rely on the underlying infrastructure established by them. OTTs do not control internet access points and are dependent on TSPs for reaching customers. OTT services cannot therefore be treated on par with telecom network services as their dependence is not equivalently mutual, i.e. while OTT firms require the services provided by TSPs, the reverse is not true. The services offered by TSPs (and by their own OTTs) may be used without any dependence on third-party OTTs. To be considered as peers, the first requirement is for the services to be independent or mutually dependent.

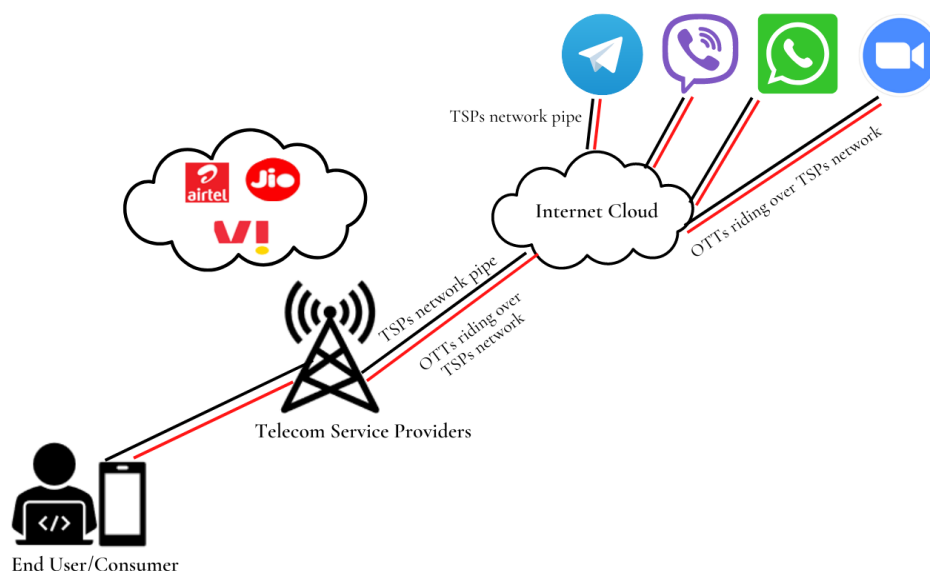


Image 3: Access flow - OTTs riding over TSPs network
(Source: [TRAI CP 2015](#), edited by the Author)

c. TSPs offering any-to-any services are not substitutes for OTT communication services

TSPs offer any-to-any services, i.e. they provide interconnection. Interconnection is the linking of telecommunications networks so that the customers of one network can communicate with those of another.¹⁵ Interconnection is important as it eliminates the need for users to subscribe to multiple networks to communicate with other users. Further, TSPs also offer essential services including emergency services, and the lack of interconnection in TSP networks could deny life-saving access to emergency services to people at large.¹⁶

The rationale for requiring TSP interconnectivity does not apply to OTT communication services. There is no interconnection in OTT services. OTT communication services that do not interconnect with the public telephone network or provide any-to-any service are not the same as or similar to the services provided by TSPs. The difference is exemplified by the European Union's revised Electronic Communications Code (EECC), which acknowledges the fundamental differences between number-based interpersonal communication services (NB-ICS) such as those interconnected with the public telephone network, and number-independent services (NI-ICS)

which include non-interconnection OTT communications services that ride over the network. The EU has created separate regulatory regimes for NB-ICS and NI-ICS, placing higher regulatory obligations on the former. The Australian Competition Consumer Commission (ACCC) too has stated that there is no basis for treating traditional voice services as substitutes for OTT communication services, as the extent of substitution is limited by technical shortfalls such as any-to-any connectivity or the ability to make emergency calls.¹⁷ Thus TSPs offering any-to-any services are not substitutes for OTT communication services, which do not provide interconnection.

d. TSPs enjoy exclusive rights

TSPs enjoy several exclusive rights conferred on them through their licences, such as the right to acquire spectrum, the right to obtain numbering resources, the right to interconnect with the PSTN, and right of way to set up infrastructure. OTT services enjoy no such privileges. Further, most TSPs already provide online services in addition to network access. Thus, while TSPs are able to operate in both the network and application layers, digital businesses are restricted to the application layer alone.

ii. OTT communication apps provide a different set of features than traditional voice/messaging services

OTT platforms have revolutionised every facet of our daily lives, whether it's ordering food, booking a cab or communicating with friends. Equating OTT communications with traditional services is overly simplistic and ignores the differences in the features offered by the two services, as outlined below.

FEATURES	OTT APPS	TRADITIONAL VOICE/MES-SAGING
Real-time features	OTTs let users get information in real time. Users can know if their message was read by the recipient through delivery reports on OTT chat services. OTTs also provide a typing feature which lets the user know if the recipient is typing.	SMS does not offer any such real-time features.
Group communication	OTT apps offer the ability to communicate with a group. Users can create groups and chat with them. They can also make audio or video calls with groups in real time.	This is missing from traditional messaging services i.e. SMS. Text messages only provide for one-to-one communication.
Multimedia exchange	OTT platforms let users receive or send images, audio, video, documents in high quality.	Exchanging pictures is possible through MMS that works on SMS protocols, but lacks quality.
Character Limit	OTT messaging apps do not impose a character limit. This lets users send lengthy messages without hassle. Any number of links can also be added to the message.	Traditional SMS messages have a limit of 160 characters and allow only one link to be added per message. This is a big hindrance for users today.

FEATURES	OTT APPS	TRADITIONAL VOICE/MES- SAGING
Number-based functionality	One-time passwords (OTPs) are not sent on OTT communication services as they require a number-based service.	The OTP which is a temporary code is sent by SMS to the phone number associated with the user's bank account.
Other features	OTT services let users send GIFs, emojis, stickers and sound effects in their messages and express their emotions in a better way.	Conventional messaging and communication services lack such media-rich features.

Thus, the features offered by OTT communication services vary significantly from traditional text messages. Given the pace at which OTT services are innovating and growing, the difference between OTT providers and TSPs will only increase.¹⁸ For this reason, OTT communication services cannot be considered substitutes for the traditional voice/messaging services provided by TSPs at present or even in times to come.

Further, creating a distinction between communication OTT providers and non-communication OTT providers for the purpose of regulation fragments the internet into two categories: one that needs an operating licence or additional regulation and a second that is not subject to such regulation. Given the many kinds of functionality offered by OTT services, it isn't easy to distinguish between the primary and ancillary features of each service. For instance, most gaming, e-commerce and health applications provide integrated communication channels. Examples of such communication service features include messaging/calls in payment apps (Paytm), gaming apps (Call of Duty), rental apps (Airbnb), food ordering apps (Zomato, Swiggy) and so on. The distinction between communication OTT providers and non-communication OTT providers is thus arbitrary and flawed. By characterising and regulating OTT communication services, we may

find ourselves in a position where OTT applications that provide the same basic functionality are treated differently under the law, simply on account of the different ancillary functionalities they offer. This might encourage OTT providers to lower their investments in voice and messaging features to prove that these are ancillary to their services, leading to a slowdown in the growth of these functionalities, and hurting innovation, competition and customer choice. With increasing innovation in the development of OTTs, such distinctions will become more complicated and may give rise to entirely new non-level playing field considerations across OTT applications. Thus, conceiving communication services as a sub-category of OTT applications serves no purpose other than creating an impracticable distinction between the communication and non-communication functionalities of OTT applications.¹⁹

iii. OTT apps, unlike traditional services, are accessible on any number of internet-capable devices

The diversity of OTT services is evidenced by the multiplicity of devices that use them. Any device (mobile, tablet, laptop, desktop) connected to the internet (whether WiFi, mobile or fixed line) can use OTT applications simultaneously with others. TSPs do not offer device synchronicity due to the hardware requirement of a SIM card, which can only be in one device at a given point in time.

Second, the substitutability of services cannot be treated as the sole criterion to assess regulatory imbalance. The approach followed by the Competition Commission of India (CCI) is instructive in this regard. The CCI considers factors such as the presence of network effects, price, convenience and regulatory conditions besides substitutability to determine the relevant markets to assess anti-competitive practices.²⁰ It has relied on these factors to differentiate between online and offline markets. In *Shri Vinod Kumar Gupta vs. Whatsapp Inc.*,²¹ the CCI used a market characteristics approach to delineate the differences between the instant messaging application Whatsapp and traditional telecommunications services. It observed that instant communication applications like Whatsapp cannot be compared with traditional electronic communication services such as the text messages or voice telephony provided by TSPs. This is because, first, the former depends on the internet and provides several additional functionalities – illustratively, instant communication applications allow you to see when your contacts are online or if they are typing a

message to you. Second, instant communication applications operate only on smartphones and some feature phones, whereas traditional telecommunications services operate on all mobile phones. Third, instant communication applications are not interoperable, whereas traditional communications services are. The CCI determined that the relevant product market for instant communications applications was “the market for instant messaging services using consumer communication apps through smartphones”. In a more recent market study on the film distribution value chain in India, the CCI also draws a distinction between video OTT service providers and television, noting that these services operate in different markets as they are not substitutable either from the demand or supply side.²² In sum, OTT applications are not equivalent to / are not perfect substitutes for traditional telecom services.

2. There is no basis for regulatory parity

i. The regulatory rationale underpinning legacy telecommunications regulations does not apply to OTT apps

Traditional telecommunication networks are surrounded by unique regulatory considerations which are in stark contrast to the regulatory requirements applicable to OTT services. These are threefold.

Firstly, the driving force behind the regulation of TSPs is closely linked to the nature of the service and its indispensability to the general public. Telecommunications connectivity relies on a critical infrastructure whose access needs to be ensured universally like other essential facilities such as waterways and roads. Much like all critical utilities, the provision of telecommunications too is heavily regulated.

Second, telecom service networks are marked by immense initial costs, reliance on economies of scale and density in the provision of services, and high barriers to entry. The combination of these factors tends to encourage monopoly in the sector.²³ For wireline carriers, the initial costs include digging trenches and laying thousands of miles of wires to reach customer locations. For wireless carriers, the start-up costs can include the price of acquiring spectrum rights, deploying a network of cellular towers and installing or leasing wires to connect these to network switches. The costs are fixed in that the carrier must incur them upfront before it can provide any volume of service. In

most cases, these costs are also sunk, i.e. the investment once made cannot be put to some other use. This makes the investment very risky.

Third, there are heavy switching costs associated with legacy telecommunications services. Consumers have a limited choice of TSPs and there may be costs associated with switching networks. For instance, consumers are inconvenienced while porting mobile connections from one service provider to another, for which an elaborate process needs to be followed. For a wired broadband connection the switching costs may be even higher, as installation fees would have to be paid to the new operator. In addition, a consumer's choice of TSP may depend entirely on the availability of network/coverage of the TSP in the area.

By contrast, OTT services ride on the backs of TSP infrastructure and do not control critical services. OTT apps operate in a highly competitiveⁱⁱ market in which it is very easy for consumers to switch between competing apps. Consumers can also access multiple OTT applications from the same device. Since OTT apps are software-based, they can be built, rolled out and adopted quickly and cheaply. A new mobile app requires minimal staff, capital investment and infrastructure. An OTT app can be set up for as little as USD 5,000 (INR 4L) for an app with limited functionality and can go up to USD 40,000 (33L) for varied functionalities.²⁴ This is minuscule compared with the fixed and sunk costs associated with setting up a telecom network infrastructure. The rise of cloud-computing platforms has further dramatically reduced the time and capital necessary to start and scale an online service. Moreover, app stores provide pre-existing distribution platforms for applications to reach users and upscale quickly. These factors all make it easier for OTT services to compete with existing products on merit. Thus, extending regulatory obligations such as licensing, quality of service, network interconnection and emergency services applicable to TSPs to OTTs is not optimal. They could create barriers to entry and expansion for OTT app providers, depriving Indian consumers of innovative and useful technology. TSPs govern several critical infrastructure areas and are essentially the gatekeepers for both OTTs and consumers to access online services. Thus, the regulatory framework for the two cannot be the same.

ii. Various communication apps such as Whatsapp, Signal, Viber, Discord, WeChat, and Snapchat compete with each other in the messaging space. There is also a class of startups coming along to disrupt the video chat industry currently dominated by Zoom, Google, Facebook, Cisco and Microsoft.

ii. OTTs are regulated already

OTT service providers are subject to several obligations and restrictions governing privacy, confidentiality, interception, cybersecurity, etc. under existing laws such as the Information Technology Act 2000 and its Rules, the Consumer Protection Act 2019 and the Consumer Protection (E-commerce) Rules 2020, the Cert-In Direction 2022, etc. Therefore, this market is already regulated. In the table below we list some of the regulations applicable to OTT service providers.

REGULATIONS	APPLICABLE PROVISIONS	DESCRIPTION
Lawful interception	S.69 of the IT Act The IT Rules, 2009 IT (Intermediaries Guidelines)	Under Section 69 of the Information Technology Act, 2000, both the Central and State Governments are empowered to direct a competent agency to intercept, monitor or decrypt any information generated, transmitted, received, or stored in any computer resource.
Consumer Protection	The Consumer Protection Act, 2019; The Consumer Protection (E-commerce) Rules, 2020; IT (Intermediary Guidelines) Rules 2021	The Consumer Protection Act, 2019 and E-commerce Rules 2020 establish the framework for redressing consumer complaints and grievances with regard to goods and services purchased online. The IT (Intermediary Guidelines) Rules, 2021 also establish a three-tiered redressal mechanism to address complaints against digital media publishers. The first level is self-regulation by OTT platforms, the second is self-regulation by the self-regulating bodies of publishers, and the third level is an oversight mechanism. The Rules also require intermediaries to designate a grievance redressal officer to address complaints of any violations.
End-user regulation (cybercrimes)	Section 43 of the IT Act	Section 43 deals with end-user cybercrimes. It applies to the end-users of OTT providers and TSPs.

REGULATIONS	APPLICABLE PROVISIONS	DESCRIPTION
Privacy & confidentiality	Section 43A of the IT Act; IT Rules, 2011 ²⁵	Section 43A provides for compensation if an intermediary is negligent in using reasonable and good quality security and safety standards to protect data or information in a computer resource. The provision is applicable to OTTs.
Blocking	Section 69A of the IT Act; IT Rules 2009 ²⁶	Section 69A of the IT Act empowers the Central Government to ask any intermediary (including OTTs) to block public access to any information generated through any computer resource.
Content Regulation	IT Act 2000; IT (Intermediary Guidelines) Rules 2021; Indian Penal Code 1861; Indecent Representation of Women (Prohibition) Act 1986.	<p>Under the IT (Intermediary Guidelines) Rules 2021:</p> <ul style="list-style-type: none"> • OTT platforms must self-categorise into five age-based categories: U or Universal, U/A 7 years, U/A 13 years, U/A 16 years and A or Adult. • OTT platforms need to provide a parental lock. • The digital media also needs to follow the Norms of Journalistic Conduct of the Press Council of India and the Programme Code under the Cable Television Networks Regulation Act. <p>Further, to curb exploitation, certain basic laws such as Information Technology Act 2000, Indian Penal Code 1861, and Indecent Representation of Women (Prohibition) Act 1986 have also been made applicable to the content generated on OTT Platforms.²⁷</p>

REGULATIONS	APPLICABLE PROVISIONS	DESCRIPTION
Digital Payment Regulations (indirect)	RBI tokenisation guidelines (Circular dated 07.09.2021)	<p>Tokenisation guidelines apply to all e-commerce (though OTTs are not regulated entities, they are indirectly regulated via these guidelines).</p> <p>Under the guidelines, merchants (websites/apps) cannot save/store customer card numbers, CVV, expiration date or any other sensitive card information. This is for enhanced card security.²⁸</p> <p>Tokenisation refers to the replacement of actual card details with an alternate code called the token produced by the card issuer or the payments ecosystem.</p>
Sectoral Regulations	Health (Draft E-pharmacy Rules 2018, Telemedicine Practice Guidelines 2020); Insurance (Insurance e-commerce guidelines)	<p>The Telemedicine Guidelines 2020 provide a framework for registered medical practitioners to follow for teleconsultations.</p> <p>The Draft E-pharmacy Rules provide for the mandatory registration of e-pharmacies (Rule 67J), a grievance redressal mechanism (Rule 67N(2)), registration requirement with the Central Licensing Authority (Rule 67L), in-built privacy safeguards (Rule 67K) and a strict data localisation mandate (Rule 67K).</p> <p>The IRDA issued guidelines on insurance e-commerce in 2017 paving the way for electronic platforms to market as well as service insurance products.²⁹ The guidelines enable insurers and insurance intermediaries to set up Insurance Self-Network Platforms (ISNPs). They lay down the manner and procedures for the grant of permission to establish an ISNP for undertaking e-commerce activities in India.</p>

In sum, it is incorrect to suggest that a regulatory imbalance exists between OTT services and TSPs, because (a) the regulatory rationale underpinning the regulation of legacy telecommunications networks does not apply to OTT apps, and (b) OTT services are already subject to regulatory obligations and compliances under existing law.

3. OTTs are NOT eating away the profits of TSPs

TSPs argue that OTT services eat into voice and SMS revenues and the resulting decline in their telecom revenues might lead to lower investment in network infrastructure and substandard service quality. Does the answer to falling revenues lie in further regulation and potential strangling of innovation, or is it just another example of the fear of incumbent operators? In the early 1990s, the invention and spread of the internet displaced the bundled models of telco services and the telcos were similarly unwelcoming. AT&T even went to court to fight the introduction of the Carterfone.³⁰ In India, the rising demand for OTT communication services might foster such fear. It is not however the business of regulation to cater to such fears and protect the profits of the incumbent. For regulatory reforms to benefit the public, they must foster competition, innovation, economic growth and increase consumer choice.

Nevertheless, it is useful to test the claim of falling revenues against publicly available information from TSPs across India to analyse trends in voice, data revenues, average revenue per user and overall growth in telco revenues. The view that OTTs are responsible for a decline in TSP revenues is based on a simplistic understanding of the source of telecom revenues. TSP revenues depend on many factors, including the number of subscribers, subscriber profiles, retail prices, level of competition in the sector, and regulation. All these factors need to be considered to evaluate the claim of TSPs that OTTs have a negative impact on their business revenues.

Increase in voice usage

Although internet-based calls have become popular over the years, voice usage per user has not gone down (see Image 2). From a consumer perspective, non-internet-based calls still serve a unique purpose, as the user does not have to rely on an internet connection to make calls. This is still an essential feature for most users as it is more reliable, especially in emergencies.

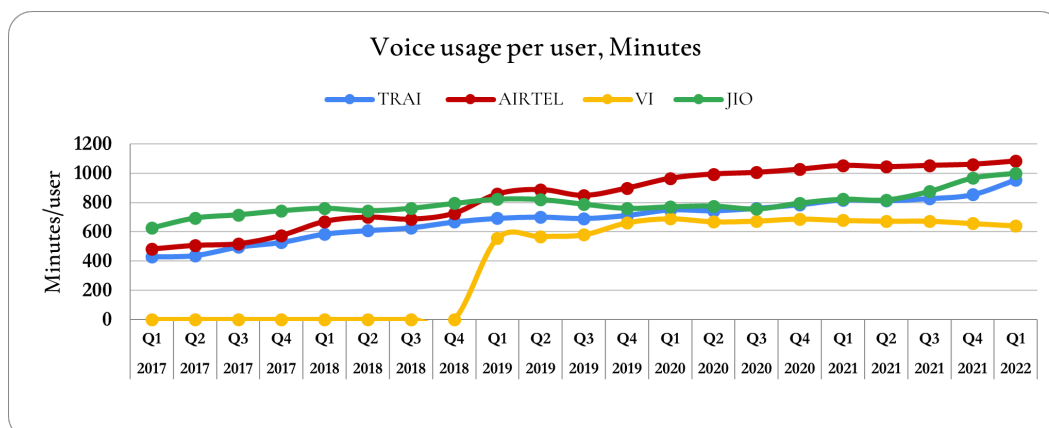


Image 4: Voice usage per user, Minutes

(Source: [TRAI Performance Indicators](#), [Airtel](#), [Jio](#) and [VI](#) data extracted from quarterly reports.)

Increase in data usage and data revenue

The popularity of internet-based calls has only led to an increase in data usage and revenue for telcos (Image 3). According to the BIF, OTTs are responsible for more than 70% of the growth in data traffic on the telcos' networks.³¹ TSP revenues are increasing with OTT usage because the more people use OTTs, the more internet usage time (data packs) they need to buy from the TSPs.

In addition, data tariffs have jumped by as much as 57% in some telecom circles. In the Haryana and Odisha circles, Airtel decided to scrap its cheapest Rs 99 plan that offered users 200 MB of 2G mobile data for 28 days. With the plan's withdrawal, the cheapest plan in these circles now starts at Rs 155 and offers 1 GB of mobile data for 24 days.³² The move is a precursor to the telco's plans to hike prices across the country. A report by CRISIL estimates that the combined revenue of Reliance Jio, Bharti Airtel and Vodafone Idea may rise by 20-25% in fiscal 2023 on the back of these recent tariff hikes.³³

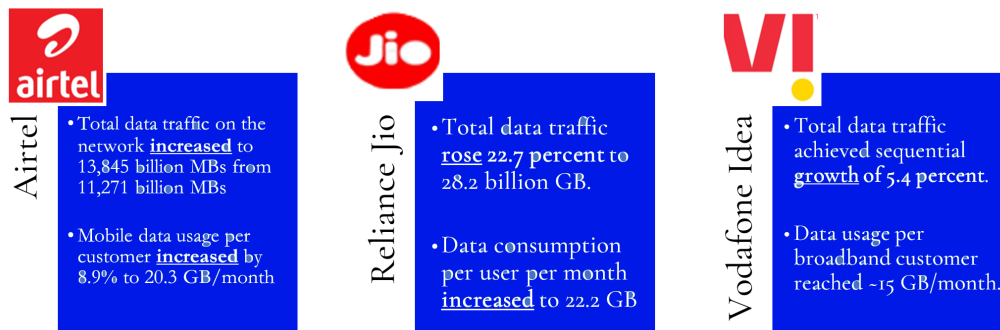


Image 5: Trends in data usage for telcos
(Source: Author's own & Telecomlead)

With technological revolution, the transition from voice and SMS to an internet-based business model is inevitable. TSPs are slowly adjusting their business models and billing practices to reflect the change in their roles from traditional communication service providers to mobile internet access providers. Under the new paradigm, the value and importance of the revenue from TSPs' communication services has decreased only to be replaced by the revenue from data services. Now, TSPs need not rely solely on revenue from traditional voice/messaging services, and can instead derive income from data customer subscriptions. The growth of OTT applications has thus expanded, not reduced, the TSPs' earning opportunities.

Fall in ARPUs: function of a hyper-competitive environment

Finally, according to market analysts, the fall in the average revenue per unit (ARPU) for Airtel and Vodafone Idea cannot be attributed to OTT services as it appears to be a function of the rising competition posed by Reliance Jio.³⁴

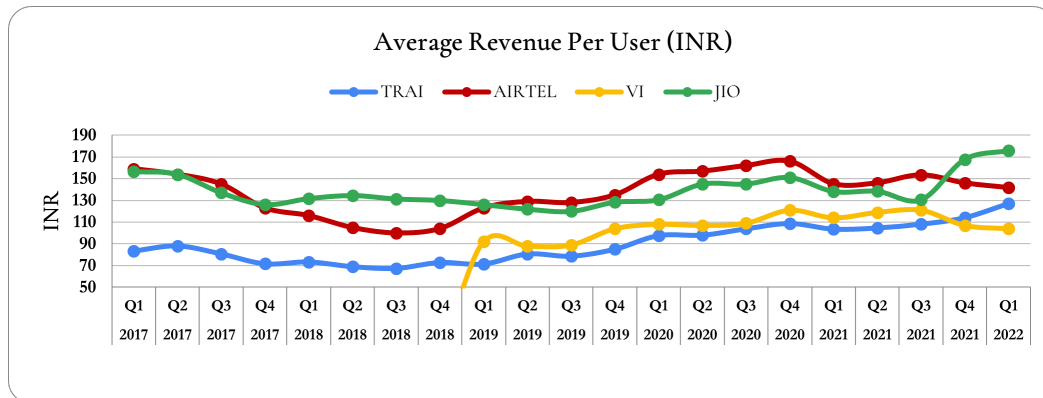


Image 6: Average Revenue Per User

(Source: [TRAI Performance Indicators](#), [Airtel](#), [Jio](#) and [VI](#) data extracted from quarterly reports.)

Ever since Jio's launch in September 2016, the Indian telecom industry has been on a roller coaster ride. Jio quickly rose to become the market leader in India's telecom sector with a 36% market share³⁵ and it supports over 55% of India's overall OTT traffic and over 65% of OTT consumption on mobile phones.³⁶ Morgan Stanley notes that the industry was in a downturn phase from FY16 due to the onset of competition from Reliance Jio. However, since the industry repair phase began, revenues are rising and ARPU is expected to grow by 50% over the next four or five years.³⁷ The drop in ARPUs is thus a function of the hyper-competitive environment in the telecom industry, and cannot be attributed to the rise of OTTs.

B. Infrastructure cost-sharing

Another demand raised by the TSPs is that OTT services should contribute to developing digital telecom infrastructure in exchange for the use of these services.³⁸ For instance, the COAI has suggested levying a mutually decided usage charge for the actual traffic carried by OTTs on telecom networks. Where a mutual agreement is not reached, the association has called for implementing a licensing and regulatory framework to govern the contribution of OTT players towards network infrastructure creation.³⁹ Such a mandatory cost-sharing arrangement raises crucial questions about the net neutrality. The cost-sharing framework may cause TSPs to block or slow the content of OTT players which do not enter into cost-sharing arrangements with them, via differential pricing for different sets of consumers. TSPs may even discriminate between OTT services that pay

them and those that don't.⁴⁰ Opening the door to infrastructure cost-sharing could lead to further issues as well – it may negatively affect free competition and impact the final prices for consumers.⁴¹

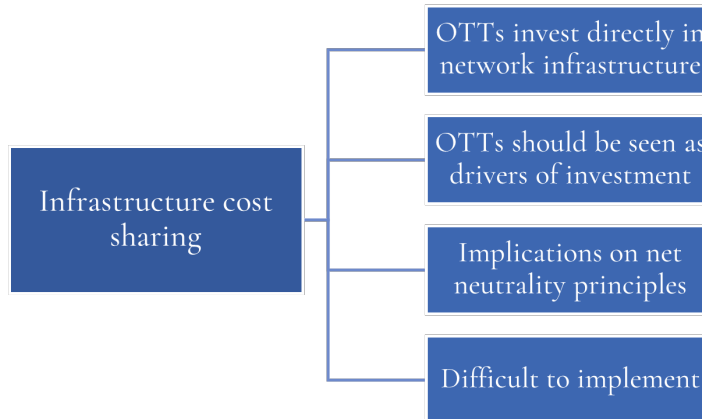


Image 7: Infrastructure cost sharing: Reasons why the demand is not reasonable (Source: Author's own)

1. OTT providers invest directly towards network infrastructure

TSPs have long alleged a fall in their profitability due to OTT communication providers such as Whatsapp and Skype and accuse such services of free riding.⁴² This is incorrect given how OTT services have made significant investments in setting up data centres and content delivery networks to bring content closer to consumers, undersea cables to carry data around the world, and caches of data to bring their services closer to consumers.⁴³ All of these form part of the infrastructure for any communications network.⁴⁴ From 2011 to 2022, OTT providers have invested almost USD 900 billion into network infrastructure, with an average spend of about USD 120 billion a year from 2018 to 2021.⁴⁵ These investments are only increasing with the rise in consumption.

Over the past few years, the overwhelming majority of investment in undersea cable infrastructure has come from companies like Meta

(formerly Facebook) and Googleⁱⁱⁱ which currently own nearly 100,000 km of cable each.⁴⁶ Amazon has its own private network connecting its AWS data centres through cables traversing oceans around the world.⁴⁷ More recently announced projects include a joint initiative by Google and Facebook to build an undersea cable named Apricot that will link Singapore, Japan, the Philippines, Taiwan and Indonesia by 2024.⁴⁸ In another project, a Facebook-led consortium recently bankrolled the longest subaquatic cable, spread over 45,000 km that will link up 33 nations in Africa.⁴⁹

Another significant way in which OTT providers have contributed to network infrastructure is by building physical facilities such as data centres, cache servers and content hosting centres. Amazon currently occupies more than one-third of the world's data centre market through its sister company Amazon Web Services (AWS).⁵⁰ It has 38 data centres in its global network,⁵¹ of which two are in India and five are upcoming.⁵² It has the most extensive cloud computing infrastructure in the world, and 33% of all daily internet usage comes from websites operating in AWS centres.⁵³ Netflix also offers thousands of cache servers to telcos, which store internet content locally at zero peering costs. These facilities (CDNs, cache servers, data centres) have not only helped speed up data access for consumers but have also reduced the strain on TSP networks for free.⁵⁴ Instead of having to bring data from thousands of miles away, TSPs can now simply tap into a cache of data that the OTT service has placed nearby to deliver. The cost difference in delivering this data across billions of content requests is what they save, and it adds up to billions every year for TSPs.⁵⁵

2. OTT services should be seen as drivers of investment

The relationship between TSPs and OTTs is symbiotic. TSPs provide the transmission capacity and OTT apps offer content that boosts user

iii. Some of these undersea cables are privately owned by Google and Facebook exclusively while others are owned in part through consortiums with the world's leading telcos. In [consortiums](#), each company has a say in the route in return for its investment and, crucially, a share of the cable's capacity. Google and Facebook don't sell capacity on their private cables for other companies to use because if they did, they would become carriers and be licensed as such. The cables are not however used exclusively for their traffic alone. What tends to happen is they swap capacity on their private cable with parties that have capacity on other cables. Put simply, Google, Facebook and the like leverage capacity on their private cables along a certain route by using it as a means of exchange.

demand for this capacity. Both are mutually interdependent. Building transmission pipes without anything to transmit is not a viable business, and developing content without transmission capability is not viable either. Further, the content provided by OTTs is driving the demand for the transmission capacity provided by TSPs, since it can increase the end-user demand for more bandwidth.⁵⁶ As consumers use more bandwidth-intensive OTTs such as video streaming services, they pay for higher-tiered services that offer faster speeds and greater bandwidth, which TSPs price at a premium. In other words, TSPs are using the content provided by OTTs to increase their revenues, which in turn would lead to higher investments in the TSPs' networks.

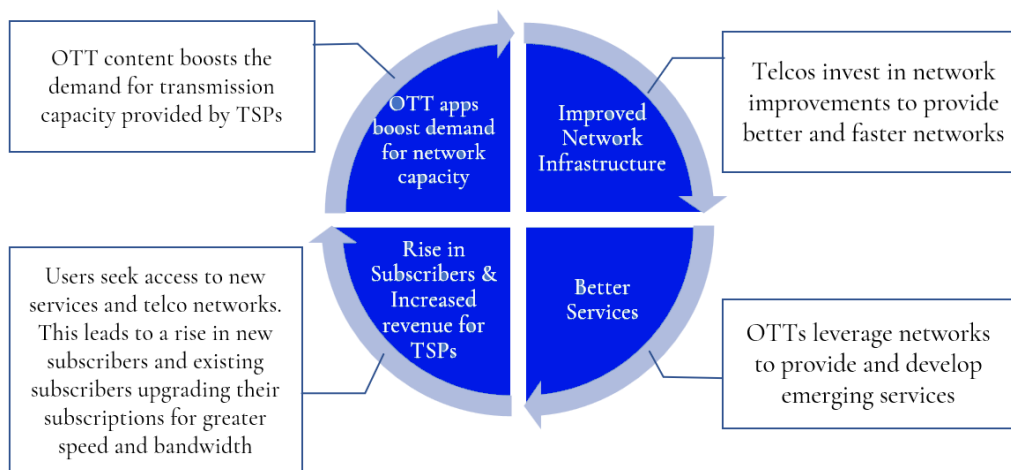


Image 8: The virtuous cycle of OTT adoption and growth of TSP networks
(Source: Author's own)

Thus, the growth in traffic driven by the success of OTT apps is beneficial to TSPs. As per a report by Ericsson, growth in mobile traffic is among the foremost economic drivers of next-generation wireless networks.⁵⁷ The average data traffic per smartphone in India is the highest globally, and is projected to grow from 25 GB per month in 2022 to 54 GB per month in 2028 – a CAGR of 14% – and total mobile data traffic in India is estimated to grow from 18 EB/month in 2022 to 53 EB/month in 2028 – a CAGR of 19%.⁵⁸ This is possible only because of the innovation in OTT services – such growth opportunities would not exist if the telecommunications sector in the country was still restricted to traditional voice and SMS services alone. OTT apps also have a broader economic impact – a 2017 study by WIK Consulting found that each 10%

increase in the use of OTT apps leads to an average increase of USD 1 billion in additional global GDP daily.⁵⁹

Second, an assumption underlying the demand for infrastructure cost-sharing is that an increase in data traffic due to OTTs directly translates into higher costs for TSPs. The European communications regulator (BEREC) notes that this is not true.⁶⁰ By carefully analysing network investments, it can be understood that the costs of IP infrastructures are not very traffic sensitive. In other words, the existing capacity can be utilised without any additional cost. Only when higher peak capacity is needed do investments in network expansion and network upgrades become necessary. The cost of such upgrades is very low compared to the total network capacity, even though they bring a significant increase in capacity. As per a recent Analysys Mason report, the annual spend by telecom operators remained stable despite a rapid increase in global internet traffic (Image 9).

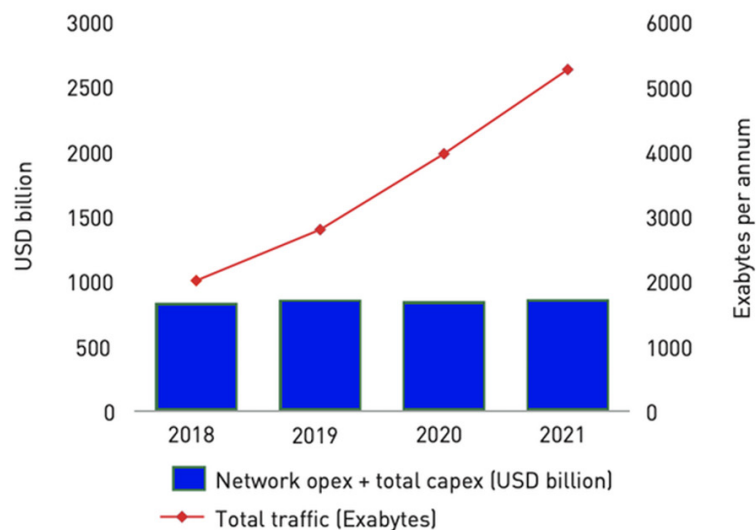


Image 9: Growth in traffic delivered over fixed and mobile access networks and evolution of network-related telecom operator costs from 2018 to 2021

(Source: [Analysys Mason Report 2022](#))

Mobile networks may exhibit some traffic sensitivity. Nevertheless, the marginal costs of additional data usage are very low. As per a report on ‘Understanding the Economics of 5G Deployment’ by Ericsson, the cost per GB for network service providers declines as user traffic increases

because traffic grows more than investment, reducing the cost of each additional GB delivered.⁶¹ Thus, the economic and technical conditions at present weigh even more strongly against the introduction of any fee on OTTs.⁶²

3. Implications for net neutrality

Demands for a mandatory cost-sharing framework may also endanger the principles of net neutrality. It may lead to competitive distortion putting smaller and medium-sized OTTs at a disadvantage. Net neutrality is the idea of equal or non-discriminatory treatment of content by those providing access to the internet. It requires TSPs/ISPs to treat all internet traffic on an equal basis without regard to the type, origin or destination of the content or the means of its transmission. The idea is for a maximally useful public information network to treat all content, sites and platforms equally. The principle of net neutrality thus requires TSPs to treat all content equally, without prioritising access to any one platform by creating fast lanes or by blocking or throttling access to others.⁶³

Keeping the net neutral is essential for innovation as otherwise, newer or small/medium-sized companies will struggle to compete with rich corporations that are better placed to negotiate deals enabling faster/better access to content on their sites.⁶⁴ The growth of small and start-up OTTs will be hindered if they are unable to secure access to specific TSPs or afford access-tiering charges. These potential barriers to entry may deter new startups from joining the market, threatening innovation and diversity in the long run. More users would be limited to walled-in ecosystems with more concerted threats to privacy and expression, especially as small players get locked out of the equation.⁶⁵

Imposing a usage fee on OTTs will also harm consumers, because OTTs subject to the levy will inevitably pass those costs down to end-users.⁶⁶ OTT users must deal with both the TSP and the OTT provider. They pay money to their TSP for broadband access and OTT providers for access to their content. In the presence of contracts between OTT providers and end users, any usage fee mandated for the OTT provider could then be (at least partially) passed through to the end user. Users may bear the real cost which may either be increased expenditure or poorer content quality.⁶⁷ Secondly, such bilateral agreements between OTTs and TSPs in each country would inevitably lead to internet fragmentation – where

certain content will only be available on certain TSPs – resulting in multiple parallel internets that are unconnected to one another.⁶⁸ The principles of an open internet that ensure an end-to-end and global level playing field will be lost, and the internet will become a ‘splinternet’ in which the provision of cross-border services requires navigating complex regulations and laws to negotiate the terms for accessibility in each and every network.

Finally, implementing a cost-sharing mandate brings its own set of challenges.⁶⁹ It raises several critical questions: Would OTTs gain control over the infrastructure? Would the revenue accrued to TSPs by providing access to infrastructure be shared with OTTs? What mechanism would determine the costs to be shared? Will it depend on the type of service or its value? It may be difficult to implement as there is no simple index or measure of the capacity or bandwidth-use of an application that is closely correlated to consumers’ willingness to pay for the application. For instance, bandwidth use is high for some highly valued services, like video on demand, but very low for information services such as search or bidding in auctions in real-time, which are also highly valuable activities.⁷⁰ Even if a model is developed, it will be subject to multiple challenges as it is likely to put some players at a disadvantage.⁷¹

There is thus no reason for OTTs to be made to pay a tax on their traffic. OTTs already pay to connect to the internet. TSPs are also compensated by their own internet service customers for transporting internet data across their access networks. By demanding an extra fee from OTTs to provide internet access, TSPs simply want to be paid twice for the same service. And should the service providers feel the infrastructure is not good enough for them, they can, and are, investing in the infrastructure on their own. Large OTT platforms invest heavily in content delivery networks and the necessary infrastructure to reduce the strain on broadband network providers. Putting a special tax on them would be like levying additional tax on businesses that use water or electricity in remarkably creative ways.⁷²

III. OTT REGULATION: A COMPARATIVE ANALYSIS

A look at global best practices indicates that while OTT communication services have been brought under telecom laws in some jurisdictions, they are not subject to the same rules as TSPs. They have only been subject to minimum and light-touch regulation in these jurisdictions.

NAME OF THE COUNTRY	ARE OTT SERVICES LICENSED?	WHAT RULES ARE OTTS SUBJECT TO UNDER TELECOMMUNICATIONS LAW?
Singapore	Singapore has introduced licensing for communications OTT services. However, it uses an activity-based licensing regime for telecom that distinguishes between entities that own and operate their own infrastructure versus those that supply calling or text services. Thus, the purpose of licensing in Singapore is to distinguish between a TSP and a communications OTT service.	<p>A communications OTT service operating in Singapore must obtain a Service-Based Operating (SBO) licence⁷³ that prescribes only a minimum quality of service standards. It does not subject OTTs to any interoperability or tariff regulation.⁷⁴</p> <p>By contrast, TSPs require a Facilities-Based Operations licence.⁷⁵ FBO licensees have far greater regulatory obligations to fulfil than SBO licensees. They must comply with the Code of Practice for Competition in the Provision of Telecommunication Services (Telecom Competition Code), Code of Practice for Info-communication Facilities in Buildings (COPIF), and the Accounting Separation Guidelines. They also have higher licence fees and must roll out their networks and services as committed to in their licence application. They are also required to implement and support number portability; provide interconnection; pay for the use of radio frequencies and comply with the IMDA's Quality of Service standards.</p>

NAME OF THE COUNTRY	ARE OTT SERVICES LICENSED?	WHAT RULES ARE OTTS SUBJECT TO UNDER TELECOMMUNICATIONS LAW?
Brazil	No, OTT services are not licensed. They are understood as value-added services and are exempt from telecom regulation. ⁷⁶	OTTs are not subject to any regulation.
South Africa	No, OTT services are not licensed. ⁷⁷	OTTs are not subject to any regulation.
European Union	The revised European Electronic Communications Code differentiates between “number-based interpersonal communications services” (NB-ICS), such as those interconnected with the public telephone network, and “number-independent interpersonal communications services” (NI-ICS), which includes non-interconnected OTT communications apps that ride over the network. The EU has created separate regulatory regimes for NB-ICS and NI-ICS, subjecting NI-ICS to lighter touch regulation. ⁷⁸	OTT communication services are subject to lighter-touch regulation.
United Kingdom	No, OTT services are not licensed.	OTTs are not subject to any regulation.
United States of America	No licensing for OTT platforms. Internet-based services are exempt from “common carrier” telecom regulation. ⁷⁹ Interestingly, internet service providers, including those providing cable broadband, have been brought under this definition as well.	OTTs are not subject to any regulation.

Only Singapore and the EU have brought OTT communication services into their legal and regulatory frameworks. However, these are subject only to light-touch regulation and minimum quality of service requirements. In all other countries studied, OTT communication services are not expressly defined. In Brazil and the US, these services are considered ‘value-added services’ and ‘information services’ respectively and are exempt from regulation.

Thus, the demands raised by TSPs in India to bring OTT communications services under the same regulatory framework that applies to them, and the consequent inclusion of communications OTTs within the purview of the Draft Indian Telecommunications Bill, 2022 deviates from existing international frameworks.

THUS THE DEMANDS RAISED BY TSPs IN INDIA TO BRING OTT COMMUNICATIONS SERVICES UNDER THE SAME REGULATORY FRAMEWORK THAT APPLIES TO THEM, ... DEVIATES FROM EXISTING INTERNATIONAL FRAMEWORKS.

IV. CONCLUSION AND RECOMMENDATIONS

The final question before us is whether it is appropriate for lawmakers to apply legacy telecommunications rules and regulations to newer OTT internet-based services. To assist lawmakers and telecom regulators in considering the question, we have explored the important differences between legacy telecommunications services and OTT services above.

A common argument in the discussions on this issue is that OTT communications service providers provide the same services as TSPs but are not subject to the same regulatory obligations, so a level playing field in terms of the regulatory requirements/restrictions should be evolved for both TSPs and OTT communications service providers. However, as discussed above, the issue of a level playing field between an OTT communications service and a TSP falls apart as the character of both services is quite different. There are technical and economic differences between OTT communications and legacy telecommunications services:

a) Lack similarity: Both services differ in all three aspects: technical, functional and operational. From a technical point of view, telecom networks and OTT services operate in different layers. OTT services depend on TSPs to reach their customers and cannot function independently. The dependence however is not mutual. From a functional standpoint, OTT communications services offer a wider and richer set of features (group communications, GIFs, emojis, no character limit, etc.) than traditional voice/messaging services. And finally from a functional standpoint, OTT services offer device synchronicity, i.e. they can be accessed on any number of internet-capable devices. This is missing from TSP services due to the hardware requirement of a SIM card, which can only be inside one device at a given point of time.

b) Difference in regulatory rationale: Since TSPs exploit scarce public resources like spectrum, they are regulated to ensure the efficient management and use of this scarce resource. There are thus public interest reasons for regulating TSPs. The second driving force behind TSP regulation is closely linked to the monopolistic propensities in the sector, which is marked by high initial costs,

reliance on economies of scale and density, high entry barriers and large switching costs.

c) OTT services have expanded the earning opportunities of TSPs:

The view that OTT services are responsible for a decline in TSP revenues is based on a simplistic understanding of the source of telecom revenues. A closer look at the publicly available information from TSPs across India suggests that OTT applications have expanded, not shrunk the avenues for earning revenues for TSPs. Moreover, the fall in average revenue per unit (ARPU) cannot be attributed to OTT services, and instead appears to be a function of hyper-competition marked by the entry of Reliance Jio in the sector.

Second, OTT services like internet messaging and calling apps play a major role in high data consumption by mobile users and ultimately benefit TSPs through higher usage. Extending heavy-handed regulations will stifle innovation and creativity in the OTT industry. It may pose a significant obstacle for OTT app providers, particularly startups, that wish to enter and expand in different markets. This would limit the availability of global OTT apps for Indian consumers and hinder the growth of Indian businesses that rely on the global reach of OTT apps to expand their customer base and boost sales. Instead of introducing more regulation, the Government should reduce the existing regulations, i.e. licence fees, spectrum usage charges, and other levies and taxes borne by the telecom industry. Indian consumers and the industry will be the lasting beneficiaries of such an outlook.

Finally, demands for a mandatory cost-sharing framework may have negative consequences for the growth of the communications sector in India. While it is tempting to think that a usage fee will improve network infrastructure, the evidence suggests otherwise. A study of the countries that charge the highest telephony access fees found a negative correlation between high fees and advanced telecom infrastructure deployment.⁸⁰ In other words, high access fees harmed infrastructure deployment instead of fostering it.⁸¹ Moreover, a cost-sharing mandate would enable TSPs to refuse traffic from OTT providers who fail to pay the network usage fee, which may result in inefficient traffic flows and higher costs of data transmission. This would threaten to derail India's concerted push to develop industries that rely on the internet economy.

In Brazil and the US, these services are considered ‘value-added services’ and ‘information services’ respectively and are exempt from regulation.

Thus, the demands raised by TSPs in India to bring OTT communications services under the same regulatory framework that applies to them, and the consequent inclusion of communications OTTs within the purview of the Draft Indian Telecommunications Bill, 2022 deviates from existing international frameworks.

RECOMMENDATIONS
1. Introduce measures for the progressive deregulation of traditional telecom firms.
2. Restrict the scope of the Indian Telecommunications Bill, 2022 to telecom carriage services.
3. Consider the technical and economic differences between OTT services and TSPs to decide the regulatory mode of action for OTT internet services.
4. Infrastructure cost sharing must be strictly restricted to voluntary contributions by OTTs.

ENDNOTES

1. Department of Telecom, '[Explanatory Note to the Telecommunications Bill 2022](#)', DoT (September 2022)
2. Subhayan Chakraborty, '[OTT apps: COAI bats for 'same service, same rules' under draft Telecom Bill](#)', Business Standards (October 2022)
3. S. Das Gupta, '[Have OTT players pay telecom firms usage charges, COAI writes to DoT](#)', Business Standard (November 2022)
4. S.D. Gupta, '[Have OTT players pay telecom firms usage charges, COAI writes to DoT](#)', Business Standard (November 2022)
5. A. Weissberger, '[India's COAI joins 4 European telcos in demanding OTT players pay to use their networks](#)', IEEE Communications Society (November 2022)
6. ENS Economic Bureau, '[TRAI issues new consultation paper, seeks views on the regulatory regime](#)', The Indian Express (November 2018)
7. Broadband India Forum, '[Response to the TRAI CP on Regulatory Framework for OTT communication services](#)' (2018)
8. Rahul Shrivastava, '[Over 25000 villages in India still lack internet connectivity, Lok Sabha told](#)', India Today (March 2021)
9. '[India to have over 800 million smartphone users by 2022: Cisco study](#)', Hindustan Times Tech (August 2022)
10. BEREC Draft Report on OTT Services, '[BEUC response to the public consultation](#)', The European Consumer Organisation (November 2015)
11. Centre for the Policy Research, '[Response to TRAI CP on regulatory framework for OTT communication services](#)' (2018)
12. Ibid
13. M. Chawdhry, '[Levelling the playing field between traditional and digital businesses](#)', Esya Centre (June 2021)
14. TRAI, '[Recommendations on Regulatory framework for Internet Telephony](#)', p.27 (October 2017)
15. E.P. Chiang, '[What is interconnection and why is it important?](#)', Body of Knowledge on Infrastructure Regulation
16. Broadband India Forum, '[Response to TRAI CP on regulatory framework for OTT communication services](#)', (2018)
17. Australian Competition & Consumer Commission, '[Communications Sector Market Study: Final Report](#)', ACCC (April 2018)
18. Internet and Mobile Association of India, '[IAMAI Submission on TRAI Consultation Paper on regulatory framework for OTT communication services](#)' (2018)
19. Broadband India Forum, '[Response to TRAI CP on regulatory framework for OTT communication services](#)', (2018)
20. Koan Advisory Group, '[Response to TRAI's Consultation Paper on Regulatory Framework for OTT Communication Services](#)' (January 2019)
21. [Shri Vinod Kumar Gupta vs. Whatsapp Inc.](#), CCI Case No. 99 of 2016 (Para 11).

-
22. Competition Commission of India, '[Market Study on the Film Distribution Chain in India](#)', CCI Market Study (October 2022)
 23. Centre for the Policy Research, '[Response to TRAI CP on regulatory framework for OTT communication services](#)' (2018)
 24. R. Jain, '[How much does it cost to create an OTT app](#)', Enveu (November 2021)
 25. IT (Reasonable Security Practices and Procedures and Sensitive Personal Data or Information) Rules, 2011
 26. IT (Procedure and Safeguards for Blocking for Access of Information by Public) Rules 2009
 27. Shally Bhasin & Prateek Gupta, '[OTT Platforms- Must Provide-Must Carry](#)', Livemint (September 2022)
 28. V. Das, '[How RBI's card tokenization will ensure a secure digital payment ecosystem](#)', Mint (September 2022)
 29. N. Ravi Kumar, '[New norms for selling insurance online](#)', The Hindu (March 2017)
 30. D. Browdwin, '[Carterfone case showed how regulations promote competition](#)' US News (June 2012); The Centre for Internet & Society, '[OTTs eating into our revenue: telcos in India](#)', CIS (2014)
 31. FE Bureau, '[Telcos should compensate OTTs for driving network usage: BIF](#)', Financial Express (December 2022)
 32. S. Barik, '[Why Airtel's tariff hike is significant and what it means for the sector](#)', Indian Express (November 2022)
 33. K. Rathee, '[Telecom revenue of private mobile operators to rise 20-25% in current fiscal](#)', Financial Express (June 2022)
 34. IFF Submission, '[Re: Comments by Internet Freedom Foundation on TRAI's Consultation Paper on OTT](#)', January 2019
 35. H. Kashyap, '[Reliance Jio continues winning streak, adds 4.2 million new subscribers in June 2022](#)', Inc42 (August 2022)
 36. Keshavdev. V., '[The rise of OTTs](#)', Outlook Business Magazine (December 2019)
 37. ET Telecom, '[Revenue of Big 3 telcos may grow robustly by 20-25% in fiscal 2023: CRISIL](#)', Economic Times (May 2022)
 38. ET Bureau, '[OTTs should compensate telcos for using infra: COAI](#)', Economic Times (November 2022)
 39. H. Baldock, '[Indian operator weigh in on fair share debate](#)', Total Telecom (November 2022)
 40. M. Kalawatia, '[Why OTTs, telcos musn't lock horns over infra-cost sharing](#)', The Print (August 2022)
 41. L. Kabelka, '[Infrastructure costs: fair contribution vs. net neutrality](#)', Euractiv (May 2022)
 42. ET Bureau, '[Telcos lash out at OTTs, call them free riders](#)' Economic Times (December 2022)
 43. C. Liu, E. Falcon & K. Trendacosta, '[Network usage fees will harm European Consumers and Businesses](#)', Electronic Frontier Foundation (December 2022)
 44. ET Bureau, '[BIF counters telecom industry demands over usage of network infrastructure](#)', Economic Times
-

45. Ibid
46. J. Ball, '[Facebook and Google's New Plan? Own the Internet](#)', Wired (October 2021)
47. Y. Sverdlik, '[AWS will be Google and Facebook's neighbour on the new US-Europe Submarine cable](#)', DataCenter Knowledge (March 2019)
48. I.A. Hamilton, '[Facebook and Google are laying another giant sea internet cable stretching 7500 between 6 Asian countries](#)', Business Insider (August 2021)
49. T.K. Okafor, '[Facebook-backed 2Africa set to be the longest subsea cable upon completion](#)', Techcrunch (September 2021)
50. V. Chernikhovska, '[Amazon \(AWS\) Data Centers: Leading the Way](#)', Nassau National Cable (April 2020);
51. '[Amazon AWS Data Centers](#)', Datacenters.com
52. V. Ananthraj, '[Amazon is opening four new mini-data centers in India](#)', TechCircle (February 2022); D.Swinhoe, '[Amazon leases 5.5 acres of land outside Mumbai, likely for data center](#)', Data Center Dynamic (August 2022)
53. Ibid
54. R. Browne, '[U.S. tech giants face pressure from Europe's telcos to pay for building the internet](#)', CNBC (October 2022)
55. C. Liu, E. Falcon & K. Trendacosta, '[Network usage fees will harm European Consumers and Businesses](#)', Electronic Frontier Foundation (December 2022)
56. Body of European Regulators for Electronic Communications, '[BEREC preliminary assessment of the underlying assumptions of payments from large CAPs to ISPs](#)', BEREC (October 2022)
57. Ericsson, "[Understanding the Economics of 5G Deployments](#)" (June 2020), p. 4.
58. Ericsson, '[Ericsson Mobility Report](#)' (November 2022)
59. T. Ramachandran, '[OTTs are telecom growth drivers](#)', Hindu Businessline (October 2022)
60. Body of European Regulators for Electronic Communications, '[BEREC preliminary assessment of the underlying assumptions of payments from large CAPs to ISPs](#)', BEREC (October 2022)
61. Ericsson, "[Understanding the Economics of 5G Deployments](#)" (June 2020),
62. [Open letter](#) to Commissioner Margrethe Vestager (sent by 34 civil society organisations from over 17 countries), Epicenter Works
63. K. Finley, '[Wired Guide to Net Neutrality](#)', Wired (May 2020)
64. IFF, '[Comments on the consultation paper on the need for a new framework for governing telecommunications in India](#)', Internet Freedom Foundation (September 2022)
65. K. Komaitis, '[Big Tech pay-outs to European ISPs would just concentrate their power](#)', Electronic Frontier Foundation (March 2022)
66. Mozilla, '[Letter to Commissioner Vestager: Maintaining the EU's global leadership on net neutrality](#)', Mozilla (June 2022)
67. J. Kane & J. Dine, '[Consumers are the ones who end up paying for sending party-pays mandates](#)', Information Technology & Innovation Foundation (November 2022)

68. A. Hetler, '[The splinternet explained: Everything you need to know](#)', Tech Target (June 2022)
69. M. Kalawatia, '[Why OTTs, telcos mustn't lock horns over infra-cost sharing](#)', The Print (August 2022)
70. TRAI, '[Consultation Paper on Regulatory Framework for Over-the-top communication services](#)' (November 2018)
71. Ibid
72. Z. Turk, '[No, big tech should not contribute to infrastructure](#)', Euractiv (October 2022)
73. Infocom Media Development Authority, '[Services-based Operations \(SBO\) License](#)', IMDA
74. '[Sixth Schedule: Class License for internet based voice and data services](#)', Telecommunications (Class License) Regulations.
75. Infocom Media Development Authority, '[Facilities-based Operations \(FBO\) License](#)', IMDA.
76. OECD iLibrary, '[Communication policy and regulation](#)', OECD Telecommunication and Broadcasting Review of Brazil (2020)
77. ICASA, '[Discussion Document: Inquiry into Subscription TV Broadcasting Services](#)' (August 2017).
78. Squire Patton Boggs, '[Five Minutes on... The EU Electronic Communications Code](#)', Lexology (March 2019)
79. Definition of 'internet service provider', Legal Information Institute, Cornell Law School. Available at https://www.law.cornell.edu/wex/internet_service_provider_isp
80. E. Dourado, '[Do high international telecom rates buy telecom sector growth](#)', Working Paper, Mercatus Center, George Mason University (November 2012)
81. [Open letter](#) to Commissioner Margrethe Vestager (sent by 34 civil society organisations from over 17 countries), Epicenter Works

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