



TRAI's Consultation Paper on the Regulatory
Framework for Over-The-Top (OTT)
Communications Services

Response by **Cenerva**

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Introduction

Cenerva is pleased to submit this response to the TRAI's Consultation Paper on the Regulatory Framework for Over-The-Top (OTT) Communications Services. We are also submitting a copy of our report "*OTT Services: Economic Impact and Options for Regulation*", published in February 2018. The report is also available to download free of charge from [our website](#).

Cenerva is a communications consultancy. We help our clients address the challenges of the digital society through our specialist advisory and training services. Our work has included direct support and advice to clients on the convergence of OTT online content and traditional broadcasting services, and training on OTTs to senior industry decision makers from multiple jurisdictions.

In this response we comment on the emergence of OTTs and the impact this has had globally. We also provide our views on some of the challenges regulators, including TRAI, are now facing in relation to OTTs, and respectfully offer recommendations on the application of regulatory best practice to OTTs. In the annex to this response, we provide direct responses to the questions in the TRAI consultation.

We would be happy to discuss any of the issues covered in the TRAI consultation, or communications policy and regulation more broadly. To do this, please contact:

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The OTTs phenomenon

The TRAI rightly identifies the growth of OTTs as being significant in communications markets, both to industry and consumers. OTTs have indeed transformed the daily lives of most of us, not just in the way we communicate and consume media, but across virtually every sector of the economy.

For its consultation, TRAI is focused on OTT services which can be regarded as the same or similar to services provided by Telecoms Service Providers. This is a sensible approach since TRAI wants to examine the impact of OTTs on the telecommunications industry.

However, in doing this, it is important not to lose sight of the broader socio-economic impacts of OTTs, e.g. globally, the development of OTTs has delivered benefits to citizens and businesses which they would otherwise have not enjoyed. Policy makers should therefore consider OTTs not just in the context of impacts on the telecommunications industry, but also their contribution to broader socio-economic

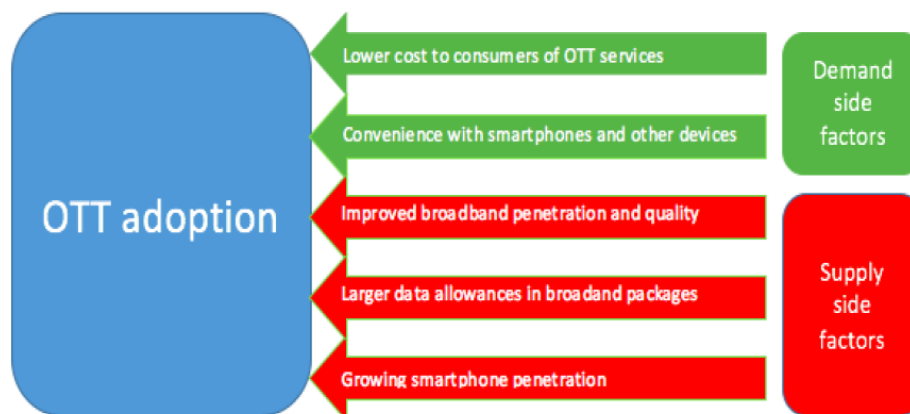
objectives like addressing the global digital divide, and growing or maintaining prosperity in rural communities.

OTT usage has grown explosively during this decade, and this is expected to continue. For example:

- Between 2011 and 2017, subscriber numbers on the four largest online messaging platforms globally (WhatsApp, Facebook Messenger, WeChat and Viber) grew by a factor of 18¹.
- Price Waterhouse Coopers Entertainment and Media Outlook 2018 reports OTT video streaming service revenues in the USA grew by 15.2% in 2017, and forecasts further growth at an annual rate of 8.8% (to \$30.6 bn).²

This growth has been driven from the demand and supply sides as consumers have become increasingly accustomed to consuming data on multiple devices and on the move. These capabilities are available to consumers as a result of the development of smart devices, and innovation in the ease and convenience of services on these devices via apps.

Figure 1: Drivers of OTT adoption



There is significant potential for usage of OTTs and online services generally to grow. Globally, 45% of the population still do not use the Internet³. Available data suggest there is growth potential in India – according to the GSMA⁴, mobile

¹ <http://uk.businessinsider.com/the-messaging-app-report-2015-11>.

² <https://www.forbes.com/sites/dbloom/2018/06/05/streaming-video-2017-revenues-pwc-netflix-amazon-hulu/#4ed6dfc55edb>

³ <https://www.internetworldstats.com/stats.htm>

⁴ GSMA data and forecasts - <https://www.gsma.com/mobileeconomy/wp-content/uploads/2018/05/The-Mobile-Economy-2018.pdf>

penetration was 53% in 2017 and is forecast to reach 63% by 2025⁵; Hootsuite has mobile penetration at 63% in 2018⁶. These data suggests there is considerable growth potential for the online economy if infrastructure is in place to support this.

Benefits of improved Internet availability and take-up

Availability and take-up of online services by people who do not currently use them will deliver significant benefits to them as individuals, and to the communities in which they live and work, as well as making positive economic contributions nationally, regionally, and globally. The advantages of driving online penetration and the digital economy were postulated in the 2014 Deloitte report, “*Value of Connectivity: Economic and Social benefits of expanding Internet Access*”,⁷ Deloitte estimated that extending internet access in Africa, Latin America, India and South and East Asia to levels in developed countries would result in a range of benefits, including increases in GDP of \$2.2 trillion.

This potential economic upside makes the options facing regulators and policy makers very important as they assess how to approach OTTs. To deliver improved internet penetration and at high quality, regulators must ensure that the right incentives are in place for investments in both

- the infrastructure to support content and services, and
- development and delivery of the content and services themselves.

This is particularly challenging in a converged regulatory environment because (1) most regulators are accustomed to regulating communications services and broadcast entertainment separately, and (2) many regulatory tools are targeted at vertically integrated networks and service providers whereas the value chain for OTT delivery is highly complex and independent of networks.

Policy challenges and regulatory principles

OTTs challenge established regulatory models

We believe the regulatory debate on OTTs to be very important with the potential to significantly influence service availability and take-up. A number of regulators around

⁵ GSMA data and forecasts - <https://www.gsma.com/mobileeconomy/wp-content/uploads/2018/05/The-Mobile-Economy-2018.pdf>

⁶ https://signuptoday.hootsuite.com/pro-uk-branded/?utm_source=google&utm_medium=cpc&utm_campaign=selfserve-bau-emea-en-ner-uk-pua-search-branded-exact&utm_term=hootsuite&qclid=EA1aIQobChMImKmrsJKV3wIVBfIRCh3P3AMMEAAAYASAAEqL7xD_BwE

⁷ <https://www2.deloitte.com/content/dam/Deloitte/uk/Documents/technology-media-telecommunications/deloitte-uk-tmt-value-of-connectivity-tmt.pdf>.

the globe have turned their attention to this but, as yet, no established regulatory model or best practice has emerged. We note that the ITU adopted a Resolution at the recent Plenipotentiary Conference to establish a number of initiatives for work on OTTs in the new study period⁸.

We recommend that the TRAI reviews the policy options carefully, weighing all the options before deciding on a course of action.

One of the reasons regulators are finding OTTs to be a challenge is that their emergence and rapid growth has disrupted established regulatory models more than any other technological or service development since regulatory frameworks for telecommunications networks and services started to emerge in the 1980s.

Some familiar regulatory concepts are the heart of this challenge.

Substitutability

The first of these is **substitutability** – TRAI’s Q1 refers to this. In simple terms substitutability between services means that one can be used instead of the other to provide the same functionality. Substitutability can be partial. For example, a mobile ‘phone call may be a substitute for a fixed ‘phone call, but a fixed ‘phone call is not always a substitute for a mobile ‘phone call since it cannot be made outside the home or business premises.

Substitutability has featured prominently in the OTTs debate. Clearly there are features of OTTs services which appear substitutable for telecommunications or entertainment services. For example:

- A WhatsApp call is a similar consumer experience to a mobile call (especially as WhatsApp is nearly always accessed via a mobile handset).
- Watching a movie on Netflix is a similar experience to watching a movie on free to air or subscription TV.

On the other hand:

- Calls on WhatsApp can only be made between WhatsApp users, whereas mobile services support calls to any public number in the World.
- Free to air movies are not available to stream at any time whereas Netflix content generally is.

In order to robustly test and establish levels of substitutability between services, we recommend that TRAI establishes relevant economic markets in which it can then carry out market and regulatory assessments. This identification of markets should be the cornerstone of the regulatory framework.

⁸ <https://www.itu.int/web/pp-18/en/page/61-documents>. See Resolution WGPL 3.

Economic markets can be identified using SSNIP tests (SSNIP is the acronym for “small but significant non-transitory price increase”).

SSNIP tests are the standard economic test for establishing the boundaries of a relevant market in which the hypothetical monopolist raises prices by a small but significant amount (5-10%). The test determines whether such a price rise increases the profits of the hypothetical monopolist, and hence also whether other services are available as substitutes⁹.

Technology neutrality

Consideration of substitutability leads regulators to apply the principle of **technology neutrality**. Technology neutrality means that regulation should not “pick technology winners” and hence should regulate services the same, regardless of the technology platform on which they are provided.

But in cases where OTTs are substitutable (fully or partially) for regulated communications services, it is very difficult to apply technology neutrality. There are important reasons for this.

First, OTTs are developed and made available through computer software innovation, and this is not regulated. It does not require licensing under national regulatory frameworks and OTT providers do not have a corporate presence in most territories.

Second, the wave of innovation which has driven OTT availability and take-up has been successful in delivering benefits to consumers - for example, the availability of VoIP and OTT messaging has brought affordable international communications to many people who could not previously afford it¹⁰. Regulators should be cautious about applying regulation to services which have delivered these benefits because there is always a risk that regulatory failure will stifle further innovation and/or harm consumers.

Yet, despite these challenges, Cenerva believes that regulators can apply established and proven principles to in their assessments of OTTs. We recommend the following approach to TRAI.

⁹ The starting point of the test is to identify the focal product, which is the product under investigation, and then potential substitute products. If a hypothetical monopolist can impose a SSNIP *above the competitive price* on the focal product profitably, then the focal product forms the relevant market. However, if it cannot impose a SSNIP profitably, due to supply or demand side substitution, then the test is re-run including the closest substitute product.

¹⁰ For example, a call from the UK to a mobile ‘phone in India can cost 36 p/min – see http://bt.custhelp.com/app/answers/detail/a_id/51975/~/-/international-call-rates - whereas a call made using VoIP is considerably cheaper or free.

Application of regulatory principles to OTTs

Regulation exists to protect consumers when markets will not do this. Hence, regulation often seeks to deliver the same outcomes as would happen in a fully competitive market. For example, price cap mechanisms are set to mimic incentives to reduce costs and maintain competitive pricing which a firm would feel in a competitive market.

It follows from this that regulation should only be imposed where markets are not working well.

Regulators should also take care to minimise the risk of unintended consequences or that an intervention will create an outcome which is worse than if the intervention was not made, i.e. a market distortion. This is sometimes described as “regulatory failure”.

To mitigate these risks, regulators undertake rigorous analysis and assessment before deciding on the right course of action. Sometimes they have a stated preference not to intervene – for example Ofcom has explained that it operates with a “bias against intervention”.¹¹

We believe consideration of regulation of OTTs should be approached in this manner. Hence regulation should only be applied where the evidence shows strongly that it is necessary.

Where there is a case for intervention, the regulator should ensure that the regulation is targeted at the harm which has been identified and requires a remedy.

The remedy must also be proportionate. **Proportionality** is a core principle of regulatory best practice. Correct application of this principle means that any remedy imposed by a regulator is proportionate to the harm the remedy is there to address.

In order to apply proportionate regulation it is necessary first to undertake a Cost Benefit Analysis (CBA). Clearly, no regulation should be imposed unless there is net benefit, i.e. the benefits of intervention outweigh the costs.

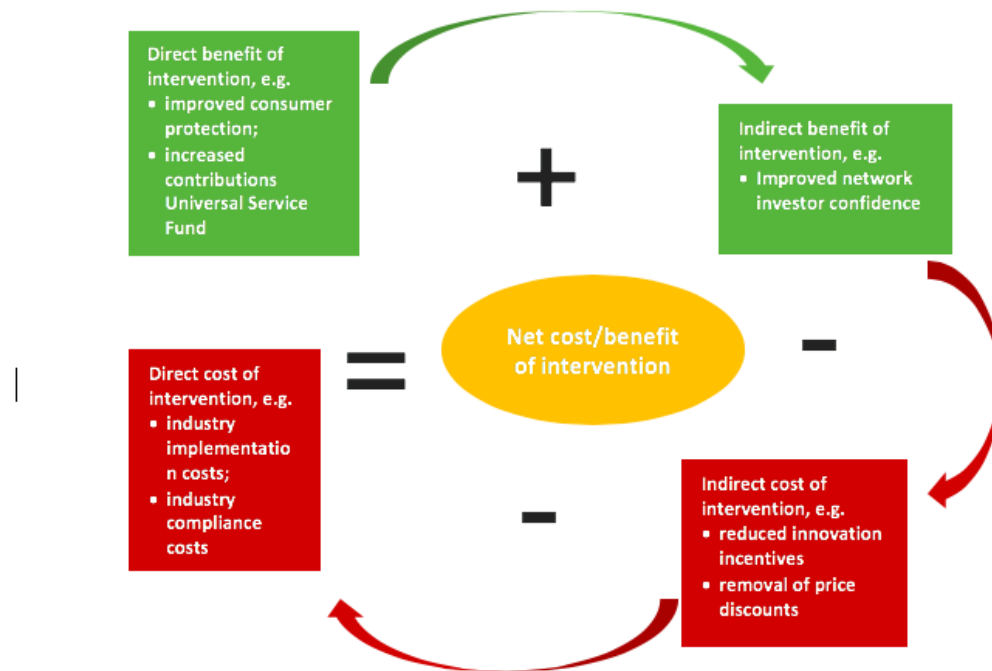
CBAs are not straightforward, and running a CBA for OTTs is likely to be a complex task. Regulators must take account of direct and indirect costs and benefits in making their assessment. In the case of OTTs, indirect factors will be significant because of the impact of OTTs across sectors. Costs may also be difficult to ascertain since OTT providers are not subject to local information provision rules.

The CBA will also need to consider the counter-factual, i.e. costs and benefits if an intervention is not made, and it may be appropriate to consider a number of remedy

¹¹ See https://www.ofcom.org.uk/consultations-and-statements/category-1/ia_guidelines

options to ensure that the remedy, if imposed, will deliver the maximum net benefit available.

Figure 2: Indicative Cost Benefit Analysis flow



Conclusions

OTTs have disrupted the telecommunications communications industry; they have changed consumer behavior and expectations, and intensified competition. They have also presented new challenges to network providers and regulators centred on the need to ensure competition is fair, and to maintain incentive and financial capability to fund investment in network capacity to meet the demand for high quality services.

We believe the TRAI and other regulatory authorities around the World can approach OTTs using well established regulatory principles and analytical tools. Proposed interventions should be assessed against the principle of proportionality and must be targeted to address harm. They should be subjected to rigorous assessment to establish whether the benefits outweigh the costs.

Annex – Cenerva responses to TRAI questions

Q.1 Which service(s) when provided by the OTT service provider(s) should be regarded as the same or similar to service(s) being provided by the TSPs. Please list all such OTT services with descriptions comparing it with services being provided by TSPs.

Cenerva response

Cenerva believes there are features of OTT voice services which are substitutable for services provided by TSPs. For example, a WhatsApp call provides a similar service and experience to a mobile call made between the same two users. However, this does not mean that the two services are completely substitutable, e.g. because WhatsApp calling is only available between WhatsApp users.

We recommend TRAI gathers and analyses further evidence on the question of substitutability – for example, measuring the impact on call volumes of OTT services, and carrying out consumer research to establish behaviours in relation to use of regulated and OTT services and patterns of substitution between them.

TRAI should use SSNIP tests where necessary to identify levels of substitutability and define relevant markets. SSNIP tests are explained in the main body of our response.

Q.2 Should substitutability be treated as the primary criterion for comparison of regulatory or licensing norms applicable to TSPs and OTT service providers? Please suggest factors or aspects, with justification, which should be considered to identify and discover the extent of substitutability.

Cenerva response

The scope of regulation should primarily be determined by correct definition of the relevant market, and so substitutability is a key consideration. As referenced in our response to Q1, we believe correct identification of substitutable services using a SSNIP test is important in establishing this.

Once TRAI has defined relevant markets, it will wish to establish whether regulation is appropriate in response to its policy objectives, e.g. the need to support network investment and innovation, and to promote service availability and take-up.

Q.3 Whether regulatory or licensing imbalance is impacting infusion of investments in the telecom networks especially required from time to time for network capacity expansions and technology upgradations? If yes, how OTT service providers may participate in infusing investment in the telecom networks? Please justify your answer with reasons.

Cenerva response

It is difficult to determine the impact of OTTs on investment in the sector, and Cenerva believes regulators should be cautious in addressing investment incentives.

The market may provide its own answers if left unregulated. For example, where there is clear demand for incremental capacity to meet the needs of OTT users, there may be natural commercial incentives for OTT providers and network providers to agree terms for network use which contribute appropriately to capital investment costs.

Regulators need to ensure that there are no impediments to commercial solutions between OTT providers and network providers – for example, net neutrality policy should be set with reference to the requirement for investments to support service provision and quality of service.

Q.4 Would inter-operability among OTT services and also interoperability of their services with TSPs services promote competition and benefit the users? What measures may be taken, if any, to promote such competition? Please justify your answer with reasons.

Cenerva response

Other things equal, we believe interoperability between platforms is positive in networked markets since it expands networks and hence delivers positive externalities. However, regulators should be cautious about mandating interoperability and allow the market opportunities to provide solutions before intervening. The costs of any regulatory initiative should be assessed together with the benefits before deciding a course of action.

Q.5 Are there issues related to lawful interception of OTT communication that are required to be resolved in the interest of national security or any other safeguards that need to be instituted? Should the responsibilities of OTT service providers and TSPs be separated? Please provide suggestions with justifications.

Cenerva is focused on economic regulation and so has not provided a response to this question.

Q.6 Should there be provisions for emergency services to be made accessible via OTT platforms at par with the requirements prescribed for telecom service providers? Please provide suggestions with justification.

Cenerva response

Access to emergency services is an essential requirement to safeguard citizens. We believe it is important that anyone making a call to the emergency services is connected.

TRAI may wish to set requirements for access to emergency services with

reference to relevant market(s) defined for regulation, i.e. the markets identified through application of SSNIP tests. Alternatively, because of the importance of emergency services to everyone, OTT providers may voluntarily adopt standards on access to emergency services – this has happened in other jurisdictions, e.g. for Skype services in Europe.¹²

Q.7 Is there an issue of non-level playing field between OTT providers and TSPs providing same or similar services? In case the answer is yes, should any regulatory or licensing norms be made applicable to OTT service providers to make it a level playing field? List all such regulation(s) and license(s), with justifications.

Cenerva response

Please see out responses to Qs 1 and 2, the scope of regulation should be set through market definition.

Q.8 In case, any regulation or licensing condition is suggested to made applicable to OTT service providers in response to Q.7 then whether such regulations or licensing conditions are required to be reviewed or redefined in context of OTT services or these may be applicable in the present form itself? If review or redefinition is suggested then propose or suggest the changes needed with justifications.

Cenerva response

In the event that markets are defined to include OTTs services (through the application of SSNIP tests), TRAI will need to carry out market assessments to establish whether the changed scope of markets gives rise to a need to implement changes to regulation.

Q.9 Are there any other issues that you would like to bring to the attention of the Authority?

Cenerva response

We have nothing to add.

¹² <https://www.skype.com/en/legal/emergency-calling/>



OTT services: economic impact and options for regulation

A short report by *Cenerva*

CONNECTION
ANALYSIS
DATA
SEARCHING
VERIFICATION
CODING
SENDING

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1. Summary

Over The Top' ('OTT') communications services like Facebook, WhatsApp, and Skype are now in common use every day all over the world. For many people, they are the default method of communication, replacing phone calls, SMS and e-mail.

The impacts of OTTs are significant and far reaching.

In many countries they have expanded the reach and availability of affordable communications and been a catalyst for innovation.

They have also driven, and will continue to drive, increased demand for bandwidth, and hence the need for investment in network capacity.

Sometimes OTTs compete directly with regulated communications services. Nevertheless, generally, OTTs are unregulated.

The spectacular growth of OTT raises important policy questions, like:

- Should OTT consumers be protected in the same way as phone users - e.g. with guaranteed availability and quality, and always-on emergency call access?
- Should OTT providers be required to contribute to the costs of network development as consumer demand for bandwidth grows?

About *Cenerva*

Cenerva is a specialist communications consultancy. We help our clients address the challenges of the digital society.

- We provide world class support through our regulatory advisory service
- We deliver bespoke project-based consultancy, which combines local focus with global insights.
- We offer capacity building through our regulatory training service.

- Should OTTs contribute to the costs of universal service?
- Should OTTs pay licence fees and/or local taxes in the markets where they operate?
- Can and should services be regulated across borders?

Regulators in many countries are working to address these questions, and there have been important recent initiatives in Europe and the USA:

- In Europe, proposals in the draft European Communications Code (ECC) would apply consumer protection rules to some OTTs.
- In the USA the decision of the Federal Communications Commission (FCC) to repeal net neutrality regulation leaves networks and OTT providers free to strike commercial deals on content prioritisation and quality of service.

In this report we examine these potentially game changing regulatory developments and consider their implications for other jurisdictions.

We conclude that there is no easy blueprint or 'one size fits all' policy or regulatory response to OTTs. However, the European ECC and US FCC initiatives show that there are levers - including removal of regulation or forbearance - available to regulators.

Some illustrative examples of how different levers may be applied to OTTs to meet policy objectives are shown in the table below.

Table 1: Regulatory levers for OTT services

Policy objectives	Increased Competition	Consumer protection	Investment incentives	Contribution to local economy	Universal service – expanding availability and take-up
Regulatory levers					
'Levelling up' rules on transparency and switching (as proposed in the ECC)	X	✓	X	X	X
Forebear from mandating net neutrality (as in repeal of the Open Internet Order)	✓ may facilitate network investment and hence expand availability and enhance competition between providers X may reduce availability of OTTs free at the point of use	X	✓ network operators X OTTs	X	X
Impose local tax levies and/or or license fees on OTT providers	X	X	✓ network operators X OTTs	✓	X
Measuring and monitoring IP traffic/packets	X	X	X	✓ traffic measurement can be used to assess the need for licence fees or local taxation	X
OTT contributions to Universal Service Funds (USFs)	X	X	✓ network operators X OTTs	✓	✓

Cenerva believes that OTTs have created some of the most significant regulatory challenges of the digital age, and we recommend that every jurisdiction considers the impact of OTTs in their markets and sets policy accordingly.

As a starting point for analysis in any market, we believe well-established principles of regulation should apply. In particular:

- Regulators should forbear from intervention unless it is needed. This means the benefits of regulation must outweigh the costs.
- Any remedies should be targeted at identified market failures or consumer protection needs.
- Regulation should be applied in a non-discriminatory way.

Cenerva's experts are engaged in the debate around the World. We offer bespoke advisory, technical and training solutions to help our clients maximize the opportunities and manage the risks of OTTs, including:

- Evaluating the economic impact of OTT services.
- Giving insights into experiences and practices globally.
- Providing options and recommendations to our clients to address OTT policy issues.
- Technical assistance to support impact evaluation and policy development.
- Assessing local legislation against the dynamic global OTT regulatory landscape
- Training, and sharing of expertise and international best practice.

2. Introduction

Although the term ‘Over The Top’ (‘OTT’) is highly familiar in policy discussions on electronic communications, entertainment and media services, it is probably unknown to most consumers. Nevertheless, the services themselves - Facebook, WhatsApp, Skype, Twitter and Instagram - along with providers like Microsoft and Google, now form part of our everyday lexicon.

OTTs have radically changed the communications and audio-visual entertainment services we use and the way we use them. Whatsapp and Facebook Messenger are replacing mobile as the de facto voice and messaging tools in many parts of Africa; Netflix releases all episodes of its mega-budget productions on the same day, thereby satisfying demand for binge viewing. This hits the revenues of traditional media and telecoms companies, which must transform their business models to compete. Regulators need new approaches which encourage investment in underlying infrastructure.

This report focuses on the impact of OTT services, both communications and audio-visual, on the electronic communications industry and its regulation. We explore:

- the reasons behind the growth of OTTs;
- the consumer benefits they bring in terms of price, convenience, choice, and transparency of pricing;
- the costs of providing OTT services, driven by the bandwidth they consume; and
- current and future industry and regulatory approaches to OTT.

We also consider the debate over whether/how OTTs should be regulated. We conclude that a dogmatic approach to regulation - either ‘levelling up’ or ‘levelling down’ - is unlikely to yield good outcomes. We recommend that regulators assess each case on its

merits and ensure remedies are only applied where a need is established, and targeted at identified market failures or consumer protection needs.

3. The OTTs market

3.1 What are OTTs?

Definitions of OTT include the following:

- In its 2016 Report on OTT, the Body of European Regulators for Electronic Communications (BEREC) defines OTT as “content, a service or an application that is provided to the end user over the public Internet.”¹
- In a 2016 Research Study, the Commonwealth Telecoms Organisation (CTO) said “we regard over-the-top (OTT) services as online services which can potentially substitute traditional telecommunications services such as voice telephony and SMS”.²
- Describing OTT audio visual content and services, Ofcom’s 2017 Communications Market Report contains in its glossary the following definition: “Over-the-top video refers to audio-visual content delivered on the ‘open’ internet rather than over a managed IPTV architecture.”³
- Wikipedia says: “Telco-OTT (Over-The-Top) is where a telecommunications service provider delivers one or more services across an IP network. The IP network is predominantly the public internet although sometimes telco-run cloud services delivered via a corporation's existing IP-VPN from another provider, as opposed to the carrier's own access network. It embraces a variety of telco services including communications (e.g. voice and messaging), content (e.g. TV and music) and cloud-based (e.g. compute and storage) offerings.”⁴

¹ https://www.berec.europa.eu/eng/document_register/.../5751-berec-report-on-ott-services_0.pdf

² http://www.cto.int/media/CTOOTTStudyPaperFinal_ReviewedDraft04Oct2016.pdf

³ https://www.ofcom.org.uk/_data/assets/pdf_file/0017/105074/cm-2017-uk.pdf

⁴ <https://en.wikipedia.org/wiki/Telco-OTT>

Key themes within these definitions are the delivery of content and communications applications generally using the public internet rather than a managed network, and substitutability between OTT and regulated services with equivalent or near equivalent functionality.⁵

3.2 The rise and rise of OTTs

Demand for OTTs has grown exponentially in the last decade. Think where we were 10 years ago and where we are now in our use of social media, messaging services, audio-visual streaming and Voice over IP (VoIP) telephony.

Between 2011 and 2017, active subscriber numbers for the four biggest online messaging services (Facebook Messenger, WhatsApp, WeChat and Viber) grew by a factor of 18, and subscribers to the four largest social media platforms (Facebook, Instagram, Twitter, LinkedIn) trebled.⁶

At the same time, consolidation led to increased scale and scope for some of the industry's largest players; Microsoft acquired Skype for \$8.5bn in 2011 and Facebook bought WhatsApp for \$16bn in 2014.

Almost all forecasts anticipate continued rapid growth; for example Technavio sees the mobile VoIP market growing by 28% each year to 2020.⁷ More broadly, the global OTT market is forecast to grow to \$158.4bn in 2025, from \$36.7bn in 2015.⁸

⁵ For example, the ability to make a voice call between mobile devices using WhatsApp looks and feels to consumers similar to calls between mobile devices across mobile networks.

⁶ <http://uk.businessinsider.com/the-messaging-app-report-2015-11>

⁷ <https://www.technavio.com/report/global-machine-machine-m2m-and-connected-devices-global-mobile-voip-market-2016-2020>.

⁸ https://www.researchandmarkets.com/research/7x6mjn/over_the_top

3.3 Drivers of OTT growth

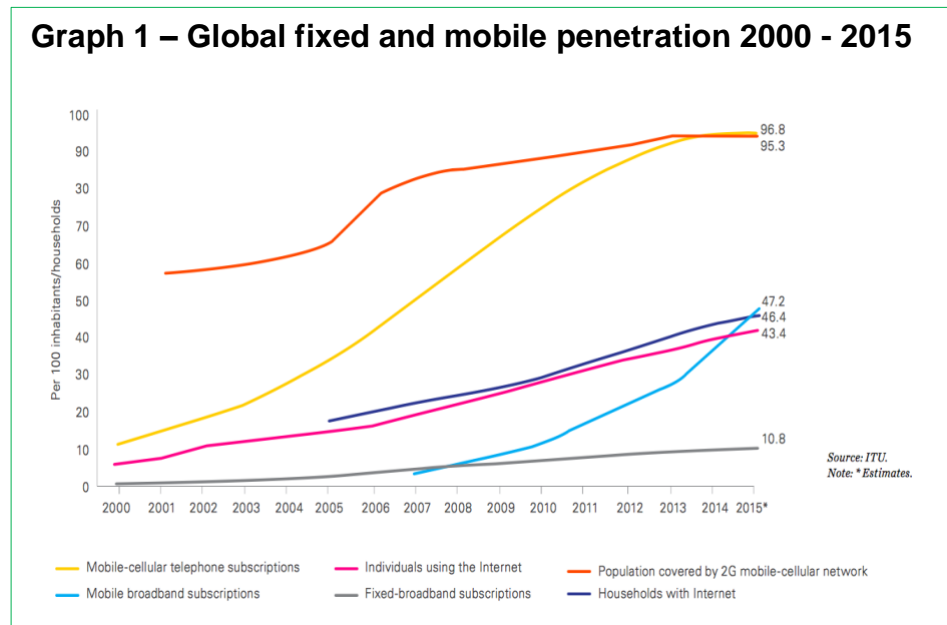
This phenomenal growth has been driven by supply-side and demand-side factors. Handset manufacturers and network operators have offered faster, better and cheaper handsets and networks with which to access online services. OTTs have delivered services similar to those offered by network operators, but at lower prices. At the same time, OTT providers have developed increasingly innovative applications and content.

3.3.1 *Broadband - faster, better, stronger ...*

The reach of online services, including OTTs, has increased as the global footprint of the fixed and mobile networks through which they are accessed has expanded. This growth has been boosted by the appearance of public Wi-Fi points, popping up almost everywhere - in developed markets at least - from coffee shops to train carriages.

While availability has increased, the speed and quality of telecoms networks have also improved, driven by the transition to fibre and 3G / 4G (LTE) deployments. This helps deliver a smoother OTT user experience, ensuring that calls don't drop and films don't buffer.¹

Graph 1 – Global fixed and mobile penetration 2000 - 2015



3.3.2 Smartphones – making OTTs convenient at home, at work and on the move

Almost all OTT services are available through smartphone apps, making them easy to use wherever data services are available; at home, at work and on the move. Most commonly used OTT services are compatible with the most popular mobile devices, though there can be issues with compatibility between apps and devices – for example where devices do not have the battery power to handle the drain caused by active apps, and when it becomes uneconomic for app providers to support compatibility with less popular devices.

With internet-connected handsets now a feature of daily life in many parts of the world, consumers can access OTTs just by picking up their phone. The falling cost of smartphones⁹ will increasingly mean that those in poorer parts of the world can do the same; MTN and Orange already offer sub \$50 connected handsets in parts of Africa. Forrester expects two-thirds of the world's population to own a smartphone in 2022, up from a fifth in 2013.¹⁰ These figures mask significant regional variation between developed and developing countries. For example, 85% of adults in the UK already own a smartphone, whereas in Bangladesh take-up is estimated at little more than 5%.¹¹¹² We discuss differences in OTT development between developed and developing markets in section 3.4 below.

3.3.3 Cost - cheaper and more transparent prices

OTT services allow consumers to cut costs where they offer a close substitute for conventional services. The most obvious example of this is the growth of VoIP.

⁹ For example, GSMA quotes Strategy Analytics figures showing average selling price of smartphones in Africa fell from around \$230 in 2012 to \$160 in 2015, and some are now available for \$50:

<https://www.gsmainelligence.com/research/?file=3bc21ea879a5b217b64d62fa24c55bdf&download> p14

¹⁰ <https://www.forrester.com/report/Forrester+Data+Mobile+Smartphone+And+Tablet+Forecast+2017+To+2022+Global/-/E-RES138971>

¹¹ <https://www.deloitte.co.uk/mobileuk/ - smartphone-adoption-stable-and-strengthening>

¹² Newzoo Global Mobile Market Report - <http://resources.newzoo.com/global-mobile-market-report-1>

WhatsApp

WhatsApp provides free voice calls between users. In 2016 the company blogged that its 1 billion users were making >100 million calls per day.

Many operators of traditional circuit-switched networks offer free phone calls at the point of use by giving generous bundles of call minutes within their line rental (subscription) offerings. However, these bundles generally do not include international calls, and sometimes there are charges for calling users on a different network. OTT VoIP services such as Skype and WhatsApp allow users to call users in other countries and on other networks at no marginal cost, provided they have access to a fixed or mobile broadband service.

By way of example, in December 2017, a call made from a UK phone roaming in the United Arab Emirates would cost up to £3 per minute, and it would cost £1.25 per minute to receive a call, 35p per minute to send SMS, and £6 per Megabyte to use data. But consumers can avoid these charges by using OTT communications services like Skype and WhatsApp on free broadband WiFi networks.

Furthermore, it is often not easy to check the price of international calls, whereas OTT calls are generally free once a broadband connection is established.

Some VoIP services, such as Skype, also offer the ability to terminate calls on a mobile or fixed network, rather than just with another Skype user. Here too, prices are typically substantially lower than those available from a traditional network; for example a Skype call from the UK to a US landline UK costs 2.1p per minute; this is about 1/24th of the cost of the same call made using BT's standard tariff¹³. Skype also allows users to retain their existing phone number when making calls.

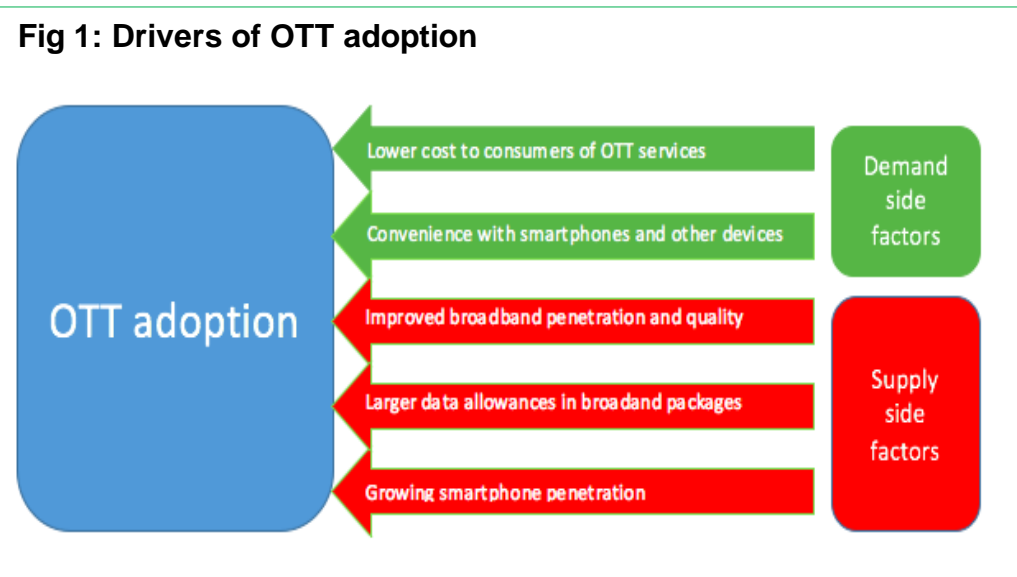
¹³ http://www.productsandservices.bt.com/assets/pdf/BT_PhoneTariff_Residential.pdf

3.3.4 Innovation

Being entirely software-based, and delivered using the Internet Protocol suite, developers of OTT services face fewer restrictions than developers of bespoke services for specific communications networks. They have no need to design their applications for use with dedicated hardware, such as set-top boxes, or to be compliant with specific signalling protocols such as CDMA.

This software-based approach also enables services to be delivered without prior authorisation or permitted access from network operators for the carriage of the OTT services as the services are delivered, in most cases, directly to the consumer, effectively by-passing telecommunications.

This encourages innovation. Many OTT services have transformed the functionality and ease of use offered by traditional services. Take conference calls for example. Until fairly recently, these were booked through central telecoms services, and involved little more than the ability to include three or more users on a call. Now, applications such as GoToMeeting and UberConference allow users to see who else is on the call, who is muted, who is speaking, and where they calling from. They also offer collaboration tools such as the sharing of presentations and notes.



3.4 Differences between developed and developing markets

There are significant differences between the drivers for OTT in developed and developing markets.

In developed markets, penetration of both fixed and mobile broadband is higher, and network quality and speeds tend to be better. This means consumers can access OTTs more easily. However, post-pay bundles with inclusive data, minutes and texts are also more prevalent in these countries, which means OTTs generally used less for calls which could be made within bundle.

By contrast, developing markets generally have lower broadband availability and penetration, which means OTT services can be used in fewer locations. But they have much higher use of pre-paid voice, where callers are charged on a per-minute basis, often with differentials between charges for on-net and off-net calls. Consumers in these markets generally save money by using an OTT service, provided the cost of their broadband access and data is less than the comparable cost of network calls. They save even more if call charges are high because of taxation or lack of competition.¹⁴

Table 2: Mobile broadband penetration (2015)

Source: ITU¹

	Europe	The Americas	CIS	Arab states	Asia and Pacific	Africa
Per 100 inhabitants	78.2	77.6	49.7	40.6	42.3	17.4
	Developed	Developing	Least Developed	Global		
Per 100 inhabitants	86.7	39.1	12.1	46.1		

¹⁴ This article states this to be the case in India and Brazil <http://uk.businessinsider.com/whatsapps-100-million-voice-calls-per-day-show-that-people-are-moving-away-from-traditional-forms-of-voice-communication-2016-6>

Taken together, this means that in developing markets, OTT services make it easier and more cost-effective to use a single device for all local, national, international, on-net and off-net calls and messages.

3.5 Network response to OTTs

There remain opportunities for networks to fight back and stem traffic losses arising from OTT calls.

Possible operator strategies include:

- **Smarter tariffing:** Standard OTT calls require data, and High Definition calls even more so. This does not matter much when using all-you-can-eat fixed network packages or public Wi-Fi to make OTT calls, but it becomes important when using 3G or 4G data plans. Some mobile operators now offer data-only (or data-focused) plans, sometimes with specific allowances for specific voice and messaging apps such as Facebook or WhatsApp. If executed correctly, this allows the operator to offset reduced ARPU by attracting new customers.
- **Product bundling:** this encourages customer loyalty by packaging services together with attractive value added and ancillary features.
- **Innovation and differentiation:** networks may offer service enhancements relative to OTTs. This might include better call quality, or improved security.
- **Blocking or de-prioritising OTT traffic** where this does not fall foul of net neutrality rules.

4. Economic impact of OTTs

OTTs have unquestionably benefited consumers, industry, and economies around the world. At the same time, they have created an unregulated sector which overlaps significantly with, and in some cases is a substitute for, regulated electronic communications, broadcasting and media.

Here we comment on some of the impacts of this, focusing on the electronic communications industry.

4.1 Electronic Communications

OTTs offer messaging and call services which consumers can use in combination with or instead of the voice and SMS services offered by telcos. The substitution impact of OTTs is strongest where call charges are high, most notably international calls¹⁵ or where there are differentials between on-net and off-net pricing. (There are also times where OTTs cannot be substituted, such as calls to emergency services, or sometimes to users on different platforms).¹⁶

Consumers may also use OTT voice and messaging services as complementary to traditional voice and SMS, for example to make calls or send messages when they have exhausted their monthly bundle allowance.

¹⁵ For example see Ofcom's Call Termination Market Review consultation which cites research results showing that UK consumers are more likely to use VoIP services to make international calls, than any other type of call -

https://www.ofcom.org.uk/data/assets/pdf_file/0011/103340/mobile-call-termination-consultation.pdf

¹⁶ For example, WhatsApp, see the prominent warning that emergency service calling is not available on WhatsApp here -

<https://faq.whatsapp.com/en/iphone/28041117>.

The total market for all these services continues to grow - an additional 1 billion digital customers is expected by 2025, mainly in emerging markets.¹⁷ McKinsey predicts that OTT voice and messaging services will continue to take market share from telcos.¹⁸

OTT benefits do not just accrue to individual users; there are also network externality benefits to all users. In economics, a network externality is the positive effect that an additional user of a good or service has on the value of that product to others. When a network externality effect is present, the value of a product or service increases according to the number of others using it. Put another way, the more active users of a communications network, the greater the value of the network.

Furthermore, the ability to communicate is a value driver in the broader economy, facilitating business and social interactions, and enabling more efficient communications and diffusion of information. In its 2014 report, “*Value of Connectivity: Economic and Social benefits of expanding Internet Access*”,¹⁹ Deloitte demonstrated the power of digital connectivity by calculating that extending internet access in Africa, Latin America, India and South and East Asia to levels in developed countries would result in a range of benefits, including GDP increases of \$2.2 trillion.

Of course, the value of communications to economic wellbeing cannot be attributed wholly to OTTs, which are a relatively new part of the value chain. Indeed, OTTs are not possible without the infrastructure which provides connectivity for users and hence allows them to access OTTs.

¹⁷ <https://www.mckinsey.com/industries/telecommunications/our-insights/overwhelming-ott-telcos-growth-strategy-in-a-digital-world>.

¹⁸ *Ibid.*

¹⁹ <https://www2.deloitte.com/content/dam/Deloitte/uk/Documents/technology-media-telecommunications/deloitte-uk-tmt-value-of-connectivity-tmt.pdf>.

This infrastructure requires investment by telcos, who must expand, modernise and provide faster higher-quality connections to keep pace with consumer demand. These investments may be commercial, but can also be driven by government policy which recognises the importance of ICT to national economies.²⁰

There is a tension between the benefit to consumers which OTTs provide, and the need to finance the infrastructure on which they rely:

- A telco which delivers calls or texts to a customer on a different network must contribute to the costs of this network by paying interconnection and access charges. These are usually regulated, and set at a level which allows for a reasonable return on capital investment given the level of risk involved. By contrast, provision of OTT services generally involves no regulated or commercial arrangement between network and service provider. Telcos have claimed this distorts competition because networks are being used by OTT players without accompanying compensation.
- Some OTT services may benefit network providers by driving demand for connectivity. But they are just as likely to create network costs: bandwidth-hungry content streaming services are expensive to provision, and voice and messaging services draw spend away from competing products offered by the networks. This can make infrastructure investments unviable, or may mean they are only viable if funded by consumer data prices rise.

Thus, while OTT generates significant consumer benefits, they also affect the amount of infrastructure investment that is required, which may in turn affect data prices.

In addition, OTT providers typically avoid the cost of complying with the regulatory obligations imposed on licensed telcos which many telcos argue gives OTT an unfair competitive advantage.

²⁰ See for example the Australian Infrastructure Plan - <http://infrastructureaustralia.gov.au/policy-publications/publications/Australian-Infrastructure-Plan.aspx>, the Next Generation Infocom infrastructure Plan for Singapore - <https://www.imda.gov.sg/industry-development/infrastructure/next-gen-national-infocomm-infrastructure>.

4.2 Audio-visual services

OTTs are now a huge part of the audio-visual entertainment industry. Anyone with a connected device can view TV programs, movies, sports and video clips, and listen to radio shows, in addition to traditional ‘one-to-many’²¹ linear broadcasts. OTT content is delivered over the open internet, and, like OTT voice/messaging services, usually involves no direct regulated nor commercial network carriage arrangement. OTTs offer the considerable advantage over traditional services of being available on the move and interchangeably between devices.

Adoption of audio visual OTTs has grown exponentially, driven by similar factors as contributed to the growth of voice/messaging OTTs, such as improving broadband infrastructure, growing penetration of connected devices, and consumer convenience. In addition, consumers are attracted by original or exclusive content: Frost & Sullivan estimated that connected video on demand revenue in Europe grew by 40% in 2016.²²

The trend to consume audio-visual content online has created substantial demand for bandwidth. In its report “*Digital Media: Rise of On-Demand Content*” Deloitte forecast that video and audio content will comprise 89% of internet data traffic by 2018.²³

This places a significant strain on networks. Alongside increasing demand for online content, there is increased demand for better service quality (e.g. High Definition – HD – streaming and downloads). Investment and innovation will be needed for the networks to keep pace with the demand for bandwidth which results from the consumption of these services.

²¹ One-to-many means transmission (typically of a radio signal) from one point (for example a television transmitter tower) to many points (for example television sets).

²² <https://ww2.frost.com/frost-perspectives/growth-over-top-ott-video-market-europe/>

²³ <https://www2.deloitte.com/content/dam/Deloitte/in/Documents/technology-media-telecommunications/in-tmt-rise-of-on-demand-content.pdf>

5. The regulatory debate

The growth of OTTs has led some policy makers and industry figures to call for a levelling of the regulatory playing field between regulated telcos and OTTs, or provisions to ensure OTTs contribute to the cost of network investments. For example, UK mobile providers called on Ofcom to include the impact of OTTs in its Telecommunications Strategic Review in 2015.²⁴ More recently, one operator called on regulators to ensure that OTTs contribute to the cost of developing infrastructure through revenue share deals with network providers.²⁵ On the other hand, OTT providers argue that by driving demand for Internet services, OTTs increase penetration and hence contribute to the costs of network provision. For example, one stated that *“Policymakers must reject the notions advanced by some that online content, applications and services “free ride” on access networks. To the contrary, they drive increased demand for broadband internet access.”*²⁶

OTTs are difficult to regulate because OTT providers and services operate internationally across borders. The laws and structures under which electronic communications and audio-visual services are regulated do not extend to OTTs and cannot easily be adapted to do so. As a result, OTTs are generally unregulated.

Furthermore, policy makers and regulators have recognised that extending legacy regulation of electronic communications and/or audio services may be risky and undesirable. OTTs emerged from a wave of commercial and technological innovation. Imposing regulation could stifle further innovation.

And yet OTTs consume a growing proportion of the bandwidth of electronic communications networks, and in some cases they provide functionality which overlaps with regulated services. Consumers frequently use them interchangeably.

²⁴ See <http://www.telegraph.co.uk/finance/newsbysector/mediatechnologyandtelecoms/telecoms/11471194/Mobile-operators-plan-regulatory-attack-on-WhatsApp.html>

²⁵ https://www.digicelgroup.com/en/media/news/2017/july/21/o_brien-calls-for-revenue-share-between-ott-operators--governmen.html.

²⁶ <https://www.itu.int/en/Lists/consultationJune2017/Attachments/69/ITU%20CWG%20Consultation%20on%20OTTs%20CORRECTED.pdf>

5.1 Global policy initiatives

Global policy institutions and regulatory fora have recognised these issues and have set up initiatives to study them.

For example, **The International Telecommunications Union (ITU)** is currently consulting on Public Policy Considerations for OTTs.²⁷ The ITU's consultation included an open consultation meeting in September 2017, and an invitation to provide written comments, of which 71 have been submitted covering a diverse range of views.²⁸

Similarly, the **Commonwealth Telecommunications Organisation (CTO)** is conducting a study to understand the market dynamics and policy and regulatory issues of OTT services.²⁹

Some regulators have acted to establish regulatory rules around OTTs.

Most notably, the **European Commission** has included provisions in its proposed Directive establishing the European Electronic Communications Code (ECC), which will capture OTTs within the key definition of "Electronic Communications Services (ECS)",

The ITU asked the following questions about OTTs:

1. What are the opportunities and implications associated with OTT?
2. What are the policy and regulatory matters associated with OTT?
3. How do the OTT players and other stakeholders offering app services contribute in aspects related to security, safety and privacy of the consumer?
4. What approaches might be considered regarding OTT to help the creation of environment in which all stakeholders are able to prosper and thrive?
5. How can OTT players and operators best cooperate at local and international level?
6. Are there model partnership agreements that could be developed?"

²⁷ <https://www.itu.int/en/council/cwg-internet/Pages/consultation-june2017.aspx>.

²⁸ A summary of the responses to the ITU consultation is available at <https://www.itu.int/md/S17-OPCWGINT5-C-0002/en>

²⁹ <http://www.cto.int/consultancy/cto-ott-study/>

and thus bring them within the ambit of regulation.³⁰ Note that the ECC is still the subject of negotiation between the European Parliament and European Council, and so may change. Nevertheless, the debate on OTTs in Europe has led to proposals for significant reform in the ECC, and it is expected that the ECC will enshrine some level of regulation of OTTs when it is finalised.

5.2 Prospective European regulation

The draft ECC has amended the definition of ECS by expanding it to include "interpersonal communications services" (ICS). ICS captures most OTT communications service – see definition in the box below.³¹

Interpersonal Communications Services (ICS) are defined as services that enable interpersonal and interactive exchange of information via electronic communications networks;

- between a finite number of natural persons determined by the sender of the communications; and
- in which the personal interpersonal and interactive communication facility is not a purely ancillary feature to another service.

However, the ECC does not envisage regulation of all ICS or OTTs in the same way; it distinguishes between ICS which use telephone numbers and those which do not.

Some ICS use telephone numbers to connect to public switched networks in order that calls to and from these networks can be completed. The European framework will seek to apply the same regulation to these services as it does to other ECS. This would mean that OTTs which use telephone numbers will need to comply with the same consumer protection rules as other ECS - for example covering transparency of contract terms and conditions, maximum contract durations, switching, number portability, and quality of service.

ICS which do not use telephone numbers will not be free of regulation, but lighter touch rules are proposed covering accessibility for disabled users and a backstop provision for regulators to intervene if end-to-end connectivity is threatened.

³⁰ <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52016PC0590&from=EN>

³¹ http://ec.europa.eu/information_society/newsroom/image/document/2016-52/executive_summary_2_-_services_40995.pdf

The European initiative essentially seeks to enshrine the principle of technology neutrality between services which use telephone numbers and connect to public switched networks. Some of these services are OTTs. For example, Skype includes the facility to make calls to and receive calls from numbers on public fixed and mobile networks.

It should be noted that OTTs which do not use numbers are in extensive use for interpersonal communications. Also, the types of regulation which would apply to ‘number-based’ ICS are general consumer protection requirements (e.g. switching, transparency), and these do not address questions of investment and cost sharing between users of communications infrastructure. Therefore, the ECC proposals, if implemented, will not bring all OTTs within scope of regulation and will not address all policy questions arising from OTTs.

The EU is not the only jurisdiction to consider or implement mechanisms to introduce regulation of OTTs. For example:

- **Colombia** has introduced taxation on sales of some OTTs via a levy on credit card transactions for online services. Other jurisdictions in South America are considering similar moves.
- In September 2017 the government of **Indonesia** announced its intention to introduce and regulatory level playing field between local and international messaging services, including OTTs.

5.3 Traffic management and “net neutrality”

Telcos have sought to manage growing demands for finite bandwidth by applying traffic management policies and operations in their networks. This enables networks to prioritise traffic to prevent congestion, particularly at busy times. However, traffic management is contentious; some argue against it on the grounds of “net neutrality” - the argument runs that all Internet content should be equally available, and that traffic management allows networks to prioritise services or content unfairly and hence may lead to anticompetitive outcomes. On the other hand, as bandwidth demands grow, advocates against net neutrality argue that networks need to intervene to ensure network operations and traffic flows are efficient.

The net neutrality debate is highly relevant as we consider OTTs because traffic management gives networks and OTT providers the ability to make commercial deals based on traffic prioritization and quality of service. This is one way in which OTT providers

can contribute proportionately to the costs of networks and bandwidth. However, there is a fear that such an approach will favour the big players by offering them better deals, and stifle innovation by new entrants and smaller companies.

Net neutrality rules are in place in a number of jurisdictions. For example:

- In Europe, the net neutrality rules are set out in the European Union’s Regulation 2015/2120³² which established that networks could implement traffic management policies as long as these were proportionate, non-discriminatory and transparent; and that traffic management could not be based on “commercial considerations”.
- In Brazil, ISPs are not permitted to discriminate between types or uses of data, or to charge differently for types of internet content. These net neutrality requirements are enshrined in the “Marco Civil” Law of 2014.³³

The debate continues, and is currently playing out through regulatory rule-making in the USA. In 2015, the Obama administration introduced the Open Internet Order³⁴ which protected net neutrality by prohibiting preferential treatment to any user or content provider. This meant that networks could not prioritise (or de-prioritise) any internet traffic. In December 2017, the Federal Communications Commission (FCC) voted to repeal the Open Internet Order, giving network providers the ability to prioritise or manage traffic. This decision is potentially a game changer, opening the way for networks to strike commercial deals with content providers, for example to guarantee real-time streaming and quality of service.

³² <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32015R2120&from=en>

³³ For discussion of the Marco Civil Law see <https://www.economist.com/news/americas/21599781-brazils-magna-carta-web-net-closes>

³⁴ <https://www.fcc.gov/document/fcc-releases-open-internet-order>

6. Conclusions

The growth of OTTs is spectacular and has had a significant impact in markets across the world. This has created benefits in expanding availability and take up of communications, and reducing user costs. It has also created risks and questions about network investment, consumer protection, and asymmetry of regulation. Regulators are seeking to address these questions.

The debate is not static, and is evolving as markets change in response to technology development and consumer demand. Regulators are active in some of the biggest markets; the European Union is considering technology neutral regulations which would apply consumer protection provisions of the electronic communications framework to some OTT services, and in the USA the FCC is removing net neutrality rules to free networks to make traffic prioritisation and QoS deals with content providers.

These initiatives demonstrate that regulators have the policy levers to intervene where needed. Cenerva believes that a dogmatic approach to regulation - either 'levelling up' or 'levelling down' - is unlikely to yield good outcomes, and that established principles of regulation should be applied by any regulator considering intervention. That means interventions should only be made when the benefits outweigh the costs, and they must be targeted proportionately at identified market failures or consumer protection needs in the interests of supporting a fair and competitive market place.

7. Cenerva and OTTs

Cenerva believes the emergence of OTTs has created some of the most significant challenges regulators are facing in the digital age.

Our experts are engaged in the debate around the World. We offer bespoke advisory, technical and training solutions to help our clients maximize the opportunities and manage the risks of OTTs, including:

- Evaluating the economic impact of OTT services.
- Giving insights into experiences and practices globally.
- Providing options and recommendations to our clients to address OTT policy issues.
- Technical assistance to support impact evaluation and policy development.
- Assessing local legislation against the dynamic global OTT regulatory landscape
- Training, and sharing of expertise and international best practice.

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