Panel Discussion: Business and regulatory solutions and strategies that will promote sustainability of the ICT ecosystem

Regulatory approaches in the new digital environment

1. Introduction

Telecommunications and cable companies through their last mile networks as well as mobile operator's wireless infrastructure, play a key economic role in providing user's access to the Internet. In addition to traditional voice communication services, content, on-line shopping, e-banking, e-government and advertising are nowadays made available via the Internet to households and businesses. The Internet also allows users to socialize in an unforeseen way and to share user-generated content.

Over the top services are independent of the network over which they are accessed by end users and in general enable two or more parties to communicate (including the provision of software if necessary) or to benefit from access to content. Over the top services are hugely diverse, allowing very different possibilities and user behaviour: some are broadcast, some allow text messaging, some just voice or voice and video, some making use of location data for information, others the streaming of video or music.

Once Internet access and use is widespread and high speeds are available (which IP networks enable), content and application providers and/or operators, which until recently had to negotiate with an internet service provider (or television operators) in order to reach users, no longer need to do so and are be able to interact directly with the consumer through a web page. All over the top services described above have a characteristic in common: they are in the edge of the network over which they are accessed or available, whilst a connection to the Internet is required, the provision of the service is independent of the provision of connectivity.

Whilst some telecommunications and cable companies are subject to *ex ante* regulation[1] (although this may happen with different levels of severity and in some cases limited to segments of business where significant market power has been found), over the top service providers are in most jurisdictions free of such obligations. Additionally over the top services such as voice and messaging, because of cost or added features, contributed so far to a significant loss of telecommunications service provider's revenues. In conjunction with these services other non-competing services supplied by over the top players created a huge increase in traffic demand constraining telecommunications and cable networks capacity to properly handle such amounts of traffic without deteriorating the quality of the user experience. This in turn translates into a need for further network investment[2].

These facts have been widely used across the world by telecommunications service providers to support the claim that identical regulation should be enforced on over the top players ("to create a level playing field") and a payment by over the top players to interconnect with

[1] Specific telecommunications sector *ex ante* regulation has been introduced to foster competition. In many jurisdictions only wholesale markets are regulated whenever there is a find of an operator holding significant market power (SMP). Anti-competitive behavior or abuse of dominant position his dealt with ex post under horizontal competition law.

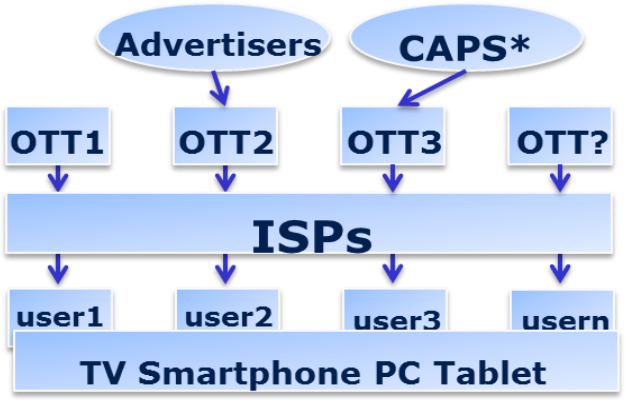
[2] However not all investment may be justified by over the top induced traffic. Public policies and content distribution (own or acquired) also require increased network investments. For example, the Digital Agenda for Europe aims for 100% of all European to have access to an access speed of 30 Mbps by 2020, half of which shall have connections above 100 Mbps.

telecommunications providers networks. Such a payment would violate, some would argue, the net neutrality principles whereby no internet service provider is allowed to charge over the top players traffic in exchange for prioritization or other discriminating acts against everyone else's traffic arriving simultaneously.
This position paper attempts to summarise, in the light of existing economic theory, to what extent the above mentioned claims justify whether over the top communications services require regulation in order to support Information and Communications ecosystem sustainability and, if so, how this could be achieved.

2. The new digital ecosystem components

In order to enjoy over the top (OTT) services, users need a device and Internet access (and skills on how to search them). In the current ecosystem, from the user's perspective, over the top services, the Internet access and devices are complementary. This means none has value on its own. Figure 1 is an over simplification of the new digital ecosystem. First there are equipment manufacturers that can also be over the top players. A good example would be Apple. Different operating systems are at play and interoperability is an issue. At the same time, as we show in Figure 1, the OTTs interconnect with Internet Service Providers (ISPs) in order to access end-users. In each national jurisdiction there can be several ISPs, but in specific areas of a country users may have only have access to one or two internet providers.

Figure 1: the new digital ecosystem



Over the top players (depicted in Figure 1 above as OTT1, OTT2, OTT3 and OTT?) have different business strategies and scope of services offered and therefore heterogeneous revenue sources and positioning in the ecosystem. Type 1 over the top players (OTT1) may sell their services directly to users and charge them accordingly. Charges may be collected by an ISP on behalf of the OTT or directly by the OTT. Cloud services providers or Skype are an example of type 1 over the top player. Some services can be free such as in Skype calls from PC to PC but additional services are paid, for instance Skype calls originating in a PC but terminating in a PSTN network. OTTs of type 2 offer their services to users "for free". However users have to allow the OTT to place cookies. By allowing this users provide OTTs information they can sell to advertisers to effectively target consumers in exchange for some revenue. Therefore consumers provide revenues indirectly, by being exposed to advertising and supplying data that the OTT can use to improve the advertising effectiveness. Several over the top players have adopted this business model. The most worldwide known brands that belong to this type are Facebook, Google and YouTube. OTTs of type 3 connect content and application

developers to users. In this case generally the OTT charges the users for the service or good delivered and the content application providers for selling them to users. Examples of type 3 over the top players include Apple iTunes or Amazon.

Consumers access to the Internet using several optional devices: through a PC, a Smartphone a Tablet or enabled TVs. As said above Figure 1 is an over simplification of the digital ecosystem. Suppliers of devices or operating systems are not represented as players. However, some OTTs are vertically integrated with device manufacturers or with the operating systems developers for these devices. Apple is a case of vertical integration with a device and operating system. The reason why this should be mentioned is that vertical integration may constitute a source of market power or allow anti-competitive behaviour among competing OTTs. When discussing regulation of the new digital ecosystem these are important issues to consider. Finally, one should also take into account that OTTs are not jurisdictionally constrained. Their scope of action is supranational and their offers are global. On the other hand ISPs generally operate at national level although some may be present in many countries at the same time.
For regulatory discussion this has significant implications. From a regulatory point of view, this raises the considerable challenge of how can a National Regulatory Authority (NRA) enforce any national laws or regulations on providers based in another country. A similar problem appears to exist with taxes. However these two topics are not the focus of this paper.

One of the inherent benefits of an over the top service provider are the low barriers to launch a service, with no need to invest in infrastructure in each country the service is to be made available. The over the top provider can develop and deploy the solution in one country, and benefit from almost immediate global reach. From a competitive point of view, this is highly advantageous when compared to ISP.

When an OTT becomes dominant and powerful the availability of the content or service it provides may be critical for an ISP in attracting users. The opposite is hardly true. The availability of access to a single ISP customer base is less critical for a global OTT, because, if blocked, it only loses a very small fraction of its user base. Therefore the bargaining power of the ISP vis-à-vis the (dominant) OTT in this case is relatively low. To better understand the balance between market forces we will look at some economic theory and research. And introduce the concept of two-sided markets and describe the implications of network effects and switching costs. These are all aspects that regulators and competition authorities should take into account when considering intervening *ex ante* in the market.

3. Two sided markets, network effects and switching costs

An important characteristic of the current digital ecosystem is the existence of two sided platforms. Economic literature studying two-sided markets is fairly recent and the most influential papers have been published by Rochet and Tirole (2003)[3] and Armstrong (2006)[4] which analysed the price implications in such platform markets. OTTs of type 2 and type 3 are two-sided platforms, as they must manage the matching between two distinct groups of participants: for example the end users and advertisers. ISPs are also two-sided platforms, as they provide the connection between users and OTTs.

[3] Rochet, J. C. and Tirole, J.: "Platform Competition in Two-Sided Markets", Journal of the European Economic Association 1: 990-1029, (2003).
[4] Armstrong, M.: "Competition in Two-Sided Markets", The Rand Journal of Economics 37 pp. 668-691, No. 3 (Autumn, 2006).

A key issue is how prices should be set on each side of the platform. Two-sided market theory shows us that when a platform owner sets the prices on each side generally it takes into account cross-group externalities to maximise the participation on both sides (Rochet & Tirole, 2006)[5]. In most circumstances, a price change on one side impacts demand on both sides of the platform. The same also applies to a competition authority or a regulator conducting a market analysis with two-sided characteristics, the user side should not be considered in isolation.

However, even if pricing could lead to more satisfying economic outcomes, allowing ISPs to charge OTTs would violate one of the current Net Neutrality principles. This is where the Net Neutrality debate heats up with opponents and defenders of its status quo. The main arguments supporting a deviation from network neutrality are three. First, that if the ISP collects revenue from the content providers (for example through paid prioritization), it will decrease prices to consumers, the so-called "waterbed effect". Second, that there is congestion on the local access network therefore some kind of prioritization can be a solution to alleviate it. Third, that if ISPs are allowed to charge OTTs traffic prioritization, the surplus can be used to invest more in network capacity.

Being able of setting a price above zero as always been a key claim of ISPs in order to support sustainability and keep up to network investments. Defenders of Net Neutrality[6] fear that allowing ISPs to charge OTTs would lead to a so-called "competitive bottleneck" where OTTs are in danger of being priced excessively even in the absence of any foreclosure strategy. If pricing allows traffic discrimination (fast lanes), new firms with small size will probably not be able to pay these prices. Therefore their content will not be accessed. The likely outcome would be an increasingly concentrated market structure and reduced innovation in the edge of the network. Under No Network Neutrality, access providers could limit the size and profitability of new firms in the content and applications provider's side. In what concerns congestion, supporters of net neutrality claim that its evidence has not been presented anywhere so far. Assuming no congestion is present, a paper by Economides and Tag (2012)[7], showed that allowing ISPs to charge a positive price to OTTs is welfare-inferior to network neutrality. Finally, allowing charging on the basis of prioritization gives the ISP an incentive to create fake scarcity over and above the normal scarcity arising from peak time congestion, and paid prioritization gives the ISPs the opportunity to do so.

As previously mentioned above, cross-group externalities consideration is an important aspect to maximise the participation on both sides of a platform. The strength of these cross-group externalities also plays a decisive role. The outcome depends on how much value each side places on the other side. The external effect from OTTs to end-users is particularly significant if users place a high value on the content or the applications. If that is the case it is important for an ISP to host such content and applications, which means that the ISP should offer the OTTs their participation in favourable terms. On the other hand, if OTTs obtain a high value from users, for example, because this allows them to obtain important advertising revenues, the ISP optimal strategy is to offer more attractive terms to users and less attractive terms to OTTs.

[5] Rochet, J. C. and Tirole, J. "Two-Sided Markets: A Progress Report", The RAND Journal of Economics 37, pp. 645-667, No. 3 (Autumn, 2006).
[6] See for example Economides, N. :"Economic Features of the Internet and Network Neutrality", Forthcoming, The Oxford Handbook on the Economics of Networks, April 2015
[7] "Network neutrality on the Internet: A two-sided market analysis" available at: http://www.stern.nyu.edu/networks/Economides_Tag_Net_Neutrality.pdf

For example OTTs of type 1 may gain market power due to direct network effects and to switching costs. In the case of cloud storage services, switching costs arise since it is time-consuming to transfer data from one provider to another. Moreover, if sharing content among users requires them to be subscribed to the same cloud storage service provider, a larger user base provides an advantage to such a provider compared to smaller providers. This is a result of direct network effects.

OTTs of type 2 can be said to show both direct and indirect network effects as well as the possible presence of switching costs. Users originate a cross positive external effect on advertisers because the latter are attracted to OTTs with the largest user base. The reasons are obvious. First, because a large user base increases demand. Second, a larger user base allows advertisers higher effectiveness on targeting consumers, because the OTT is able to give more valuable consumer information to the advertiser. There is also a negative cross external effect in the other direction, as users tend to dislike advertisers.

4. The need for regulation

The need to regulate over the top services has to be seen as fundamentally different to the need in the early days of liberalisation, thought to manage the transition from monopoly to competitive markets. It was also conceived for the regulation of traditional telecommunications services conveyed in networks specific to each service. On the other hand with over the top services, rather than trying to make happen and then manage the liberalisation of a previously restricted sector, we have an emerging and flourishing market, in which new entrants face low barriers, and the effect is an increase of competition and innovation in services. Regulation of over the top services, one might argue, is perhaps more similar to try to control the uncontrollable.

Although network operators have made strong advocacy (the main advocates have been the European ISPs, particularly the larger historic monopolists such as Telefonica or Deutsche Telekom) about the impact of over the top communications services on their business models, in many cases there is no clear empirical evidence that all their claims are true or that the extent of the harm is such that they are unable to continue to operate. For instance there is no doubt that voice and messaging services provided nowadays by OTTs are substitutes or close substitutes of similar services provided by telecommunications operators, and because of that significant revenue is being transferred to OTTs. In any case, as usual, before regulation is considered there appear to be a number of market based opportunities that could be explored. Some contributing measures could be provided by regulators such as improved management of spectrum. Although network operators may feel a substantial harm is being done and foregone revenues are estimated to be huge, there are market based opportunities operators should seek to explore, including network sharing, partnering with OTTs, or decrease operating costs. Contrary to fixed broadband pricing, where users are expecting a flat rate for a bundle of services, mobile player's offers have substantial pricing flexibility through caps or fair use practices in order to avoid congestion of their networks. Other practices involve off-loading traffic to wi-fi networks (although only appropriate for fixed user's traffic).

Over the top communications services may need to be brought to a certain extent within the scope of existing regulatory frameworks in each jurisdiction. However a number of issues should be taken into account. Over the top providers are substantially heterogeneous in terms of their offerings, positioning in the value chain and size. Imposition of obligations should be based firmly on proportionality. A one size fits all *ex ante* regulation applied to over the top players would certainly cause a reduction of consumer welfare and stifle innovation. A case by

case approach needs to be considered and ex post competition law a sufficient tool to deal with harmful behaviour.

Regulatory action in Europe regarding net neutrality can be traced back to 2009 when a new Regulatory Framework was approved to be transposed by Member states by May 2011. In relation to network neutrality it introduced at the time new duties upon and powers for the national regulators to enforce consumer transparency and a minimum quality of service threshold both through the Universal Service Directive[8]. Increased transparency gave national regulators the power to oblige all providers to inform subscribers of any changes to conditions for access to lawful services and provide information on traffic shaping. Contracts should state clearly minimum quality information and what procedures for traffic shaping were in place. National regulators could impose minimum Quality of Service (QoS) standards in order to prevent the degradation of service and the hindering or slowing down of traffic over networks.

Regarding net neutrality discussions, Ofcom, the UK regulator, suggested in its response to a BEREC[9] consultation that the best approach could be first to ensure that competition between ISPs is vibrant and consumers have and can act on the relevant information, before considering more radical additional interventions such as minimum QoS standards[10]. It also rightly pointed out that the debate should focus on traffic management practices which it recognised is essential to consumer's satisfaction demand but that it could also potentially be used as an anticompetitive and exclusionary tool. However, such concerns should only arise in presence of market power and when ISPs discriminated traffic in the benefit of their own services. Transparency though was seen as an increasingly important issue together with ensuring that consumers switching was easy. For consumers switching to be easy there are several factors such as lock in maximum periods, number portability and a number of alternative options of equal value available to users.

More recently the European Parliament substantially amended the Commission's proposal in April 2014. It clarified the net neutrality concept and limited network operator's options to offer preferential services to OTT providers. It banns blocking and throttling practices, and makes traffic management non-discriminatory and transparent. But allows network operators and OTT providers agree on "specialized services" to assure a quality of service, if it does not affect the "normal" internet service. This is supposed to mean the "best efforts" quality level. What specialized services mean remains to be clarified. In spite of harmonization concerns, countries in the European Union are doing it in different ways, some creating laws such as the Netherlands or Slovenia (which defined strict net neutrality rules and banned zero rating), others just having general principles being set by the National Regulatory Authority (e.g. UK, France, Sweden).

A pending issue in the European Union regards the existing definitions of electronic communications services (ECS) and information services (IS). From the regulatory perspective, one of the key issue is to determine whether or not some OTT services may be qualified as ECS as set out in Article 2 (c) of the Framework Directive in order to determine if the electronic communications networks and services (ECNS) Framework is applicable to them. A recent report by BEREC[11] states the intention to address and reformulate these definitions.

[8] Universal Service Directive (Art. 20(1)(b), 21(3)(c) and (d) and 22(3))
[9] BEREC: The Body of European Regulators for Electronic Communications
[10] Ofcom: Traffic Management and Net Neutrality, available at: http://stakeholders.ofcom.org.uk/binaries/consultations/net-neutrality/summary/netneutrality.pdf
[11] Report on OTT services, BoR (15) 142

Differences in the regulatory treatment of ECS and OTT services are also addressed in the Berec report:

> *"From the end-user protection or public safety perspective, there is merit in analysing the suitability of envisaging that the general obligations foreseen in the ECN/S Framework (e.g. access to emergency numbers, legal interceptions, transparency obligations, interoperability obligations, switching and contract information and data protection) apply to all equivalent services. These obligations pursue important general interest objectives. So, it is important to examine whether or not these obligations are fulfilled by the current general Directives in which these obligations are addressed. If not, then it is relevant to analyse the convenience of extending the obligations of the ECN/S Framework to those OTT services equivalent to the ECS taking into account the proportionality criteria."*

The current situation regarding OTT voice services such as Skype, Viber, WhatsApp and Google Talk which only allow calling within the user group that use these services has been rather uniform across Europe. Nearly all NRAs consider these to be pure OTT voice services and therefore not subject to regulations of ECS. For those OTT voice services that offer the possibility to make calls to the Public Available Telephone Service (PATS), like Skype, NRAs have in general the view that these services are an ECS. Also for OTT email services most countries do not consider email and instant messaging as an ECS, although there are a few exceptions.

The US faced similar problems with definitions. In December 2010 the FCC passed rules in that imposed, among others, transparency rules regarding the disclosure of the network management practices, performance characteristics, and terms and conditions of fixed and mobile broadband services; no blocking and no unreasonable discrimination were also considered Even only unreasonable discrimination rather than all paid discrimination was covered, Verizon litigated to abolish them. In January 2014, a court decision supported Verizon claims, and the Federal Communications Commission (FCC) rules were nullified. In the rules that were abolished, the FCC had classified Internet service under "Title I" as an "information service," over which it has only "ancillary jurisdiction." The FCC could have classified Internet service as a "telecommunications service" under "Title II" which would impose strict non-discrimination. This year March 12, the FCC reclassified the Internet as a telecommunications service falling under Title II. This imposes strict non-discrimination and bans any sort of paid prioritization. Essentially this rule adopts strict network neutrality. More litigation will follow before the FCC decision can be enforced.

5. Conclusions

The characteristics of the current digital ecosystem appear to recommend the avoidance (and regulatory temptation) to impose one size fits all solutions. Instead stakeholders (regulators, telecommunications operators and OTTs) should look for evidence of adverse effects regarding lack of competition or anti-competitive before either ex ante regulatory or ex post enforcement tools are thought. In this respect, for instance, BEREC acknowledges:

"that in the future, NRAs will have to address new challenges in assessing the competitive dynamics of markets and the relationships between OTT services and ECS. The one-side logic might be inadequate in market analyses and some adaptation to the traditional methodologies of analysing costs, prices and revenues might be required. In either case this should be closely

targeted to the specific harm identified, and every care given to avoid disproportionate actions"

There are however a number of areas where regulatory action towards a more leveled playing field makes sense:

- Consumer's privacy;
- Data protection;
- Consumer protection: for instance the regulatory framework should ensure that online platforms provide clear information on how they operate and what their responsibilities are, so consumers can make informed decisions

Whenever a point is reached where it is impossible for networks to operate, or there is insufficient bandwidth to offer services at a sufficient quality of service level caused by demand originated by over the top services providers, the imposition of ex ante regulation is more likely to be proportionate.