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Net Neutrality: an E.U./U.S. Comparison

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ABSTRACT

Net neutrality has been an issue that has preoccupied consumers, firms and regulators over the past decade. It concerns the financial and qualitative terms on which unaffiliated content and application providers ("CAPs") may have their content delivered by the local access provider or Internet Service Providers ("ISPs"). The paper discusses the terms of this debate in the European Union and the United States. Broadly, the same view is taken in each jurisdiction of anticompetitive conduct by ISPs, such as discriminatory blocking of rival content, but the question whether ISPs should be entitled to make differential charges to CAPs for different tiers of delivery services, though nominally resolved in each jurisdiction, remains in dispute. The basic economics underlying this conflict are exposed, and intermediate solutions are examined.

INTRODUCTION

The recent net neutrality ("NN") proceeding before the U.S. Federal Communications Commission ("FCC") has been the most commented proceeding in the FCC's 80-year history. Almost 4 million comments were received on the proposed rulemaking issued by the FCC in May 2014.[2] Thus, the net neutrality issue must be ranked as one of the most prominent regulatory topics of our time. It also could mark a reversal in the almost secular trend towards deregulation in the telecommunications and communications

sector. Net neutrality in its strictest form means that no termination fees for the access of CAPs to end users, no quality of service differentiation ("tiering") with and without pay, no degradation of traffic, no blocking, throttling, and exclusive contracts would be allowed.

The following first brings out the differences in the NN policy debate between the United States and Europe and then concentrates on paid prioritization or tiering as the most controversial remaining issue in both regions.

WHERE THINGS HAVE GOT TO IN THE UNITED STATES AND EUROPE

A. United States

The U.S. Federal Communications Commission ("FCC") started formulating a net neutrality ("NN") policy in 2005 at a time when it was otherwise pursuing a deregulatory path towards the incumbent network operators that are the main ISPs. Over the last ten years, both under Republican and Democratic leadership the FCC has persistently continued to pursue NN obligations on the ISPs. First, in 2005, in the form of an Internet Policy Statement without legal powers, then in a 2008 order against Comcast's policy of throttling P2P services, then in a 2010 Open Internet Order, and as of yet finally in the February 2015 order "Protecting and Promoting the Open Internet."[3] The earlier orders were struck down by federal courts, because the FCC lacked the necessary authority to establish common carrier obligations on ISPs that were classified as "information service" providers. Whether the newest order will withstand court challenges that are already lined up remains to be seen.

In its latest order the FCC takes a totally new approach by assuming authority mainly based on two sources. Following a suggestion by the January 2014 Federal Court of Appeals of the D.C. Circuit the first source is the FCC's general authority under Section 706 of the 1996 Telecommunications Act, which is about providing incentives for advanced telecommunications capability.[4] The second and more substantial authority is based on the application of Title II of the Communications Act to the Internet. This is a clear reversal of old FCC policy. For years the FCC had "backed itself into a corner"[5] by interpreting ISPs as providers of "information services" rather than of "telecommunication" (FCC 2002 for cable modems and 2005 for all fixed broadband access services).[6] Under the Telecommunications Act of 1996 the FCC has ample authority to regulate telecommunication services but little or no authority to regulate information services. By switching ISPs from information services to telecommunications, the FCC would under Title II gain the necessary authority but, at the same time, may be seen as contradicting its own longstanding legal interpretation. The FCC now considers broadband Internet access service ("BIAS") as a telecommunications service with add-ons that can be information services.[7]

Under the telecommunications provisions of Title II the ISPs become common carriers. At the same time, many other regulations would apply that seem to be inadequate for ISPs. The FCC is therefore forbearing from most of the Title II regulations and, under a light touch approach, only applies a limited set of rules. Specifically, the FCC requires brightline nondiscrimination rules that were already part of the previous NN orders. However, this time the FCC goes further in the direction of a purer form of NN than in the previous NN orders. In the 2010 order there had been partial exemptions for reasonable network management, for mobile services and for special services that could be given priority. In contrast, under the

2015 order no tiering will be allowed at all, not even for special services that could be given priority under certain circumstances under the 2010 rule. In addition, ISPs for mobile services are covered similarly to fixed line services. They can only receive some more flexible treatment under the reasonable network management exception, which remains in place but has become more specific than before. [8]

The FCC's brightline NN rules now include:

- No blocking.9
- No throttling.10
- No paid prioritization.11
- No unreasonable interference.12 This is a catchall for any newly emerging or not yet discovered discriminations.
- Extensive transparency requirements.13

The blunt prohibition of paid prioritization (tiering) came only late in the game along with the FCC's switch to the Title II classification of ISPs. FCC's proposed NN rulemaking of Spring 2014 indicated that the Commission was leaning toward relying exclusively on Section 706 and that it would have allowed paid prioritization if "commercially reasonable." The subsequent strict denial of paid prioritization comes as a particular surprise to economists, who find quality differentiation for different consumer tastes or for different Internet applications a natural business response that comes closer to customer needs than an "onesizefitsitall" approach. [14] It may, however, come closer to the views expressed by the Internet community. Maillé and Tuffin call the NN approach the "idealistic and humanist" view, which they contrast with the "economic" view against such NN policy.[15] The former view also comes out in the FCC's emphasis on the open Internet as a "platform for speech and civic engagement."[16]

In justifying its prohibition of paid prioritization, the FCC maintains that "the threat of harm is overwhelming" and therefore exceeds any beneficial effects.[17] It also notes that there are no "practical means to measure the extent to which edge innovation and investment will be chilled" by paid prioritization.[18] Contrary to the other NN requirements, there is no exemption from the paid prioritization prohibition for reasonable network management.[19] The only remaining ways open for paid prioritization are (1) a waiver request (which must demonstrate "some significant benefit but no harm"[20] or (2) the structuring of a service that it is outside "broadband Internet access service."[21] The latter currently includes, for example, telephone services. The FCC acknowledges that some large edge providers (CAPs) can assure themselves priority services outside the ISP offerings but accepts that as inevitable.[22]

The FCC views the main NN issues as largely independent of the level of ISP competition, as long as consumers.[23] In that case, ISPs fulfill a gatekeeper function between edge providers and consumers. Mobile operators in particular can be an edge provider's only consumer access.[24]

B. Europe

It is often remarked that Europe lags behind the United States in the timing and the intensity of its concerns about net neutrality. A number of hypotheses have been advanced to explain this, including:

- The notion of the Internet as an open and democratic space for innovation and the exercise of the right of free speech had much greater resonance in the United States, the land of the Internet's birth, than in Europe.
- The United States had different competition and regulatory arrangements than Europe in at least two significant respects. First, the ability in the United States to impugn the conduct of a dominant or monopoly firm was more limited, and second, a ruling of the U.S. Supreme Court (Trinko) disapplied competition law in certain case where a regulation was in place.25
- Most importantly, the fixed broadband retail market structure in the United States was much more concentrated than in Europe. Whereas incumbent ISPs in the European Union were almost everywhere obliged to share their networks or local loops with their retail rivals, in the United States such mandatory access progressively came to an end from 2004. 26 Thus, in 2006, telecommunications incumbents accounted for only 48 percent of retail broadband lines in the then 25–E.U. Member, the remainder being distributed among a variety of unbundlers, one or more cable companies, and others. Thereafter the incumbents' share continued to fall. In the United States, by contrast, the period of the NN debate saw, after 2003, the strengthening of the duopoly in most areas between a single telecommunication company and a cable company, with the cable company, often Comcast, in a position of increasing strength. As a result, in the United States, for connections of 25Mbps, 75 percent of Americans have only one provider.27

The early aspects of the European discussion of NN exhibited a phenomenon which has continued to this day: of the three bodies involved in the process of lawmaking in the European Union, the European Commission, the European Parliament and the Council of Ministers (the Member States' governments)[28] – it has been the Parliament which has made the running over NN proposals. Since a large degree of agreement between Parliament and Council is required to pass a law, the restricting factor has been, and still is, the Council. The stance of the European Commission on NN was initially unworried: if there were a problem for any country, it was the United States, not Europe with its pervasive access-based broadband competition; or if there were a problem in Europe, it was one which measures to improve transparency would resolve.[29] In 2010, European Commissioner Kroes observed, à propos of NN, that "I will not be someone who comes up with a solution first and then looks for a problem to attach to it. I am not a police officer in search of a busy corner."[30]

Turning to the European NN legislation that has been enacted to date, the major instrument was the 2009 revision of the set of Directives that formed the European regulatory system for electronic communications services coming into effect in 2003. Though the term NN is not used, the proposition that "access competition + transparency on data management = preservation of network neutrality" is clearly enshrined. Thus, two changes were made within the Directives:

- Obligations were placed upon ISPs to be more explicit about the network management policies they employed. And national regulatory authorities ("NRAs") were expressly given power to specify measurement parameters.
- NRAs could, subject to an oversight process, impose minimum quality standards on broadband suppliers if they had significant market power ("SMP") or dominance.

While, in a 2012 report, BEREC (the newly created College of NRAs in Europe) collected evidence of large scale throttling and traffic management, noting that at least 20 percent of mobile customers were denied access to VoIP services,[31] it noted that new transparency rules had come into force in 2011, and

observed that general European competition law provisions were already in place to deter and punish anticompetitive actions taken by ISPs in their dealings with non-affiliated content providers.[32]

Was this optimism enough to end the European NN debate? It had already become clear that it was not. Two Member States reacted forcefully to events in their domestic markets. With some of the highest capacity broadband networks in Europe and sophisticated users, the Netherlands was an early flashpoint. In April 2011, the Dutch legislature had amended the telecom law to enshrine a very strict NN obligation. Similar legislation was adopted in Slovenia, which only became law on 1 January 2013.[33]

In 2013, the Commission proposed a major reformulation of the regulatory regime, known as "Connected Continent" and designed to achieve a single market in telecommunications. This included a section on rights of end-users with a subsection proposing:

"The obligation on providers to provide unhindered connection to all content, applications or services being accessed by end-users – also referred to as Net Neutrality while regulating the use of traffic management measures by operators in respect of general internet access. At the same time, the legal framework for specialised services with enhanced quality is clarified."[34]

While the Connected Continent passed and was even strengthened by amendments in its first Parliamentary reading in 2014, it was overtaken by the expiry later in that year of the mandates of both the Parliament and of the Commission. Meanwhile the Council remains hostile to the core NN proposal that prohibits or severely circumscribes opportunities for CAPs to pay ISPs more for priority transport.

In the end, the elements concerning on NN and one other matter are all that remains of the Connected Continent proposals. The situation is complicated by the new Commission's intention to conduct a wider review of regulation. When the new proposals were initially unveiled in May 2015, they merely expressed the hope that a uniform regime would be established in Europe by passage of the remaining Connected Continent proposals.[35]

On June 30 2015, the solution agreed between the Council and the Parliament, subject to formal ratification by each body, was announced, with the claim that the new rules are "the strongest in the world." On one hand, it is asserted that "there will be no paid prioritisation of any content or service or category of content or service"; on the other hand, the supply of specialised or innovative services "like IPTV, high definition videoconferencing or healthcare services like telesurgery" can be exempted "on condition that they do not harm the open Internet access."[36] The Netherlands government immediately objected that the new rules admitted price discrimination by the back door, and commentators suggested that they contained ambiguities that would have to be resolved by Member States' regulators and courts.[37]

How the situations in the United States and the European Union have changed over the past few months can be seen by the fact that one of us in a recent survey that was finished in August last year expressed the view that the European Union would end up with stricter NN regulations than the United States.[38] Currently, in spite of the EC's own claim, the opposite result seems to prevail but, at least in the United States, the courts may still have the last word and reverse this assessment.

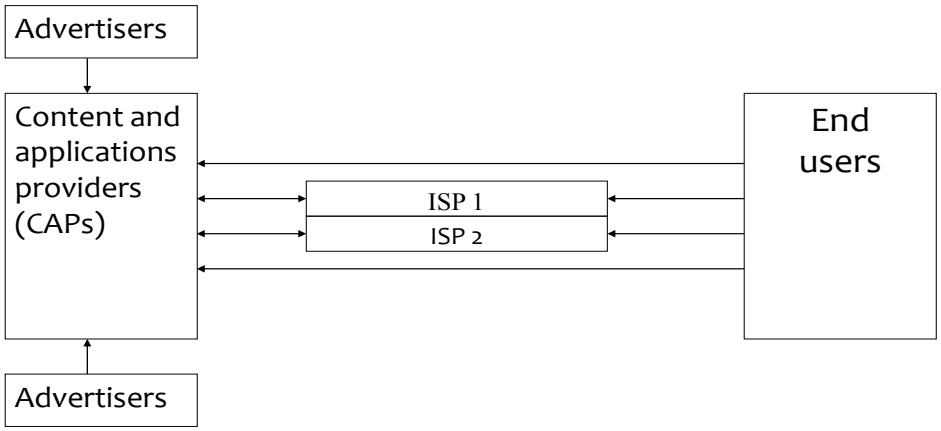
THE TIERING QUESTION AT THE HEART OF THE NN DEBATE

A. Introduction

On a number of NN issues a basic consensus seems to exist between the U.S. and E.U. policies. These include a prohibition of blocking, throttling and unreasonable discrimination, affirmative transparency requirements and an exemption for reasonable network management. However, as the previous section has demonstrated, the most controversial paid prioritization or tiering aspect of the NN debate remains. Not surprisingly, it follows the flows of money among the parties, notably the legitimacy of payments levied by ISPs on CAPs for the delivery of their content to end-users.

The totality of such flows are represented by the arrows in figure 1. End users, notably households, buy broadband services from (in this case duopolistic) ISPs. They also buy content and other services directly with content and application providers (CAPs), some of which are vertically integrated with ISPs, for example acting as providers of managed IPTV services. CAPs also receive revenues from advertisers, and end-users "pay" for such content by exposing themselves to advertisements.

Figure 1.



Note: arrows denote financial flows.

Under these arrangements, unless pre-existing strong market power is reduced, end-users are likely to end up paying in one form or another for everything; if they do not, supply will dry up. CAPs and ISPs are thus both suppliers of complements and rivals for the end users' dollar.

In the NN debate, there are three fundamentally different ways in principle in which monetary flows between CAPs and ISPs can be defined and modelled:[39]

- They can be prohibited, or confined to application in the minor exceptional cases known as specialised services; this prohibition (or confinement) lies at the core of the continuing NN debate.
- They can be subject to negotiation between the parties; this will likely generate a set of tiered rates at different quality levels corresponding to different levels of priority. The outcome of such negotiations will depend, among others, on the market power exercised by the negotiating parties. In this version, in deference to the status quo, a basic "best efforts" rate is usually assumed to be available at a zero price (but this is not necessarily the case).
- They can be set in a regulatory manner, as a regulated termination rate, in the same fashion as voice termination rates are set by regulators in the context of a "calling party pays" pricing regime, however with a potential differentiation for different Quality of Service ("QoS"). The simplest but not the only way of doing this is to set a single, uniform positive rate.

It is worth pointing out that, in relation to broadcasting platforms, there are ample precedents for negotiation between content providers and providers of platforms such as cable and satellite companies. And the resulting money flows can go in both directions, as shown in figure 1. Thus, a provider of run of the mill "commoditised" content might pay for inclusion on a platform, while the platform might pay a provider of key content to offer its services. In other words, the issue is not confined to ISP/CAP relationship alone.

It is also important that, in the case of advertiser supported content, there is no direct way in which the content provider can provide a monetary benefit to end-users to exploit its services;[40] the only thing it can do to benefit them is to reduce the advertising content. Such a transfer to end-users payment can, however, be accomplished via the ISP. Thus we find advertiser supported Facebook in some countries paying mobile operators not to count time spent on Facebook as part of the subscriber's data allowance.[41]

B. Economic modelling

A number of authors have applied the standard tools of economic analysis to evaluate the effects of the above noted options, and we report the results of some of them.[42] The models adopted can be either "static", which in this case normally means ignoring the effects on investment, or "dynamic" – taking effects on investment into account. As usually happens, the greater realism of the dynamic models tends to spoil the clearer and more intuitive results of the static models.

One of the earliest and most transparent models is due to Hermalin and Katz.[43] They operate with an ISP structure that is either monopolistic or duopolistic, while CAPs differ in the quality of service that they require. In effect the three options noted above are considered: a uniform QoS at either a zero or a uniformly positive price; and a menu of differentiated service levels at different prices. Indirectly mandating a uniform quality excludes certain providers, generating an effect on end-users welfare that is probably negative. This effect is most pronounced when the imposed price is zero.

This confirms a widely derived and unsurprising result that when end-users have different tastes (or different applications for the same user), their welfare can be enhanced by being able to pay different prices

for different products in the market place. But work by others has shown the possibility of a counterexample. Economides and Tag introduce into a different model the impact of an externality in the content market.[44] They suppose that multiple advertiser supported CAPs dealing with a monopoly (alternatively, duopolistic) ISPs. The choice is between having a zero or nonzero termination charges. But they differ from Hermalin and Katz by supposing that end-users gain a benefit from the simple "availability" of additional CAPs, even if they do not use them. This they call a "crossgroup externality." And they show that if these externalities are high enough, then in both a monopoly and a duopoly ISP setting, NN can generate more end-user welfare than allowing positive payment for CAPs to ISPs. As before, this corresponds with economic intuition: if more CAPs confer a large enough benefit on all end-users, then this effect might outweigh the detrimental impact on variety noted by Hermalin and Katz. However, no evidence is cited for the presence of the externalities.

Within the Hermalin/Katz model for the NN result to hold, externalities would have to apply at the margin reached under a non-NN policy. Given the apparent low entry barriers for most CAPs, and their observed proliferation, one might think that the benefits offered to non-consumers by the "option" of even more of them might be quite small. However, some CAPs actually are confronted with substantial entry barriers and – like Google, Facebook or ESPN – command market power. The Hermalin/Katz model does not seem to capture, for example, exclusive arrangements between such CAPs and ISPs that could lead to Internet fragmentation, and that could happen in particular under ISP competition.

When we enter the looking glass of dynamic economic models, the mapping between assumptions and results gets more complex. As an illustration, the well known 2010 model of Choi and Kim assumes a single ISP which either levies no charge on either of the two assumed CAPs, or auctions a higher quality channel to one of them.[45] In their particular setup, they discover that it is impossible to state which regime yields the larger ISP investment, though NN encourages more investment by the CAPs. Other models are specified differently. At least some of them find NN less conducive to ISP investment than its opposite.[46]

What can we conclude from this? Simple, or even complex, economic models are not by themselves a reliable guide to economic policy. However, the static models do indicate: i) that a restriction like NN on freedom of contract has the potential to distort end-user choices, which ii) it might be expedient to do in the presence of large externalities. This predisposes us to be sceptical of outright NN tiering prohibitions and to favour the permission of negotiation for service differentiation in the absence of other cogent reasons to follow this course. But there is another potential factor – the presence of market power exercised by ISPs. This could open the door to both exploitative and exclusionary conduct – overcharging of CAPs (and ultimately of end-users) and discrimination against CAPs not affiliated with an ISP. At the same time the article cited in endnote 44 indicates that adverse effects from not enforcing NN could be more common under ISP competition than under monopoly. The example of mobile services, where competition and widespread NN violations coexisted, could confirm this.

That this has resonance with the public is shown by the fame and widespread viewing on YouTube of a diatribe in mid 2014 by John Oliver against the now abandoned Comcast Time Warner cable merger, which would have created a superISP and which encouraged a flood on opposing comments to the FCC.[47]

However, Joshua Gans[48] has shown that even with an NNstyle prohibition on charges levied by ISPs on CAPs, the same exercise of dominance by the ISP can result simply via the ISP's charges to its own customers.[49] That is, the ISP, sitting as in figure 1 at the heart of the two-sided market involving CAPs and

end users, can build in content based price discrimination into its charges to end users, and thereby extract the same amount of surplus from end-users as they would from CSPs. To prevent them from doing this, restrictions on ISPs' charges to end-users ("strong net neutrality") must be imposed as well.

Moreover, Gans argues that not even competition among ISPs can prevent CAPs from being short-changed. This arises because the ultimate monopolists (in the form of singlehoming broadband bottleneck customers) are the end-users. Competition forces ISPs to maximise their upstream monopoly rents but then transfer them to end-users, via a waterbed effect. As Gans writes (informally in his blog): "that means that content providers get stuffed even when there is net neutrality regulation."[50]

C. Assessment

We have argued – probably uncontroversially – that tiering is the most durable and important extant economic issue in the NN debate. Because it hinges on the whole gamut of NN considerations, from the desirable degree of product differentiation to the best way to control market power, it is inevitably very complex, and may require compromise among objectives. In particular, if there are concerns about the use of market power by ISPs, then it is sensible to build into the regime a means of managing this risk.

The extreme approaches we have identified in our discussion range are a full NN policy encompassing no charging of among CAPs, and the application to the relevant transactions between CAPs and ISPs of nothing beyond the two regions' competition laws.

In the United States, the FCC's path is clearly set on the strict NN approach (subject, of course, to appeal to the courts). In Europe, the matter is more fluid, with major differences between the Parliament and Member States, while the European Commission pursues its own chosen objectives, one of which is to have a uniform regime to support the Digital Single Market.

In these circumstances, it may be fruitful to examine intermediate solutions. Starting for convenience from the NN end of the spectrum, one such is the making of exceptions to the "no price and product differentiation" rule. These already feature in the debate. In the United States, they are known as "special services" and parsimoniously defined as "using some form of network management to isolate the capacity used by these services from that used by broadband Internet access services." In Europe, they are known as specialised services, and their proper extent is still one of the subjects of sometimes-heated debate.[51]

The best that can be said for this approach is that if differentiation is advantageous, it is likely (but not certain) that even a small amount of it in key areas is better than none. But if the exceptions were confined to such things as emergency services, driverless cars and critical health applications, and if exceptions stop short of the bulk of commercial Internet transactions, the difference from pure NN might be small.

A broader departure from NN would be to impose certain ex ante restrictions on the transactions which ISPs could enter into with CAPs. These would bear some similarity with prohibitions under the competition laws of the two regions, but could be tailored to meet the circumstances of the case in a way that

competition law cannot, and would be distinguished both by their ex ante nature and by the different enforcement mechanism which would be entailed.

The logic of this approach is to impose some restrictions on the individual negotiations between ISPs and CAPs. One main argument against allowing such paid prioritization is that monitoring and evaluating it on an individual basis is cumbersome and almost impossible. But pre-specified prioritizations based on generally available and transparent criteria are an alternative. If different applications have different QoS requirements then one should be able to design prioritization that is nondiscriminatory in the sense that it is available to all who want to pay for it. This would both reduce transactions costs for parties and reduce enforcement costs. A possible way of doing this could be to require that an operator proposing any QoS deviation from the best-effort Internet (which would first have to be defined) would have to formulate a tariffed offerings available to all customers. Such a tariff would have to contain a QoS description and a price schedule. The QoS description and potential warranties may be difficult, but that would also hold for negotiated outcomes.

The advantage of negotiated outcomes is that the ISP and the CAP have to find common QoS criteria that are verifiable. Under a tariffed version the ISP would have to come forward with a tariff notification to the regulator. In a stronger version of the rule, this would be subject to prior regulatory approval via an open process. While the price schedule would be at the discretion of the ISP, it should follow some restrictions that would prevent discrimination against small users. For example, a monthly fixed fee of a million dollars would exclude all small users, while a high usage fee would be neutral. An alternative to a usage fee could be pricing based on the capacity of lines used. The presence of notified tariffs would make it easier to enforce, for example, prohibitions on margin squeezes when the ISP was also a content provider.[52]

The next step in the interventionist progression puts considerably more detail on the setting of charges. This takes us into the territory of the regulated "termination model", where the level of charges on the CAP to be levied by the ISP are set by a regulatory process. To avoid the problem of a single quality of service, they could allow differentiation of this key attribute.[53]

In our view, this could involve crossing the Rubicon from territory, in which certain negotiating behaviours and price structures are forbidden or "proscribed", into the territory in which detailed prices and commercial arrangements are "prescribed or imposed." Yet the lack of intrusive regulation of the latter kind in data termination (as distinct from voice termination) is widely seen as one of the foundations of the success of the internet. Its practical substitute has been a flexible regime of peering and paid peering which operates in the shadow of competition law (including merger control), and has delivered results which are not perfect but satisfactory or better.[54] It has to be kept in mind, however, that this system evolved among large backbone networks that successively admitted smaller networks to the club. However, this may not work for small CAPs relative to large ISPs. Nevertheless, famously, the economist George Stigler is said always to have advised his business clients to seek to get themselves regulated: this was the reliable path to long term excessive profitability. The enthusiasm of some ISPs for the regulation of data termination should thus give us pause before adopting this proposal.

Where has this discussion taken us? We have three fundamental options for governing transactions between ISPs and CAPs. The strict NN proposition is to prohibit any such payment and with it, any quality differentiation. Absent a special reason such as powerful externalities, this looks likely in competitive circumstances to be welfare reducing.

In contrast, wholly unregulated ISP/CAP transactions might fare well in a world with controllable market power and few significant externalities. If the latter abound and/or are large some interference may be warranted. If the ISP sector were riddled with ineradicable market power, where tiering is concerned then even strict NN might be an n-th best outcome. (As noted above, we suspect that this may explain the more favourable view of NN taken in the United States than Europe, where broadband markets appear to be more competitive).

We have suggested that it may be fruitful to search for a solution which lies in the middle ground between the extremes of NN and wholly unregulated ISP/CAP transactions. We do not endorse the imposition of a model of regulated differentiation termination charges, but suspect that less intrusive form of intervention can both reduce transactions and enforcement costs and place a limit on, and make more transparent, any use of market power by an ISP.

CONCLUSIONS

Content Service Providers (CSPs) need access to singlehoming end-users via ISPs that own the access networks. NN characterizes a termination monopoly issue, but is nonreciprocal. There are two apparently simple regulatory options for resolving the NN issue and potentially many complex regulatory options. The two simple policies are (a) no net neutrality regulation, meaning that ISPs are free to discriminate against CSPs, as long as they do not violate competition law, and (b) strict net neutrality regulation forbidding ISPs to discriminate in any way against CSPs (common carrier approach). In contrast, a complex policy would allow discrimination against CSPs based on specific criteria (case-by-case). It turns out that the simple policies are not simple after all. Specifically, under no net neutrality regulation the use of competition law may itself pose complex issues. In addition, competition law has a hard time dealing with specific externality issues raised by NN. These include internet fragmentation, the dirt road fallacy, and externality issues occurring in competitive environments. In contrast, under strict NN regulation ISPs may circumvent NN via (a) network management, or (b) peering with content providers disguised as ISPs (Netflix). Strict NN regulation may then be less constraining on ISPs than it first appears. However, it may discriminate against small CSPs (which cannot disguise as ISPs).

The two apparently simple policies have generated heated political controversies. Adopting one of them will leave large sections of the population and business community unsatisfied. This, at least from a political perspective, calls for a compromise, which would mean a more differentiated and thus more complex policy. In contrast to the simple policies, a complex policy would allow discrimination against CSPs based on specific criteria. This opens up many different policies and is likely to entail intricate design and monitoring issues. We suggested as an intermediate policy located between no and strict NN regulation to allow tiering based on publicly available tariffs that differentiate the various offerings.

The NN discussion is likely to stay alive for a while. The FCC Order is under appeal, while the European outcome has the appearance of being irresolute and inconclusive. New developments on NN evolve through the impact of firms like Google (and now Verizon) operating on both sides of the CAP/ISP street. Also, the implications of the much higher level of encryption which is now taking hold everywhere will affect the NN discussion.

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[2] U.S. Federal Communications Commission, *Open Internet NPRM*, 29 FCC Rcd at 5562 (2014).

[3] U.S. Federal Communications Commission, *In the Matter of Protecting and Promoting the Open Internet,* Report and Order on Remand, Declaratory Ruling, and Order, GN Docket No. 14-28 (adopted February 26, 2015).

[4] Verizon v. FCC, 740 F.3d 623 (D.C. Cir. 2014).

[5] Kevin Werbach,"No dialtone: The end of the public switched telephone networks", *Federal Communication Law Journal* 66, no.2 (2014): 203.

[6] U.S. Federal Communications Commission, *Cable Modem Declaratory Ruling*, 17 FCC Rcd at 4819, ¶ 32 (2002). U.S. Federal Communication Commission, *Wireline Broadband Classification Order*, 20 FCC rcd at 1486365, ¶1427, 1490912, ¶ 10306, (2005).

[7] *See* U.S. Federal Communication Commission (2015*) supra* note 3*,* at 47.

[8] *Id*., at 118.

[9] *Id*., at 105.

[10] *Id*., at 106.

[11] *Id*., at 107.

[12] *Id*., at 108.

[13] *Id*., at 109.

[14] The FCC goes so far as to interpret paid prioritization as a third degree *price* discrimination issue rather than as a *product differentiation* issue (FN 296).

[15] Patrick Maillé and Bruno Tuffin, *Telecomunications Network Economics – From Theory to Applications* (Cambridge: Cambridge University Press, 2014).

[16] *See* U.S. Federal Communication Commission (2015*) supra* note 3 at 77.

[17] *Id*., at 19 and 291.

[18] *Id*., at 19.

[19] *Id*., at 20.

[20] *Id*., FN 22 and 130.

[21] *Id.,* at 207

[22] *Id*., at 128.

[23] *Id*., FN 131.

[24] *Id*., at 97.

[25] Eleanor Fox, "Monopolization and Abuse of Dominance: Why Europe is Different," *The Antitrust Bulletin* 59, no. 1 (2014): 129-152.

[26] *See* U.S. Federal Communication Commission, *In the Matters of Petition For Forbearance of the Verizon Telephone Companies Pursuant to 47 U.S.C. § 160(c) (WC Docket No. 01-338), SBC Communications Inc.'s Petition for Forbearance Under 47 U.S.C. § 160(c) (WC Docket No. 03-235), Qwest Communications International Inc.*

Petition for Forbearance Under 47 U.S.C. § 160(c) (WC Docket No. 03-260) and BellSouth Telecommunications, Inc. Petition for Forbearance Under 47 U.S.C. § 160(c) (WC Docket No. 04-48) (adopted October 22, 2004) and also http://www.fcc.gov/wcb/cpd/triennial_review/triennialremand.html.

[27] *See* http://www.fcc.gov/document/chairmanremarksfactsandfuturebroadbandcompetition. Note that economic models suggest that the situation is more complicated than this account suggests: more particularly that departure from NN in competitive situations risks adverse events for end users which are simultaneously more frequent but less severe. *See* Ingo Vogelsang, "Will the U.S. and EU Telecommunications Policies Converge? A Survey", *Journal of Industrial and Business Economic* 42, no. 2 (2015): 117-155; *available* at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2463156.

[28] Roughly speaking, the Commission drafts legislation, which is voted on by the Parliament. A compromise is then sought between the Parliament's preferences and those of the Council.

[29] European Union, "Commission declaration on net neutrality," *Official Journal of the European Union*, C 308/02 (2009): 2.

[30] Neelie Kroes, "Net neutrality in Europe" (speech in ARCEP Conference, Paris,13 April, 2010).

[31] BEREC, "Findings on Traffic management and other practices resulting in restrictions to the open Internet in Europe," BoR (12) 30 (2012). BEREC was the newly created College of NRAs in Europe.

[32] BEREC, "BEREC public consultations on Net Neutrality" BoR (12) 34 (2012).

[33] *See* http://www.uradnilist.si/1/content?id=111442.

[34] European Commission, "Proposal for a Regulation of the European Parliament and of the Council laying down measures concerning the European single market for electronic communications and to achieve a Connected Continent, and amending Directives 2002/20/EC, 2002/21/EC and 2002/22/EC and Regulations (EC) No 1211/2009 and (EU) No 531/2012" COM(2013) 627 final, Brussels, 11 September, (2013). The reference to "specialised services" covers exceptions to the uniform quality of service otherwise contemplated.

[35] European Commission, "A Digital Single Market Strategy for Europe" COM(2015) 192, 6 May 2015, 9.

[36] *See* http://europa.eu/rapid/press-release_IP-15-5265_en.htm.

[37] Chris Marsden, "Oettinger: a significant step towards a digital single market without borders - European Commission," *Net neutrality in Europe*, 4 July 2015, available at http://chrismarsden.blogspot.co.uk.

[38] Ingo Vogelsang, "Will the U.S. and EU Telecommunications Policies Converge? A Survey," *Journal of Industrial and Business Economics* 42, no. 2 (2015): 117-155. *Available at* http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2463156.

[39] We discuss various more practical subcases below.

[40] Joshua Gans calls this a "missing price"; *see infra* note 48.

[41] For a similar issue in India, *see* http://www.techrepublic.com/article/facebookgetsentangledinindiasnetneutralitydebate.

[42] Our account is intended to be both summary and illustrative of a broader range of models available. It does not form an adequate basis for a full evaluation of modelling work in this area.

[43] Benjamin Hermalin and Michael Katz, "The economics of productline restrictions with an application to the network neutrality debate," *Information Economics and Policy* 19, no. 2 (2007): 215–248.

[44] Nicholas Economides and Joacim Tag, "Network neutrality on the Internet: A two-sided market analysis," *Information Economics and Policy* 24, no.2 (2012): 91–104.

[45] Jay Pil Choi and Byung-Cheal Kim, "Net neutrality and investment incentives," *Rand Journal of Economic*s 41, no.3 (2010): 446-471.

[46] Marc Bourreau, Frago Kourandi and Tommaso Valletti, "Net neutrality and competing internet platforms," *Journal of Industrial Economics* 63, no. 1 (2015): 30-73.

[47] *See* https://www.youtube.com/watch?v=fpbOEoRrHyU.

[48] Joshua Gans, "Weak vs Strong Net Neutrality," *Journal of Regulatory Economics* 47, no. 2 (2015): 183-200.

[49] Gans' argumentation is based on an exceedingly simple yet very complete model, considering net neutrality in an idealized setting without frictions arising from transaction costs or from horizontal product differentiation between content providers or ISPs. This produces strong, somewhat surprising but ultimately intuitive results across a large set of cases. If in reality there were any differences between CAP and customer discrimination then it would have to arise from realworld imperfections that the Gans model does not cover.

[50] *See* http://www.digitopoly.org/2014/05/21/netneutralitymaybehardertoachievethanwethought.

[51] Thus a European Commissioner described some Parliamentarians' narrow approach to such exceptions as "Talibanlike".

[52] Under current EU procedures, now under review, in order to impose such a process the NRA would to satisfy itself and the European Commission that the relevant market, appropriately defined, would exhibit significant market power (SMP), unless the market in question were added to the current list of those automatically requiring analysis.

[53] Interestingly, an abandoned part of the former European Commission's so called Connected Continent proposals of 2013 was precisely to set up a European wide regulated 'Assured Quality Service' of this kind.

[54] Nicolas Economides, "The Economics of the Internet Backbone", *Handbook of Telecommunication Economics,* ed. Sumit Majumdar, Ingo Vogelsang and Martin Cave, (2005): 373-412.