MAINTAINING COMPETITION IN TELECOMS IN THE ERA OF GIGABIT CONNECTIVITY

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The conventional view at the start of telecom liberalisation was that this sector would be the first among all privatised utilities to experience the withdrawal of economic regulation. A few decades later this prospect has never been closer to realisation, thanks to rapid technological progress and the impact of ex ante regulation in promoting competition. While legislators and governments may increasingly be seeking to achieve goals, such as increased coverage, better consumer protection or more resilient services, telecoms economic regulators should still pay significant attention to protecting and ideally improving competition.

I. IS THE PROMOTION OF COMPETITION IN TELECOMS STILL RELEVANT TODAY?

This contribution takes a look at the evolution of regulation and promotion of competition in the telecoms sector. It considers the regulatory and technological changes, their expected future impact on competition and it takes stock to consider the implications in terms of the current and future role of telecoms regulators. We consider competition in telecoms services and ask whether regulators can say *"job done"* in telecoms or whether there are still tangible risks that the currently acquired degree of competition may wane in the near future, requiring continued or renewed oversight.

It is worth noting at the start that competitive markets and efficient investment levels usually go hand in hand – i.e. lower prices increase demand for services, which in turn needs more investment, which the competitive process elicits from more efficient and innovative suppliers. There was a brief flurry of articles 20 years ago analyzing the possibility of "excessive" investment in networks, but the focus has now shifted more on trade-offs between competition and investment associated with a wider set of public policy objectives. In the communications sector these are now also associated with consumer protection and the universal availability of very high-capacity networks.

It has been argued in a UK context that two decades ago the emphasis in network regulation was on an *"econocratic"* analysis in pursuit of efficiency rather than distributional goals.[2] However the social and economic stresses imposed by the global financial crisis (and possibly also the more recent energy price crisis) contributed to a change in popular perceptions, leading to a degree of skepticism in light-touch regulation and the faultless operation of markets. This generated what the authors call a *"responsive regulatory state"* in which the scope of regulation is wider, accountability is extended, and the focus on equity and consumer protection grows.

In this article we argue that while regulatory attention may have shifted away from competition, towards consumer protection and universal availability as means to the end of improving consumer welfare, telecoms regulatory authorities should still keep their eyes on maintaining and improving competition to the long-term benefits of consumers.

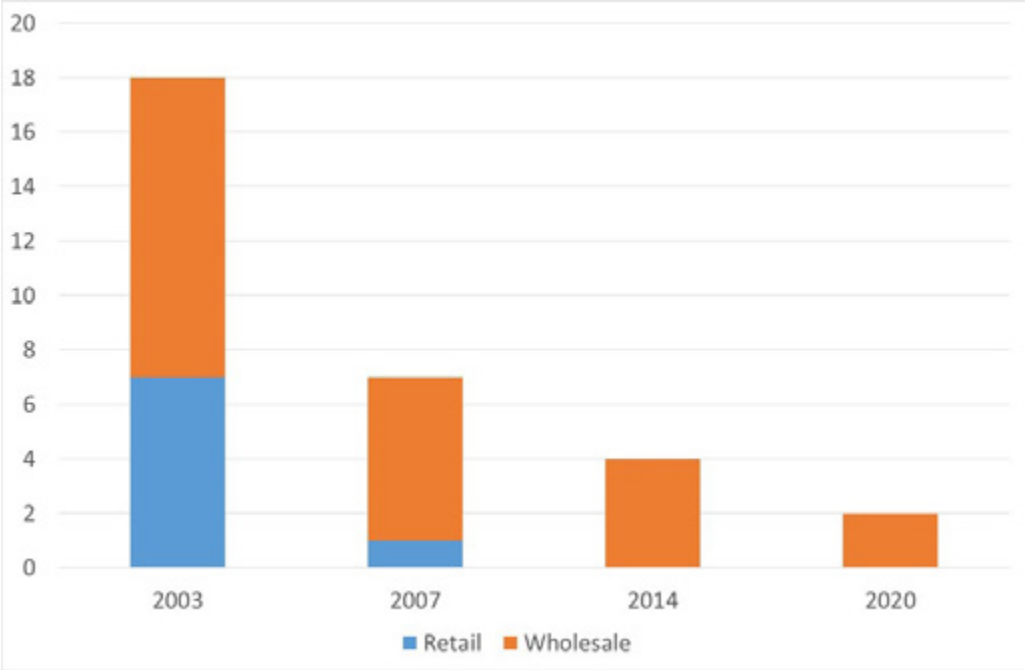
II. WHAT SHOULD BE THE FUTURE ROLE OF TELECOMS REGULATORS?

Most *ex ante* communications regulators were set up at the end of last century with a very well-defined role – i.e. promote competition in the provision of communications services. Although their remit varied somewhat across jurisdictions (in many, but not all, countries this covered telecoms, spectrum management, broadcasting), their main focus was on promoting competition in the provision of telecoms services by mandating access to bottleneck inputs.

This has ultimately proved a success, helped by technological progress that made rollout of competing fixed and mobile networks gradually more contestable. As an indicator of the success of this approach, in Europe the number of markets for which regulatory authorities need to undertake an ex ante market review assessing the state of competition and, if appropriate, introduce remedies declined from 18 to just 2 in less than twenty years (Figure 1).

2 C Koop & M Lodge, "British economic regulators in an age of politicisation: from the responsible to the responsive regulatory state?" *Journal of European Public Policy*, 2022, 27:11, pp. 1612-1635.

Figure 1: Number of telecoms markets subject to *ex ante* regulation in the EU



As a result, today, *ex ante* regulatory authorities have limited resources and attention dedicated to the promotion of competition in telecoms. Their role kept expanding with several additional duties and competences added, as well as new sectors, such as the Internet and post. Today they look much less like their ancestors and much more like agencies focused on protecting consumers from harm that can arise from online content or interaction and on setting output and outcome targets for connectivity.

A. The Example of Ofcom Twenty Years On

We have compared the two Annual Plans of Ofcom of 2004-05 and 2022-23. These plans provide a good indication of the changing Ofcom's focus and role in less than 20 years. These trends illustrate well the journey of similar regulators elsewhere.

The 2004-05 Plan[3] starts by making very clear what its role was: *"Ofcom exists to further the interests of citizen-consumers through a regulatory regime which, where appropriate, encourages competition."* At the time Ofcom planned to launch three main strategic reviews reconsidering the then existing regulation. These covered telecom, spectrum, and Public Sector Broadcasting ("PSB"). It also identified three main market challenges: 1) helping to drive forward digital switchover and broadband roll-out, 2) promoting competition and 3) safeguarding the interests of citizen-consumers. Ofcom's core projects and programs were designed to address its mission which was summarized in four points:

1. Encourage the evolution of electronic media and communications networks;
2. Support the need for innovators, creators, and investors to flourish via promoting competition;
3. Foster plurality, inform and protect citizen-consumers and promote cultural diversity; and
4. Serve interests of citizen-consumers.

Under 1 and 2, in particular, almost all objectives were about encouraging competition and promoting efficiency.

This resembled a typical ex ante economic regulator that saw the promotion of competition as its main mean to achieve its objectives and improve the consumers' experience and value for money from telecoms services. Its focus was on making competition work in telecoms, tailoring spectrum management to demand and promoting PSB as a set of programs that the market would otherwise fail to deliver.

Comparing this to the 2022-23 Plan[4] helps to understand the radical change and evolution in Ofcom's role and focus. Although sector-wise, its competences were extended further to cover postal and internet services, the main differences lie elsewhere. Ofcom's main duty

3 Ofcom, Ofcom's Annual Plan April 2004 – March 2005, May 1, 2004, available at https://www.ofcom.org.uk/__data/assets/pdf_file/0019/3691/ap_200405.pdf.

4 Ofcom, Ofcom's plan of work 2022/23, March 25, 2022 available at https://www.ofcom.org.uk/__data/assets/pdf_file/0019/234334/Statement-Plan-of-Work-2022_23.pdf.

remains unchanged (though it does no longer appear as prominently as it did in 2004-05), but it acquired several additional duties and new legislations were added (e.g. the Telecom Security Act on reliable networks and the draft Online Safety Act whose aim is to protect consumers from online harm). These have shifted Ofcom's focus towards addressing harm from content and ensuring resilience of networks. Critically though, in the more traditional areas of intervention, Ofcom's focus is no longer on *"furthering the interests of consumers"* through the promotion of competition as such, but on setting direct *"output"* targets (e.g. increased take-up, more investment in fixed and mobile networks, more reliable and resilient high-quality networks, safety and trust in content, promotion of PSB, ensuring representation of every part of society in programs to cite the most important ones listed in its 2022-23 Annual Plan). Competition is no longer prominent as a means to an end, instead the aim is to directly set what consumers want and achieve direct regulatory intervention.

In telecoms (fixed and mobile), Ofcom's focus is now firmly on directly increasing investment, take-up, resilience, security, reliability, *"support[ing] the delivery of high-quality mobile connections and support innovation," "supporting investment in gigabit networks" and "safeguarding telecoms customers' interests, including those who are vulnerable."* Instead, either promoting competition (i.e. *ex ante* regulation to provide access to bottleneck elements or reducing barriers to switching) or protecting competition (*ex post* competition law) seem relegated to play a very minor role in the 2022-23 Annual Plan. The one exception is net neutrality, which sits at the interception of telecoms and internet content and, as such, has several additional content connotations alongside a more traditional access issue – i.e. the terms at which content providers can get access to the Internet Service Providers' ("ISPs") customer bases.

III. SHOULD TELECOMS REGULATORS STILL CARE ABOUT COMPETITION?

The success in increasing the degree of network competition in fixed and mobile telecoms over the last twenty years is self-evident. Does this mean that from now on regulators could mostly focus on achieving the "outputs" required by legislators, such as countering online content harm, improving resilience, increasing bandwidth and network coverage? We claim that promoting and protecting competition in the telecoms should not yet be out of fashion and should remain a key goal for the years to come, in conjunction with other goals. Furthermore, technological evolution, while it brings increasing benefits to consumers. it may lead to less or more competition. The net neutrality debate determining how the ISPs should commercially interact with digital, small, and giant, actors will also remain central. In this debate, although the degree of competition is not the only issue, it remains an important factor. The next sections discuss these issues in more detail.

A. Trading Off Competition vs Investment Goals in Telecoms

In almost all jurisdictions, *ex ante* regulation is now directed both at benefits to current end users, including those derived from competition, and at the broader goal of achieving near-to-universal high-speed connectivity. In the EU the latter aim was expressly included in the 2018 European Electronic Communications Code and has been elaborated in the 2021 Digital Strategy as the goal of universal gigabit connectivity via Fiber-To-The-Home ("FTTH") or equivalent and of full 5G coverage of populated areas and has been elaborated since.

The relationship between these two goals can be complex. In relation to fixed telecoms, a market dominated by historic monopolists, but subject to limited cable competition, was turned in three decades or so into an oligopoly in major parts of many Member States ("MS"). This was achieved as an early example of what has become known as *"pro-competitive regulation."* It involved a single minded focus by the European Commission ("EC") and National Regulatory Authorities ("NRAs"), who shared the regulation responsibility, on clear competitive objectives, which were built into the regime from the start; the consistent use of standard network regulatory instruments (notably the determination of the price of access to monopoly assets) in a fashion designed to promote infrastructure competition; and the imposition of sunset clauses which, progressively deregulated the different markets as they became competitive.

1. FTTH Competition

When FTTH came onto the scene in the EU, two groups of MS emerged, differing in how ruthlessly NRAs promoted competition in fiber investment. Some (notably Germany and the UK) imposed an obligation to supply an active fiber-access product – the equivalent of bitstream. This perpetuated and even enhanced the dependence of access seekers on the former historic monopolist. Others (notably, Portugal and Spain) promoted infrastructure competition by requiring that the incumbents made available only ducts and poles - an access product that is significantly more limited than Unbundled Local Loops ("ULL") had been, and thus *"higher up in the ladder of investment."* In these MS the only option open to competitors was to install their own FTTH home networks. This triggered an investment race in which, by 2019 Portugal and Spain, had about

80 percent of homes were passed by fiber, often by two or three operators. The equivalent figure in Germany and the UK was barely 10 percent, although they are now catching up.[5]

Looking ahead, a forecast has recently been published for Europe as a whole that by 2030, 89 percent of all homes will be passed by FTTH.[6] But this disguises significant differences between MS, and the take-up data are much lower. Furthermore, as a recent paper has (unsurprisingly) shown, it is the take-up rate and not the availability of new communications technology which has an effect on GDP.[7]

In late February 2023, the EC published a suite of papers on high-speed connectivity, all directed at making connectivity available to all by 2030. One is a proposal for a Gigabit Infrastructure Act, a regulation that will put forward new rules to enable faster, cheaper, and more effective rollout of Gigabit networks across the EU. Another is an exploratory consultation on the future of the connectivity sector and its infrastructure, to gather views on how increasing demands for connectivity and technological advances may affect the future developments and needs.

The third, which is regulatory in scope, aims at adapting in the age of gigabit connectivity of the some of the current regulatory remedies imposed on fixed networks found to have significant market power in the relevant market for central access provided at fixed location (market 3b listed in the 2014 Recommendation on relevant markets), where such markets are subject to wholesale regulation on that score.[8]

This involves such measures as:

1. Adapting some non-discrimination prohibitions on wholesale-only networks;
2. The non-imposition of wholesale access pricing rules' or allowing greater flexibility within them, for example with respect to contracts and quantity discounts;
3. More generous implementation of cost-based pricing, including allowing a greater rate of return on investment; and
4. Amending or withdrawing removing regulated prices from pre-FTTH wholesale products, with a view to bringing forward migration form and closure of such services.

These are a natural response both to the higher degree of competition in FTTH, and in the case of the latter, to the goal of increasing connectivity speeds. The end game would be a finding by the NRA that Significant Market Power ("SMP") was no longer present, hence, no remedy was required. But where there is still an SMP finding, the effect may be to rebalance the situation between that operator and its wholesale competitors. It is possible that this may put the SMP operatorsn a better place in investing more heavily in extending the coverage of their FTTH networks. It is well known that the cost of providing fixed gigabit coverage rises as coverage extends further into more marginal areas, as would the corresponding cost of subsidizing that investment from general taxation. The possible relaxations might in some jurisdictions represent a means of generating additional investment funds within the sector, and for that reason can be quite legitimate and rational.

This is a theoretically possible present-day example of the complex interrelationship that exists between competition and investment in telecoms. This is more evident when regulation applies to a supplier with considerable market power, such as copper incumbents. However, in a FTTH environment care should be taken not to reduce the regulation of the incumbent too much and risk suppressing competition too much. Additionally, such indirect means of promoting investment do carry a risk and may require means of ensuring that the money is invested in network expansion rather than goes into the pockets of shareholders.

2. 5G and Competition

Turning to 5G, it is generally recognized that a full-blown *"stand-alone"* 5G network differs in fundamental ways from its predecessors, in a manner which may disrupt the persistent *"normal"* structure of the mobile industry – having either three or four operators in each MS. In recent years, mergers have occurred in many jurisdictions to turn four into three, often after a court or appeal body has overturned possible objections.

5 Shortall, T., "{European success in achieving very high-capacity networks: a process of trial and error," *Utilities Law Review*. 2022, 23(6) pp. 219-230.

6 ETNO, *The State of Digital Communications 2023*, p.57.

7 Briglauer, W., Cambini, C. & Gugler, K., "Economic Benefits of High-Speed Broadband Network Coverage and Service Adoption: Evidence from OECD Member States," September 2022.

8 European Commission, "Draft Recommendation on the regulatory promotion of Gigabit connectivity," February 23, 2023, available at https://digital-strategy.ec.europa.eu/en/library/gigabit-connectivity-recommendation.

The main issue in these mobile mergers often reproduces the above-noted competition/investment trade-off in fixed telecom. In the mobile sector, companies seeking to merge often claim that any adverse price effects are more than compensated for by favorable investment benefits, such as more investment leading to higher service quality – i.e. as 5G came closer reliance on these arguments grew.

5G potentially brings a large of innovations across the whole mobile value chain, but the three potential characteristics that are likely to be key from a regulatory perspective at the outset are:

· Densification: realization of the expansive version of 5G requires a much denser network of base stations, capable of meeting higher demand and involving use of higher spectrum bands. It also expands demand for backhaul, which generally uses wired technologies in all but remote areas;
· Versatility, in the particular form of "network slicing": software is increasingly replacing hardware in the "engine room" of a 5G network. It permits the same network to offer different services in different slices to a number of customers; and
· Open RAN: a current radio access network ("RAN") technology requires an integrated platform. The ambition for Open RAN is to create a multi-supplier RAN solution that allows for the separation - or disaggregation - between hardware and software with open interfaces and virtualization. The promised benefits include supply chain diversity, solution flexibility, and new capabilities leading to increased competition and further innovation.

These developments may have a major impact on mobile structure in a number of ways. The network slicing capability of 5G conveniently enables different services to be provided by the same network. Thus, the provider of a digital education or transport service may choose to buy connectivity at wholesale level and bundle it with the rest of its service, cutting the mobile operator's direct and probably profitable commercial tie with the end user.

The potential cloud-based nature of advanced 5G services also introduces new players into the game. A brand-new U.S. 5G network has been described as *"except for antennas and cables, mostly a cluster of code that runs on Amazon Web Services (AWS)*." This "cloudification" of networks brings new digital giant into the game. AWS has gone further by announcing a new managed service to help enterprises to set up and scale the new private 5G networks. This has been facilitated by regulatory authorities allowing local sharing or reserving spectrum at auction for leasing to firms for an annual fee per square kilometer. In Germany over a hundred such applications for leases had been approved by mid-2021, for Internet of Things ("IoT") and other roles in advanced manufacturing factories, for example.

In addition, many mobile operators have sold their masts to specialized companies, which now, particularly in the light of the above changes, have the capacity to integrate into network provision and become wholesale only operators.

In combination these changes have the potential to lead to a major shift in the structure of the mobile market. There is, however, a further consideration which may, given the high cost of a fully-fledged 5G network, lead to more investment, but at the cost of less competition.

This is 5G network sharing. Sharing has been a bone of contention in the mobile sector for more than two decades. In the EU, initially the EC took a skeptical view, concerned about the reduction in competition and the development of collusion. This fear abated somewhat over time, and a more nuanced approach with different approaches to tower sharing, sharing other passive assets, sharing spectrum, and sharing active assets. A summary of its conclusions on network sharing in the EU was published in 2019 by the EU's "college" of telecoms regulators.[9]

Increasingly the issue has faced the scrutiny of competition authorities and telecoms regulators in a 5G context. A recent (and unfinished) competition case in Australia is of interest.

There a newly combined entity comprising Vodafone and TPG (which were allowed to merge over the objections of the relevant competition authority – the ACCC), sought to enter into an agreement with Telstra, the largest mobile operator, to share a network, and for Telstra to use TPG's spectrum for the purposes of seeking to serve about 17 percent of the Australian population living in remoter areas. This counted as a merger, and the ACCC investigated and rejected the arrangements on several grounds. It would increase TPG's regional coverage from 86 to 99 percent, but the reduction in number of networks competing from 3 to 2 would harm the competitive process.[10] The spectrum arrangement would also strengthen Telstra's dominant competitive position. This decision is currently under appeal.

9 BEREC, *Common Position on Mobile Infrastructure Sharing*, BoR (19) 110, 2019.

10 ACCC, ACCC decides not to grant authorisation for Telstra and TPG regional network deal, December 2022, available at https://www.accc.gov.au/media-release/accc-decides-not-to-grant-authorisation-for-telstra-and-tpg-regional-network-deal.

A different response was elicited from competition and infrastructure regulators in Germany when, in a four-operator market, the two largest operators entered into an agreement for active network sharing in areas where there was only one 4G networks. This led to the inclusion of a third operator in the agreement.[11]

It is reasonable to expect such arrangements increasingly to be sought, either as a first best, or as a second best, if merger is refused. Such proposals may cover remoter areas only, or larger swathes of the population.

3. Net Neutrality Raises Complex Issues and will Continue to be Debated

Even if the competitive conditions may in the future allow a further withdrawal of the scope of access regulation in the fixed and mobile telecoms sectors, the issue of net neutrality will continue to occupy regulators. The term net neutrality refers to a regulatory intervention that has been imposed by many countries to limit the freedom of ISPs in their commercial dealings with content providers. It thus applies indifferently to both fixed and mobile networks.

While in Europe and many other countries strict net neutrality obligations are now in place, others, such as New Zealand and Australia, never implemented them and the U.S. reversed their regulations in 2017, thus returning to a less strict rules. Ofcom in the UK has also recently proposed some relaxation of the net neutrality rules.[12] The issue has never stopped to be debated and its importance remain critical as it affects how two of the biggest sectors in the economy, telecoms, and digital content, commercially interact.

Consumers subscribe to an ISP to obtain a broadband connection and access content on the internet by Over The Top ("OTT") players. At its most basic, the latter either sell the content to subscribers (e.g. Netflix) or make the contentavailable for free and are financed through advertising (e.g. Google) or a mix of the two (e.g. YouTube). Irrespective of that, the traffic is now very asymmetric with most of the data being sent from OTTs to consumers. Net neutrality rules vary across jurisdictions and proposals, ranging from obligations not to discriminate across OTT to debated prohibitions against ISPs charging for incoming traffic.

The economic issues around what is an optimal set of charges reflect the complexity of the relationships. It may be useful to start with a simple two-sided market setting where the ISP is the two-sided platform connecting consumers and OTT. As such, it can set the price for consumers and OTT. Unrestrained an ISP may charge both sides and potentially more the OTT than consumers. A net neutrality rule forcing the ISPs to charge the OTT nothing is predicted to increase the price by consumers for broadband services. However, if we add further complexity to the model, such results may be called into question. To give some examples: first, if the ISPs set uniform prices for OTTs, this may force some of them to exit. If, instead they tailored their prices to each OTT, exit may not take place, but ISPs may in principle extract all most of the rents from OTTs. Furthermore, ISPs claim that some capacity is limited and, if they could not manage incoming traffic, congestion may occur and consumers may suffer from delays and lower quality for services, such as video and gaming, which are sensitive to latency. On the other hand, there are concerns that if the ISPs had too much freedom in setting (and could set) the termination charges, this freedom may be abused.

The degree of competition among ISPs may also be an important factor. In the U.S. where consumer choice of ISPs is almost everywhere limited to a maximum of two, in order to reach consumers, content providers will have no choice than to accept high termination fees. Where competition is more intense, as in Europe, this concern may be less relevant. However, it remains true that consumers very often single-home, when it comes to choosing an ISP and may be reluctant to shift for smaller changes in quality of the OTTs' services. Critically, policy makers are particularly interested in the effect of the commercial arrangements between ISPs and OTTs on long term investment incentives. This is a notoriously difficult question to tackle, and it is particularly complex in a heterogenous setting like the Internet. Investment in delivery networks is not only the field of ISPs, as some OTTs have also invested heavily to bring and store the content closer to consumers, though the last mile remains the priority of ISPs. Similarly, though less common, some ISPs like Comcast in the U.S. are vertically integrated into content. The empirical work on this is still very limited and the debate will continue.[13]

11 See https://www.bundesnetzagentur.de/SharedDocs/Pressemitteilungen/EN/2021/20210119_TelefonicaTelekom.html.

12 Ofcom, Net Neutrality Review, Consultation, October 21, 2022, available at https://www.ofcom.org.uk/__data/assets/pdf_file/0028/245926/net-neutrality-review.pdf.

13 A recent exception is Briglauer, W., Cambini, C., Gugler, K. and Stocker, V., "Net neutrality and high-speed broadband networks: evidence from OECD countries," *European Journal of Law and Economics*, 2022, available at https://link.springer.com/article/10.1007/s10657-022-09754-5.

4. PROTECTING AND PROMOTING COMPETITION WILL REMAIN RELEVANT TOMORROW

Overall, the massive expansion of competition in the last twenty years in fixed telecoms networks is a major triumph, and the ability to maintain the status quo in mobile networks (despite merger pressure from companies) is a good start. And when NRAs make their own trade-offs among policy objectives, we hope they will be skeptical of the siren voices from many sides sectors which under-estimate the short- and long-term benefits of competition.

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