A TIPPING POINT FOR REGULATION

With the rise of OTT there's no doubt we are in the midst of transition in telecoms markets – but how best to respond, asks **BRIAN WILLIAMSON**

Sector specific telecoms regulation evolved when the market was comparatively static and applications were comparatively homogenous. For around a century, telecoms equalled voice, and slow progress was made towards universality, typically under state ownership. Now, markets are in transition to broadband access, including fibre, and applications – including over the top (OTT) messaging applications – are proliferating, fostered by smart mobile devices and 'apps marketplaces'.

In less developed regions a transition is also underway, but from no service or voice only to mobile broadband access. Globally, mobile access already dominates and its dominance is growing.

Regulatory norms and principles including cost orientation, unbundling and the ladder of investment concept were developed in a comparatively static era. It was also an era in which services equalled switched voice and basic broadband, rather than an increasingly heterogeneous mix of connectivity and applications.

This article considers the implications of this more dynamic and heterogeneous market for regulation, policy and business strategy.

OBJECTIVES DIFFER

Policymakers may have comparatively common high-level goals, but nevertheless have different objectives and approaches. For example:

- The US National Broadband Plan of 2010 focused primarily on mobile and the demand side, and did not pursue fibre to the premises or very high-speed broadband targets. In the US, investment has been left to commercial players, with limited regulation.
- In Europe, the objective is universal availability of 30 Mbps broadband by 2020, delivered on a technology neutral basis, and primarily by vertically integrated commercial entities. Regulation was in a state of flux during the period 2010 to 2013, and is under review yet again, in recognition of concern that sufficient private investment to meet the targets may not be forthcoming.
- In Australasia, governments adopted fibre to the premises strategies with substantial state involvement and separation of networks from service provision. In Australia, in response to limited progress, high costs and a review which found little evidence of benefits from deploying fibre to the premises as opposed to copper-fibre hybrid systems, a mixed technology strategy has now been adopted.

A tipping point for OTT content? Amazon Prime has signed the ex-BBC Top Gear trio to establish a probable world-beating car TV programme

It is only possible, therefore, to understand policy differences in the light of consideration of objectives. For example, separation of networks from applications tends to follow a belief in the benefits of investing in near universal fibre to the premises. Substantial investment by the state tends to then 'cause' separation, rather than separation causing investment (one might expect separation to weaken commercial investment incentives).

HISTORY MATTERS

Markets differ for historical reasons. In some, fixed access is mostly absent. The primary means of delivering connectivity in such markets will then be mobile. The extent of parallel fixed network development also differs with cable, now able to compete with fixed broadband access, in some locations and not in others. Network topography and the quality and availability of duct and pole access also differ, shaping the investment case for fibre to the cabinet versus fibre to the premises. From an economic perspective the costs and benefits of different incremental investment options will therefore differ for historical reasons. Expecting the same approaches to work, and expecting the same outcomes, in different regions may not therefore be a realistic goal (or it may be a goal whose pursuit would involve substantial costs).

CHANGES IN AVAILABLE TECHNOLOGY ARE A COMMON STRAND

What is common globally is technology. At a high level, the payoff from information and communications technology has varied significantly, contributing substantially to growth in some regions and much less so in others (including within Europe). This is a hint that policy matters. Turning to communications markets I focus on two things – the transition underway in access networks and the development of OTT.

NETWORKS ARE INCREASINGLY LOCAL

In the recent past, networks and applications were tightly coupled, and tended to be thought of as national in actual, or desired, extent. The economics of access network investment and its dependence on history is now making access increasingly local.

Some locations may have fibre, cable and mobile, while others may have mobile or mobile and copper line only. Competition and network performance are therefore heterogeneous and local, and increasingly so. Further, economies of scale at the network level appear limited, with networks servicing small markets faring well on a comparative basis.

APPLICATIONS ARE INCREASINGLY GLOBAL AND NO LONGER TIED TO NETWORKS

OTT applications are not tied to networks, and have global economies of scale. Applications such as WhatsApp, Slack, iMessage, Skype and FaceTime scale globally. This also means that, at a stroke, OTT applications have broken down barriers to cross-border communication and created a single global market. The benefits of this for consumers, businesses and nations individually and collectively are substantial. It is also worth noting that the providers of these applications are minor beneficiaries compared with users.

Content markets have proved more resistant to the rise of OTT than messaging. However, OTT content providers, Netflix and Amazon, have now achieved sufficient scale to commission original content including House of Cards (Netflix) and win rights in competition, including signing the previous Top Gear car programme trio (Amazon). This may prove to be a tipping point.

OTT is therefore separating applications and networks, and also acting to unbundle telecoms bundles that include access, voice and content (the possibility of bundling fixed and mobile access remains, irrespective of OTT).

Some network operators, particularly those that have not adapted their pricing models away from applications and towards access, have found these developments challenging. Here, history also matters with, for example, operators in Asia and Europe more dependent on voice and messaging revenues than operators in the US. Nevertheless, there are signs of progress in adapting network business models. For example, the chief executive of UK mobile operator EE has said the growth of mobile-messaging services like WhatsApp isn't a threat as the sector's growth is driven by data-hungry consumers.[1]

Some have also sought extension of existing regulation to slow the advance of OTT – a protectionist response with little if any basis in terms of the protection of competition and consumers, as opposed to existing competitors. Others, however, have sought the relaxation of specific regulation that is no longer appropriate, and sought to benefit from the increased demand for network access flowing from OTT.

In Europe, the removal of fixed voice origination from the list of relevant markets susceptible to ex-ante regulation was, in part, a response to competition from OTT. Other areas of regulation should also be examined to assess their continued relevance. However, there is a distinction between access and applications, with OTT increasing competition in services but not in access.

OTT IS DRIVING NETWORK DEMAND

Growth in OTT services has been rapid not just because such services are cheap or free, but because they include new features valued by consumers, such as the ability to work over WiFi, device interoperability, presence, photo and video sharing, and ways of contacting people without the need for a phone number.

> **"OTT applications have broken down barriers to cross-border communication."**

The growth in value to consumers from OTT is fuelling increased demand for network access – ubiquitous access to high quality fixed and mobile connectivity. The challenge for operators is turning this demand into revenues – both by adapting their business models and by seeking a reduction in no longer justified regulation.

Some in Europe have in effect argued that demand is bad, as it imposes costs without corresponding payment from OTT providers to networks operators. However, increased demand can be monetised via the consumer market, from those purchasing network access and higher data or speed tiers as their demand grows.[2]

In India it has been argued that OTT will harm operators, investment and broadband adoption goals since the revenues from the data required by voice and messaging OTT services that replicate existing services will be small in comparison with existing revenues.

However, OTT is not simply a substitute for existing voice and messaging services, but grows overall data demand. Consumers increase their level of communication and they increase the amount of data demanded via, for example, use of video and photo sharing. In the absence of OTT, market growth would be more limited, as would broadband adoption and network investment.

Indeed, without rapid demand growth, network operators would see their revenues shrink. For fixed operators, traffic growth and growth in demand for higher speeds are necessary to forestall substitution by mobile. For mobile operators, traffic growth is necessary to offset the impact of declining unit

costs – due to increased spectrum availability and more efficient technology (4G and, in future, 5G).[3] Without growth in demand, network access revenues will decline.

To paraphrase the Red Queen in Through the Looking Glass, the industry has to run to stand still, and OTT is the key to doing just that.

TRANSITION REQUIRES A DIFFERENT POLICY APPROACH

Regulators have learned their craft during a period that was comparatively static, at least in relation to fixed networks. Copper access, for the privileged few who have fixed access (globally, only around 20% of consumer access will be via fixed lines in the near future), was already in place. Adding broadband capability, while ingenious, was not a major undertaking in investment terms.

Now networks and services are in transition, regulation must adapt to facilitate rather than impede the process. Copper is in transition to fibre, and fibre itself is transition to more capable standards (Verizon is exploring PON2, for example). Mobile networks are also in transition from 2G and 3G to 4G, which will be followed by 5G.

Transition involves up-front commitment of capital, and requires flexibility – the opportunity to differentiate price-service, experiment, and earn a return that aligns investor and customer interests,[4] coupled with commitment that the government and/or regulator will not engage in ex-post appropriation once investment is sunk.

The relative price of legacy and new services is important for transition, and it is challenging for regulation to get this right. One option is to relax the constraint on the price of the legacy or new service, with the price that is controlled acting as an 'anchor' on the service price.[5] Another – potentially complementary option – would be to rely on long-term contracts rather than ex-ante price controls.[6] These approaches offer consumers protection during transition while leaving the investor to determine the margin between legacy and new services, and to differentiate service prices. First, Ofcom, the UK regulator, and subsequently the European Commission (in its 2013 recommendation on costing and non-discrimination), have supported the anchor product approach for the copper-fibre transition.

EUROPE ASKS A QUESTION...

The European Commission has now floated the possibility that regulatory relief would be targeted only at the most advanced next generation access, excluding fibre to the cabinet *(see also news item, page 3)*. This would remove one of the virtues of pricing flexibility – that it promotes efficient technology choice based on an assessment of the anticipated costs and willingness to pay for alternatives. It may also reduce rather than increase investment, because the possibility of a reversal of policy regarding pricing freedom for fibre to the cabinet immediately cuts the attractiveness of investing in it, while the investment case for fibre to the home may not in any case stack up, even with the proposed freedoms.

Transition not only involves new investment, but retirement of legacy network elements and services. Copper may be retired to the premises or cabinet in favour of fibre. However, a high level of adoption is a likely prerequisite and this requires not only network investment but the installation of customer premises equipment in the case of a fibre to the premises deployment.

To facilitate network rationalisation, constraints on notice of closure and relative pricing – instruments that can be used to promote transition – should be the minimum consistent with customer protection. One approach is simply to specify that customers can receive the old service level over the new technology at the prior price – leaving the investor free to determine the price of the legacy service and all other service-price offers on the new technology. This is the approach proposed by the FCC.[7]

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Any universal service or other obligations should also be expressed in technology neutral terms so as not to impede migration.

Similar considerations apply to the transition to all-IP service provision in the voice and business services market. In addition to notice requirements there is a risk that price constraints on legacy services may reflect depreciated asset values, thereby lowering the price of legacy services relative to new services and discouraging customer migration.[8] In commercial settings, such as the end of support for Windows XP, continued support for legacy service is a private matter for negotiation between provider and consumer.[9] The same principles should apply in telecoms markets.

OTT – LEVELLING UP VERSUS LEVELLING DOWN

As a general rule, regulation should be removed from legacy services rather than extended to OTT. Voice should no longer be price controlled, and coverage obligations for voice should arguably be removed now that broadband access is the basic service building block (emergency calls may constitute a special case). Where social obligations remain, for example in respect of coverage, they should be tax funded rather than industry funded since input taxes are inefficient (the Diamond and Mirrlees result).[10]

Other considerations such as interoperability requirements should arguably differ between legacy communications services and OTT. This is because consumers can use multiple OTT services on a single device and because the costs and benefits of interoperability regulation can be expected to differ between standardised legacy services and an open and evolving ecosystem of applications.

OTT is also more interoperable than legacy communications services in a number of key respects such as cross-network (including WiFi) and cross-device. This raises the question of whether application of a 'level playing field' concept would

see requirements for cross-network and cross-device interoperability imposed on legacy services.

OTT AND AN INSTITUTIONAL FORK IN THE TELECOMS POLICY ROAD

An underlying institutional question is whether the scope of coverage of sector-specific ex-ante telecoms regulation should be extended to OTT, limited to broadband access bottlenecks or eliminated entirely, with ex-post competition law applying to both telecoms and OTT. Given that regulators are finding it challenging to adapt their frameworks to network transition, extending their remit to the even more dynamic domain of applications would arguably be misplaced.

While removal of all ex-ante regulation is a possibility, it is unlikely (at least in Europe), and where it was tried in New Zealand the result, ultimately, was the re-imposition of regulation (in a form involving a disconnect between copper and fibre regulation). Network access bottlenecks are likely to be the focus of continued sector-specific regulation in most jurisdictions.

This leaves as a high-level option a narrowing of the focus of ex-ante sector-specific regulation to access bottlenecks, as and where they occur. In Europe, this could be achieved by changing the scope of the regulatory framework from electronic communications services to network access. This option deserves consideration.

MORE CHANGE COMING – TWO TECHNOLOGY WILDCARDS

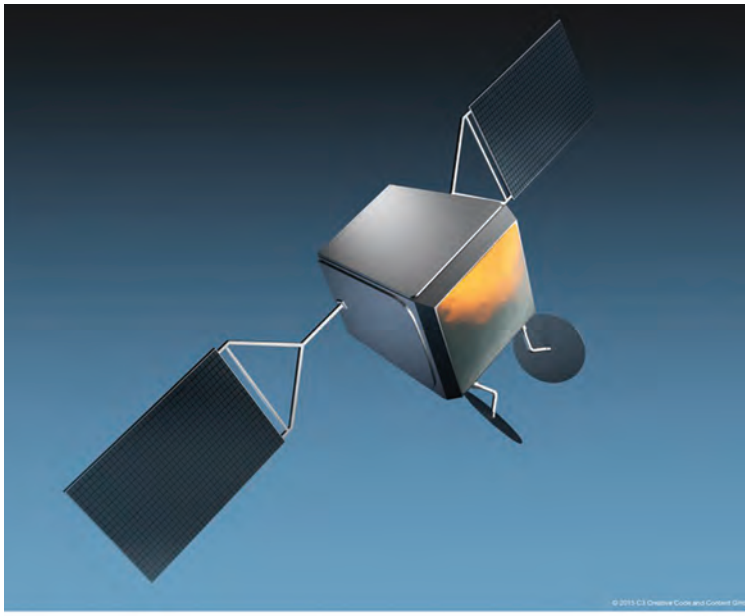
The options for providing network access may soon expand from terrestrial fixed and wireless networks to include high altitude platforms – including balloons,[11] solar powered planes[12] and low earth orbit satellite constellations[13] – linked by free space laser links. These possibilities may change the economics of connecting the next few billion internet users – predominantly in less developed countries but also in low density areas throughout the world. Free space optical links may also have terrestrial applications such as mobile backhaul.

Another wildcard with potentially wide ranging implications is artificial intelligence, which is now, after long being disappointing, making rapid progress. Image recognition and translation are now feasible, using neural networks, and many other applications are under development that will impact the telecoms market and wider value chain.

Artificial intelligence will be both a complement to and substitute for connectivity. Applications such as Skype Translate require connectivity to the cloud, while the Google Translate app performs real-time visual translation without an internet connection.[14]

The growing power of artificial intelligence to 'understand' what it sees may also see some internet of things (IoT) applications using video links rather than sensors using very low data rate connections.

Finally, artificial intelligence using neural networks and learning may behave in a manner that is inherently non-transparent. Commenting on Skype Translate, Microsoft CEO Satya Nadella noted that as it learned an additional language it got better at the ones it already knew and that no one knew why.[15] In a world of artificial intelligence the concept of neutrality may be difficult to define and apply.



One of the players in ambitious bids to put hundreds of internet satellites in orbit is the OneWeb consortium set up by Virgin and Qualcomm, with Airbus on board to build the micro-satellites

IN CONCLUSION

- Key problems for regulation include supporting network transition and how to respond to OTT applications.
- Flexibility is needed on the closure of legacy network elements and services, and over the margin between new and legacy product prices, to promote efficient transition and network retirement.
- In relation to OTT, applying existing ex-ante regulatory approaches to this new and evolving dynamic market would likely prove counter-productive, not only in foregone benefits from OTT but also in foregone demand for enhanced network access.

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REFERENCES **1** WhatsApp is killing SMS, but that's OK, EE's CEO says. Wall Street Journal, 20 February 2014. on.wsj.com/1wxRyVJ **2** Williamson B (2013). Over-the-top – hindering or helping achieve European Digital Agenda goals? Plum Insight. bit.ly/1EeImRj **3** Williamson B and Wood S (2015). The spectrum crunch is dead, long live spectrum demand. SSRN. bit.ly/1LtjHaG **4** Jean Tirole: Market power and regulation. Scientific background on the Nobel Prize in Economics. 2014. bit.ly/ZnyX4Z **5** Williamson B (2014). Anchor product regulation – a new regulatory tool. Info 16 5: 32–45. bit.ly/1Fxvf82 **6** KPN reaches agreement on fixed network access. KPN press release, 20 July 2015. bit.ly/1MCvR02 **7** Wheeler T (2015). Advancing technology transitions by protecting consumers, competition and public safety in an IP world. fcc.us/1PNcOT3 **8** Williamson B and Wood S (2015). Leaving a legacy. Plum report for BT. bit.ly/1U9Fx5d **9** Navy re-ups with Microsoft for more Windows XP support. Ars technica, 23 June 2015. bit.ly/1U2HQvX **10** Mirrlees J et al. (2011). Tax by design. Chapter 6: Taxing goods and services. bit.ly/1Fxyigs **11** Sri Lanka is considering Google's Project Loon for country-wide internet coverage. The Verge, 29 July 2015. bit.ly/1VPg0BK **12** New milestones in Connectivity Lab's aircraft and laser programs. Facebook, 30 July 2015. bit.ly/1H7K8gx **13** The details behind SpaceX's ambitious satellite internet experiment. Quartz, 11 June 2015. bit.ly/1NwKHcx **14** How Google Translate squeezes deep learning onto a phone. Google, 29 July 2015. bit.ly/1NPRuen **15** The rise of machine learning: Microsoft, AWS and IBM leading the era of AI. V3, April 2015. bit.ly/1JxsCFD