

Northumbria Research Link

Citation: Curwen, Peter and Whalley, Jason (2017) The evolution of US mobile operators within a multi-play world. Digital Policy, Regulation and Governance, 19 (1). pp. 40-57. ISSN 2398-5038

Published by: Emerald

URL: <https://doi.org/10.1108/DPRG-07-2016-0034> <<https://doi.org/10.1108/DPRG-07-2016-0034>>

This version was downloaded from Northumbria Research Link: <http://nrl.northumbria.ac.uk/30517/>

Northumbria University has developed Northumbria Research Link (NRL) to enable users to access the University's research output. Copyright © and moral rights for items on NRL are retained by the individual author(s) and/or other copyright owners. Single copies of full items can be reproduced, displayed or performed, and given to third parties in any format or medium for personal research or study, educational, or not-for-profit purposes without prior permission or charge, provided the authors, title and full bibliographic details are given, as well as a hyperlink and/or URL to the original metadata page. The content must not be changed in any way. Full items must not be sold commercially in any format or medium without formal permission of the copyright holder. The full policy is available online: <http://nrl.northumbria.ac.uk/policies.html>

This document may differ from the final, published version of the research and has been made available online in accordance with publisher policies. To read and/or cite from the published version of the research, please visit the publisher's website (a subscription may be required.)



**Northumbria
University**
NEWCASTLE



University**Library**

The evolution of US mobile operators within a multi-play world

Introduction

In the course of the discussion surrounding the proposed takeover of Telefónica O₂ by CK Hutchison ('3') in the UK during 2015/16, much was made of the comparison between a single European country and the USA. At the time, the USA had four large nationwide mobile operators as did the UK, so it appeared to many analysts that the much smaller UK market could manage perfectly well with three. However, the European Commission took a different view and rejected the proposal (European Commission, 2016).

In practice, the USA mobile market is more complex than any in Europe because, unlike any European country, it contains a large number of regional networks – for an illustration of the complexity and dynamism of the USA market see, for example, FCC (2015). Nevertheless, because those that remain nominally independent are all small and with few exceptions are affiliated to one of the 'big four' operators, it remains the case that the market is highly concentrated. In addition, an unusual feature of the USA is the presence of large satellite operators that have been trying unsuccessfully for some time to enter the terrestrial mobile market. Obviously, there is a substantial pay-TV market in Europe but the major players such as BSkyB have until very recently remained separate from mobile networks. So far as cable provision is concerned, the situation in both the USA and Europe is that the cable and mobile markets have historically remained in independent ownership.

However, all this is about to change. The historic separation of markets is under pressure as never before, driven by the ever-increasing use of smartphones – effectively mobile hand-held computers – that can download data in exactly the same way as fixed-wire desk-top computers. Mobile technology has moved on very rapidly and now encompasses Long Term Evolution (LTE) and LTE-Advanced (LTE-A) which is currently capable of providing a downlink of up to 300 megabits per second (Mbps), more than sufficient to handle streaming video even if the individual customer receives on average a much slower service. This, in turn, has driven the need for operators in individual markets to arrange for the provision of multi-play including high-speed broadband, pay-TV and mobile.¹

But it is not economic for, say, a mobile network to provide multi-play through the payment of fees for access to all non-mobile services. There are clearly economies of scale available if the different strands of multi-play can be provided by a set of subsidiaries of a single holding company. Furthermore, why stop at the level of the network? Clearly, there are additional economies available if the content that flows through the network is also – at least in part – controlled by the holding company.

For these reasons, telecommunications provision is in the early stages of what will almost certainly turn out to be a major restructuring exercise. However, this is not simply a market-driven exercise because regulators – covering either the entire economy or sector-specific – need to be persuaded that the bringing together of entities from previously largely independent markets will not lead to the exercise of market power to the detriment of consumers.

The purpose of this paper is to analyse the way in which the provision of multi-play in the USA has developed over the past decade, primarily from the viewpoint of the mobile operators that provide a key form of infrastructure in a world that is increasingly substituting mobile for fixed-wire connectivity. As can immediately be seen from Table I, there is a clear division between the period prior to 2010 when merger and acquisition (M&A) activity was essentially restricted to fixed-wire and mobile operators, and the subsequent period which has witnessed activity involving fixed-wire, mobile, cable and satellite providers not to mention the appearance of content providers.

Background

It is salutary to remind ourselves how much has changed during the past decade or so. At the end of 2003, the ‘big six’ mobile operators at that time – AT&T Wireless, Cingular Wireless, Nextel Communications, Sprint PCS, T-Mobile USA and Verizon Wireless – accounted to roughly 80 per cent of the subscribers and a further 10 per cent was accounted for by eight regional operators: Alltel, Centennial, Dobson Communications, Leap Wireless, Qwest, Rural Cellular, US Cellular and Western Wireless.

One year on and AT&T Wireless was about to be taken over by Cingular Wireless leaving a ‘big five’, all of which could reasonably be referred to as nationwide as against regional operators. Post-merger, Cingular Wireless and Verizon Wireless were significantly larger than the other three. This is where the restructuring process is picked up in Table I.

[Table I roughly here]

In practice, the ‘big five’ structure did not last for long since Sprint PCS reacted by making an ill-advised bid to merge with Nextel Communications which used a technology known as iDEN rather than the code division multiple access (CDMA) used by Sprint PCS. The post-merger entity would be known as Sprint Nextel and would have almost as many subscribers as Verizon Wireless and Cingular Wireless. Technically, this created a ‘big four’, but with T-Mobile USA lagging the other three by a significant margin it could reasonably be claimed that the era of the ‘big three’ had now dawned.

The next move did not involve the transfer of mobile assets. By the end of 2004, AT&T had been reduced to a corporate long-distance operation and it appeared to be too highly-valued to attract a predator.² Nevertheless, SBC Communications chose to make a bid worth \$16 billion, paying with its own shares, adopting the name of the target once the merger was completed in November 2005. This new company subsequently acquired BellSouth, and with it control of Cingular Wireless, in 2006 (FCC, 2006).

But 2005 was notable also for the beginning of a restructuring process among the second tier of regional operators. The list both of current as well as defunct, merged and acquired wireless operators in the USA can be found at http://en.wikipedia.org/wiki/List_of_United_States_wireless, but for our purposes only a handful have had a major role to play in the restructuring process due to their size relative to the bulk of regional networks.

In June 2008, for example, Verizon Wireless bid \$28.1 billion for Alltel, with the telecommunications regulator, the Federal Communications Commission (FCC), approving the acquisition subject to Verizon divesting assets in 105 Alltel markets. These were all subsequently acquired by AT&T.

In September 2007, MetroPCS made a hostile takeover bid for Leap Wireless, its main like-for-like competitor, which the Leap board turned down on the grounds that it was too low. Dish Network (see below) made a second unsuccessful bid worth \$4 billion in August 2012 (Ramachandran, 2012). A further interesting development was the aborted (at literally the final hour) deal whereby Sprint Nextel would buy MetroPCS for \$8 billion including debt taken over (Telecom.paper, 2012). In the event, it was T-Mobile USA that ultimately won the day with a revised deal, tabled in April 2013 (Wood, 2013a), whereby it would merge MetroPCS with T-Mobile USA. The new operator would be known as T-Mobile US – a subtle but crucial distinction – but it still remained very much the fourth-largest operator in the USA. The new company formally came into being in May 2013.

As for Leap Wireless, it did not prosper after it turned down the offer from MetroPCS. It accordingly came as something of a surprise when AT&T moved in July 2013 to offer \$1.2 billion for Leap, roughly twice what it was worth prior to the bid (Hillen, 2013), as well as taking on its \$2.8 billion of debt. However, Leap was sitting on \$4.8 billion of tax credits that could be set against future profits and these would become available to AT&T. The proposed deal was (not surprisingly) met with great enthusiasm by Leap shareholders and the transfer of assets officially took place in March 2014 (Cellular News, 2013). The legacy CDMA network was shut down on a rolling basis during 2015.³

The evolution of Sprint

In April 2004, the two previously separated parts of Sprint, namely Sprint FON (fixed-wire) and Sprint PCS (mobile) were re-integrated as Sprint Corporation. In December, it instigated (for tax reasons) a ‘merger of equals’ with Nextel Communications valued at \$35 billion although in reality it was more akin to a takeover bid as Sprint shareholders ended up with a controlling stake. At the time, Nextel had 15 million subscribers in the USA but also owned a minority stake in four subsidiaries in Latin America held by Nextel International. The merger, which created Sprint Nextel, was completed in August 2005.

The change in its structure meant that Sprint was also obliged to pay in excess of \$10 billion over a period of years to acquire outstanding stakes in most of its affiliates such as Alamosa Holdings – see http://en.wikipedia.org/wiki/Sprint_Corporation and Curwen (2007).

At the time of the merger the two companies had a combined market value of over \$60 billion and in March 2006 Sprint Nextel’s value peaked at \$76 billion. But disillusionment rapidly set in causing Sprint Nextel in 2008 to write down \$29.7 billion of the value of Nextel on its books. One major contributory factor was the incompatible technologies used by the two companies – whereas Sprint provided conventional CDMA-based services in the 1900 MHz (PCS) band, Nextel used a proprietary technology known as iDEN in the 850 MHz band. Sprint Nextel seemed unable to adopt a strategy that would restore its image. For example, as noted below, it became involved with Clearwire and adopted WiMAX as the technology of choice to deliver high-speed data services at a time when its three main rivals were all opting for LTE.

In October 2011, Sprint Nextel announced that it would not be selling any devices using Clearwire's WiMAX technology after 2012. Rather, it would be speeding up the roll-out of Network Vision which would combine its various technologies (now including LTE) using the 1900 MHz band. The commercial launch took place in 15 cities in July 2012, with nationwide coverage to be achieved during 2013 (by which point it expected to have re-farmed the 850 MHz spectrum previously used by its terminated iDEN service). Sprint Nextel's credit rating was badly affected – the fact that it was going it alone in the 1900 MHz band meant at the very least that equipment vendors would not be rushing to provide compatible devices – and elicited the common response that it appeared to have relegated itself to the status of permanent also-ran behind AT&T and Verizon Wireless.

Not surprisingly, Sprint Nextel now sought a solution to its problems by acting as a predator while at the same time appearing in its weakened state to be a target. In October 2012, Japan's SoftBank bid \$20 billion for a 70 per cent stake, which was not expected to create regulatory problems. Sprint Nextel immediately responded by raising its stake in Clearwire (see below) so that, in effect, SoftBank was acquiring control of both companies (Osawa, 2012).

Further complications arose in April 2013 when Dish Network made an (allegedly informal) unsolicited bid for 68 per cent of Sprint Nextel worth \$25.5 billion – considerably more than the prior offer by SoftBank. SoftBank, in response, refused to raise its own offer, claiming that it expected its offer to be accepted on 1 July without further amendment. However, it soon changed its mind when shareholders reacted negatively, adding additional cash to its offer so as to raise it to \$21.6 billion. Curiously, this meant that it would now end up with 78 per cent of Sprint Nextel (Gabriel, 2013).

The evolution of T-Mobile US

T-Mobile USA started out as the wholly-owned subsidiary of Germany's Deutsche Telekom but was seemingly stuck in fourth place among the 'big four'. Deutsche Telekom was unwilling to invest on a scale that would resolve the problem, which meant that the network needed either to be sold or, failing that, to bulk up by acquisition of other networks and licences.

Given that T-Mobile USA used Global System for Mobile (GSM) technology, there could realistically only be one possible buyer which was the other GSM operator among the 'big four', AT&T. In March 2011, AT&T duly made a takeover bid worth \$39 billion in cash and shares. However, in August the Department of Justice filed to prevent the merger and in November the FCC indicated that it would be conducting a full enquiry. As a result, the bid was called off (Moritz and Rahn, 2011).

The completion of the MetroPCS takeover created a new entity, T-Mobile US, which was 74 per cent owned by T-Mobile. This now left T-Mobile US with two ways to progress. The first was to accumulate licences in low (below 1 GHz) bandwidths in order to improve its network and attract more subscribers (Lennigan, 2014a). The other was to be taken over.

But this presented a major difficulty. In the first place, there was no longer an operator using GSM in a position to do a deal. Secondly, even if a CDMA operator was willing to have a

shot at a takeover, it faced huge regulatory problems. Since these would be insuperable for Verizon Wireless, that only left Sprint and until recently Sprint (in the guise of Sprint Nextel) had also been a non-starter. What changed was that Sprint Nextel had itself been taken over by SoftBank which in early 2014 somewhat surprisingly indicated that it intended to make a bid for T-Mobile US, as discussed below.

Satellite

A feature of the USA is the opportunity to launch a wholesale LTE service using mobile satellite spectrum, and this has led to certain owners of satellite spectrum becoming involved with the nationwide mobile incumbents in the ongoing restructuring process. Three companies in particular are involved, namely LightSquared, Dish Network and Clearwire.

LightSquared

Harbinger Capital Partners set up LightSquared using licences owned by subsidiary SkyTerra. LightSquared partnered with Inmarsat in order to create the necessary contiguous bandwidth to supply terrestrial services and subsequently joined up with rural access start-up OpenRange to provide services in areas neglected by the terrestrial incumbents. However, widespread concerns arose over the potential for LightSquared to interfere with Global Positioning Systems (GPS) signals (Fitch Ratings, 2011) because LightSquared hoped to use the 1545-1555 MHz band while GPS operated in the 1559-1610 MHz band. These concerns were first expressed by regulators in early 2011, but the FCC went ahead anyway with provisional approval for the terrestrial usage.

LightSquared had agreed in July 2011 to pay \$9 billion over an 11-year period for Sprint Nextel to manage the roll-out of its wholesale network. However, LightSquared's prospects appeared to have been damaged irreversibly by the claims that there could be interference with aircraft safety systems and that there was no solution to this problem (Cellular News, 2012a). In late February 2012, the FCC announced that it intended to revoke LightSquared's provisional approval. This, in turn, was expected to affect Sprint Nextel's agreement with LightSquared and it was duly scrapped by Sprint Nextel in late March (Cellular News, 2012b).

LightSquared's financial situation began to look increasingly precarious and Chapter 11 bankruptcy rapidly became the inevitable outcome – a process which allows a company to continue in operation while it restructures its affairs. However, a debtor-in-possession loan in June 2012 meant that the company could at least remain in business for the time being.

Subsequently, it appeared that a stalking-horse bid for LightSquared had been lodged by Dish Network affiliate L-Band Acquisition – this had a superficial value of \$2.2 billion in cash but was worth \$3.3 billion in total after allowing for certain debts taken on. A private-equity firm, Centerbridge Partners, then intervened by tabling a provisional offer of \$3.3 billion in cash and \$5 billion in total, but withdrew soon afterwards citing uncertainty over the eventual date for regulatory clearance to be given for LightSquared to roll out its network. Dish Network duly dropped its own bid in early January 2014 (see below).

In February 2015, LightSquared – now owned by multiple investment groups – rebranded as Ligado Networks (Gibbs, 2016; Wikipedia, 2016e). In December, it noted

that it had settled adjacent spectrum issues with Garmin and Deere and reached a settlement with Trimble. As a result, it would abandon its right to conduct terrestrial operations in the 1545-1555 MHz band but would seek access to alternative downlink spectrum compatible with its uplinks in the 1627.5-1637.5 MHz and 1646.5-1656.5 MHz bands. In February 2016, it proposed that the FCC reallocate the 1675-80 MHz band for sharing by commercial broadband providers and federal government users prior to it being auctioned. Further progress is awaited.

Dish Network

Dish Network – see Wikipedia (2016a) – spent \$2.8 billion buying up 40 MHz of contiguous S-band spectrum (2000-2020 MHz plus 2180-2200 MHz) – this so-called S-band is known in FCC parlance as AWS-4. This was acquired from bankrupt DBSD and TerreStar subject to regulatory approval by the FCC and the resolution of Chapter 11 proceedings. The S-band is considered to be superior to the L-band used by LightSquared because it can be used terrestrially and via a satellite. However, Dish's main problem remained a cash shortfall to fund a full terrestrial roll-out together with a shortage of spectrum. Analysts argued that since the takeover of T-Mobile USA by AT&T had failed to come to fruition, Dish Network should consider merging its spectrum with that of T-Mobile USA or even offering to be bought by AT&T (Gabriel, 2012).

The situation in November 2012 appeared to be that the FCC was prepared to sanction full terrestrial rights, but only if onerous conditions were to be accepted. Dish considered the proposal to be unreasonable and likely to cause yet further delays in its roll-out. The official FCC clearance finally came in mid-December with the expected conditions attached, together with a requirement that Dish Network build out at least 70 per cent of its network within five years.

As noted above, LightSquared was in need of a concrete proposal to take it out of Chapter 11 in November 2013. Thwarted in the execution of its original plans, Dish Network now intervened to place on the table a so-called 'stalking horse' bid for LightSquared spectrum designed to set in motion an auction for LightSquared. The bankruptcy court accepted the \$2.22 billion bid in October 2013 and set the auction date as 25 November. As noted, Dish Network withdrew its bid in early January 2014.

Clearwire

When Sprint took over Nextel, it ended up with the great bulk of the spectrum in the 2.5 GHz band in the largest 100 markets in the USA. Given the existence of other users in the band, it appeared unlikely that Sprint Nextel could use it to roll out any kind of nationwide service, but the FCC imposed a condition for sanctioning the takeover of Nextel in the form of a requirement that the merged company offer services in the 2.5 GHz band to at least 15 million citizens by 2009 and to 15 million more by 2011.

In March 2007, AT&T had sold its entire 2.5 GHz spectrum to Clearwire in order to satisfy one of the conditions attached to its purchase of BellSouth. This meant that, in effect, Clearwire and Sprint Nextel now had the 2.5 GHz field to themselves. In July, Sprint Nextel and Clearwire announced that they now intended to build a joint nationwide WiMAX network branded as Xohm. Each would build out its own network and these would then be

linked via a roaming agreement. By January 2008, Sprint Nextel was said to be desperately seeking partners in Xohm. In May came the announcement that the new partners would be Comcast, Time Warner Cable, Bright House Networks, Intel and Google. They would get a combined 22 per cent stake in a new network branded as Clear, with Clearwire itself holding a further 27 per cent and Sprint Nextel the residual 51 per cent. The deal was sanctioned by the FCC in November 2008 and closed in December. Sprint Nextel chose to provide services over the Clear network acting as a MVNO branded as 'Sprint 4G'. The initial launch was in Baltimore at the end of September 2008.

In June 2011, Sprint Nextel reduced its voting rights in Clearwire to 49.9 per cent to allay shareholders' fears that it would be liable for debts incurred by Clearwire if the latter was deemed to be a subsidiary company.

In August 2011, Clearwire confirmed that it would be overlaying its WiMAX network with LTE technology in the main urban areas provided it could secure the necessary funding. In early December, Sprint Nextel agreed, subject to certain conditions, to pay Clearwire \$926 million in return for unlimited 4G WiMAX retail services during 2012 and 2013. In addition, Sprint Nextel agreed to pay \$350 million in return for LTE capacity provided that Clearwire achieved specified roll-out targets by June 2013. Finally, Sprint Nextel agreed to provide additional equity finance in the event of a further share issue which was needed because, in early December, the owners of SpectrumCo, a group of cable operators including Clearwire investors Time Warner and Comcast, sold their AWS licences to Verizon Wireless for \$3.6 billion, subject to regulatory approval. This meant that they would cease to re-sell Clearwire's 4G services in March 2012. The deal received conditional approval from the Department of Justice and FCC in August 2012.

The SoftBank takeover bid for Sprint Nextel prompted the latter to raise its voting rights in Clearwire from 49.8 per cent to a small majority (without affecting its majority equity stake). This meant that SoftBank would gain control of two companies, each with significant spectrum holdings. In December, Sprint Nextel set in motion a plan to acquire full control of Clearwire. However, this plan was thrown into disarray when Dish Network made an unsolicited bid for the whole of Clearwire in January 2013 – its motives were questionable since, given its majority voting rights in Clearwire, Sprint Nextel could forestall any takeover bid.

In late May 2013, Sprint Nextel tabled an offer for the outstanding Clearwire voting rights which it declared was its 'best and final offer'. Within days, Dish Network responded by raising its own bid contingent upon acceptance by at least half of the minority shareholders (equivalent to one-quarter of the voting shares) and the offer of at least three seats on the board. This raised the possibility that it would end up as a minority shareholder in a company controlled by Sprint Nextel.

Analysts were divided about the relative merits of the two offers for Clearwire. The main benefit of the Dish Network proposal was that it would create a portfolio of 230 MHz of spectrum across a range of bandwidths. This would enable it to provide a multi-play offer in competition with AT&T, Verizon Communications and Comcast. However, there would be a need to invest heavily over a period of years to create the requisite network of cell sites, especially in urban areas, and to integrate the two companies.

Sprint Nextel now raised its offer to \$5 a share, valuing the whole of Clearwire at \$14 billion, nearly three times its value in October 2012 before the bidding war began, and emerged victorious. Meanwhile, pending the closure of the former Clearwire WiMAX network which was pencilled in for November 2015, Sprint began switching the sites over to the provision of LTE using the 800 MHz, 1900 MHz and 2.6 GHz bands. The final permissions to shut Clearwire down were eventually forthcoming in February 2016 with a terminal date of end-March (TeleGeography, 2016a).

The events of 2013 and 2014

As is evident from the above discussion, the restructuring driven by the need to provide high-speed data transfers in the USA became unusually complicated during 2013 and had unique characteristics because of the involvement of satellite operators. It is accordingly sensible at this point to bring the various protagonists together to form an overview of events during the year.

As of mid-June 2013, the position was as follows.

- T-Mobile USA had merged with MetroPCS to form T-Mobile US.
- Dish Network had offered to buy Clearwire.
- Sprint Nextel had offered to buy Clearwire minorities.
- Dish Network had offered to buy a majority of Sprint Nextel.
- SoftBank had offered to buy a majority of Sprint Nextel.
- Dish Network had made a 'stalking horse' offer to buy LightSquared spectrum.

The total amount being committed came to comfortably in excess of \$50 billion, but whereas that might indicate that there were huge synergies there for the taking via any number of possible combinations between the protagonists, it might also be taken as a sign that there was considerable uncertainty as to what might be termed a sustainable longer-term equilibrium structure for spectrum holdings in the USA.

Towards the end of June, the first sign of matters moving toward some kind of resolution came in the form of public recognition by Dish Network that it was no longer an active bidder for Sprint Nextel. Sprint Nextel shareholders overwhelmingly voted in favour of the SoftBank offer and the FCC gave its approval in early July. The takeover was formally completed on 10 July and Sprint Corp. was merged into Sprint Nextel. This created 'new' Sprint which became the parent company of Sprint Nextel with Sprint Nextel its wholly-owned subsidiary – in the process changing its name to Sprint Communications.

Dish Network also withdrew its offer for Clearwire (Telecom.paper, 2013a), in effect admitting that the Softbank/Sprint Nextel/Clearwire link-up was a done deal. The FCC duly approved the Sprint Nextel/Clearwire deal which was completed on 8 July.

It was felt in some quarters that Dish Network would now turn its attention to some kind of link-up with one or more of T-Mobile US, Leap Wireless, nTelos Wireless and US Cellular. However, Leap Wireless was promptly removed from the equation when AT&T made a takeover bid in July (Telecom.paper, 2013b). The assets were transferred in March 2014.

While all of this suggests that Dish Network will remain independent, it cannot be entirely disregarded as a player in the US mobile market. This is partly because Dish Network was set to gain from draft rules published at the end of June 2013 by the FCC in respect of sections of the 1900 MHz H Block (TeleGeography, 2013). This was to be auctioned (via Auction 96) in mid-January 2014 (but postponed) and there would be no interference issues with Dish Network's S-band spectrum. Hence, Dish Network was almost certain to emerge victorious, especially as it had agreed to pay the reserve price of \$1.56 billion as part of a complex deal with the FCC which would allow it to convert part of its 2 GHz AWS-4 spectrum from uplink to downlink. In early March 2014, Dish Network was duly declared to be the winner at the reserve price (Wood, 2014).

However, the real surprise emerged at the year-end when SoftBank announced that it was in advanced negotiations with T-Mobile to take a stake of up to 70 per cent in T-Mobile US – if 70 per cent then the cost would be roughly \$19 billion at the ruling share price (Lawson, 2013) although T-Mobile was talking in terms of nearly \$30 billion in early 2014. The formal takeover bid would be forthcoming, if at all, in 2014H1 and would in effect make SoftBank the clear majority owner of both Sprint and T-Mobile US because it intended to use Sprint as the vehicle for financing the takeover via the US bond market (MarketWatch, 2013).

In July 2014, it was revealed that Softbank now intended to acquire a minimum 50 per cent stake in T-Mobile US, representing the great bulk of what had become Deutsche Telekom's 67 per cent stake in the aftermath of the takeover of MetroPCS (Gabriel, 2014b). Overall, roughly \$40 billion would need to be raised in the financial markets to cover the cost of the takeover, the re-financing of T-Mobile US debt, future purchases of spectrum and on-going operations. The regulatory hurdles that now needed to be jumped were not merely important in themselves but had to be viewed in the context of the huge impositions placed upon T-Mobile US management resources which had been heavily stretched during the recent takeover attempt by AT&T.

Meanwhile, Verizon Wireless remained far less pre-occupied with restructuring than its main rivals because it had remained under the direct control of its majority (now only) owner, Verizon Communications, and hence had not been directly affected by its parent's own successful bid for the stake held by Vodafone.

AT&T had largely kept up with Verizon Wireless in terms of overall subscribers although it was playing catch-up for the time being in relation to LTE. The most significant concerns accordingly related to the other two nationwide incumbents, Sprint and T-Mobile US. For its part, Sprint was showing signs of a fight-back now it was owned by SoftBank. In October 2013, it announced a LTE service branded as Sprint Spark. The intention was that time division LTE (TD-LTE) using unpaired spectrum in the 2.5 GHz band would be combined with paired spectrum in the 800 MHz and 1900 MHz bands with tri-band devices becoming available from November.

SoftBank's negotiations to take over T-Mobile US had the potential to derail this progress because, if successful, the takeover would have forced Sprint to face issues that it had failed to address successfully on the earlier occasion when it had sought to merge its activities with those of Nextel. Once again there was an issue of incompatible technologies – Sprint used CDMA while T-Mobile US used GSM – although it was possible to argue that most 2G customers of both networks would eventually switch to LTE. Once again there was a need to bring together two sets of management with different cultures. While it was true that

SoftBank would be overseeing the process, SoftBank had no prior history of tackling a merger process within an overseas mobile market and there was the not so minor matter of simultaneously sorting out an ongoing role for Clearwire.

In practice, these issues ultimately never needed to be addressed, primarily because the regulatory responses to a SoftBank takeover bid for T-Mobile US were uniformly negative. What the takeover would have done, in effect, was to create a third nationwide operator of a size that would much more closely have matched that of Verizon Wireless and AT&T and hence, in principle, set the scene for tougher competition between three more or less equals. But there would have been very little left of the regional structure that had previously provided competition in most markets given that both Leap Wireless and MetroPCS had already been absorbed by the 'big four'², and the FCC had made it clear on previous occasions – in particular, when it rejected the proposed merger between AT&T and T-Mobile USA – that it wanted to preserve at least four meaningful competitors in every market. It must be said that three nationwide operators do seem to be too few for a market the size of the USA, so in reality it would have come as something of a surprise if either the FCC or the Department of Justice had taken a positive view of this development. In the event, both organisations expressed considerable misgivings about the matter (Reuters, 2014) and expressed pleasure when the deal was called off.

It initially seemed possible that Dish Network would decide to try its luck yet again (Lennighan, 2014b), but matters became more complicated when, at the end of July, Iliad, a French operator using the Free brand for its mobile network and itself valued at roughly \$15 billion, offered \$15 billion for a 56.6 per cent stake in T-Mobile US. Given that it had no operations in the USA, Iliad was unlikely to face regulatory problems but its offer of \$33 a share was thought to be rather less than that being proposed at the time by Softbank – allegedly in the region of \$40 a share or \$31 billion overall – and definitely less than what the shareholders in T-Mobile US had in mind (Telecom.paper, 2014b) which turned out to be a minimum of \$35 a share (Rahn and Kirchfeld, 2014). A key aspect of the bid was the dubious claim that it would generate \$10 billion of synergies even though the two networks were completely independent of one another. Furthermore, Sprint did not provide either a fixed-wire broadband link or pay TV and it is the provision of a full quad-play bundle of services at a rock bottom price that has underpinned Iliad's ability to acquire market share at the expense of the mobile incumbents in France (Middleton, 2014).

It was subsequently claimed that Iliad was touting for partners and, having formed a consortium with two leading private equity funds and Tier-1 international banks, Iliad was able to raise the amount of cash on the table by offering \$36 per share and to increase its proposed stake to 67 per cent. This elicited a response from the T-Mobile US CEO to the effect that 'I can tell you everything you need to know about Iliad. The owner is wealthy, he has got long hair and he made his money in porn'. In October, Iliad formally withdrew its offer (TeleGeography, 2014).

T-Mobile US claims that it is now happy to soldier on alone, but it is thought in some quarters that it remains open to a bid from an operator that is not a competitor – under the terms of the takeover of MetroPCS, Deutsche Telekom must sell its stake to a single buyer. Needless to say, América Móvil was touted as a potential bidder given that it already operated a successful MVNO, TracFone, in the USA. However, it did not appear that it would be left to its own devices given that in June 2015, Dish Network restated its desire to merge with T-Mobile US. The big difficulty was that T-Mobile US had been trading very

successfully which had resulted in a rough doubling of the share price since the MetroPCS takeover in 2013 – this compared to a 85 per cent rise for Dish Network – and hence would now cost in the region of \$62 billion including debt (Gabriel, 2015a). So far, however, neither protagonist has made any kind of formal statement on the issue.

Meanwhile, it was reported in May 2014 that AT&T was preparing a bid worth over \$50 billion for DirecTV, the largest US satellite-TV provider, which would provide AT&T with a fully-nationwide footprint, much improved service bundles and a foothold in Latin America. With this in process – it would inevitably take some time before the initial regulatory opinions were forthcoming – AT&T would have neither the time nor the funds to pursue other targets.

It is significant that, in order to improve its prospects for regulatory clearance given that DirecTV had 18 million pay-TV customers in Latin America, AT&T promptly sold its 8.3 per cent stake in América Móvil to companies controlled by the Slim family. Subsequent to this sale, AT&T acquired two Mexican based wireless operators – Nextel Mexico and Iusacell – in 2015 (AT&T, 2015a and 2015b). In effect, AT&T was swapping one set of assets in Latin America for another, but in the process it was effectively admitting that the stake in América Móvil had not been an integral part of any strategy to become a force on the worldwide mobile playing field. In July 2015, the FCC provisionally approved the takeover of DirecTV subject to specified conditions (Telecompaper, 2015a) and the deal was immediately closed (Telecompaper, 2015b). Subsequently, AT&T has sought to strengthen the new streaming offers that it planned to launch in late 2016. For example, it acquired Canada-based Quickplay Media – an online TV platform that supported AT&T's U-verse TV Everywhere service – in June 2016 (Lennighan, 2016b).

The emergence of multi-play

The move to buy DirecTV by AT&T confirmed a trend that was also visible in Europe, namely the blurring of the traditional demarcation lines between fixed-wire and mobile telephony, the Internet and television. In practice, most operators were moving towards the provision of bundles encompassing combinations of these services known as multi-play or, more commonly since it encompassed all four elements, quad-play. However, it would not be easy for the other mobile incumbents to pursue AT&T's strategy because of the high cost of potential targets. In principle, for example, Dish Network could itself become a target but one that was hardly attractive at a potential cost of \$30 billion. Equally, regional operator CenturyLink was an attractive target but it was already a reseller of Verizon Wireless and Dish Network services and would cost well over \$20 billion.

The need for a facility to offer multi-play is by definition not confined to telecoms operators, and in the case of the USA necessarily involves some substantial cable-TV networks as providers of fixed-wire broadband links. As in the case of the mobile operators, the need to achieve economies of scale was an ongoing issue. In February 2014, for example, Comcast made a take-over bid for Time Warner Cable (TWC) valued at \$45.2 billion. However, this was opposed by regulators on the grounds that the combined entity would hold an excessive share of the broadband market (Nagesh and Flint, 2015) and the bid was withdrawn in April 2015. Shortly thereafter, Charter Communications – the third-largest cable broadband operator in the USA – which had itself made a prior bid worth \$37.4 billion for TWC in January 2014 only to be out-bid by Comcast, returned to the fray with another offer worth

\$56 billion plus roughly \$22 billion in net debt. The bid was also tied in with its previous offer of \$10.4 billion for sixth-largest broadband cable operator Bright House Networks. Regulatory approval was granted in May 2016 – thereby creating the USA’s second-largest cable operator and third-largest pay-TV provider – subject to certain restrictions on arrangements relating to programmers’ provision of content (Telecom.paper, 2016a; TeleGeography, 2016c). Majority ownership of ‘new’ Charter was to be divided between TWC (40-44 per cent), Advance/Newhouse (13-14 per cent) and Liberty Global (owner of Charter and a major force in Europe – 19-20 per cent).

A possible further offer was anticipated from France’s Altice Group – for details see Altice.net – which began its foray into the USA via a takeover bid for 75 per cent of Suddenlink, the seventh-largest cable broadband operator, worth \$9.1 billion in terms of the entire enterprise (TeleGeography, 2015). This was completed in December 2015 thereby creating Altice USA. However, Altice stated that it did not have the management resources available to digest TWC but could adopt a strategy of taking over five or so smaller networks, in the process becoming as large as TWC.

The possible contenders to be taken over were:

- 4th- largest: Cox Communications
- 5th- largest: Cablevision Systems
- 8th- largest: Mediacom
- 9th- largest: Wide Open West.

In September 2015, Altice revealed that it had made an agreed takeover bid (via subsidiary Neptune Holding US) worth \$17.7 billion for Cablevision (TeleGeography, 2016b). In conjunction with Suddenlink, the acquisitions would propel Altice into fourth spot among the cablecos with 4.6 million customers in 20 states. BC Partners and CPP Investments were awarded an option to buy up to 30 per cent of the shares in Cablevision prior to the closing of the transaction in 2016H1 and this option was taken up in October 2015 (Telecom.paper, 2015c). It was noted that whereas Comcast (and some other cablecos) had shown an interest in linking up with a mobile operator, Cablevision had concentrated upon provision via Wi-Fi – it had built out a network of hotspots more aggressively than its rivals and had launched a Wi-Fi-only smartphone service called ‘FreeWheel’.

In this respect its strategy largely mirrored that of Iliad in France – a strategy that had reduced costs and led to a price war and considerable disruption in the mobile market. This had benefited Altice as it had provided an opportunity to buy incumbent mobile operator SFR relatively cheaply. Altice subsequently stated that it would take a break from deal-making in order to digest its recent acquisitions but would make an exception in the unlikely event that privately-held Cox Communications came on the market. The takeover of Cablevision completed all regulatory clearances by June 2016 (Lennighan, 2016a).

As for Comcast, the way forward was potentially to make an offer to buy T-Mobile US which was less than keen on the alternative suitors. It was alleged to be discussing this very matter in June 2015 (Majithia, 2015) although it denied subsequently that this was the case.

Meanwhile, Verizon Communications was also becoming more active in relation to multi-play, albeit not in the cable sector. In May 2015, it tabled a \$4.4 billion takeover bid for AOL which was completed before the end of June. According to Verizon, the prime assets

acquired included AOL's advertising platforms, content brands and subscription services (Lennighan, 2015).

For its part, in August 2015, AT&T announced the launch of the first nationwide package to include mobile and TV services which utilised the assets acquired via the takeover of DirecTV. Branded as 'All in One', the service came with the high price tag of \$200 a month, although this was justified through the provision of four TV receivers, unlimited talk and text minutes for four mobile connections and 10 GB of shared data.

In May 2016, bidding opened for Yahoo! with the more than 10 initial offers including those made by AT&T and Verizon Communications. The bids ranged between \$4 billion and \$8 billion (Telecom.paper, 2016b). In June, Verizon made a second offer which amounted to only \$3.5-4.0 billion because it included Yahoo!'s website businesses but not its patents and real estate. Its main rival appeared to be buy-out firm TPG (Cellular News, 2016a) although AT&T subsequently offered around \$5 billion for the entire package. Having declared a loss in 2016Q1, Yahoo! now appeared to sustain its \$15 billion market capitalisation largely due to its stakes in China's Alibaba and Yahoo! Japan. In mid-July, it was alleged that the bidders were Verizon, AT&T, TPG, Vector Capital and the founder of online lender Quicken Loans. However, what exactly each bid entailed was not revealed. In July, Verizon was declared the winner with a bid of \$4.8 billion including Yahoo!'s search products, digital content brands, advertising and analytics assets and the real estate assets. The deal effectively doubled the size of Verizon's digital advertising business, AOL included, although it still trailed a long way behind Google and Facebook (Lennighan, 2016c).

However, all preceding bids were dwarfed by that made by AT&T for Time Warner in October 2016 which involved \$85.4 billion for the equity – half in AT&T shares equivalent to roughly 15 per cent of AT&T – plus \$23.3 billion of debt taken on, bringing the total cost to \$108.7 billion. The deal was driven by the belief that video would increasingly be watched on smartphones – a view that also underpinned Comcast's (vastly cheaper at \$4.1 billion) purchase of Dreamworks Animation in August 2016 (Comcast, 2016). It is important to note that Time Warner hived off Time Warner Cable in 2009 with the latter being acquired by Charter Communications in 2016 to form Charter Spectrum (Bond, 2016).

Time Warner owns, inter alia, premium content network HBO, film and TV studio Warner Bros Entertainment and media conglomerate Turner. That being the case, immediate fears were expressed that AT&T would be in a position to discriminate against rival content owners that sought to distribute over AT&T's networks and raise prices to rival distributors to carry Time Warner content (Wood, 2016).

The deal was expected to be completed during 2017 after a period of intense regulatory investigation comparable to that which took place after Comcast bid for NBC Universal in December 2009 (Wikipedia, 2016). However, this was a vertical integration and hence the issues were different from a horizontal integration between two mobile operators. AT&T stood to be paid \$500 million by Time Warner if the deal was blocked by regulators whereas Time Warner would have to pay \$1.7 billion to AT&T if it accepted a better offer from another bidder. The deal received the blessing of the EU in March 2017 (Wood, 2017).

The main issue for many analysts is less the regulatory threat than the underlying rationale for the takeover (Hatch, 2016; Telecom.paper, 2016c). They argue that the similar takeover of NBC Universal has not led to a significant improvement in the fortunes of Comcast and they are sceptical that AT&T will emerge with a plan that will enable it to compete successfully with Verizon, Facebook and Google. More specifically, they note for example that content can already be acquired under licence and that AT&T may not be able to improve by much its share of the mobile market simply by virtue of controlling Time Warner content.

In late January 2017, it was alleged that Verizon had made a preliminary approach to Charter Communications which at the time was valued at in excess of \$80 billion (Telecom.paper, 2017b). Leaving aside the difficulties of raising the necessary finance, it would firstly be necessary to gain the approval of John Malone and the Newhouse family, given their substantial stakes in Charter and, secondly to deal with the regulatory implications of fixed-wire overlaps in certain areas such as New York.

Until recently, as discussed above, the focus of mobile operators in the USA has been upon internal market consolidation. The battleground for mobile operators in the USA is that for high-speed data, which in essence currently means LTE-Advanced. Naturally, large sums will be needed for investment in multi-play but there is already considerable financial pressure owing to the roll-out of LTE-A and up-grading to improve downlink speeds. Achieving an internal structure that facilitates this has pre-occupied all US operators and has induced them in recent years to concentrate almost exclusively upon investment in their domestic networks, the only real exception being AT&T's incursion into neighbouring Mexico.

Because the introduction of new technology has been so successful – the USA has amassed far more LTE subscribers to date than any other country – it has proved to be attractive to well-funded foreign predators although things have by no means gone to plan. The departure of Vodafone from Verizon Wireless is not strictly relevant because it reflected Vodafone's long-standing lack of control as a minority shareholder. Softbank appeared to have the resources to make a go of it in the USA but appeared to acknowledge its failure when it was forced to admit in August 2015 that its efforts to sell Sprint to the likes of Comcast and the Altice Group had come to nothing. Softbank's chairman admitted that he had badly misjudged the US regulatory environment and that further progress would probably have to wait until the dust from the Presidential election in 2016 had settled. As for T-Mobile US, it has struggled for some time to decide whether or not it has a future as a stand-alone network.

As shown in Figure I, not only are both Sprint and T-Mobile US the product of M&A activity but since their respective creations they have been subject to frequent actual or rumoured takeover bids. It is, therefore, reasonable to assume that both companies will be the subject of such speculation once again in the near future. It is also worth noting that even though Softbank's attempt to acquire T-Mobile US in late 2013 was unsuccessful, the possibility of such a takeover continues to be discussed by commentators and analysts – see, for example, Barrons (2015), FierceWireless (2015) and Goovaerts (2016). While such a merger would transform the mobile market, creating a substantially larger company that should be better placed to compete against AT&T and Verizon, it would not, of course, create an operator with a triple-play or quad-play facility.

[Figure I roughly here]

Though it is perhaps too early for the impact of the M&A activity outlined above to be evident in the revenue streams of the largest operators, it is possible to identify the broad split between wireless and non-wireless revenues for AT&T and Verizon. As can be observed from Table II, the revenue growth for AT&T has been considerably more than it has for Verizon over the last three financial years – AT&T has added close to \$20 billion in additional revenues, while Verizon has grown by ‘just’ \$11 billion over the same period. Not only does this reflect the purchase of DirecTV by AT&T, but also the larger growth in its wireless subscriber base compared to Verizon. However, somewhat surprisingly, wireless revenues are accounting for a declining proportion of the overall revenues of AT&T. By the end of 2015, wireless revenues accounted for around half of the total revenues of AT&T, with the comparable figure for Verizon being close to 70 per cent. Indeed, whereas the significance of wireless revenues has declined for AT&T between 2013 and 2015, it has increased for Verizon.

This highlights the importance for Verizon of acquiring AOL, as not only would the acquisition generate some revenue in its own right but also help enhance the competitiveness of its other Internet-related businesses. **Equally, AT&T has been driven to make a massive bid for Time Warner in recognition of the fact that whereas DirecTV subscriptions were growing prior to September 2016, these were being offset by similar-sized declines in U-verse TV subscriptions.**

[Table II roughly here]

Although the big four incumbents are almost certainly not going to be allowed to consolidate further among themselves, they have gradually been absorbing the regional players both large (for example, Leap Wireless and MetroPCS) and small, and most of those that are nominally independent are tied to the big four via affiliation deals. With consolidation also proceeding rapidly among the cablecos – there is an excellent diagram illustrating the prior consolidation process in Molla (2014) – the market is certain to end up with a structure that would have been difficult to predict even five years ago – a structure increasingly dictated by the economics of providing multi-play services (Gabriel, 2015b).

In February 2017, it was rumoured that Softbank was willing to cede control of Sprint Corp. via a merger with T-Mobile US that would leave the latter with a controlling stake in the merged entity (Baker, 2017). Softbank had previously attempted to acquire T-Mobile US (see Table I) but at that point in time T-Mobile US was worth less than \$30 billion whereas it was now worth roughly \$53 billion as it had seen a significant growth in subscriber numbers during the intervening period. In contrast, Sprint’s market value had remained fairly constant at \$35 billion although the share price had initially fallen sharply after the collapse of talks in 2014 before staging a recovery.

Deutsche Telekom had made it clear that it was no longer interested in selling its US subsidiary, and hence Softbank was no longer in the driving seat as far as a bringing together of the two operators was concerned. There are many sources of potential synergies were the two operators to merge, but the FCC has stated its strong preference for a market with four national incumbents and it would be surprising if a formal proposal is tabled.

In April, AT&T acquired Straight Path Communication for \$1.25 billion – \$1.6 billion including liabilities and outstanding payments to the FCC (Telecom.paper, 2017c). The deal was driven by the desire to acquire nationwide spectrum suitable for mmWave services in the 28 GHz and 39 GHz bands and to support the development of 5G technologies. However, another bidder – unnamed but alleged to be Verizon – offered \$1.8 billion later in the month.

The moves on AOL and Yahoo! by Verizon Communications are quite revealing in this regard. As things stand, both the fixed-wire and mobile markets are near-saturation, so there is little room to acquire new subscribers without triggering a price war with other incumbents. Improvements in voice, messaging and data packages might help but unlimited voice and text plans are already the norm and per-gigahertz data prices are on the decline.⁴ What AOL had to offer was not simply its content empire but a sophisticated suite of advertising technologies for online and traditional media matched only by Google and Facebook. Verizon is working hard to get its internet video service off the ground having acquired video delivery network Edgecast in 2013 and Intel's media assets in 2014 and AOL's digital platform fits in very well with its plans (Fitchard, 2015). In August 2016, it also provisionally acquired Fleetmatics – a provider of fleet and mobile workforce management services – for \$2.4 billion.

It is reasonable to conclude – and developments involving the likes of Vodafone in Europe indicate this is by no means a trend restricted to the USA – that the future for telcos lies in bringing together networks and content. However, network operators do not have good records when it comes to developing content. Acquiring expertise via takeovers would therefore seem to offer a better way forward, but there are always issues of integrating different cultures to deal with as history shows only too well (Curwen, 2000).

Conclusion

Multi-play has developed at quite different speeds in different countries because of the historic ownership structures of its various elements. In Europe, for example, France is a market leader in the take-up of quad-play, as it is even measured in worldwide terms, and the likes of Portugal and Spain are not so far behind (Dargue and Lin, 2015). Yet, despite the fact that quad-play bundles have been available in the USA for a decade or so – currently, for example, AT&T, Comcast, Cox, Time Warner and Verizon are providers – take-up is very low as is also the case in Germany and the UK.

So what can network operators in the USA do, in the absence of further M&A activity, to ensure that they secure a profitable role in a multi-play world? The first point to make is that because multi-play involves bringing together a number of historically separate services that customers have paid for via service-specific subscriptions, there has to be a price advantage in favour of the purchase of a bundle if take-up is to take off. That is very much the case in France, for example, but it does not currently hold true in the USA. This is somewhat surprising given that, in principle, multi-play delivers four clear benefits – reduced rates of churn because subscribers are locked into bundles, a greater share of the entire market for relevant services, economies of scale and improved opportunities for cross-selling.

However, set against these benefits are a number of potential drawbacks including difficulties in integrating the separate parts of bundles and cannibalisation of revenues from existing

products due to price reductions. Furthermore, latecomers are likely to struggle more than is usual for a specified service such as mobile.

A particular issue is obviously mobile/fixed-wire substitution. Once a mobile contract providing a significant data allowance has been taken out – especially if it is all-you-can-eat – there is an incentive to do away with fixed-wire connectivity altogether, especially if the likes of Netflix are available independently. So-called ‘over-the-top’ (OTT) services are increasingly viewed as substitutes for fixed-wire provision and as a particular substitute for Pay-TV (Cellular News, 2016b; Wikipedia, 2016b and 2016c). The relatively young are especially prone to relying exclusively on mobile connectivity (Cellular News, 2016a).

This is not simply because once you leave home you rely upon your laptop or smartphone. The basic reality is that expenditure on communications is steadily rising as a percentage of total expenditure and needs to be kept under some sort of control. According to Knutson and Gryta (2015), households in the USA were spending on average in excess of \$190 per month for the various elements of quad-play in 2013, a rise of 25 per cent overall in five years, but for Internet access alone the figure was up 78 per cent. Not surprisingly, this produces the phenomenon of ‘sticker shock’ which can be avoided by the simple expedient of paying for each service separately (even if at a greater overall cost).

An example is cited whereby if the bill of a T-Mobile average subscriber in 2013, at \$145 per month, was to be combined with that of a Dish Network average subscriber at \$86 per month, the total would rise above \$200 even with a bundle discount if the two companies were merged. For this reason, the big four mobile operators are less enthused than one might expect about quad-play, recognising that smaller packages of, say, Pay-TV channels directed specifically at mobile-only subscribers – over half of all adults were claimed to be living in mobile-only homes at the end of 2016 (Telecom.paper, 2017a) – may be a better way forward.

In parts of Europe, the belief remains that quad-play is the way forward – in the UK, for example, fixed-wire incumbent BT has recently bought mobile incumbent EE and Vodafone is busy acquiring fixed-wire connectivity across its European markets. However, quad-play in the UK could cost a customer £100 with a large mobile data allowance so, as in the USA, the potential market is limited without significant bundling discounts. As Virgin Media – the cableco that is the primary UK provider of quad-play – demonstrates, the key is to offer something approaching a 50 per cent discount on non-mobile services for one year to new customers, but they are likely to be reluctant to continue when they see the cost of the service soar in year two. In any event, this strategy is more problematic where access is not by cable but – at least in part – by often antiquated copper lines where the access speed is much lower. This suggests that the need for fibre access is a crucial aspect for the future development of quad-play.

In other words, whether in the UK or USA where no tradition of multi-play exists, time and investment are needed with the pay-off to be measured in years rather than months. Furthermore, the decline in revenue from voice and texting – which is often nominally thrown in as a free extra even though it is increasingly used as a substitute for a voice call – is likely to continue. Hence, it is reasonable to suppose that M&A activity will continue to be the hallmark of the US communications market as a varied range of service providers puzzle out how to combine in cost-effective ways.

In February 2017, the new chairman of the FCC appointed by the incoming Trump administration, Ajit Pai, called for a greater degree of ‘regulatory humility’ in order to stimulate more investment in 5G and fibre networks. He declared that the FCC would not rule on the Time Warner takeover although that did not imply that it would ignore future consolidation activity. Ultimately, Pai wanted to establish a ‘modern, flexible framework that recognises that the industries are dynamic and converging’ (Fildes, 2017).

Notes

1. Multi-play has evolved through dual-play and triple-play to its increasingly common form of quadruple- or quad-play which includes a fixed-wire voice connection, a broadband Internet connection, a mobile voice and data connection and pay-TV.
2. For an overview of the changing strategy of AT&T, see, for example, Curwen & Whalley (2004: Chap 4).
3. AT&T, T-Mobile US and Sprint have all shut down the cdma2000 or WiMAX networks they inherited as part of their M&A activity. Verizon intends to shut down its historic cdma2000 network in 2019.
4. During 2016, the ‘big four’ have turned increasingly to competition via so-called ‘unlimited data plans’. In practice, these are not exactly as described since, for example, users typically have their downlinks throttled to 128 kbps when they reach pre-determined upper limits. However, it is of no small interest that it is the two smaller networks, T-Mobile US and Sprint, that are undercutting their larger rivals and in effect acting as disruptors – see, for example, Flanagan (2016), Meyer (2016) and Total Telecom (2016).

References

- AT&T (2015a), ‘AT&T closes acquisition of Mexico wireless provider Iusacell’, www.att.com, 16 January.
- AT&T (2015b), ‘AT&T completes acquisition of Nextel Mexico’, www.att.com, 30 April.
- AT&T (2016), *Mobilising your world - AT&T Inc. 2015 annual report*, Dallas, Texas, available at: www.att.com
- Baker, L. (2017), ‘Exclusive: Softbank willing to cede control of Sprint to entice T-Mobile - sources’, www.uk.reuters.com, 18 February.
- Barrons (2015), ‘Could Sprint, T-Mobile form a REIT, then merge?’, www.barrons.com, 23 September.
- Bond, P. (2016), ‘AT&T clarifies its intent to buy Time Warner (not a similarly named cable company)’, www.hollywoodreporter.com, 24 October.
- Cellular News (2012a), ‘Blow to LightSquared as government agency says GPS interference cannot be solved’, www.cellular-news.com, 16 January.
- Cellular News (2012b), ‘Sprint Nextel scraps \$9 billion network sharing deal with LightSquared’, www.cellular-news.com, 20 March.
- Cellular News (2013), ‘Leap shareholders approve \$1.2 billion takeover bid from AT&T’, www.cellular-news.com, 1 November.
- Cellular News (2016a), ‘Verizon preparing \$3 billion Yahoo bid’, www.cellular-news.com, 7 June.
- Cellular News (2016b), ‘Quarter of millennials are OTT-only broadband households’, www.cellular-news.com, 20 June.
- Comcast (2016), ‘NBCUniversal completes DreamWorks Animation acquisition’, www.corporate.comcast.com, 22 August.
- Curwen, P. (2000), ‘Hey presto! How to turn Monopoly money into real money with a wave of the magic merger wand – The AOL-Time Warner merger’, *info*, 2(4), 379-89.
- Curwen, P. (2005), ‘Consolidation in the USA: does bigger mean better?’, *info*, 7(5), 61-63.
- Curwen, P. (2007), ‘Anatomy of a merger: Sprint Nextel’, *info*, 9(4), 86-88.
- Curwen, P. and Whalley, J. (2004), *Telecommunications strategy – Cases, theory and applications*, Routledge, London.
- Dargue, M. and Lin, J. (2016), ‘The quad-play balancing act’, www.cartesian.com, 30 August.
- European Commission (2016), ‘Press release. Mergers: Commission prohibits proposed acquisition of Telefónica UK’, <http://europa.eu>. 11 May.
- FCC (2006a), *Annual report and analysis of competitive market conditions with respect to commercial wireless services*, 11th report, www.fcc.gov, 29 September.

FCC (2014), *Annual report and analysis of competitive market conditions with respect to mobile wireless, including commercial mobile services*, 17th report, www.fcc.gov, 18 December.

FCC (2015), *Annual report and analysis of competitive market conditions with respect to mobile wireless, including commercial wireless services*, 18th report, www.fcc.gov, 23 December.

FierceWireless (2015), 'Sprint, T-Mobile could combine network assets into a new company, analysts argue', www.fiercewireless.com, 22 September.

Fildes, N. (2017), 'Trump's new FCC chairman calls for 'regulatory humility' on 5G', <http://www.ft.com>, 1 March.

Financial Times (2007), 'Alltel agrees \$27.5 bn private equity buyout', www.ft.com, 21 May.

Fitchard, K. (2015), 'The real reason Verizon bought AOL', <http://fortune.com>, 24 June.

Fitch Ratings (2011), 'The road to 4G', www.fitchratings.com, 3 August.

Flanagan, T. (2016), 'T-Mobile, Sprint add fuel to US unlimited data price war', <http://rethink-wireless.com>, 23 August.

Gabriel, C. (2012), 'Dish can play all sides in US 4G fall-out', www.rethink-wireless.com, 17 January.

Gabriel, C. (2013), 'SoftBank lures Sprint investors with more cash', www.rethink-wireless.com, 11 June.

Gabriel, C. (2014b), 'Sprint reaches deal for TMO, but regulators beckon?', www.rethink-wireless.com, 15 July.

Gabriel, C. (2015a), 'T-Mobile has better options than Dish merger', www.rethink-wireless.com, 16 June.

Gabriel, C. (2015b), 'Altice buys Cablevision as quad play reaches US', www.rethink-wireless.com, 17 September.

Gibbs, C.. (2016), 'LightSquared rebrands as Ligado Networks but spectrum plans remain cloudy', www.rethink-wireless.com, 9 February.

Goovaerts, D. (2016), 'Could Sprint end up buying T-Mobile after all?', www.wirelessweek.com, 28 March.

Hatch, O. (2016), 'A dose of reality on the AT&T-Time Warner merger', <http://rethink-wireless.com>, 6 December.

Hillen, B. (2013), 'AT&T purchase of Leap Wireless brings Cricket under new ownership', www.slashgear.com, 12 July.

Knutson, R. And Gryta, T. (2015), 'Are Americans ready to pay for 'quad play'?', www.wsj.com, 5 June.

Lawson, S. (2013), 'SoftBank and DT near a deal on the Sprint/T-Mobile merger', www.totaltele.com, 25 December.

Lennighan, M. (2014a), 'T-Mobile US to pay \$2.4 billion for Verizon spectrum', www.totaltele.com, 6 January.

Lennighan, M. (2014b), 'Dish interested in T-Mobile US, warns against "betting on Washington"', www.totaltele.com, 9 May.

Lennighan, M. (2015), 'Verizon completes \$4.4bn AOL takeover', www.mobileworldlive.com, 24 June.

Lennighan, M. (2016a), 'Altice gets final regulatory OK for Cablevision buy', www.totaltele.com, 16 June.

Lennighan, M. (2016b), 'AT&T announces quick closure of Quickplay buy', www.totaltele.com, 30 June.

Lennighan, M. (2016c), 'Verizon announces \$4.83bn Yahoo buy', www.mobileworldlive.com, 25 July.

Majithia, K. (2015), 'Comcast in T-Mobile US takeover talks', www.totaltele.com, 30 June.

MarketWatch (2013), 'Softbank may buy U.S. bonds to buy T-Mobile', www.marketwatch.com, 25 December.

Meyer, D. (2016), 'Verizon under spotlight following T-Mobile, Sprint unlimited data moves', www.rcrwireless.com, 24 August.

Middleton J (2014) Sprint calls off chase for T-Mobile; Hesse on way out. <http://www.telecoms.com>, 6 August. 2014

Molla, R. (2014), 'Chart: two decades of Cable-TV consolidation', www.bloomberg.com, 13 February.

Moritz, S. and C. Rahn (2011), 'AT&T pulls its \$39 billion bid for T-Mobile', www.bloomberg.com, 20 December.

Nagesh, G and J. Flint (2015), 'Charter's deal with TWC more likely to get approval than Comcast', www.wsj.com, 26 May.

Osawa, J. (2012), 'SoftBank deal for Sprint turns on spectrum', <http://online.wsj.com>, 21 October.

Rahn, C. and A. Kirchfeld (2014), 'Deutsche Telekom said open to T-Mobile talks at \$35/Share', www.bloomberg.com, 29 August

Ramachandran, S. (2012), 'Dish frustrated in dream of breaking into wireless', www.totaltele.com, 20 November.

Reuters (2014), 'Update 2 – FCC chief tells Sprint chair he is sceptical on T-Mobile deal', www.reuters.com, 4 February.

Telecom.paper (2012), 'Sprint backs out from MetroPCS at last hour', www.telecompaper.com, 7 March.

Telecom.paper (2013a), 'Dish withdraws Clearwire tender offer', www.telecompaper.com, 27 June.

Telecom.paper (2013b), 'AT&T to acquire Leap Wireless', www.telecompaper.com, 14 July.

Telecom.paper (2014a), 'AT&T agrees DirecTV takeover for USD 48.5 bln', www.telecompaper.com, 19 May.

Telecom.paper (2014b), 'France's Iliad makes takeover bid for T-Mobile US', www.telecompaper.com, 31 July.

Telecom.paper (2015a), 'FCC set to approve AT&T's DirecTV takeover with conditions', www.telecompaper.com, 22 July.

Telecom.paper (2015b), 'AT&T's completes acquisition of DirecTV', www.telecompaper.com, 27 July.

Telecom.paper (2015c), 'Altice to sell 30% stake in Cablevision to investors', www.telecompaper.com, 27 October.

Telecom.paper (2016a), 'Charter, TWC merger wins DoJ, FCC approval with conditions', www.telecompaper.com, 26 April.

Telecom.paper (2016b), 'AT&T joins bidding for Yahoo! - report', www.telecompaper.com, 26 May.

Telecom.paper (2016c), 'AT&T and Time Warner: not a trend to follow', www.telecompaper.com, 25 October.

Telecom.paper (2017a), 'Over half of US adults now live in mobile-only homes', www.telecompaper.com, 18 January.

Telecom.paper (2017b), 'Verizon approaches Charter about potential takeover - report', www.telecompaper.com, 26 January.

Telecom.paper (2017c), 'AT&T acquires Straight Path, with spectrum, for USD 1.25 bln', www.telecompaper.com, 10 April.

TeleGeography (2013), 'FCC sets wheels in motion for 1900MHz H block auction', www.telegeography.com, 28 June.

TeleGeography (2014), 'Iliad ditches T-Mobile US bid citing lack of interest from DT', www.telegeography.com, 14 October.

TeleGeography (2015a), 'Charter close to USD55bn TWC deal; Altice boss arrives in NYC for takeover talks', www.telegeography.com, 26 May.

TeleGeography (2015b), 'Altice to 'pause' US expansion... unless Cox goes on the market', www.telegeography.com, 25 September.

TeleGeography (2016a), 'Final nail in the coffin for US WiMAX network; Clearwire switch-off to conclude on 31 March', www.telegeography.com, 2 February.

TeleGeography (2016b), 'FCC grants approval for Altice takeover of Cablevision', www.telegeography.com, 5 May.

TeleGeography (2016c), 'FCC approves Charter takeover of TWC, Bright House', www.telegeography.com, 9 May.

TeleGeography (2016d), 'Private equity firm TPG linked with USD2.25bn swoop for US cablecos', www.telegeography.com, 15 August.

Total Telecom (2016), 'U.S. mobile industry roundup: 600 MHz auction and unlimited data plans', www.totaltele.com, 18 August.

Verizon (2015), *Financial and operating information as of December 31, 2014*, 22 January, available at: www.verizon.com

Verizon (2016), *Financial and operating information as of December 31, 2015*, 21 January, available at: www.verizon.com

Wikipedia (2016a), 'Dish Network', http://en.wikipedia.org/wiki/Dish_Network, 20 June.

Wikipedia (2016b), 'Over-the-top content', http://en.wikipedia.org/wiki/Over-the-top_content, 20 June.

Wikipedia (2016c), 'Telco-OTT', <http://en.wikipedia.org/wiki/Telco-OTT>, 20 June.

Wikipedia (2016d), 'Acquisition of NBC Universal by Comcast', http://en.wikipedia.org/wiki/Acquisition_of_NBC_Universal_by_Comcast, 25 October.

Wikipedia (2016e), 'Ligado Networks', http://en.wikipedia.org/wiki/Ligado_Networks, 25 October.

Wood, N. (2013a), 'T-Mobile, MetroPCS merger closes'. www.totaltele.com, 19 March.

Wood, N. (2014), 'Dish spends \$1.56bn in US spectrum auction', www.totaltele.com, 3 March.

Wood, N. (2016), 'AT&T to test regulators' resolve with \$85.4bn Time Warner acquisition', www.totaltele.com, 24 October.

Wood, N. (2017), 'EU OKs AT&T-Time Warner tie-up', www.totaltele.com, 15 March.

Table I: Main M&A activity involving US-based operators, January 2004 to August 2016

Bidder	Target	Date	Value \$billion
Cingular Wireless	AT&T Wireless	February 2004	41.0
T-Mobile USA	Cingular Wireless assets	May 2004	2.3
Sprint	Nextel	December 2004	35.0 ¹
Alltel	Western Wireless	January 2005	4.4 + 1.5 debt
SBC Communications	AT&T	January 2005	16.0
Sprint Nextel	Alamosa Holdings	November 2005	3.4 + 0.9 debt
AT&T (SBC)	BellSouth	March 2006	67.0 + 17.0 debt
Verizon Communications	Vodafone USA	May 2006	48.0 + 6.0 debt
Goldman Sachs/TPG	Alltel	May 2007	27.5
AT&T	Dobson Communications	July 2007	2.8 + 2.3 debt
Verizon Communications	Rural Cellular	July 2007	0.8 + 1.9 debt
MetroPCS	Leap Wireless	September 2007	5.5 + 2.0 debt
Verizon Wireless	Alltel	June 2008	5.9 + 22.2 debt
CenturyTel	Qwest	April 2010	10.6 + 11.8 debt
AT&T	T-Mobile USA	March 2011	39.0
Dish Network	MetroPCS	August 2012	4.0
T-Mobile USA	MetroPCS	October 2012	2 ²
SoftBank	Sprint Nextel	October 2012	20.1 ³
Sprint Nextel	Clearwire	December 2012	2.2 ⁴
Dish Network	Clearwire	January 2013	4.9
Dish Network	Sprint Nextel	April 2013	25.5 ⁵
AT&T	Leap Wireless	July 2013	1.2 + 2.8 debt
AT&T	DirecTV	May 2014	48.5 + 18.6 debt
Softbank	T-Mobile US	July 2014	⁶
Iliad	T-Mobile US	July 2014	15.0 ⁷
AT&T	Nextel Mexico	January 2015	1.4 + 0.4 debt
AT&T	Iusacell	April 2015	1.8 + 0.7 debt
Verizon Communications	AOL	May 2015	4.4 ⁸
Charter Communications	Time Warner Cable	May 2015	56.7 + 22.0 debt ⁹
Charter Communications	Bright House Networks	May 2015	10.4
Altice Group	Suddenlink	May 2015	9.1 ¹⁰
Altice Group	Cablevision Systems	September 2015	17.7 ¹¹
Verizon Communications	Yahoo!	June 2016	3.5 ¹²
AT&T	Yahoo!	June 2016	5.0 ¹³
Verizon Communications	Fleetmatics	August 2016	2.4
TPG	RCN/Grande Comms	August 2016	2.3 ¹⁴
AT&T	Time Warner	October 2016	85.4 + 23.3 debt

Notes:

1. Technically a 'merger of equals' but designed so as to give Sprint shareholders 51% of the merged company.
2. See section on MetroPCS..
3. Bid for a 71% stake. Successful after bid altered to \$21.6 billion (with a larger cash element) for a 78% stake.
4. Bid for the outstanding 51%.of voting rights.
5. Bid for a 78% stake, causing SoftBank to raise its own offer to \$21.6 billion.
6. Agreed in principle but details undisclosed prior to discontinuing negotiations in August 2014.
7. In cash for a 56.6% stake. The \$33 a share offer was thought to be below that under consideration by Softbank and was formally withdrawn in October.
8. Completed in June.
9. Following on from the rejection by regulators of Comcast's 2014 take-over bid for TWC.
10. For a 70% stake. The takeover was completed in December.
11. In October, a 30% stake was sold to BC Partners and the Canada Pension Plan Investment Board – owners of the residual 30% stake in Suddenlink – for \$1 billion. The Federal Communications Commission approved the deal in May 2016 and other regulators in June.
12. For the website assets.
13. For the entire company. As a result of two security breaches at Yahoo! in September and December 2016, the price was lowered by \$350 million to \$4.48 billion in February 2017.
14. See TeleGeography (2016d).

Table II Emerging multi-play operators: AT&T and Verizon

Company		31 December		
		2013	2014	2015
AT&T	Total revenues \$ billions	128.7	132.4	146.8
	Wireless revenues, \$ billions ¹	69.9	73.9	73.7 ²
	Wireless customers, 000s	110,376	120,554	137,324
	Video connections, 000s	5,460	5,943	37,934
	In-region access lines, 000s	24,639	19,896	16,670
	Broadband connections, 000s	16,425	16,028	15,778
Verizon	Total revenues, \$billions	120.5	127.1	131.6
	Wireless revenues, \$ billions	81	87.6	91.7
	Wireless customers, 000s	102,799	108,211	112,108
	Fios digital connections, 000s	15,582	16,867	17,615
	Total voice connections, 000s	21,085	19,795	18,387
	Broadband connections, 000s	9,015	9,205	9,228

Notes:

1. Wireless revenues are presented in two ways in AT&T (2016): by line of business and as an aggregated total for AT&T Mobility. For the financial years ending 31 December 2013 and 2014, these are the same but for 2015 they differ as the figure for AT&T Mobility refers to domestic wireless revenues only. Domestic revenues are reported here.
2. This figure does not include international wireless revenue of \$1.647 billion.

Sources:

AT&T (2016), Verizon (2015, 2016)