



Sustainability of pre-2017 telecoms land rents

A Cebr report for Protect and Connect: Annex to
*Response to 2021 DCMS consultation on changes
to the Electronic Communications Code*

September 2021

Disclaimer

Whilst every effort has been made to ensure the accuracy of the material in this document, neither Centre for Economics and Business Research Ltd nor the report's authors will be liable for any loss or damages incurred through the use of the report.

Authorship and acknowledgements

This report has been produced by Cebr, an independent economics and business research consultancy established in 1992. The views expressed herein are those of the authors only and are based upon independent research by them.

The report does not necessarily reflect the views of Protect and Connect.

London, September 2021

Contents

Executive Summary	4
Introduction	4
Pre-2017 telecoms land rents	4
The changing structure of the telecoms market	5
Mobile operators' and infrastructure providers' profitability and investment.....	6
Consumer prices	6
Discussion of results.....	7
Introduction	8
Context.....	8
Existing Cebr work for Protect and Connect	8
Purpose and structure of this report.....	9
Pre-2017 telecoms land rents	10
Land rent evidence.....	10
Telecommunications Survey 2019	10
Analysys Mason: Financial impact of ECC changes	13
Discussion of evidence	14
The changing structure of the telecoms market	15
How and why the market is changing	15
Implications for the sustainability of pre-2017 telecoms rents.....	19
Mobile operators' and infrastructure providers' profitability and investment	20
Profitability evidence	20
Mobile network operators' financial performance	20
Revenue pressure on mobile operators	23
Infrastructure providers' financial performance	25
Investment evidence.....	27
Discussion of evidence	31
Consumer prices.....	32
Consumer price evidence	32
ONS consumer price data	32
Operator data	33
Other sources	33
Potential impact of land rents on consumer prices.....	34
Discussion of evidence	35
Discussion of results	36

Executive Summary

Introduction

The government's 2017 reforms to the Electronic Communications Code were intended to speed up investment in the UK's mobile infrastructure, such as the rollout of 5G. They are widely perceived as having failed in this objective, leading to the Department for Digital, Culture, Media & Sport (DCMS) launching a consultation on further changes.

The key change imposed by the 2017 reforms was a new valuation mechanism, which significantly reduced the rents paid to providers of sites for telecoms infrastructure. This has also resulted in delays to rollout, as landowners are reluctant to accept rents at these levels, resulting in protracted negotiations and litigation over access to land.

Recent research by Cebr suggested that the 2017 reforms have resulted in:

- Site providers losing £209 million per year in revenues.
- Delays to 5G rollout which will cost the UK £6.0 billion in GDP over the next decade.

Telecoms companies that benefit from lower land rents under the new valuation mechanism have advanced the argument that prior to 2017 rents were unsustainable and these reforms were therefore necessary despite the costs to site providers. This report sets out to test that claim by considering the following questions:

1. Was the growth in rents prior to the 2017 reforms high in relation to broader measures of price growth?
2. Might rents have been expected to grow rapidly in the absence of the 2017 reforms?
3. Do rental levels or growth therein have a substantial impact on the profitability of mobile network operators or wholesale infrastructure providers?
4. Do rental levels or growth therein have a substantial impact on investment in infrastructure by mobile network operators or wholesale infrastructure providers?
5. Do rental levels or growth therein have a substantial impact on consumer prices?

Pre-2017 telecoms land rents

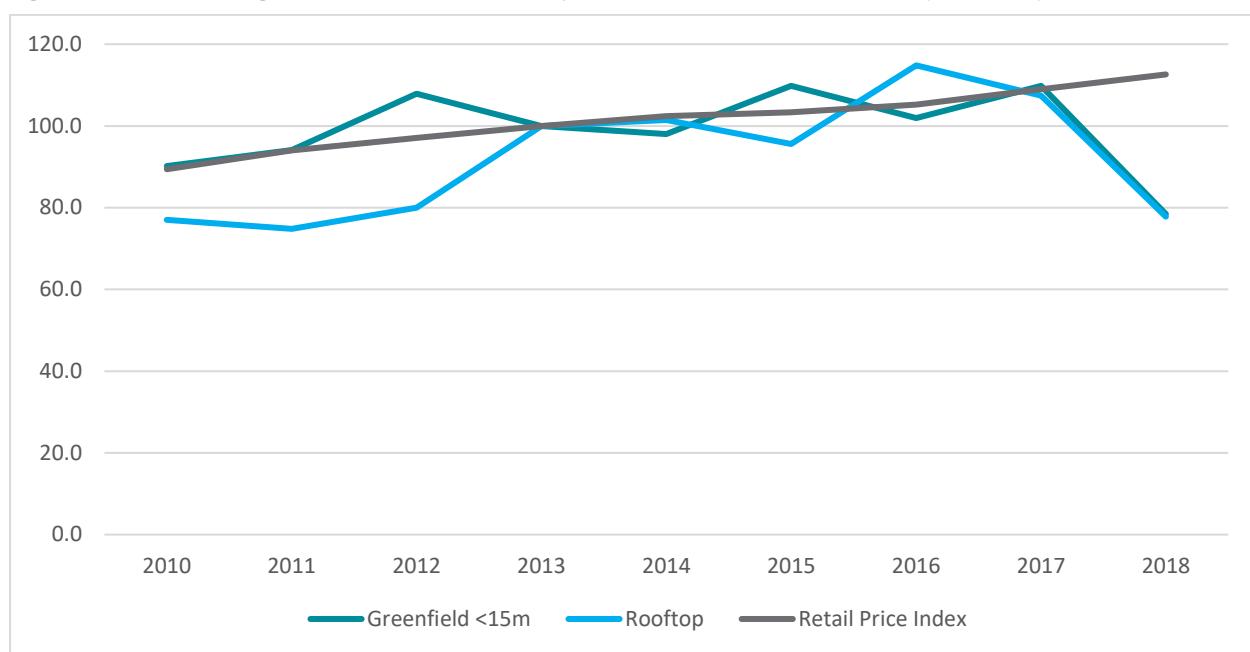
Survey evidence shows that between 2013 and 2017, rents for greenfield sites rose by 9.8% and those for rooftop sites rose by 7.4% – slightly above and slightly below the 9.0% increase in RPI over this period (see Figure 1). Whilst there had been a sharp increase in rooftop rents in the early 2010s, in the run-up to the 2017 reforms rent increases were moderate. Rent levels (or their growth) over this decade do not appear to have been an impediment to the deployment of 4G networks in the UK.

Prior to the 2017 reforms, Analysys Mason produced some independent forecasts of how total site rental expenditures by operators would change between 2015 and 2020. They estimated that there would be a £60 million (22%) increase related to factors affecting all operators, however most of this was not due to rent increases:

- £29 million (48.3%) due to inflation
- £16 million (26.6%) due to construction of new sites
- £13 million (21.7%) due to upgrades and site sharing (co-location)

This leaves just £2 million (3.3% of the total increase) accounted for by rent increases at renewal. Moreover, for O2 and Vodafone, expected rent increases overall were just 14% due to planned consolidation of their mast sites.

Figure 1: Annual rents for greenfield sites <15m and rooftop sites, Retail Price Index, 2010-2018 (2013 = 100)



The changing structure of the telecoms market

Mobile telecoms infrastructure is increasingly built and operated not by the mobile operators themselves, but by infrastructure providers – although all four operators have a stake in one of two joint ventures. In the UK, the market is dominated by:

- Cellnex, an independent ‘Towerco’ which hosts equipment from various operators in exchange for licence fees
- Cornerstone, a Towerco set up as a joint venture by O2 and Vodafone
- MBNL, a joint network-sharing venture of EE and Three

The emergence of these companies has a few implications for the mobile telecoms market:

- Downward pressure on land rents, as Towercos and joint ventures are likely to enjoy significant market power and to negotiate harder as land rents are a larger proportion of their overall costs.
- A reduction in the number of mast sites required, as tenancy ratios increase.
- Potential pro-competitive effects, as Towercos will offer a ‘ready-made’ tower network to potential new mobile operators, allowing them an easier route to market.
- Mobile operators have new ways of accessing liquidity, either by spinning off towers into a separate company and holding an IPO (as Vodafone has with part of Vantage Towers) or by selling towers to a Towerco like Cellnex and leasing them back. Where land rents are lower (as in the UK under the ECC, relative to the rest of Europe) the profitability and therefore value of tower infrastructure is higher.
- The link between land rents and operators’ finances is weakened, as savings realised due to lower land rents accrue, in the first instance, to Towercos. Therefore, they may not be passed onto operators, particularly given the lack of competition among infrastructure providers. In any case, prices charged to operators are fixed for the duration of (often quite long-term) contracts – and there is no guarantee that rental savings will be passed on at renewal either.
- In some instances, Towercos acquire sites via freeholds or long leaseholds rather than renting land – this may help them and landowners to avoid some of the issues associated with the current dysfunctional market.

Mobile operators' and infrastructure providers' profitability and investment

The available evidence suggests that mobile operators are facing profitability pressures driven by declining revenues and stagnant costs – both in the UK and abroad. Therefore, the rent reductions sought under the reformed ECC may reflect a response to these competitive pressures, rather than to unsustainable rents. Vodafone, which operates in multiple countries, has enjoyed healthier earnings performance (measured by EBITDA) in the UK than in Europe as a whole – so these pressures are not UK-specific.

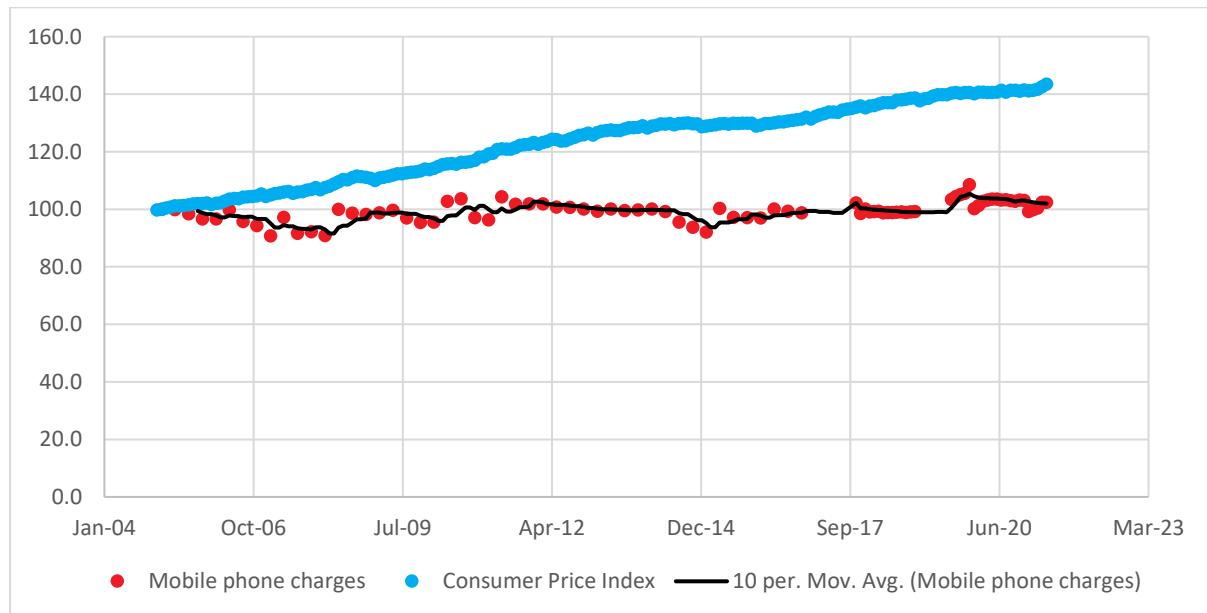
Annual capital expenditures by the four UK mobile operators stood at just over £2.5 billion in 2017 – over 10 times the rent savings brought about by the 2017 reforms – and had been steadily rising in the years immediately before.

The data on operators' and infrastructure providers' investment in new equipment is limited, but that which does exist suggests that for both Vodafone and Cornerstone it declined after 2017 – which does not support the view that the reforms to the Code would unlock further investment.

Consumer prices

Between 2005 and 2021, the overall consumer price index (CPI) rose by over 40% (as shown in Figure 2). The mobile phone charges component of CPI rose by just 2.5% – and there is nothing to suggest that the 2017 reforms applied any downward pressure on this. Operator data and existing research suggests that per-customer revenues have declined in recent years – though recently all four operators have announced significant price increases.

Figure 2: Mobile phone charges component of CPI vs overall Consumer Price Index (Feb 2005 = 100)



Even on an extremely generous set of assumptions, changes in land rents could not have significant impacts on consumer prices – at most around 35p per month (£4.20 per year) per subscriber.

Discussion of results

There is no firm definition of what constitutes an ‘unsustainable’ rent for a telecoms mast site. The evidence considered in this report does not, however, support the operators’ view that pre-2017 rents were unsustainable:

- Rents were growing at a moderate level in the years preceding the 2017 reforms and were forecast to continue doing so even without reform.
- The emergence of dedicated infrastructure providers has driven consolidation of sites and may have weakened the market position of site providers. This has also substantially weakened the link between land rents and operators, as savings are not necessarily passed onto them, even in the long term.
- There were genuine pressures on operators’ profitability, but these were driven primarily by competitive pressures on revenues.
- There is no indication that operators’ investment in mobile infrastructure has increased as a result of the drastic reduction in rents following the 2017 reforms.
- Relative to operators’ overall revenues and investment, the changes in rents paid to site providers are small.

The key question for government is this:

“Did the previous reforms not go far enough in their attempts to ease access to land, or did they go too far?”

This report, and the previous work to which it forms an annex, suggest the latter. The financial impacts of lower rents are – for operators – relatively small. The real impact of the 2017 reforms has been to create a large increase in protracted negotiations and litigation, creating a bottleneck in infrastructure deployment.

Introduction

Context

In 2017, the Department for Digital, Culture, Media & Sport (DCMS) made major reforms to the Electronic Communications Code, the legislation which governs relationships between operators of telecommunications infrastructure and the owners of land on which this infrastructure is or may be located (site providers). Key changes included the introduction of a new valuation mechanism, introduction of some automatic rights to upgrade and share, and transfer of jurisdiction over disputes to the Lands Chamber of the Upper Tribunal.

These reforms are widely perceived as having failed in their goal of speeding up telecoms infrastructure rollout. As a result, DCMS launched a fresh consultation on further reform, for which Cebr prepared a response on behalf of Protect and Connect in March 2021.

An argument made by infrastructure operators and their representative organisations is that prior to the 2017 reforms, rents charged by site providers were unsustainable, necessitating changes to the valuation mechanism that in turn significantly reduced the rents site providers were able to secure. To quote Belinda Fawcett, general counsel and director of property and estates for Cornerstone (an infrastructure provider established as a joint venture between Telefónica and Vodafone): “*The government introduced the new legislation because the unsustainable high level of rents was slowing down the industry from deploying the mobile infrastructure we desperately need across the country and have come to depend on in recent times. Speeding up the rollout of mobile technologies is critical to society, particularly in our post-pandemic recovery.*”¹

This report will consider evidence from a variety of sources to assess the claim that pre-2017 rents were unsustainable.

Existing Cebr work for Protect and Connect

Response to 2021 DCMS consultation on changes to the Electronic Communications Code ('the consultation response') brought together industry evidence, academic research, and legal evidence to evaluate the impacts of various models for the Electronic Communications Code on economic growth and site providers' revenue. It found that:

- Following the 2017 reforms which introduced the Current Code, mobile network operators and wholesale infrastructure providers began attempting to negotiate land rents for telecoms masts based on 'no-scheme' valuations and to enforce these through legal action.
- The resulting increase in litigation and protracted negotiations has led to delays in the rollout of new mobile infrastructure, including 5G. The estimated cost of this slowing of rollout is £6.0 billion over the next decade (relative to the Old Code).
- Based on figures from the operators themselves, these reforms also cost site providers £209 million per annum.
- The reforms under consideration by DCMS (the Proposed Code) would only slightly speed up rollout. Expediting legal disputes and introducing retrospective changes to agreements are attempts to tackle the symptoms of the current disputes, but do not address their cause – the valuations mechanism. Site providers would lose out by an estimated £50 million annually, on top of the loss from the 2017 reforms.

¹ Welsh farmers feel the pinch over reduced telecom mast fees, The National, May 2021. [Link](#).

- Alternative reforms based on the Law Commission's proposals prior to the 2017 changes (the Alternative Code) would restore market-based valuations alongside new safeguards against (rare) abuses of monopoly power by site providers, effective Alternative Dispute Resolution, whilst avoiding more drastic measures like making or allowing courts to impose changes to existing agreements.
- This would largely reverse the revenue impact on site providers and would generate significant economic benefits to the UK through faster rollout – worth £7.4 billion over the next decade relative to the Current Code.

Purpose and structure of this report

This report, which forms an annex to the consultation response, aims to establish the validity of the claim that pre-2017 telecoms rents were unsustainable.

A conclusive ‘yes’ or ‘no’ answer is difficult to establish, as there are no firm rules for determining what constitutes a ‘sustainable’ or ‘unsustainable’ level of rent. Nevertheless, it might be argued that rents were unsustainable if they were having a significant, detrimental effect on operators’ profitability, investment in infrastructure, or consumer prices; or if rapid growth in rents threatened to do so.

Therefore, this project will set out to answer the following questions:

1. Was the growth in rents prior to the 2017 reforms high in relation to broader measures of price growth?
2. Might rents have been expected to grow rapidly in the absence of the 2017 reforms?
3. Do rental levels or growth therein have a substantial impact on the profitability of mobile network operators or wholesale infrastructure providers?
4. Do rental levels or growth therein have a substantial impact on investment in infrastructure by mobile network operators or wholesale infrastructure providers?
5. Do rental levels or growth therein have a substantial impact on consumer prices?

If the answer to most or all of these questions is clearly ‘Yes’, the argument that rents are unsustainable would appear to be valid and vice-versa.

The rest of this report is therefore structured as follows:

- **Pre-2017 telecoms land rents:** examining trends in telecoms rents prior to the 2017 reforms. This will help to answer [question 1](#) and [question 2](#).
- **The changing structure of the telecoms market:** discussing the rise of ‘Towercos’ and joint ventures and their implications, which is relevant to [all questions](#) above.
- **Mobile operators’ and infrastructure providers’ profitability and investment:** analysing the available data on the financial performance of operators and infrastructure providers in comparison with their investment in infrastructure. This will help to answer [question 3](#) and [question 4](#).
- **Consumer prices:** analysing public and operator data on prices charged to consumers. This will help to answer [question 5](#).
- **Discussion of results:** bringing together the results of the preceding analysis and research and coming to conclusions.

Pre-2017 telecoms land rents

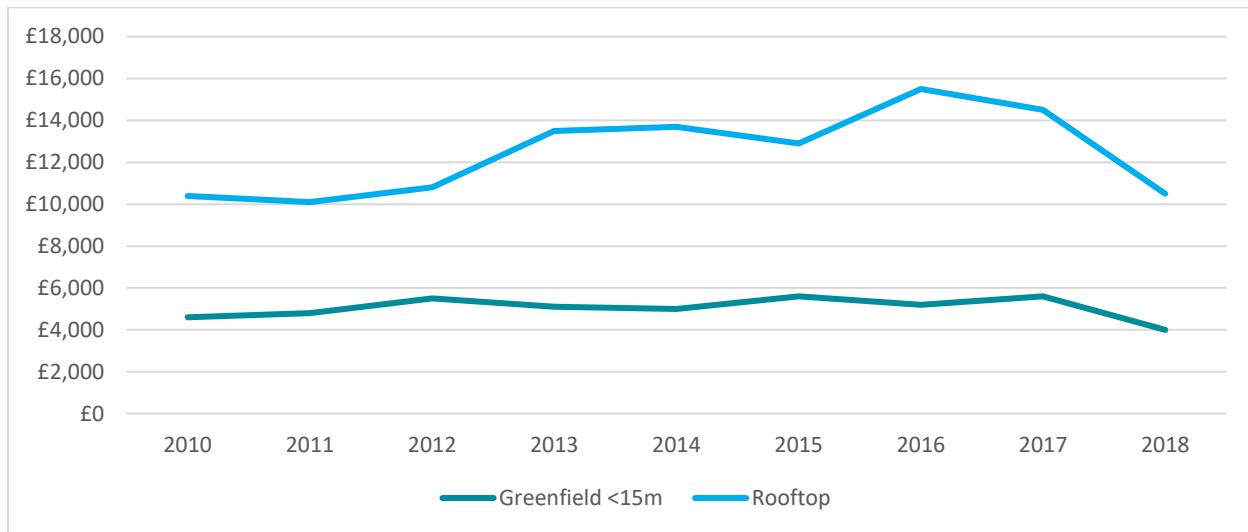
Land rent evidence

Telecommunications Survey 2019

Given the private, commercial nature of agreements between operators and site providers, comprehensive data on telecoms land rents is not available. Recent tribunal cases provide some more recent figures, but only for a subset of agreements (those where rent has been imposed through the legal process) and only for post-2017 leases.

The Strutt & Parker 2019 Telecommunications Survey², however, provides evidence on mast site rents for the years 2010-2018, with responses for greenfield sites less than 15m tall and for rooftop sites. These are shown in Figure 3³.

Figure 3: Annual rents for greenfield sites <15m and rooftop sites, 2010-2018



A sharp fall in rents is apparent in 2018, the year after the 2017 reforms to the ECC – by 26% for greenfield sites and 28% for rooftop sites⁴. In the years immediately preceding the reforms – roughly 2013-2017 – rents changed relatively little, though those for rooftop sites were certainly more volatile, and had increased sharply between 2011 and 2013 and again in 2016. Possible reasons for the 2011-2013 increase include:

- The London 2012 Olympics, which created an urgent need for increased capacity in various city centres where events were being held.
- Upgrading of sites (and therefore increase in per-site rents) to host both Vodafone and O2 following the creation of Cornerstone. This would have occurred earliest in urban centres where returns are highest and rooftop sites dominate.

² *Telecommunications Survey 2019*, Strutt & Parker, August 2019. [Link](#).

³ Figures are non-exact, based on careful inspection of bar charts, as full data is not provided in the document.

⁴ This is less than Speed Up Britain's recent figure of 63% for the fall in rents following the reforms, indicating that the full effects of the changes to the ECC were not felt immediately.

Figure 4 and Figure 5 also include the annual Retail Price Index⁵ for comparison, with figures indexed to their 2010 and 2013 values respectively. Different index years illustrate the importance of the 2011-2013 jump in rooftop rents. As shown in Table 1, relative to an index year of 2010 rooftop rents rose 39% by 2017, whilst the RPI went up by 22%. With a 2013 index year, rental increases for greenfield sites are only slightly above that in the RPI, and those for rooftop sites are somewhat below – despite the substantial increase in 2016.

Figure 4: Annual rents for greenfield sites <15m and rooftop sites, Retail Price Index, 2010-2018 (2010 = 100)

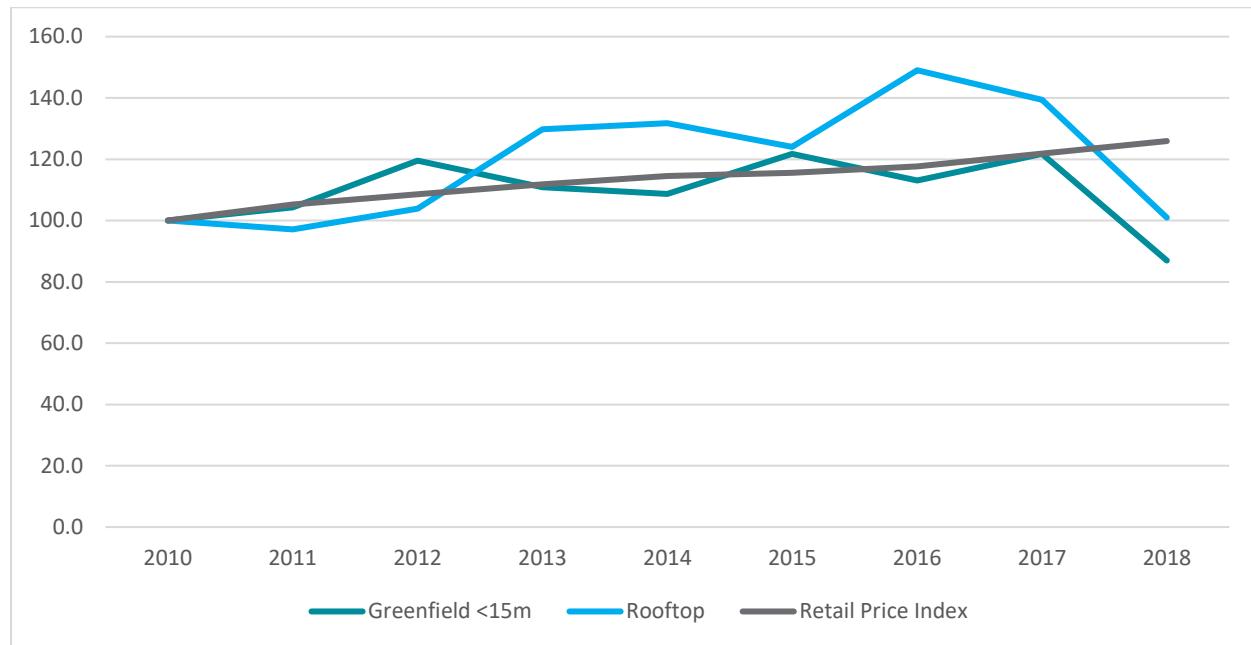
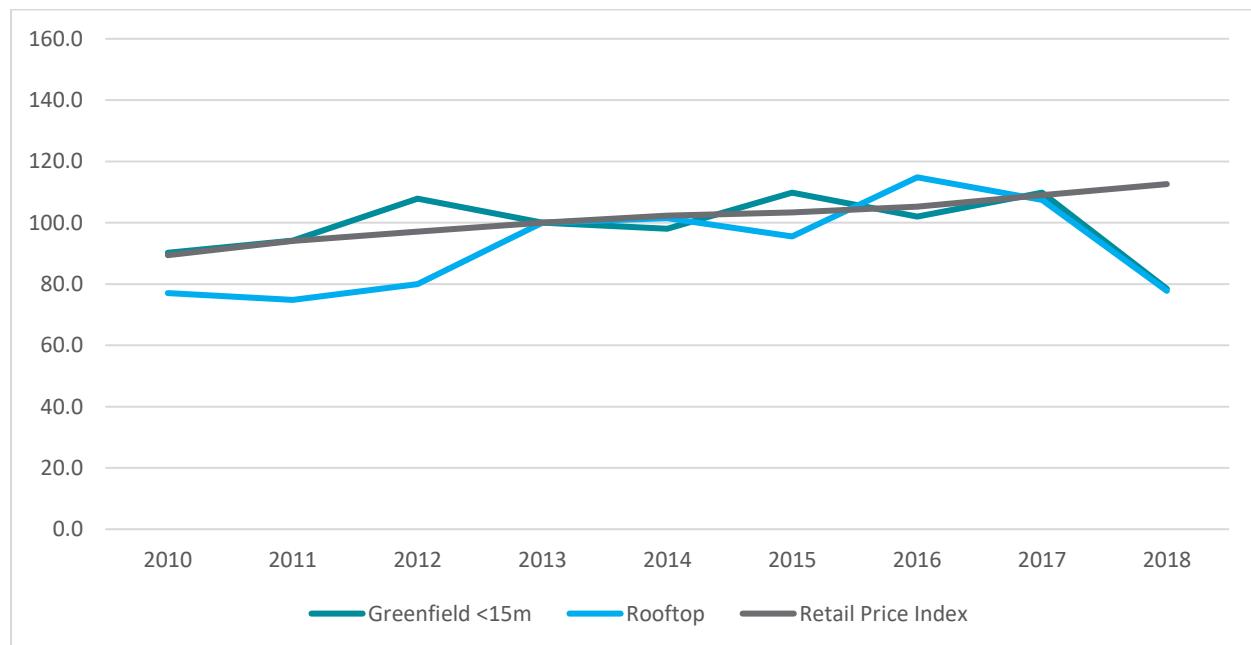


Figure 5: Annual rents for greenfield sites <15m and rooftop sites, Retail Price Index, 2010-2018 (2013 = 100)



⁵ RPI All Items Index: Jan 1987=100, ONS. [Link](#). RPI has been used rather than CPI as it includes property costs.

Table 1: 2017 values of rents and RPI for different index years

	2017 value, 2010 index year	2017 value, 2013 index year
Greenfield rents	121.7	109.8
Rooftop rents	139.4	107.4
Retail Price Index	121.9	109.0

Had rooftop site rents continued to rise as they had in the early 2010s, it would certainly be arguable that their growth had become unsustainable. Their growth did, however, slow down after this and in the years preceding the reforms to the ECC, which suggests that rapid growth earlier in the period was driven by isolated factors, rather than being a long-term trend. The increase in rooftop rents in 2016 also looks like a one-off – this may have been driven by 2012/2013 agreements, which had seen significant increases, coming up for review (and even including this, growth in rooftop rents was below that in RPI).

The Strutt & Parker survey also highlights some points which, while not directly relevant to rental levels, do demonstrate some consequences of the 2017 reforms to the ECC and wider changes in the market:

- In the three years prior to the new Code being introduced, site providers sought to restrict rights to share, with 62% of new leases specifying the operators entitled to use the site⁶. This suggests that site providers were concerned about the burden on them of additional sharers being imposed without compensation or reward. This may have been driven not by the 2017 reforms or expectation thereof, but by the consolidation of leases under the Cornerstone and Mobile Broadband Network Limited projects (discussed in more detail in the following chapter), and site providers wishing to avoid having to accept two tenants on one lease.
- 74% of new leases included three-yearly rent reviews, compared to 60% (and 37.5% five-yearly) in the previous survey. If these more frequent reviews were requested by operators, it would suggest that they were seeking early opportunities to impose lower rents once the new Code was in place. Over the three years prior to the survey, just 8% were RPI only reviews, suggesting a reluctance on the part of operators to link rents to retail prices, preferring instead to use Open Market Valuation (OMV).
- New lettings have declined since the new Code was enacted (though Strutt & Parker do not provide figures for this), with operators focusing on reducing the cost of existing sites rather than expanding coverage.

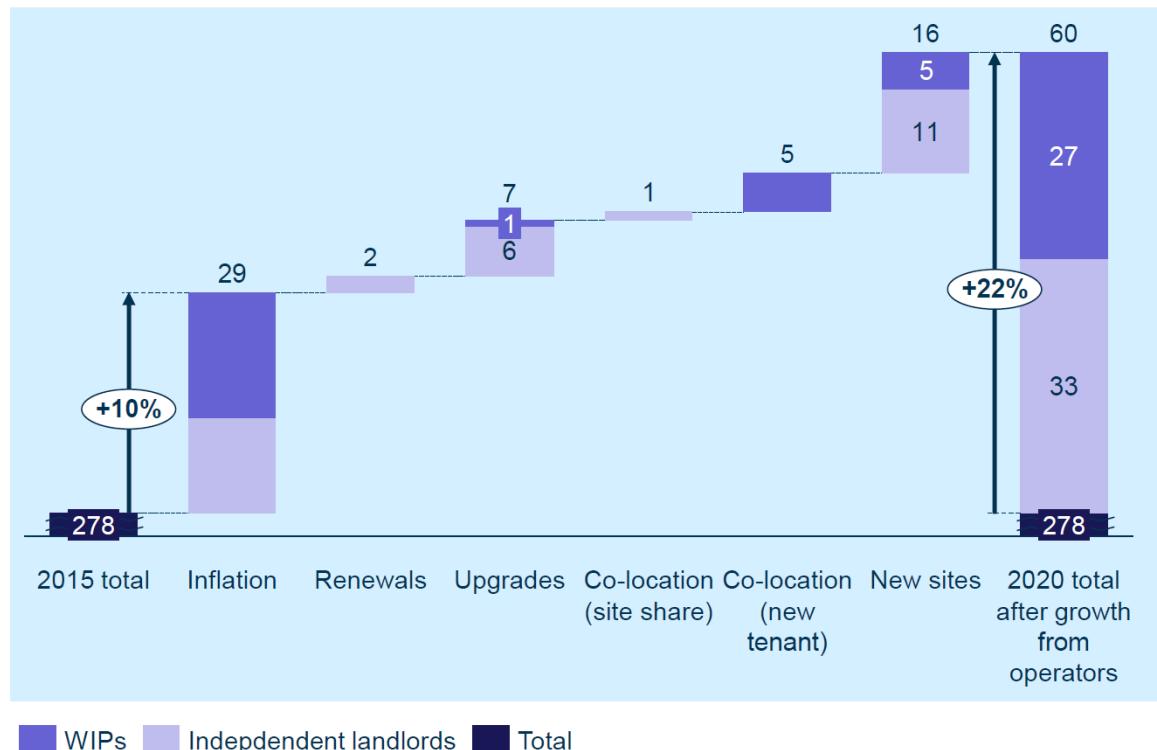
⁶ The [2016 survey](#) does not provide a comparable figure for leases which specify operators allowed to use the site. The 2019 survey does, however, report that ‘only 12% provide for a payaway based on a percentage of the site share income enjoyed by the Operator.’ – the corresponding figure in 2016 was 62%, suggesting that the recent reforms have discouraged the use of mechanisms which reflect some of the benefits of site sharing directly to the operator.

Analysys Mason: Financial impact of ECC changes

This report⁷, prepared in 2016, examined the impacts of the then-proposed changes to the ECC on behalf of DCMS. The key output of this work was a set of forecasts for growth in rent paid by operators. These estimated that:

- Between 2015 and 2020 the industry would see net growth in nominal rents paid of 14%, assuming no changes to the Code.
- The operators involved in 'Project Beacon' (Vodafone and O2, the owners of Cornerstone) were expected to see lower growth in rents due to consolidation of sites. EE and Hutchison 3G were expected to see a larger increase, of 22%. The emergence of Towercos and joint ventures is discussed in the next chapter.
- Considering the growth in rents from factors affecting all operators (i.e. the 22% growth for EE and Hutchison 3G), almost all of this was accounted for by inflation, new sites, or increased rents for upgrading and sharing, as shown in Figure 6.
 - £29m (48.3% of the £60m increase) is accounted for by inflation (it is not clear whether this is CPI or RPI). It is reasonable to expect that rents would increase in line with general inflation.
 - £16m (26.6%) is accounted for by new sites and £13m (21.7%) by upgrades and co-location. These do not reflect increases in per-site rents, but operators either establishing more sites (including Emergency Services Network sites) and therefore rental agreements or using sites more intensively.
 - £2m (3.3%) is accounted for by renewals. This is the only element which reflects a 'genuine' increase in per-site rental levels.

Figure 6: Forecast 2015-2020 growth in rent from factors affecting all operators, £ million (graph from Analysys Mason report)



⁷ *Financial impact of ECC changes*, Analysys Mason, May 2016. [Link](#).

Whilst these are only forecasts and need to be treated with an appropriate degree of caution, they are drawn from an independent report and are based on industry submissions and interviews. Therefore, they do provide reasonable evidence that in the absence of the 2017 reforms, rents would have increased only moderately, and almost all of this increase would be accounted for by an external macroeconomic factor beyond the control of operators and site providers (inflation) or by market demand for improved coverage, capacity, and technology (new sites or improvements to existing sites).

The report also estimated the total cost (in net present value terms) to an operator of ownership of a tower over a 20-year period. This assumed annual land rent of £5,500, typical for a greenfield site prior to the 2017 reforms. Total cost of ownership was estimated at £242,000, with land rent comprising £63,000 of this – just over 25% of cost – with the estimated £150,000 capital expenditure dominating.

Discussion of evidence

The evidence considered in this chapter should help to address:

- **Question 1:** Was the growth in rents prior to the 2017 reforms high in relation to broader measures of price growth?
- **Question 2:** Might rents have been expected to grow rapidly in the absence of the 2017 reforms?

Whilst there are limitations on the quality and quantity of evidence available, what there is does not support a 'Yes' answer to either of these:

- Survey evidence from Strutt & Parker shows that greenfield rents rose only a little more quickly than the RPI in the 2010-2017 period. Rooftop rents increased by more, but this was driven by a few years of high growth in the early 2010s rather than a long-term trend – in the period 2013-2017, they grew more slowly than RPI.
- Independent forecasts made by Analysys Mason prior to the 2017 reforms suggested that while rents would rise in the 2015-2020 period, almost all of this would be accounted for by inflation, new sites, and upgrading and sharing. Moreover, this work demonstrated that consolidation of sites was driving cost reductions.

The changing structure of the telecoms market

How and why the market is changing

There are four mobile network operators (MNOs) in the UK, each of which has several mobile virtual network operators (MVNOs) ‘piggybacking’ on its network. The four MNOs are Vodafone, Telefonica UK (branded as O2), EE (part of BT Group), and Hutchison 3G UK (branded as Three).

A relatively recent development in the telecoms market is the emergence of wholesale infrastructure providers (WIPs, or ‘Towercos’) and network-sharing joint ventures. These companies own and operate mast sites, hosting equipment from multiple operators in exchange for licence fees.

The key players in the UK market are:

- Cellnex, a Spanish company which acquired Arqiva’s wireless division in 2019. It operates mast sites and hosts equipment from multiple operators in exchange for licence fees. It is by far the largest independent (i.e. not affiliated with any operators) infrastructure provider in the UK.
- Cornerstone (CTIL), a joint venture of Vodafone and Telefonica UK which was announced in 2012⁸. It owns sites across Europe and primarily serves its shareholders as anchor tenants. Vodafone recently transferred its shareholding to Vantage Towers, a company set up to manage its European tower infrastructure – but still owns (indirectly) a substantial proportion of Cornerstone⁹.
- Mobile Broadband Network Limited (MBNL), a joint venture of EE and Hutchison 3G UK which was launched in 2007¹⁰. It is responsible for operational management of the radio access network (RAN) and shared infrastructure of its shareholders. Whilst it acquires certain assets relevant to the shared network, it is not a full ‘Towerco’¹¹.
 - Cellnex is currently attempting to acquire Three’s tower infrastructure (including a 50% stake in MBNL). This has been challenged by the Competition and Markets Authority and is discussed further later in this chapter.

Although the emergence of Towercos is recent, it does not appear to be linked to the UK’s ECC reforms in 2017, as this is a Europe-wide phenomenon (Cornerstone and Cellnex both have operations across the continent). Even without Towercos, there was significant potential for those seeking access to land for telecoms infrastructure (primarily the four mobile operators) to enjoy monopsony power. From the point of view of site providers, four

⁸ *Telefonica UK and Vodafone UK to strengthen their network collaboration*, Vodafone, June 2012. [Link](#).

⁹ Following its IPO, Vantage Towers is 81.1% owned by Vodafone ([Link](#)). Vantage Towers owns Central Tower Holding Company BV ([Link](#), section 2.1.1), which owns 50% of the shares in Cornerstone (with the rest held by two O2 companies) according to its latest confirmation statement on Companies House ([Link](#)).

¹⁰ *T-Mobile and 3 UK build Europe’s largest shared 3G network*, Comms Business, April 2010. [Link](#).

¹¹ *Site Acquisition*, Cellnex UK. [Link](#).

mobile operators have turned or are turning into a market dominated by two operator-owned joint ventures, plus Cellnex, which may intensify this.

Moreover, for these entities acquiring and managing mast sites are core parts of their business, and land rents will make up a bigger component of costs – therefore they will focus comparatively more on lowering or preventing growth of rents. These developments exert downward pressure on land rents independent of the regulatory environment – though in the prospectus released ahead of its IPO¹², Vantage Tower references a ‘*Significant ground lease cost saving opportunity over the long term on existing and new sites under the Electronic Communications Code ("ECC")*’, saying that they will retain 30% of net savings.

Cellnex appears to be taking this a step further, by purchasing freeholds or long leaseholds for some of its greenfield sites, along with access rights. Long leasehold interests are sometimes created for rooftop sites¹³. Provided that these transactions are settled equitably, this may avoid some of the issues with rent levels and access to land in the current market for land rentals – but it is not clear whether or not this is the case, or how significant the number of sites affected is.

The following sub-sections discuss possible outcomes from or reasons for the rise of infrastructure sharing in the UK telecoms market.

Telecoms infrastructure as a natural monopoly

A ‘natural’ monopoly is one which exists due to powerful economies of scale, meaning that a single, large provider (at least within a particular geographical area) is much more efficient than multiple providers. In the case of mobile masts, there are high fixed costs involved in securing planning permission and building the infrastructure. This creates an incentive to use them highly efficiently – rather than each operator building their own network of towers and several towers covering the same area. As previously discussed, Analysys Mason estimated the 20-year cost of a ‘self-build’ tower at £242,000. The corresponding cost for a WIP licence was estimated at just £126,000¹⁴.

Project Beacon (the consolidation of O2 and Vodafone sites) and Project Godiva (the EE-Three equivalent) drove increased sharing of radio access networks (RAN) between operators. By their nature, independent towercos like Cellnex provide services to multiple operators. As tenancy ratios (operators served per tower) increase, fewer new tower sites will be needed to provide full coverage. There may be limits to how far this goes, due to:

- Physical constraints on how much equipment or capacity a single tower can provide.
- Different operators’ coverage requirements.
- Regulation on EMF emissions per tower.

12 *Growing Vantage Towers in the UK: Commercialisation of Cornerstone Agreed*, Vantage Towers, January 2021. [Link](#).

13 Notwithstanding continued ‘unilateral’ projects by some providers, including masts constructed and shared as part of the Shared Rural Network.

14 *Financial impact of ECC changes*, Analysys Mason, May 2016. [Link](#). Pages 10-11. The report does acknowledge that there are other factors to consider: a self-build site has lower annual operating costs and a capex element which is depreciated yearly, which improves EBITDA; renegotiation of licence fees can generate tensions between operators and WIPs. The headline cost saving does, however, provide a powerful incentive to operators to use WIP sites.

- New sites in ‘not-spots’ (i.e. through the Shared Rural Network) or high-demand areas (for instance micro urban sites – though these may avoid some of the current issues over access to land).
- Concerns over resilience – for example the consequences of a single mast which serves lots of people in an urban area going ‘offline’ would be serious.

Capacity constraints, rather than the need to extend coverage, appear to be the dominant factor in the building of new sites for Vodafone and O2. Vantage Towers has committed to 1,200 new macro sites by 2025¹⁵. 950 of these are due to ‘unwinding’ of existing site-sharing arrangements into two separate sites. A further 150 are under the government-subsidised Shared Rural Network (SRN), leaving just 100 entirely new committed sites being provided on a commercial basis. Notwithstanding this, any reduction in the number of telecoms mast sites required (relative to a market without Towercos and joint ventures) will reduce the influence of land rents on operators’ overall costs.

Therefore, Towercos and network-sharing joint ventures can be seen as a response to a clear set of economic incentives which compel maximisation of the use of infrastructure (regardless of the regulatory environment). This is no bad thing – but it raises the question of how unsustainable telecoms rents were in the context of developments which make them a smaller factor in operators’ overall cost base and reduce the relative market power of site providers.

As an aside, a potentially negative impact – from the perspective of mobile operators, but not consumers – is that Towercos could serve to *increase* competition by enabling new players to enter the market. The existence of independent Towercos catering to multiple operators means that a prospective new mobile operator has access to a ‘ready-made’ tower network, and as established by Analysys Mason buying licences is cheaper and quicker than building their own towers. This is, however, not very likely given the pressure on existing operators’ revenues (discussed later).

Moreover, new operators’ ability to enter the market would depend on the willingness and ability of Towercos to enter into agreements with them, with existing operators’ equipment already in place – and as discussed above there is little competition in the infrastructure market. The Competition and Markets Authority has found that the proposed purchase of Three’s UK passive infrastructure by Cellnex raises competition concerns¹⁶. Key points from their Phase 1 decision paper include:

- Cellnex is already the largest independent tower company in the UK by quite some margin. Acquiring Three’s ‘unilateral’ sites would represent a substantial increment to Cellnex’s share of sites, which would increase further upon the transfer of sites from MBNL. In the counterfactual, where these sites were bought by another purchaser, Cellnex would have faced a significant additional competitive constraint.
- Other independent WIPs pose ‘only a limited constraint’ on Cellnex. Following the acquisition of the Three and MBNL sites, the next-largest competitor would have a share of supply less than 10%, with the remaining competitors having shares less than 5% (this does not include the towers held by operators for their own self-supply).

15 Growing Vantage Towers in the UK: Commercialisation of Cornerstone Agreed, Vantage Towers, January 2021. [Link](#).

16 Cellnex / CK Hutchison UK towers merger inquiry, UK Government, July 2021. [Link](#).

- Self-supply of towers by MNOs and their joint ventures constrains Cellnex to some extent, but they are unlikely to strengthen competition (and therefore constrain Cellnex further) by making their sites available to other customers.
- The CMA believes that there will be insufficient competition from other suppliers to constrain the post-merger Cellnex. Their chief economic adviser, Mike Walker, said: *"It's important that services provided to mobile networks remain competitive so that the millions of businesses and consumers across the UK that use mobile phones can enjoy lower prices. (...) Cellnex is already the largest independent supplier of mobile towers in the UK. We're concerned that this deal could help to lock in this position and prevent the emergence of new direct competition."*¹⁷ – this reduction in competition is expected to lead to higher prices, and – presumably – to a weaker link between changes in the costs of mobile infrastructure (such as land rents) and operators' finances.

Towercos as a source of liquidity

Separating infrastructure from their core business provides an opportunity for operators to access cash:

- Vodafone's recent IPO of Vantage Towers¹⁸ raised them €2.3 billion, valuing the company at €12.1 billion. Vodafone has said it will use these proceeds to cut its debt¹⁹.
- By selling their towers and then leasing them back from Towercos, operators can effectively borrow at reasonably low interest rates of a level and duration that would otherwise not be available.

Assuming payments from operators to Towercos are fixed (Cornerstone's prospectus refers to a blended average anchor fee of £17k per site), lowering rents paid to site providers increases the value of towers, making both ways of raising cash more lucrative. Therefore, while the Towerco system is in place across Europe, the low land rents brought about by the ECC in the UK make it especially lucrative there and increase the value of towers to operators.

Weakening the link between operators and land rents

Under a purely 'self-build' model a reduction in rents paid to site providers, such as that induced by the 2017 ECC reforms, would immediately and commensurately reduce operators' costs. These savings might then be passed on to consumers in the form of lower prices or invested in infrastructure – although even then there is no guarantee of this, and savings may instead be reflected in dividends or debt repayments.

The long-term nature of Towerco licence agreements means that this link is weakened or, in at least the short term, severed entirely. Vantage Towers fixed rents with its anchor tenants (Vodafone and O2) for 8 years²⁰ – therefore any changes in rents (in either direction) will not

17 Cellnex and CK Hutchison deal raises competition concerns, UK Government, July 2021. [Link](#).

18 A company set up to manage its European tower infrastructure, and to which it has transferred its shareholding in Cornerstone.

19 Vodafone's Vantage Towers climbs after Germany's biggest IPO since 2018, Reuters, March 2021. [Link](#).

20 Growing Vantage Towers in the UK: Commercialisation of Cornerstone Agreed, Vantage Towers, January 2021. [Link](#).

be felt by these operators for at least that period. Cellnex has agreements of as long as 35 years with anchor tenants (i.e., those who sold the tower to them) and 5-6 years with secondary tenants. They also operate ‘all or nothing’ renewals. Operators cannot pick and choose which towers to renew at the end of a contract, so unless they have been able to replicate an equivalent tower network of their own (a very expensive undertaking) or secure an agreement to provide comparable coverage via another infrastructure provider (unlikely given the small number of WIPs in the UK), they are effectively ‘locked in’ to long-term agreements with index-linked growth of licence fees.

Savings in rents which do not benefit operators cannot, by definition, be passed onto consumers. Even when contracts are renewed or agreed for the first time, Towercos will not necessarily be compelled to pass savings onto operators in full – and this will only intensify if competition in the infrastructure market reduces further (for instance if Cellnex acquires CK Hutchison’s towers). Similar arguments apply to operators’ investment in new infrastructure – however, it is possible (though by no means certain) that Towercos themselves will invest in infrastructure in response to lower rents.

Implications for the sustainability of pre-2017 telecoms rents

The progressive growth of Towercos (plus joint ventures) as middlemen between site providers and operators has a few implications for the argument that rents were unsustainable prior to 2017:

- Greater monopsony power faced by site providers would act to limit growth in rents per tower and curb monopoly power, regardless of ECC reforms.
- Towercos drive more efficient use of infrastructure and therefore a smaller number of towers. Other things being equal this holds down overall rental costs.
- The link between land rents and consumer prices, and between land rents and mobile operators’ investment, is weakened due to the market power of Towercos and long-term contracts between them and operators. Many of these contracts are also exclusive (in the case of operator-owned joint ventures) or operate all-or-nothing renewals, further reducing the chances of lower land rents being passed on.

Mobile operators' and infrastructure providers' profitability and investment

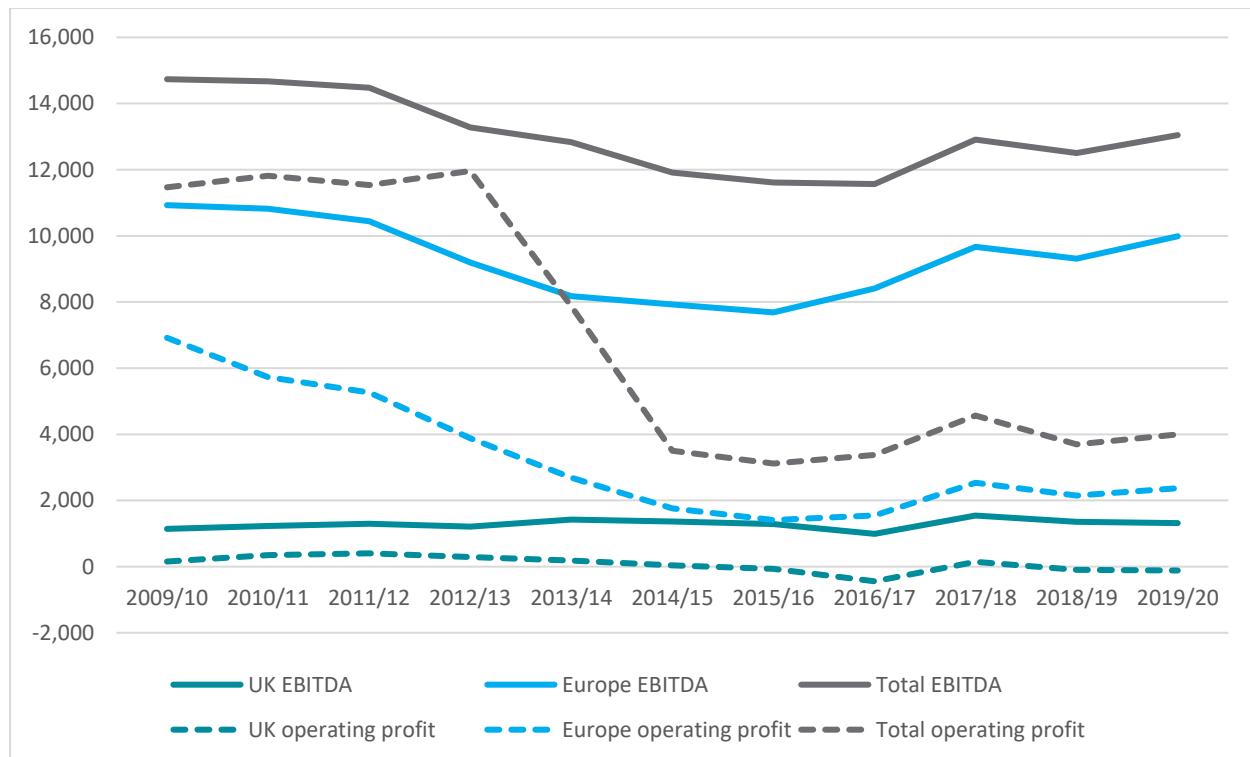
Profitability evidence

Mobile network operators' financial performance

Vodafone's annual reports²¹ provide rich data on financial performance across geographies. This data strongly suggests that the company was facing pressures on profits and revenues in the UK and abroad.

Figure 7 shows two different metrics for the UK, Europe, and Vodafone as a whole – EBITDA and operating profit²². This demonstrates that there was some pressure on profitability in the mid-2010s.

Figure 7: Vodafone EBITDA and operating profit - UK, Europe, and total (2009/10 - 2019/20) (£m)

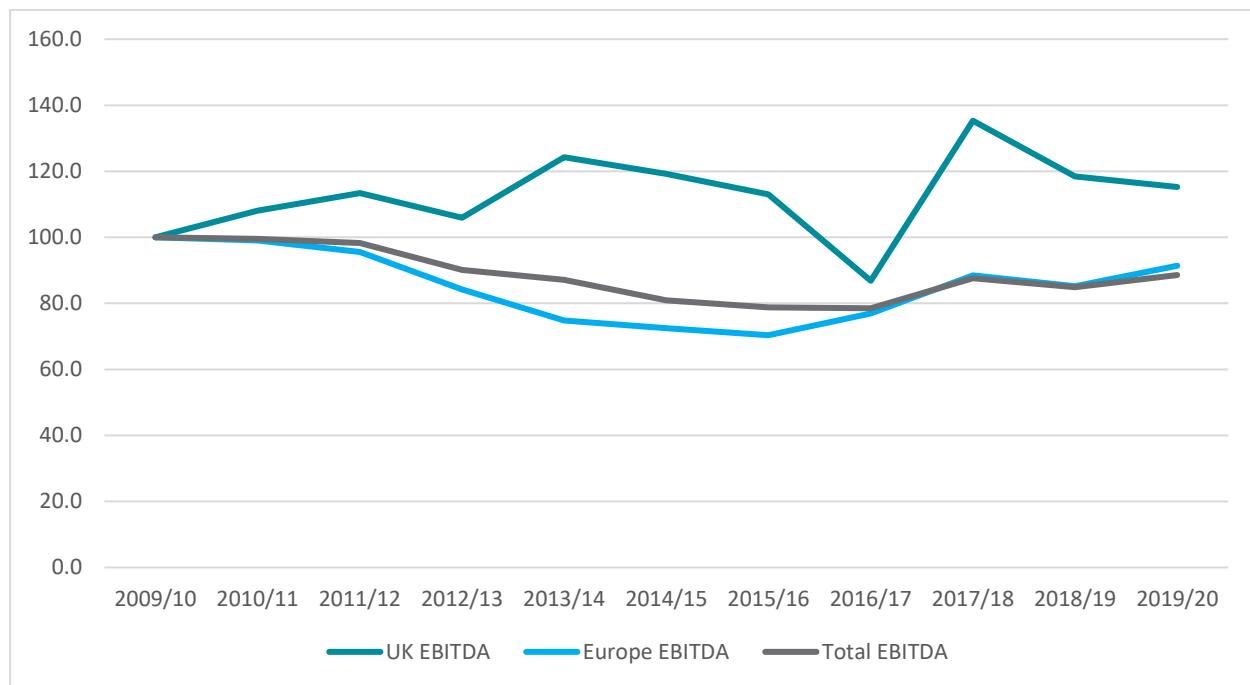


Indexing EBITDA over time in Figure 8 shows that, if anything, Vodafone was performing better in the UK than it was more widely – which raises the question of whether or not the UK situation was in fact unsustainable. The UK figure is volatile but generally higher than it was in 2009/10, whilst the European and total figures are clearly below.

21 Results, reports & presentations, Vodafone. [Link](#).

22 Vodafone annual reports provide figures in £ from 2009/10 – 2015/16 and in € thereafter. Post-2015/16 values for all Vodafone graphs converted into £ using average annual Sterling exchange rates from the ONS. [Link](#). Post 2015/16 values are adjusted EBITDA and adjusted operating profit rather than EBITDA and operating profit.

Figure 8: Vodafone EBITDA - UK, Europe, and total (2009/10 - 2019/20) (Index, 2009/10 = 100)



Such comprehensive, comparable data is not available for other operators is not available. Relevant findings from what is available are:

- From 2018 to 2020, O2's UK revenues were reasonably stable at around £6bn per year, as were operating profits at around £800m²³.
- EE's revenues, EBITDA, and operating profit were slightly higher in 2017/18 than 2016/17²⁴ – these are the only two years for which this data is available for EE specifically.
 - Revenues increased from £5,090m in 2016/17 to £5,294m in 2017/18. Mobile subscription revenues for BT Group as a whole (which may include some non-EE revenues) are reported thereafter, declining from £5,273m in 2018/19 to £4,841m in 2020/21.
 - EBITDA increased from £1,156m to £1,353m.
 - Operating profit increased from £376m to £577m.

Dividends paid

Total annual dividend payments per share for the group companies of three of the major operators are shown in Figure 9²⁵. Hutchison 3G UK (Three) has been left out as its Hong Kong parent company has operations including shipping and ports in around 50 countries, so any movements in its dividends are unlikely to provide any useful information here. As it is, dividends here are for companies which span Europe (Vodafone, Telefonica) and/or other

23 Financial Results, O2. [Link](#).

24 Financial Reporting & news, BT. [Link](#).

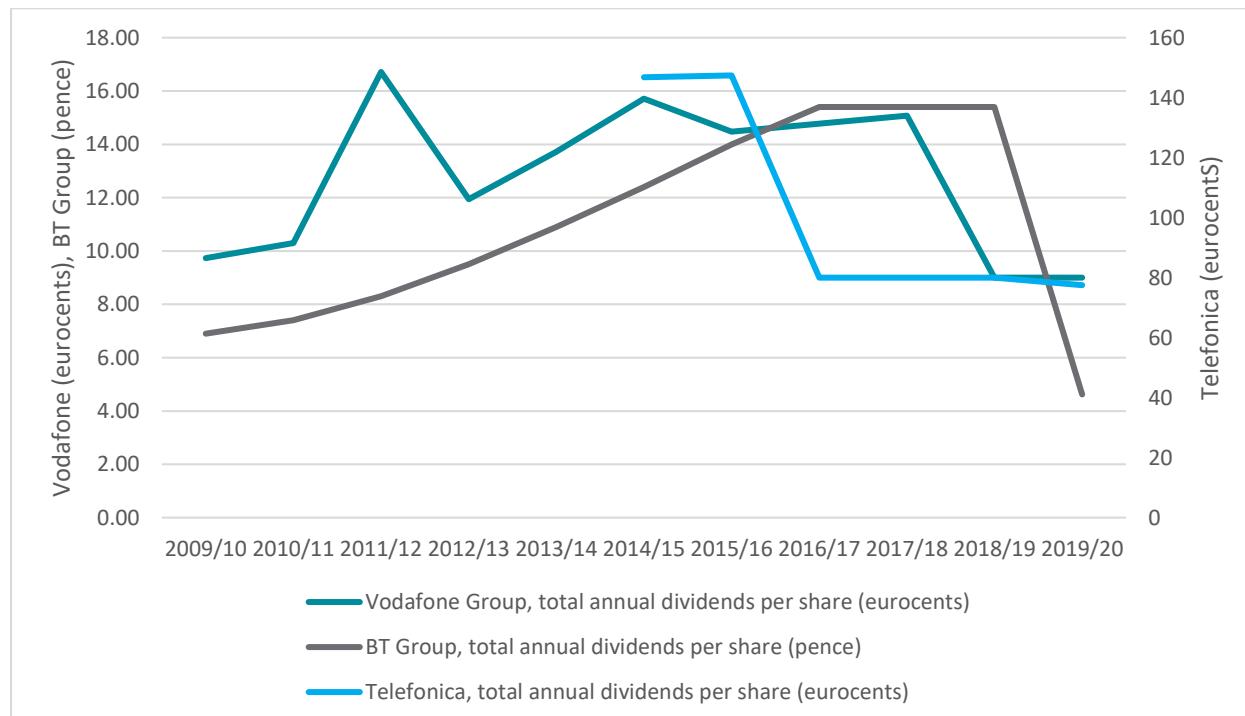
25 Vodafone results [here](#); BT [here](#); Telefonica [here](#).

operating areas like fixed-line and television (BT). Therefore, payments will still be affected by much wider factors than developments in the UK mobile market.

In theory, if the 2017 reforms to the Electronic Communications Code had made it easier for operators to invest in new infrastructure, they may cut dividend payments in order to do so. Conversely, rent savings could simply be reflected in higher dividends to shareholders.

All three companies have seen some decline in dividends paid in recent years, though only in the case of Vodafone does this appear to coincide with the reforms to the ECC. The sharp decline in BT Group's dividends – which had stayed constant at 15.4p from 2016/17 to 2018/19 – was driven by the financial impacts of the pandemic²⁶. Overall it is therefore difficult to discern any impact of the ECC reforms on mobile operators' dividends.

Figure 9: Dividends per share, 2009/10-2019/20, Vodafone Group, BT Group, Telefonica



Following its IPO, Vantage Towers announced that it would be paying out just over €280 million in dividends, 56 eurocents per share, for the 2020/21 financial year²⁷. In future, it intends to pay out 60% of recurring free cashflow²⁸. MBNL does not pay dividends, being owned wholly by EE and Hutchison 3G. Cellnex paid progressively higher dividends from 2015 until 2018, since which time they have started to decline somewhat²⁹ – however, they only entered the UK market in 2019 so this is of very limited relevance.

26 *BT takes the axe to its dividend: Shareholders will get no annual payout for first time since 1984 privatisation*, This is Money, May 2020. [Link](#).

27 *Dividend Announcement*, Vantage Towers, July 2021. [Link](#).

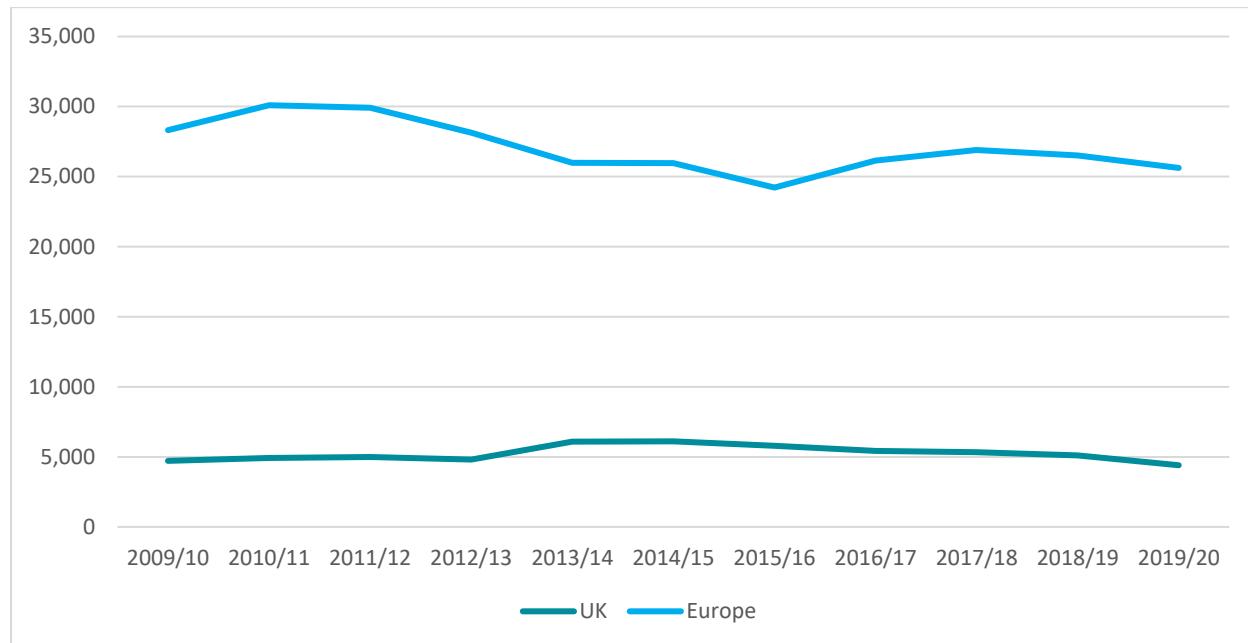
28 *Vodafone launches Vantage Towers float and pledges hefty dividend payouts*, Yahoo! Life, February 2021. [Link](#).

29 *Dividends and other remuneration*, Cellnex. [Link](#).

Revenue pressure on mobile operators

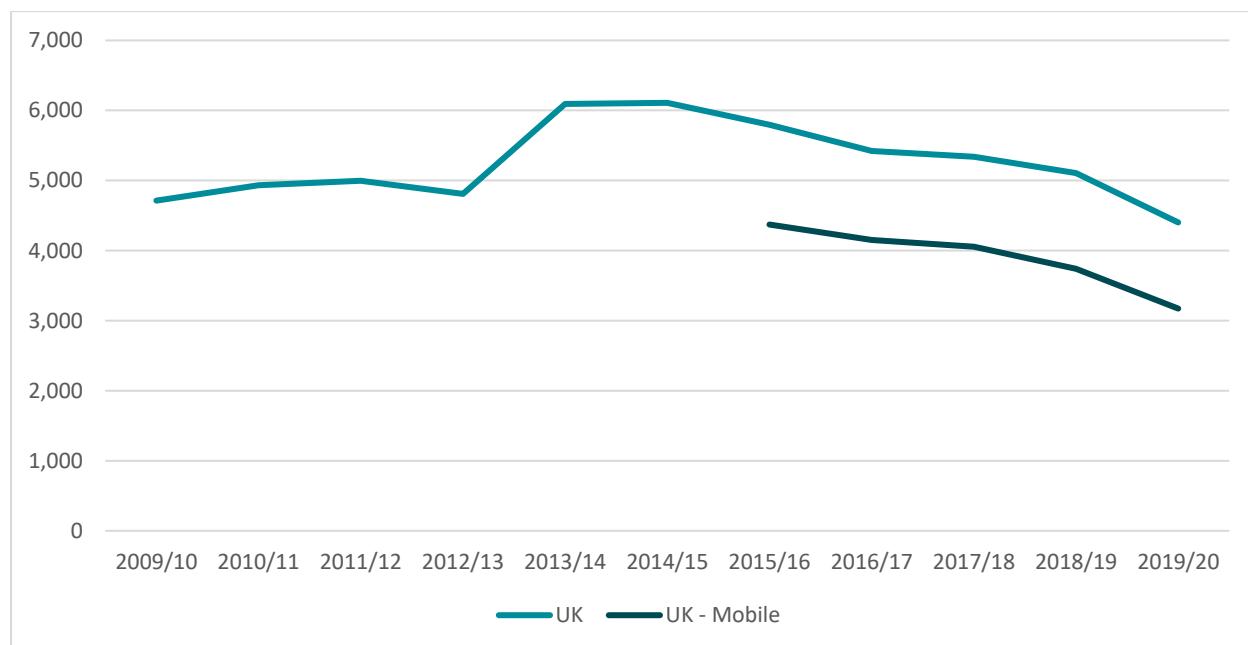
One reason for the pressures on operators' profitability identified above is certainly what was happening to revenue over the period. Vodafone's service revenue data is available for the UK and Europe, and as Figure 10 shows it declined over the period in question (by 6.6% and 9.5% respectively).

Figure 10: Vodafone service revenue - UK and Europe (2009/10 - 2019/20) (£m)



From 2015/16, data is also available for mobile service revenue (as opposed to fixed service revenue) for the UK. Its decline almost exactly mirrors the decline in overall service revenue during this period. This indicates that pressures on mobile revenues are driving wider revenue pressures – as explored in the following chapter, evidence on consumer prices backs this up.

Figure 11: Vodafone mobile service revenue, service revenue - UK (2009/10 - 2019/20) (£m)



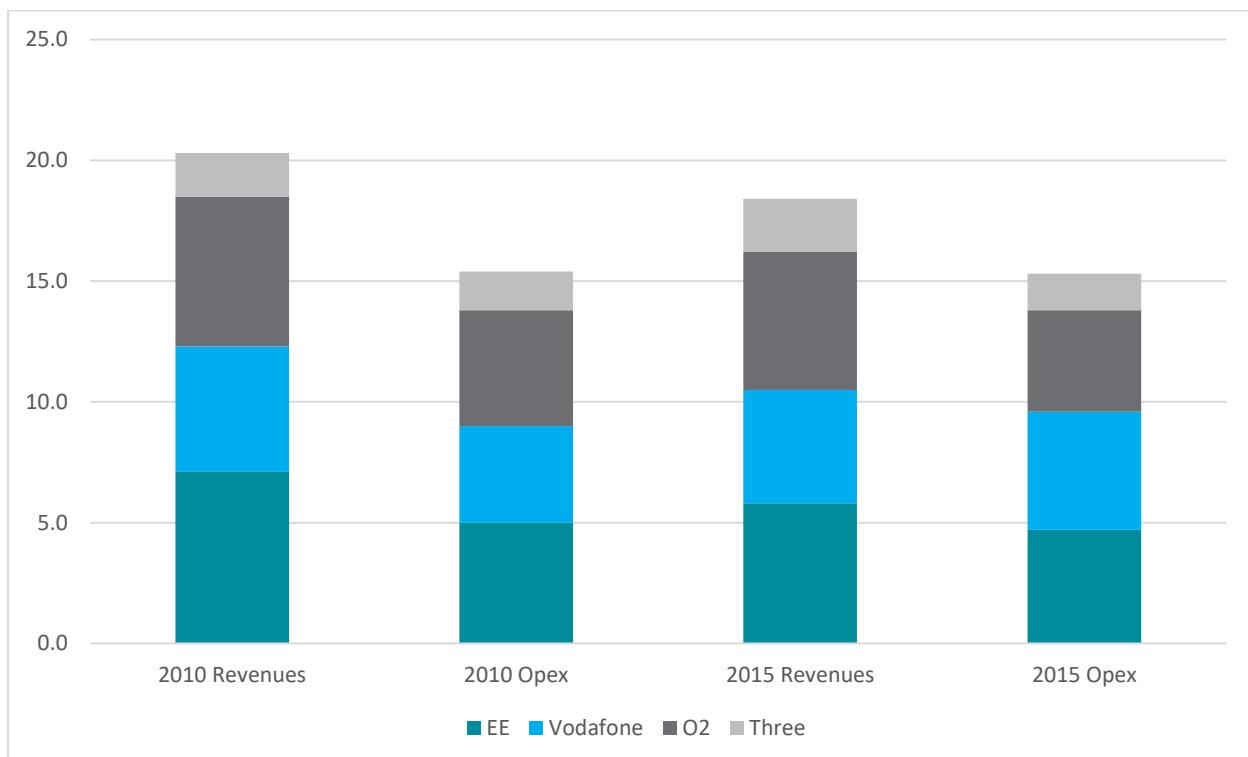
Overall, the 6.6% or £309m decline in UK service revenue between 2009/10 and 2019/20 more than explains the decline in operating profit, as shown in Table 2. In Europe, about two-thirds of the decline is explained in this way.

Table 2: Declines in Vodafone's service revenue and operating profit, UK and Europe, 2009/10-2019/20 (£m)

		2009/10	2019/20	Difference
UK	Service revenue	4,711	4,402	-309
	Operating profit	155	-116	-271
Europe	Service revenue	28,310	25,614	-2,696
	Operating profit	6,918	2,374	-4,544

Looking more broadly than Vodafone, Analysys Mason's report includes revenue and operating expenditure figures by operator for 2010 and 2015, which are presented in Figure 12. Overall, revenues fall from £20.3 billion to £18.4 billion (9.4% - but as much as 18.3% in the case of EE). Meanwhile, operating costs were essentially static – £15.4 billion in 2010 and £15.3 in 2015.

Figure 12: UK MNOs' revenues and operating costs in 2010 and 2015 (£ billion)



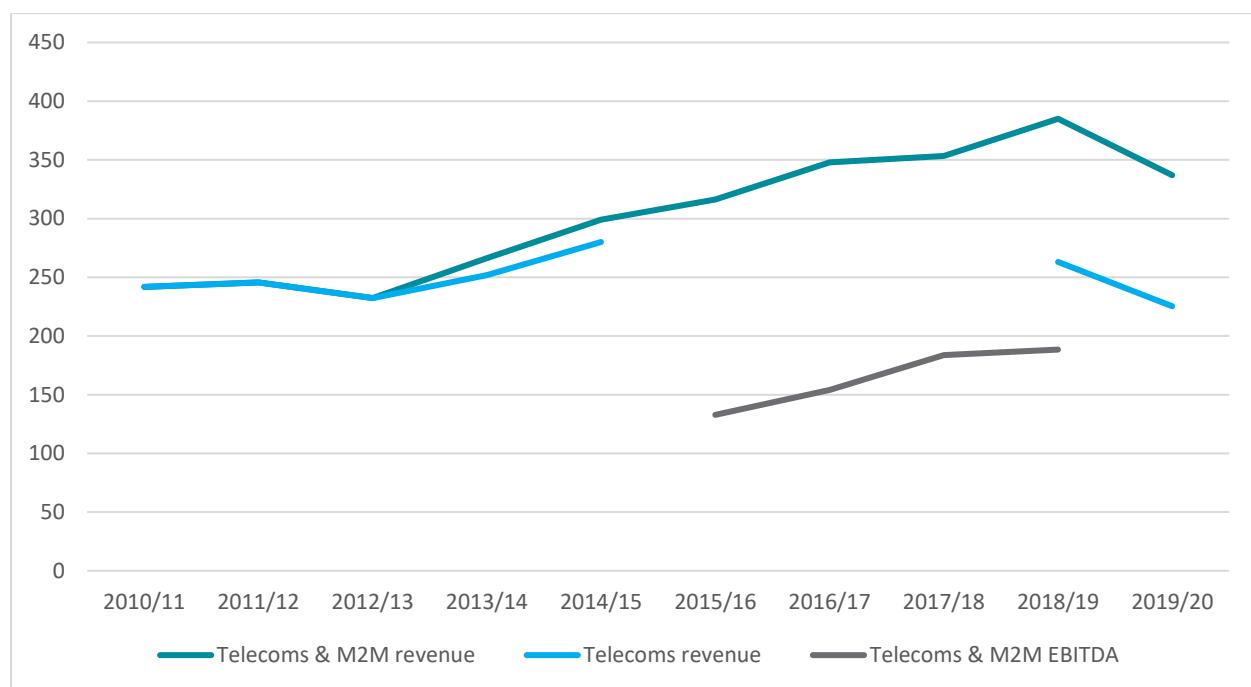
Infrastructure providers' financial performance

Cellnex, the biggest independent tower company in the UK, is new to the British market, so very little data is available. Its UK operations made a small net loss (£31m) in 2020/21, but so did the group as a whole (of £133m). No UK figures are available prior to this date³⁰.

Some data is available for Arqiva, from which Cellnex purchased 7,400 sites in 2019³¹. Arqiva's operations are mainly in broadcast transmission for television and radio. Prior to the sale to Cellnex, it was also a significant tower operator through its Telecoms division (later Telecoms & M2M, including smart metering). As this was only a division of a larger organisation, data available is also somewhat limited.

Figure 13 shows that telecoms revenue was growing in 2014/15, after which these operations were subsumed into the Telecoms & M2M division. Telecoms figures were reported separately again prior to the sale of the towers, and revenues had fallen somewhat relative to 2014/15 (from £280 million to £263 million) – suggesting that it was smart metering (M2M) operations that were driving growth of revenue and EBITDA in the interim³². It is not clear to what extent the small decline in telecoms revenue was driven by a decision to move away from these activities (culminating in the sale to Cellnex) or by commercial pressures.

Figure 13: Arqiva Telecoms / Telecoms & M2M revenue and EBITDA, 2010/11-2019/20 (£ million)



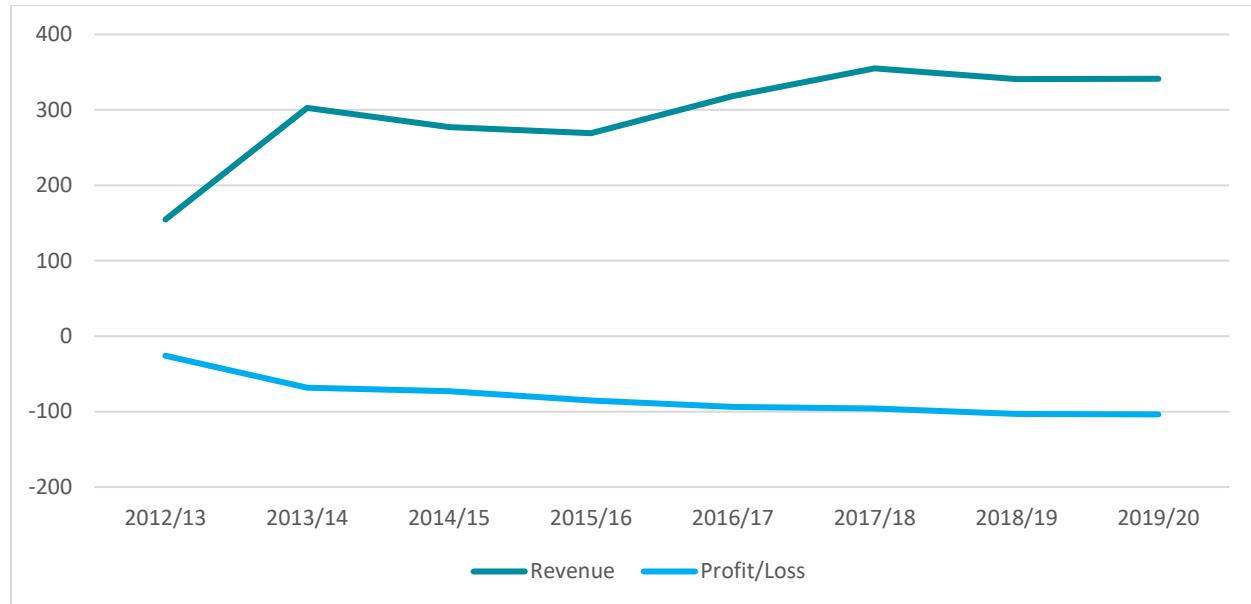
30 Annual/half-yearly reports, Cellnex Telecom. [Link](#).

31 Cellnex acquires Arqiva's Telecoms division for a total consideration of £2bn, Cellnex Telecom. [Link](#).

32 Group financial results, Arqiva. [Link](#).

More consistent data is available for O2 and Vodafone's joint venture, Cornerstone. Over the last few years revenues and operating losses have grown, stabilising in 2017/18, as shown in Figure 14³³.

Figure 14: Cornerstone revenue and profit, 2012/13-2019/20



MBNL's turnover and operating profit have grown sharply (from £10m and £1m respectively in 2009/10 to £124m and £10m in 2019/20)³⁴ – however this may represent transfer of operations from EE and Three rather than underlying growth.

33 Information from [Vodafone Group Plc](#) and accounts filed on [Companies House](#).

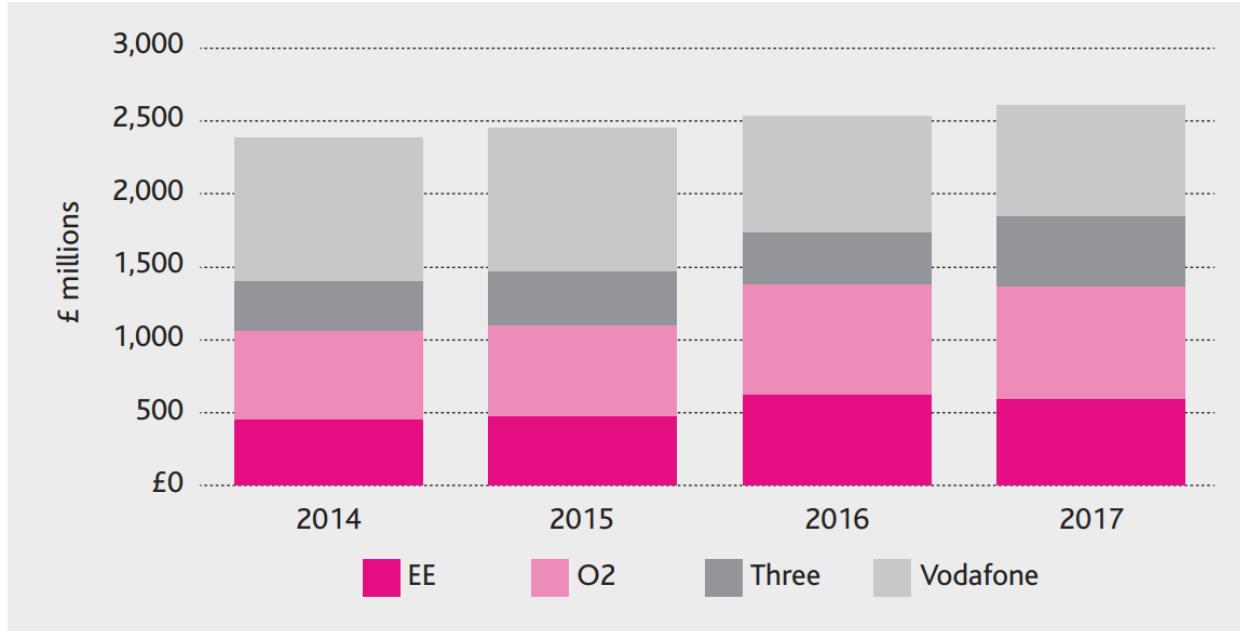
34 Mobile Broadband Network Limited, Companies House. [Link](#).

Investment evidence

The Future Telecoms Infrastructure Review

In 2017, UK mobile operators' capex stood at just over £2.5 billion and had been steadily rising since 2014, as shown in Figure 15, which is from the *Future Telecoms Infrastructure Review*³⁵.

Figure 15: UK Mobile Network Operators' Capex, 2014-17



The review was published shortly after the ECC reforms came into force, and – unsurprisingly – is optimistic about them, saying (para 195):

*"The ECC reforms came into force in December 2017. Independent economic analysis projected that these **reforms could reduce the cost of accessing sites by around 40% over time**. The Government's view is that the reforms provide an effective regulatory framework to support infrastructure deployment. However, we recognise that there is a risk that these changes **might lead to some market uncertainty and consequent negotiating difficulties during the transitional period**. We are working closely with stakeholders across the sector to address these risks. The Government will consider undertaking a formal review of the ECC reforms to assess their impact in 2019."*

As discussed in previous research, rents have been cut by 63% on average – and over 90% in many cases – rather than by around 40%. Moreover, the negotiating difficulties and accompanying increase in litigation over imposition of Code rights appear to have been much greater than anticipated – hence the 2021 consultation on further reform.

The cost of upgrading existing sites to 5G is estimated at £4-5 billion (para 179), and '*Information gathered for this Review suggests that MNOs should be able to collectively invest around £1 billion per year on 5G rollout.*' It should be acknowledged that the £209 million annual reduction in rents paid to site providers (as estimated in the main report) is not entirely insignificant in this context – it is a little under 10% of MNOs' existing capex, or

³⁵ *Future Telecoms Infrastructure Review*, Department for Digital, Culture, Media & Sport, 2018. [Link](#).

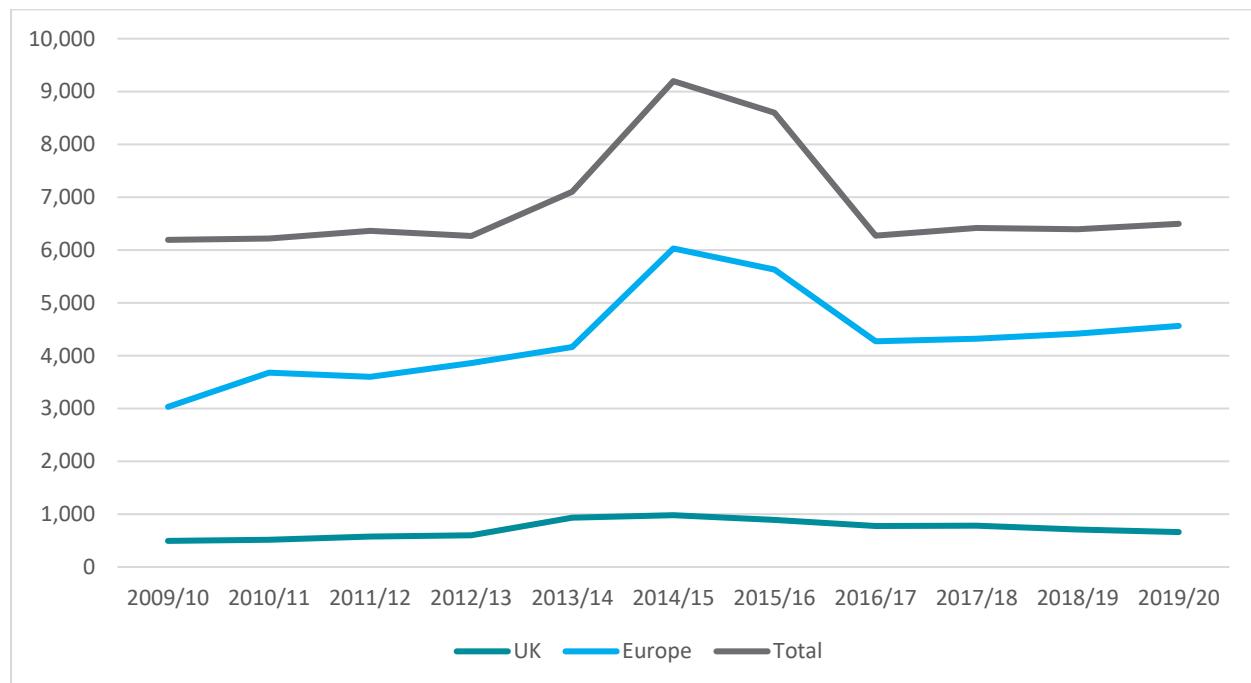
around 20% of the estimated annual requirement for 5G rollout on existing sites. Nevertheless, the time and money costs associated with long negotiations and litigation – which were clearly not anticipated at the time of the reforms – have negated at least some of these savings, and it is not clear from any of the evidence in the Review that the cost of accessing sites was a barrier to deployment prior to 2017.

Operators' figures

Data from Vodafone's annual reports³⁶ shows that whilst capital additions in Europe increased sharply (but temporarily) above their trend levels in 2014/15 and 2015/16, in the UK they changed comparatively little. This lends support to the idea that the UK regulatory environment at this time hindered investment in infrastructure. After the 2017 reforms, however, capital additions in the UK actually fell back further, while they increased somewhat in Europe as a whole.

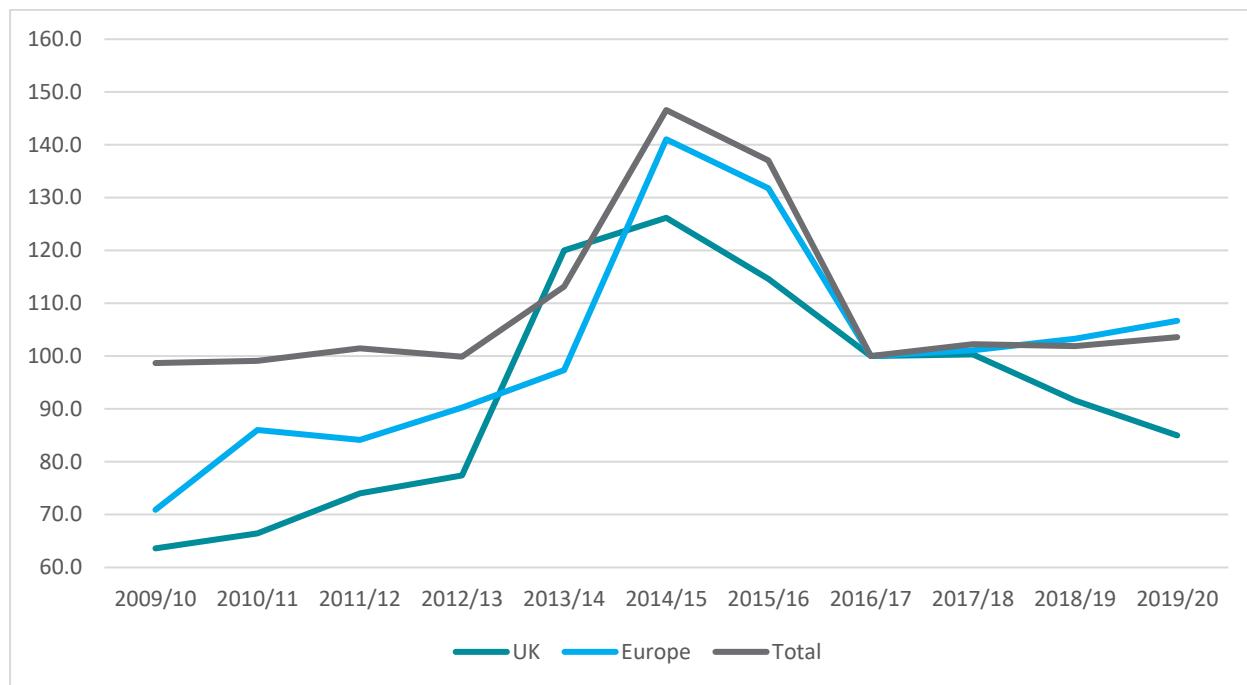
Capital additions are shown in Figure 16. Figure 17 shows values indexed to 2016/17, after which the fall in UK investment can be seen.

Figure 16: Vodafone capital additions - UK, Europe, and total (2009/10 - 2019/20) (£m)



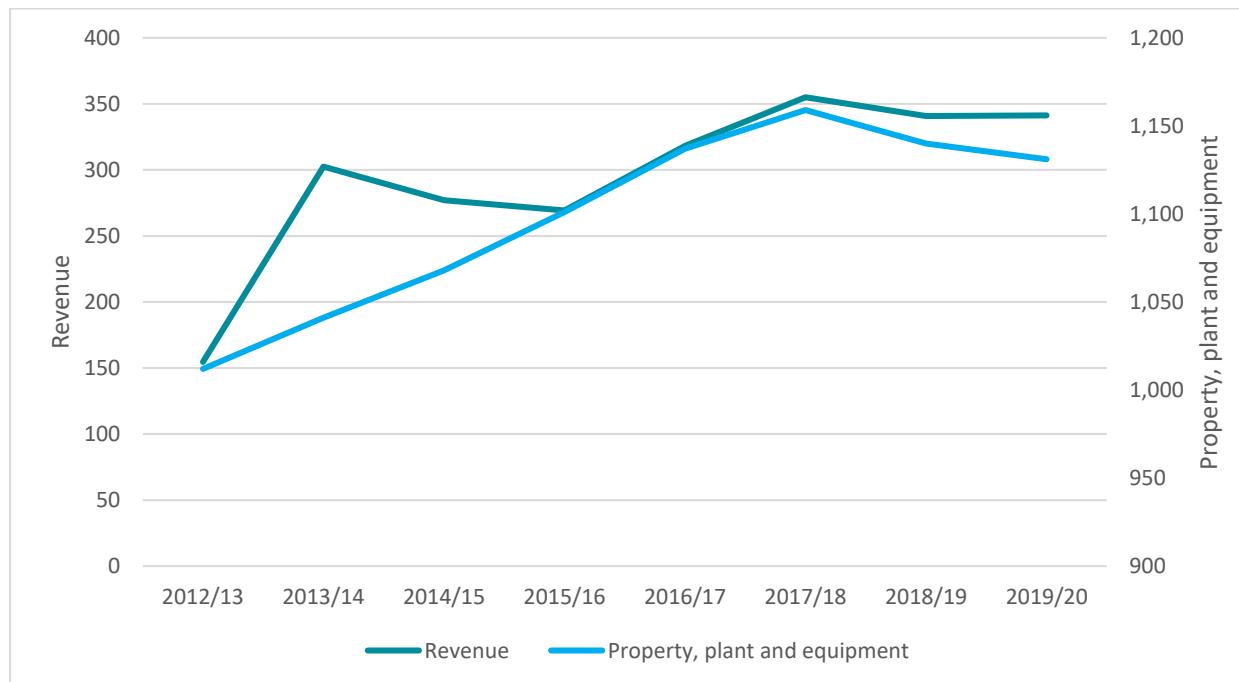
36 Results, reports & presentations, Vodafone. [Link](#).

Figure 17: Vodafone capital additions - UK, Europe, and total (2009/10 - 2019/20) (Index, 2016/17 = 100)



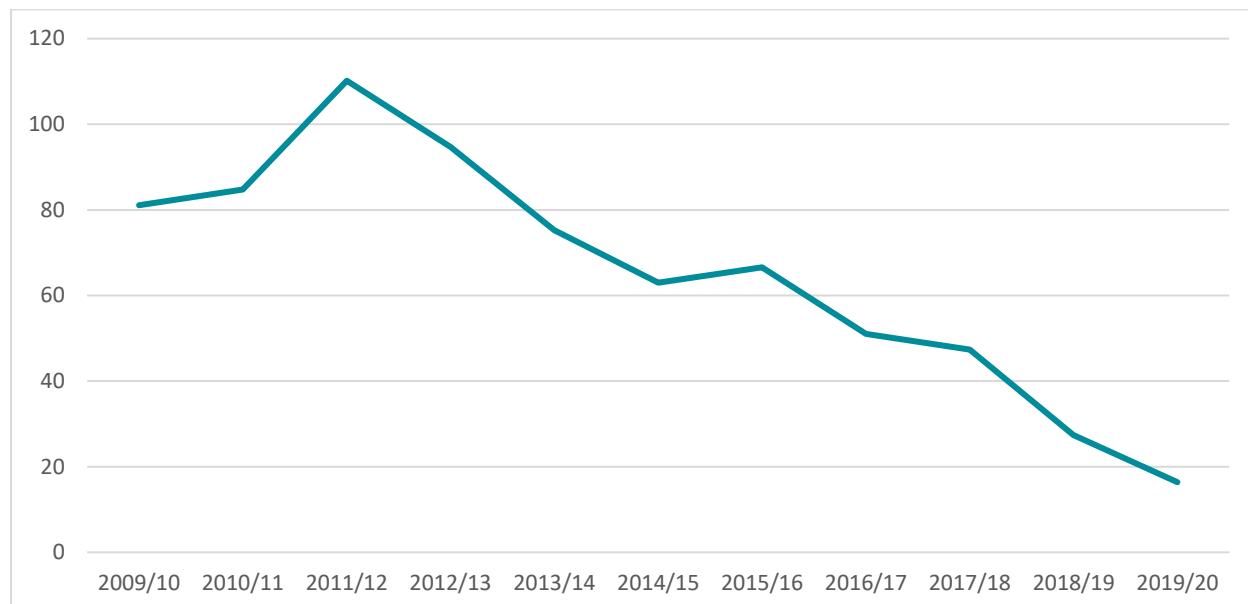
Data on property, plant and equipment is available for Cornerstone itself from its annual balance sheets and is shown in Figure 18 (note truncated right axis). Interestingly, this increases year-on-year until 2017/18, when the ECC reforms came into effect, and declines thereafter – a similar pattern to revenue, which is also shown for context. This suggests that construction of or upgrades to towers has not kept pace with depreciation and/or decommissioning of existing assets.

Figure 18: Cornerstone revenue and property, plant and equipment, 2012/13-2019/20



Again, there is more limited data for other operators. MBNL data on purchases of tangible fixed assets is, however, available and shown in Figure 19³⁷. In the early 2010s, shortly after the company had been established, they were high (perhaps reflecting transfer of assets from EE and Three). Thereafter they declined almost every year, and the 2017 ECC reforms seem not to have influenced this pattern. Moreover, by its nature MBNL does not own all of the infrastructure used by its shareholders as its primary role is the *operation* of the network.

Figure 19: MBNL purchases of tangible fixed assets (2009/10 - 2019/20) (£m)



37 Mobile Broadband Network Limited, Companies House. [Link](#).

Discussion of evidence

The evidence considered in this chapter should help to address:

- **Question 3:** Do rental levels or growth therein have a substantial impact on the profitability of mobile network operators or wholesale infrastructure providers?
- **Question 4:** Do rental levels or growth therein have a substantial impact on investment in infrastructure by mobile network operators or wholesale infrastructure providers?

There is clear evidence that mobile operators have been facing profitability challenges in recent years, however this appears to be driven almost entirely by revenue pressures. For example, Vodafone's annual service revenue has fallen by £309m over the last ten years, and its operating profit by £271m.

The estimated £209m reduction in rent paid to site providers following the 2017 ECC reforms therefore 'compensates' for just over 10% of this reduction. Moreover, evidence explored in a previous chapter suggests that land rents were increasing roughly in line with inflation. Therefore, they cannot have been driving recent profitability challenges.

The position on infrastructure investment is similar – the savings realised by operators under the ECC represent around 10% of their annual capex. Moreover, their figures do not suggest that the 2017 reforms have allowed them to increase investment – if anything the opposite has happened. The launch of the Shared Rural Network in 2020, with £532m of operator investment backed by £500m of government investment³⁸, demonstrates that despite the 2017 reforms significant government subsidy has been required to meet the UK's goals for more universal mobile coverage.

The relatively small scale – from the perspective of operators – of the savings from the reforms to the Electronic Communications Code is further illustrated by the outcome of Ofcom's spectrum auction for 700 MHz and 3.6-3.8 GHz spectrum bands. EE alone paid £475 million – however, as this was short of the £702 million in prepayments deposited with Ofcom, a refund of £227 million was received in April 2021³⁹. This rebate, for one of four mobile operators, therefore exceeded the total estimated annual impact of the 63% rent reduction brought about by the 2017 reforms. On the back of a spectrum auction described as 'cut-price', EE's owner BT saw its share price rise, as did Vodafone, which spent £176 million⁴⁰. In total, the auction raised £1.36 billion, slightly higher than the £1.1 billion reserve and well below the £2.5 billion or more predicted by some analysts⁴¹.

38 *Shared Rural Network*, HM Government, March 2020. [Link](#).

39 *EE Limited Report and Financial Statements for the year ended 31 March 2021*, Companies House, March 2021. [Link](#).

40 *BT and Vodafone shares rise on cut-price 5G spectrum auction*, City A.M., March 2021. [Link](#).

41 *5G spectrum auction raises just £1.3bn for UK government*, Financial Times, March 2021. [Link](#).

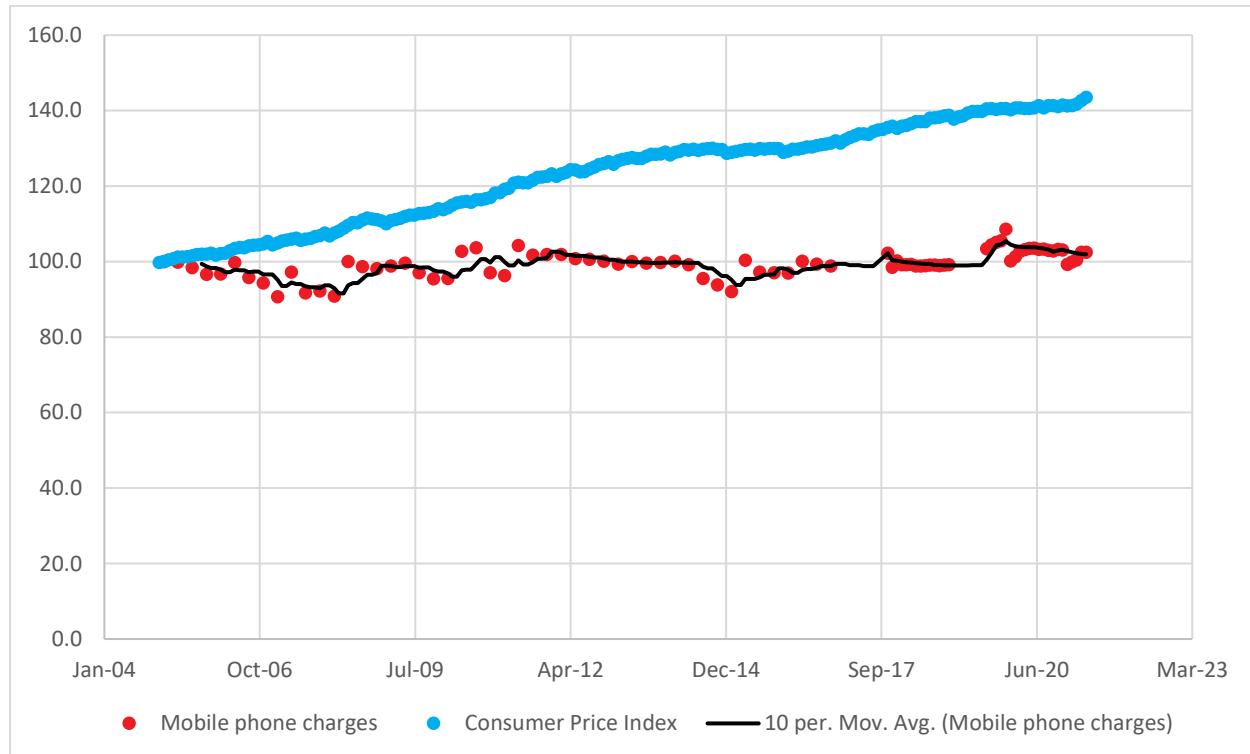
Consumer prices

Consumer price evidence

ONS consumer price data

Figure 20 shows how the overall Consumer Price Index and the ‘mobile phone charges’ component of it have evolved since early 2005, drawing on ONS price history data⁴². Mobile phone charges currently stand around 2.5% higher than they did in February 2005. There has been some volatility but even at their highest point, in December 2019, they stood only 8.6% higher. Meanwhile, overall consumer prices have gone up by over 40%.

Figure 20: Mobile phone charges component of CPI vs overall Consumer Price Index (Feb 2005 = 100)



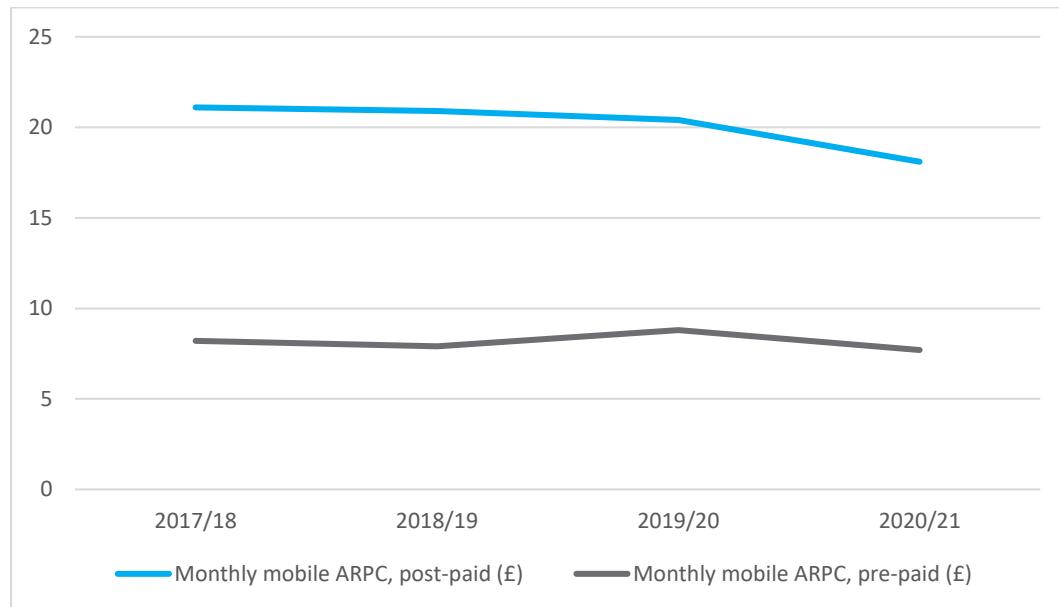
There is no clear pre- or post- 2017 element to growth in the charges for mobile phone services. Overall, in the period between February 2005 and December 2017, they declined by 1.5% (0.0098% per month) and the average price index was 98.1. Between December 2017 and May 2021, they increased by 4.0% (0.0975% per month) and the average price index was 101.5.

⁴² All data from ONS inflation and price indices ([Link](#)). Overall CPI data available monthly. Mobile phone charges available quarterly or monthly with some gaps.

Operator data

Data from BT (which owns EE) shows that in just the last few years their per-customer mobile revenues have declined significantly⁴³. Figure 21 shows that post-paid (i.e. pay monthly) revenues per customer declined by 14.2% and pre-paid (pay as you go) by 6.1%.

Figure 21: BT monthly mobile average revenue per customer, post-paid and pre-paid, 2017/18-2020/21 (£)



Similar historic data is not available from other operators. Recently, however, all four have announced or enacted significant price increases – EE, Three, and Vodafone all increased prices by 4.5% last year, while O2 plan to increase theirs by 3.9% + RPI. These similar increases, announced relatively close to one another, have raised suspicions of uncompetitive behaviour, whilst operators have cited the costs of network investment and renewal of Huawei equipment⁴⁴.

Other sources

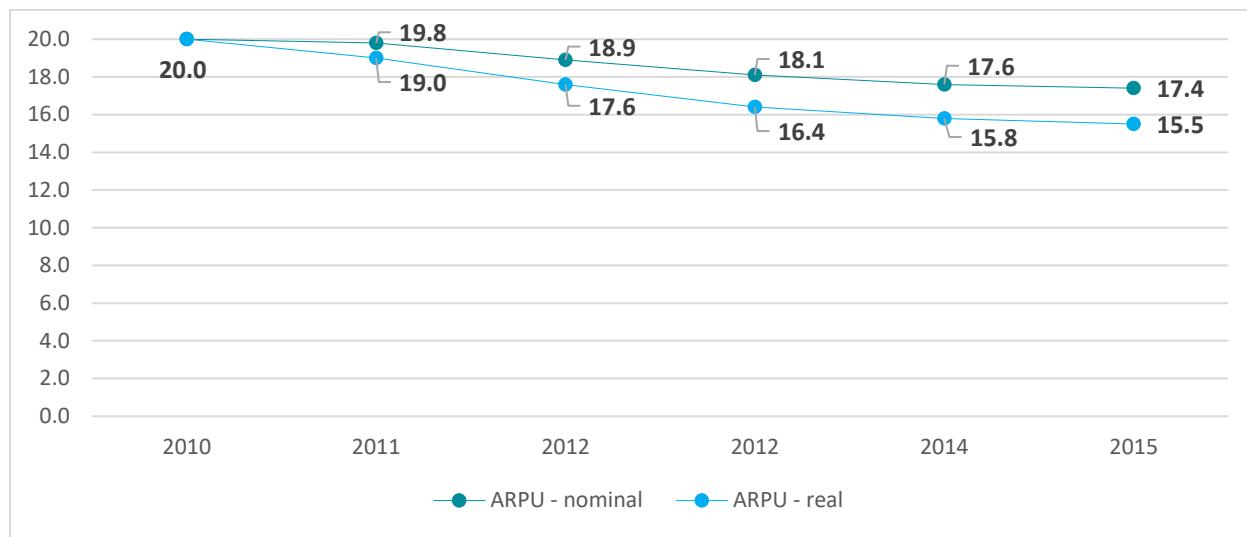
The Analysys Mason report on the financial impact of ECC changes⁴⁵ notes that subscriber numbers have gone up while total revenues have declined, resulting in a decline in real-terms ARPU from 2010 to 2015 of more than 20%, as shown in Figure 22. This reinforces the pattern shown in the BT ARPC data.

43 Results, events & financial calendar, BT. [Link](#).

44 U.K. Told Mobile Operator Price Hikes May Be Uncompetitive, Bloomberg, June 2021. [Link](#).

45 Financial impact of ECC changes, Analysys Mason, May 2016. [Link](#).

Figure 22: Average ARPU, UK mobile network operators, 2010-2015 (£ per month)



Potential impact of land rents on consumer prices

In the main report, the maximum potential impact of changes in land rents on consumer prices was estimated. A monthly saving of 19p per subscriber was estimated, based on:

- An average spend of £22.80/month on mobile services per subscriber.
- 1.2% of operators' Opex being accounted for by rents to site providers, and no profit margin for operators, meaning that 28p of the average monthly bill is accounted for by these rents.
- A 78% reduction in rents (the figure used for a move from the 'Old Code' to the 'Proposed Code').

Updating these calculations to reflect the £18.10 post-paid ARPC and £7.70 pre-paid ARPC from BT gives 'Proposed Code' impacts which are even smaller, of just 17p and 7p respectively.

Another way of looking at this question is to 'share' the savings among UK mobile phone subscribers:

- Estimated site provider revenues under the Old and Proposed Codes are £330.9 million and £72.8 million respectively, a difference of £258.1 million per year or £21.5 million per month.
- There are roughly 66.65 million people in the UK and an estimated 119.9 mobile subscriptions per person⁴⁶, resulting in 79.9 million mobile subscriptions.
- A 30% profit margin⁴⁷ over costs for operators and/or infrastructure providers is assumed.
- This results in a maximum potential saving of 35p per month (£4.20 per year) per subscription.

⁴⁶ Mobile cellular subscriptions per 100 inhabitants in the United Kingdom (UK) from 2000 to 2019, Statista. [Link](#).

⁴⁷ O2's OIBDA margin for 2019/20 was 30.8%. [Link](#).

The similarity in magnitude of estimates derived through each of these methods gives some confidence that they are robust. In both cases, of course, any savings are likely to be much lower as these estimates assume that cost savings are passed through in their entirety from Towercos to operators and from operators to customers. Given the oligopolistic nature of both markets and the long-term nature of contracts between Towercos and operators, this is highly unlikely or impossible in at least the short term.

Discussion of evidence

The evidence considered in this chapter should help to address:

- **Question 5:** Do rental levels or growth therein have a substantial impact on consumer prices?

On the evidence available, it is difficult to see how this could be the case. In recent years, mobile subscribers have benefitted from prices which have risen much more slowly than general measures of inflation.

This is reflected both in their figures for revenues per customer and figures for overall revenues discussed in the previous chapter. It may be driven by increasing competition between the four main operators, and by the rise of ‘virtual’ network operators or MVNOs. These operators obtain access to network services at wholesale rates but offer their own consumer services. As of 2017, 1 in 7 UK mobile phones was connected via an MVNO – the largest of which are Tesco Mobile (established in 2003), Virgin Mobile (established in 1999, but recently merged with O2), and Giffgaff (established 2009)⁴⁸. This increased choice and competition is unambiguously good for consumers.

Estimates of the potential contribution of land rents to consumer prices clearly show that – even on very ambitious assumptions – large rent reductions of the sort brought about by recent and proposed changes to the ECC cannot deliver more than marginal changes to consumer prices – and in the face of these savings, all four operators have recently increased their prices.

⁴⁸ State of the UK MVNO market, Grant Thornton. [Link](#).

Discussion of results

This research has set out to establish whether or not the available evidence supports the idea that pre-2017 rents for telecoms mast sites were unsustainable. Whilst there is no fully objective way of determining this, the evidence indicates that:

- Telecoms rents were growing roughly in line with the RPI in the years preceding the 2017 reforms.
- Prior to the 2017 reforms, rents were forecast to continue growing at a moderate level, much of it accounted for by site sharing or upgrading.
- The growth of Towercos was already acting to weaken the position of site providers and deliver potential advantages (such as access to liquidity) to operators. Moreover, their presence weakens the link between land rents and operators' finances, as changes will not necessarily be passed on.
- Operators faced profitability pressures, but these do not appear to be unique to the UK, and in any case were driven by falling revenues in a competitive market – not rising costs caused by land rents.
- Operators' and Towercos' investment in new infrastructure was growing steadily prior to reform, and it is not clear that it has increased in response to them.
- The changes in payments to site providers resulting from the 2017 reforms are small relative to revenues and investment. For instance, even on very ambitious assumptions, they could have little impact on prices paid by consumers.

Mobile operators clearly face a challenging revenue environment, and this may have spurred efforts to reduce costs, such as rents paid to site providers. In itself, this is not a surprising response to competitive pressures, however it does not necessarily mean that those rents were 'unsustainable'.

The changes made to the Electronic Communications Code in 2017 are widely agreed to have failed in their aim of unlocking investment in mobile infrastructure, hence the consultation on further changes.

The key question for government is this:

"Did the previous reforms not go far enough in their attempts to ease access to land, or did they go too far?"

This report, and the previous work to which it forms an annex, suggest the latter. The financial impacts of lower rents are – for operators – relatively small. The real impact of the 2017 reforms has been to create a large increase in protracted negotiations and litigation, creating a bottleneck in infrastructure deployment.

