PROFITABILITY AND THE INCENTIVE TO INVEST

A report for Vodafone

28 September 2017

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EXECUTIVE SUMMARY

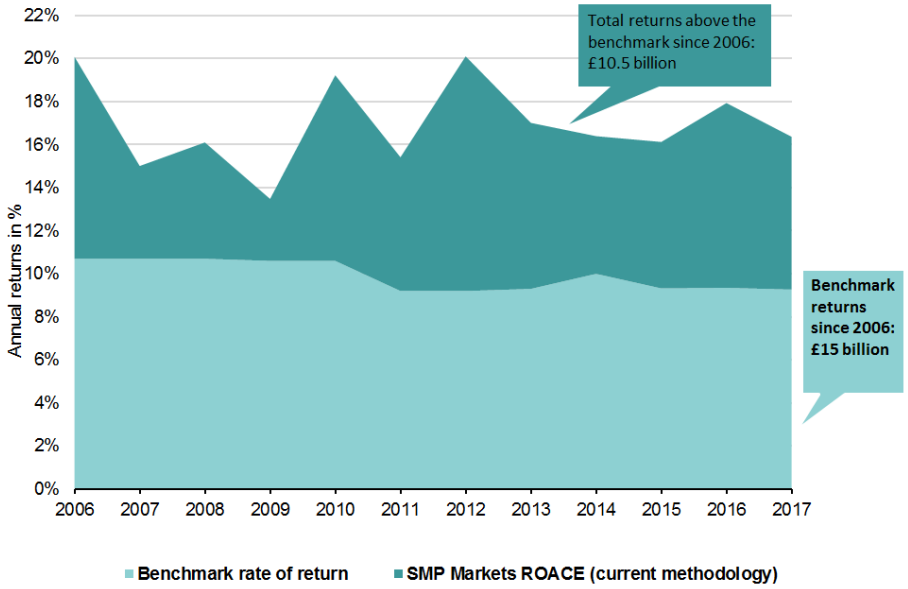
There has been significant regulatory debate over the last few years around improving broadband services offered to consumers. This is likely to require significant further investment.

Thus far, to achieve the desired consumer outcomes Ofcom has attempted to incentivise BT to invest with a variety of regulatory levers. This report reviews the effectiveness of Ofcom's approach, considering:

- how the incentive to invest varies according to different market circumstances;
- Ofcom's approach to incentivising BT to invest in improved broadband in markets where it intervenes; and
- how Ofcom has balanced the need to incentivise investments with the need to protect customers from excessive pricing.

BT has consistently reported profits in regulated markets in excess of the regulated cost of capital, as can be seen in Figure 1. BT's returns in the 12 years since the creation of Openreach have exceeded the regulated WACC by a total of **£10.5 billion** (in addition to the **£15 billion** benchmark return), with no clear downward trend in the level of returns.

Figure 1 Historical ROACE



Source: *Based on BT regulatory financial statements, Frontier analysis*

Note: *In 2016, Ofcom required BT to adjust the methodology to calculate costs in the RFS. The £10.5 billion excess returns have been calculated by using an adjustment factor to capture this change for the pre-2016 years. See Section 5 for a discussion of the change in methodology.*

In some cases the increased returns have been explicitly foreseen as Ofcom has allowed BT pricing flexibility. In other cases, there are higher than expected returns in areas where Ofcom has attempted to constrain returns to BT's regulated cost of capital.

At the same time as BT generating high profits across a range of services, there are areas/products where the quality offered by BT has been below expectations[1]: For instance, 5% of households are unable to receive speeds of 10 Mbps[2] and the Quality of Service (QoS) in regulated services has been found to be below an acceptable level, requiring Ofcom to introduce QoS regulation[3].

These outcomes are consistent with the principle that in general, a company will invest in "projects" where the forward looking expected returns exceed a hurdle rate but will not be directly influenced by the level of profitability in other parts of their business or on past investments. The fact a company is making significant profits in other parts of its business, or has historically made profits in a market, should not in general[4] be considered sufficient for future investment to occur. In markets where there are very high barriers to entry, Ofcom should not have an expectation that an unregulated incumbent would necessarily have the incentive to invest, even if they are generating high profits. In such a case, appropriately designed regulation could create the necessary incentives to invest.

Ofcom has attempted to set price regulation on a market-by-market basis taking account of the need to support investment, in the light of the particular characteristics of the market. The evidence on the success of Ofcom's regulatory strategy in achieving service improvements through investment appears mixed:

- In markets where Ofcom has applied charge controls to constrain BT's prices, there is evidence that in the past **BT's investment was below the level forecast by Ofcom with impacts on the quality of service offered to customers**. In recent years Ofcom has implemented charge controls which have better constrained the level of profitability and included appropriate quality of service standards;
- In those areas of the country where despite BT being assessed as not facing effective competition at a wholesale level from other providers, Ofcom applied a less stringent regulatory approach. **This does not appear to have achieved Ofcom's objectives in terms of protecting customers from high pricing, incentivising investment or encouraging competition.** If anything this approach may have delayed investments providing higher quality (e.g. fibre to the cabinet) because there were still high returns to be earned on the legacy technology.

Future regulatory intervention needs to provide incentives for an improved quality of service for all consumers in terms of both speed and reliability.

1 For instance, the DCMS' consultation on the design of a USO for broadband recognises that "there are still pockets of the UK where decent connectivity is an aspiration rather than a reality" https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/634016/USO_consultation_document.pdf

2 http://researchbriefings.files.parliament.uk/documents/SN06643/SN06643.pdf

3 See for instance the Business Connectivity Market Review and the consultation on QoS remedies for products in the Wholesale Local Access market. Available at https://www.ofcom.org.uk/__data/assets/pdf_file/0015/72303/bcmr-final-statement-volume-one.pdf and https://www.ofcom.org.uk/consultations-and-statements/category-1/quality-of-service respectively.

4 To the extent that historic returns can provide a reliable indication of future returns, then they could be relevant for future investment decisions.

1 INTRODUCTION

The issue of how to incentivise an appropriate level of investment by BT and others is an important element of Ofcom's overall regulatory approach. This issue is particularly important for services that are offered by BT in markets where it has been found to have Significant Market Power (SMP), i.e. where there is a strong risk that in the absence of regulation the outcome would not reflect competitive conditions.

In principle, the decision to invest will be made based on the expected return for the investment relative to the cost of capital i.e. the "hurdle rate". If the expected return is above the hurdle rate, the investment will be made. However, in markets where there are very high barriers to entry there should not be an expectation that an unregulated incumbent would necessarily have the incentive to invest to improve service quality, even if they are able to generate high profits. In such cases appropriately designed regulation can be used to fill this investment shortfall, creating appropriate incentives to invest, that may be lacking due to the reduced threat of competition.

Ofcom attempts to set price regulation on a market-by-market basis, taking account of the need to support investment, in the light of the particular characteristics of the market. In general, in markets where future demand is more uncertain, and where Ofcom may wish to support upstream entry, Ofcom has allowed BT to earn returns higher than the regulated WACC. Where such considerations are not relevant, Ofcom has sought to constrain BT's prices to earn the regulated WACC: this is in general considered appropriate to both protect consumers from high prices, and provide BT with the appropriate (efficient) investment incentives.

This report therefore considers the outcomes in the various regulated markets to see the extent to which Ofcom's regulatory approach has met its objectives: to simultaneously stimulate sufficient investment and protect customers from excessive prices. In conducting this assessment, we distinguish between cases where Ofcom has:

- attempted to directly constrain BT's prices, i.e. where allowing BT to earn returns above the cost of capital was considered to have little impact on investment, has this been effective in protecting consumers; and
- allowed BT to set the level of prices which potentially generates a return above costs in regulated markets (in the hope that the potential for higher returns incentivises investment in the market), assessing if this approach has in fact resulted in the desired investment.

The rest of this report is structured as follows:

- Section 2 outlines the current level of profitability in BT's regulated markets and the evolution of BT's profitability over time;
- Section 3 discusses the relationship between investment and profits in different types of market in general and incentivising investment in fixed broadband markets in particular;

- Section 4 analyses the regulatory outcomes in the Wholesale Broadband Access market;
- Section 5 analyses the regulatory outcomes in the Wholesale Local Access market;
- Section 6 analyses the regulatory outcomes in the Business Connectivity market;
- Section 7 discusses how the returns made in these markets have (or have not) translated into investment; and
- Section 8 concludes.

2 EVOLUTION OF BT'S PROFITABILITY

2.1 The regulatory financial statements and BT's cost of capital

Under the EU framework, national regulatory authorities such as Ofcom may impose obligations such as quality of service obligations, non-discrimination and price regulation on providers, such as BT, in markets where they are found to have Significant Market Power (SMP). To support compliance with the remedies, the SMP providers can be obliged to produce and publish detailed regulatory accounts for these markets, known as Regulatory Financial Statements (RFS). Ofcom requires BT to produce RFS for SMP markets and sets out publication requirements for a subset of the documents

The published RFS also allow stakeholders to monitor the effectiveness of regulation. For instance, if revenues far exceed costs, including the cost of capital, in a market where SMP has been found and regulation has been imposed, it could be indicative of issues with the effectiveness of the regulation remedy that Ofcom has selected.

The costs referred to above include the regulated Weighted Average Cost of Capital (WACC). Periodically Ofcom determines the appropriate (regulated) cost of capital for given charge controls. This cost of capital therefore provides a benchmark of the return that BT's shareholders require to invest in the regulated business. In general, charge controls are set such that over time, prices are expected to converge to costs; this is equivalent in general to the Return on Average Capital Employed (ROACE) being equal to the determined (regulated) cost of capital.

2.2 BT's returns have consistently been above the benchmark rate since 2006

The determined costs of capital can be found in Ofcom publications on the regulation of BT's SMP services.[5] In our analysis, we have used the determined cost of capital for BT Group as a whole.[6] As Ofcom periodically reviews the cost of capital, it has changed over the period. To provide a consistent approach for each financial year, we have used determined cost of capital at the beginning of each financial year as stated in relevant regulatory decisions.

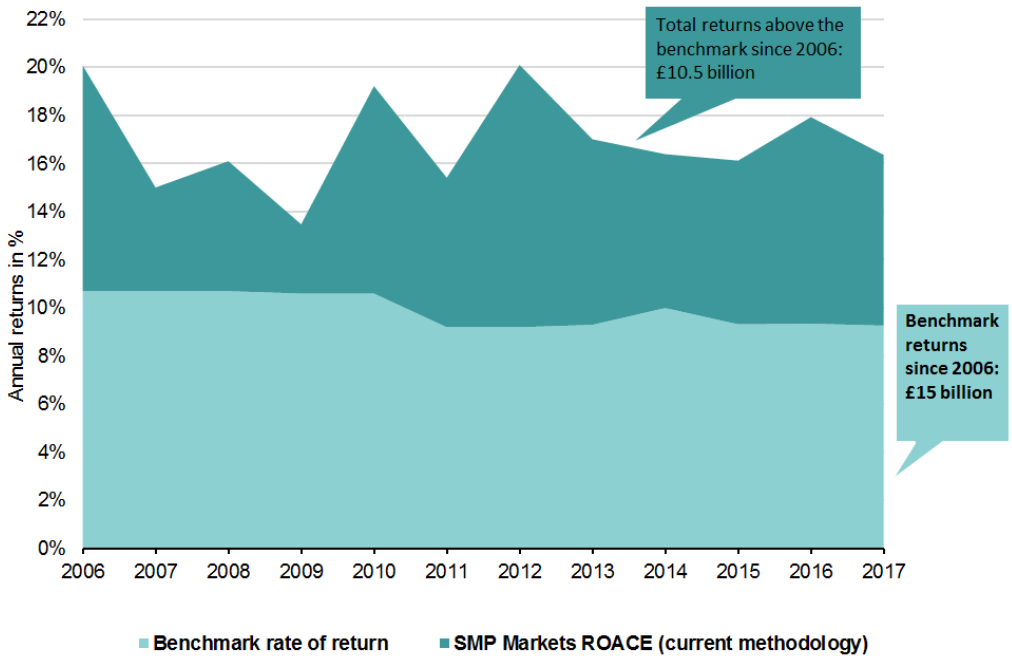
BT's returns have been consistently above the benchmark rate since 2006, the point at which the RFS were initially produced in the current format (as shown in

[5] Sources: For 2006-2008, Ofcom (Ofcom's approach to risk in the assessment of cost of capital - Final Statement, Ofcom, 18/08/2005. Source: For 2009-2010: A new pricing framework for Openreach, Statement, 20092012: Source for 2011-12: WBA charge control, Statement 2010, Source: For 2013-15: Fixed access market reviews: Approach to setting LLU and WLR Charge Controls Annexes Table A15.1: Estimate of BT WACC, March 2013.

[6] Ofcom determines a separate, lower, cost of capital for certain services delivered by BT's Openreach division from other regulated and unregulated services ("rest of BT"). As such the cost of capital across SMP markets would be expected to be somewhat lower than the determined cost of capital for BT Group.

Figure 2). BT's returns in the 12 years since the creation of Openreach have exceeded the benchmark rate by a total of £10.5 billion.[7]

Figure 2 Historical ROACE[8]



Source: Based on BT regulatory financial statements, Frontier analysis

While there has been variation in the absolute level of over-recovery year-on-year, BT has consistently over-recovered relative to the benchmark rate. Furthermore, although BT's returns have fallen in the last year, over a longer time period there appears to be no clear downward trend in the level of returns.

2.3 BT's returns in 2016/17 were significantly above the WACC for a number of markets

The RFS shows returns on a market-by-market basis and down to individual services. In 2016/17, BT has seen returns above the benchmark rate in three regulated markets, as shown in Figure 3:

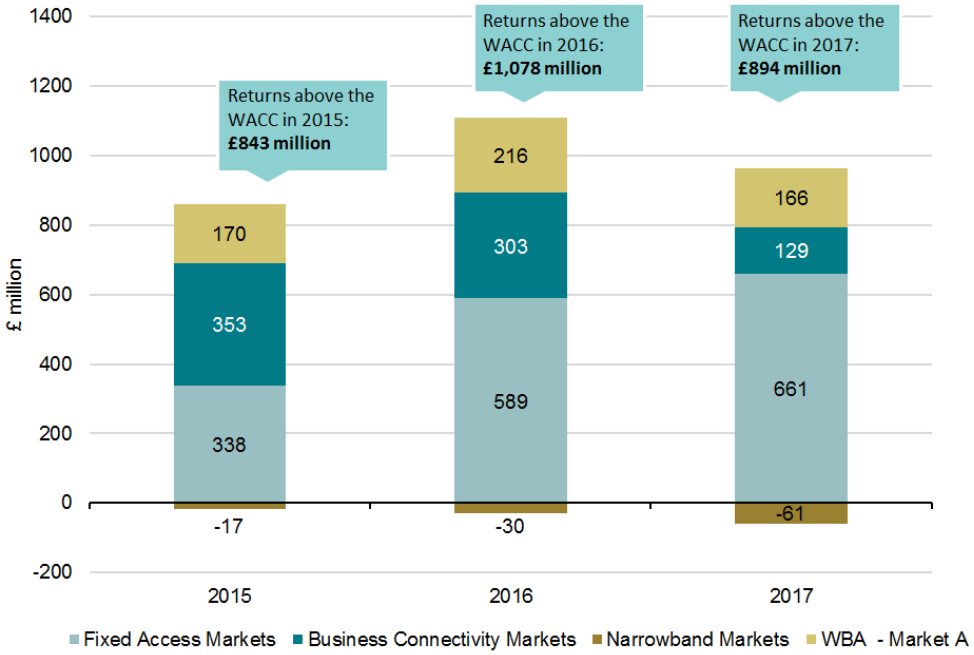
- Wholesale Local Access (WLA), or fixed access market – wholesale services which allow competing providers to provide broadband services and voice services;
- Wholesale Broadband Access (WBA) – wholesale services provided at a higher level in the network in areas of the country where competing providers do not use WLA services or their own infrastructure.

[7] In 2016, Ofcom required BT to make certain adjustments to the methodology used to calculate costs in the RFS. The £10.5 billion excess returns have been calculated by using an adjustment factor to capture this change for the pre-2016 years. See Section 5 for a discussion of the change in methodology- http://btplc.com/Thegroup/RegulatoryandPublicaffairs/Financialstatements/2017/ReconciliationReport2016-17.pdf

[8] This chart calculates the ROACE for the 12 year period since Openreach was created using the methodology Ofcom required in 2016, referred to in the previous footnote as well.

- Business Connectivity- The business connectivity market covers dedicated connectivity services bought by Communications Providers (CPs) either to provide services to large corporate customers or to transport traffic within their networks.

Figure 3 Returns above the benchmark rate (WACC) for SMP Markets



Source: Based on BT regulatory financial statements, Frontier analysis

Returns in the WLA market have grown strongly over the last three years, largely reflecting the growth of SFBB services where BT has been allowed regulatory pricing flexibility (i.e. wherein a cost-based charge control was not set; instead prices were regulated using an ex-ante margin squeeze test[9]).

"WBA Market A" consists of a small subset of subscribers (approximately 10% of the households in the country), who were not expected to experience competitive network choice from other suppliers. The reduction in returns in 2017 appears to reflect a change in the mix of services purchased by users rather than any reduction in prices due to the remedies imposed by Ofcom, as discussed in Section 4.

Returns in the Business Connectivity markets have declined in the last year, reflecting the imposition of a more stringent regulatory charge control, with BT required to cut prices significantly in this year by imposing a one-off starting charge adjustment and a substantial price reduction for the first year of the charge control.

[9] See for example, Section 8 of the 2010 WLA statement. https://www.ofcom.org.uk/__data/assets/pdf_file/0027/37935/wla_statement.pdf

3 PROFITABILITY AND THE INCENTIVE TO INVEST

Decisions to invest in new technology/projects are made based on the expected return from the new projects compared to a "hurdle rate" that investors are expecting for projects with similar risk profiles. If the expected return is above the hurdle rate, the investment will be made.

With well-functioning capital markets, a company should in general be expected to have the ability to invest in all projects whose returns clear the hurdle rate. The incentive to invest will depend on the expected returns from the investment, which in turn will need to take into account expected competitive circumstances in the market and regulation. Thus, current profitability in and of itself should not be expected in general to improve the ability or the incentive to invest on a forward-looking basis, unless it provides an indication of future expected returns.

In this section, we first discuss how the incentive to invest can vary in different types of market[10]. We then go on to outline how regulation can support these incentives in markets for fixed broadband.

3.1 Market circumstances influence the inherent incentive to invest

3.1.1 Markets with low barriers to entry

Markets with low or no barriers to entry tend to lead to competition between multiple providers in the market. Competition between firms supports their incentive to invest as they attempt to:

- differentiate on "quality" from other firms in the market so as to acquire and retain customers- this may require investment to increase quality or to innovate;
- reduce costs of providing services so as to be able to offer services profitably which acquiring and retaining customers- firms may invest and innovate to lower their costs of production.

Barriers to entry being low or absent imply that if a firm fails to invest, other firms can invest to enter the market or expand with better quality or lower cost and win market share.

Regulatory intervention is therefore in general unnecessary, as there is unlikely to be market failure: competition can be expected to drive productive, allocative and dynamic efficiency. Firms continue to invest and innovate till the point where the expected return on marginal investment equals the cost of capital.

[10] We assume that in general companies in the UK can be expected to have access to well-functioning capital markets, hence if they have the incentive to do so, they should not be constrained by their ability to fund this investment – we do recognise however that the ability to fund investment may play also a role in specific circumstances.

3.1.2 Markets with very high barriers to entry

At the other extreme, there are markets where the barriers to entry are both high and persistent: in such markets entry may not be feasible. Typical examples of such markets are those for utilities such as energy distribution and transmission and water and wastewater services. Traditionally, these markets have been served by a single provider as this minimises the (average) cost of production due to economies of scale.

In such markets, an incumbent would be expected to have market power as it can operate without the threat of new entry. In the absence of regulation, it would therefore exercise this market power to maximise profits by raising prices and restricting output relative to the efficient level.

This profit-maximising behaviour also implies that the incumbent provider is likely to invest less than the efficient level in the absence of regulation for a number of reasons.[11]

- First, very high barriers to entry mean that there is virtually no threat of new entry. This implies that the incumbent does not need to invest to differentiate on cost or quality to either compete with existing providers (since there are none) or forestall entry (since there is unlikely to be any).
- Second, the profit-maximising price being higher than the allocatively efficient level implies that demand is lower than in a competitive market. This in turn would reduce the incentive to invest in capacity and/or quality.

As a result in the absence of actual or the credible threat of prospective competition, in industries with technology change/improvements in quality, incumbents may have an incentive to “sweat” existing assets rather than upgrade or replace them with the newest technology. Even if the investment to upgrade a network is incrementally profitable, if this involves a transition from a legacy technology to a new one, this transition could have an additional opportunity cost for an incumbent: the lost profits from the continued provision of the service based on the legacy technology. Thus, it is possible that transition to a new technology is likely to be slower than it would have been in a scenario where there was competition or a credible threat of entry.

In these industries, regulation will typically be required to:

- ensure prices are set at a level which allows investors to make a reasonable return but also protect users/consumers of the services from high prices; and
- ensure appropriate quality standards to prevent providers generating monopoly profits by reducing quality of services for a given price level.

[11] There may still be incentives to invest to serve existing customers at lower cost in the longer run so as to ensure long-run profit maximisation. In network industries, investment may be related to expanding geographic coverage. In this case, because an unregulated monopolist would expect to earn higher profits than a firm in a competitive market, they may still have an incentive to invest to increase the number of customers over which they can generate monopoly profits.

3.1.3 Markets with high barriers to entry but that remain contestable

In some markets[12], even though barriers to entry are high, there remains a credible threat of entry and/or there may be existing competitors. This can support stronger incentives to innovate to differentiate through improved quality or lower cost of production incentivised by existing competition or possible entry – compared to the case set out in the previous sub-section.

However, an incumbent provider may continue to have a degree of market power which they may be in a position to use in the absence of regulation. Allocative efficiency may therefore not be achieved as an incumbent may still not face sufficient competitive constraint in relation to pricing. Investment could also be lower compared to a market where competition was working effectively as the incentives to differentiate and reduce costs are lower.

Thus, there may still remain a need for regulatory intervention, taking account of the need to incentivise competition where possible.

3.2 Incentivising investment in fixed broadband networks

A critical question in the UK at the moment is investment in broadband networks:

- To increase the quality and speed available to consumers generally; and
- To ensure all households have access to a minimum level of service.

We outline how regulation can incentivise investment to these ends.

3.2.1 Regulation can create appropriate incentives to invest in quality and speed improvements

There are a number of regulatory interventions that can be used to incentivise such investment.

First, interventions that alter the expected returns from the investment would have a significant impact on the decision to invest. If the expected returns fall below the relevant “hurdle rate” (e.g. the incremental cost of capital for the project), the investment will not be made. Regulatory intervention can modify the expected returns from future investments by:

- affecting the expected level of prices for new services delivered as a result of the investment to be undertaken- For instance, the expectation that a regulator could impose an overly strict charge control on a new product which would dampen the expected returns compared to a scenario where pricing flexibility was allowed. To this extent, allowing pricing flexibility on Next Generation Access (NGA) products could encourage investment in its roll-out; and/or

[12] In the case of network industries these may be different geographies, as the costs of network roll-out are lower in dense/urban areas.

- affecting the level of prices for services based on legacy/mature technologies- Imposing a strict charge control on mature services while allowing pricing flexibility on new services could increase the incentive to invest in the new technology as there would be scope to earn higher returns. Thus, if a strict charge control is applied to copper-based technologies, and now to fibre-to-the-cabinet (FTTC)-based products such as Virtual Unbundled Local Access (VULA), this could encourage the roll-out of G.Fast/FTTP as there would be less returns to be made on the former and scope to earn returns in excess of cost on the latter.

Second, certain regulatory interventions can necessitate investment. For example, a regulator could require that the incumbent meet certain minimum quality of service standards, with significant financial penalties for non-compliance. To be able to comply with these standards, the incumbent may have to invest in new infrastructure or systems. In this case, investment will have taken place as a result of such regulatory intervention as the penalties for non-compliance will have effectively increased the return on the investment

Third, regulatory intervention can also encourage investment by the incumbent and competitors by lowering the barriers to entry and creating the threat of entry/facilitating new entry. This can then encourage the incumbent to invest and innovate to differentiate on cost, quality, etc.

It is important, however, that the regulatory regime considers the expectations for the incumbent in the counterfactual where it *does not* invest. For example, suppose the incumbent believes that the government would provide the funding for any investment it does not undertake, despite the regulatory interventions set out above. In this scenario, it may prefer to withhold less profitable investment on the expectation that it could be funded by the government. Such expectations around the counterfactual could undermine the incentives to invest, effectively crowding out private investment.

3.2.2 Regulation can be modified to ensure a minimum level of service

Regulation can also be modified to support investment by the regulated incumbent to provide a minimum set of services, for example a minimum broadband speed for all households.

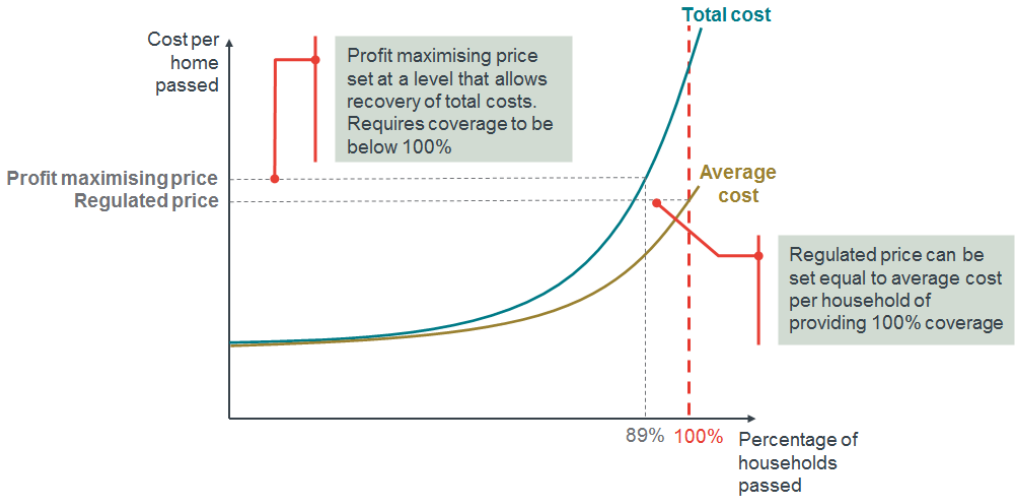
At the moment, in markets where pricing flexibility is allowed and there is no additional coverage obligation, BT is incentivised to set prices to maximise profits. Depending on the competitive pressure faced, this may involve restricting output in terms of households passed by BT's superfast broadband (SFBB) network, as seen in Figure 4, where marginal households do not justify sufficient incremental revenues to justify investment.

Regulation could be introduced to ensure that BT is incentivised to provide a minimum level of service to all households. To this end:

- prices could be set equal to the average cost of passing all households. This would ensure that BT would recover the costs of providing this service even for marginal customers by spreading this cost across all customers; and

- an *obligation* to provide this coverage could be imposed. This would make certain that the necessary investment is indeed incurred.

Figure 4 Setting prices to ensure necessary investment: an illustration



Source: Frontier Economics

Thus, a combination of regulatory measures could help ensure that *all* households have access to a minimum quality of service

3.3 Regulation should account for market circumstances

As discussed earlier, the incentive to invest can be expected to vary depending on the market circumstances. In fixed telecommunications/broadband markets, regulation has attempted to optimise efficiency by:

- encouraging competition in sub-markets/parts of the network that have lower barriers to entry (for instance because fixed costs and so, economies of scale are lower) so that competition rather than regulation supports the achievement of consumer outcomes that are consistent with economic (productive, allocative and dynamic) efficiency. Once competition has been fostered/established, economic regulation can then be lightened and eventually removed;
- more stringent regulation to simulate outcomes of a competitive market in sub-markets/parts of the network with high barriers to entry.[13]

It is important that regulation is tailored to market circumstances. There is a risk that in a market that does not tend towards effective competition, premature or over-reliance on light-handed regulation (e.g. allowing pricing flexibility) may lead to the emergence of profits that are above what would be expected if a market

[13] In fact, the EU three criteria test seeks to classify markets along these lines and regulate only those that cumulatively meet the following three criteria: There are high and non-transitory structural, legal or regulatory barriers to entry, The market structure does not tend towards effective competition within the relevant time horizon; and Competition law alone is insufficient to adequately address the identified market failure(s). https://ec.europa.eu/digital-single-market/en/news/explanatory-note-accompanying-commission-recommendation-relevant-product-and-service-markets

was effectively competitive, with no or limited realistic prospect of such profits being competed away. As explained above, there would be no reason to expect such profits to be invested in another project/market (unless the returns in that market justify the investment).

Furthermore, light-handed regulation of legacy technologies in markets which may not tend towards effective competition can delay the transition to the next generation by increasing the opportunity cost of investing as there remains scope to earn high returns on the legacy products.

In the sections that follow, we consider the regulatory tools applied to wholesale fixed telecommunications markets in the context of the specific markets' competitive circumstances.

4 THE WHOLESALE BROADBAND ACCESS MARKET

Ofcom attempts to intervene at as low a level in the network as possible by mandating that BT provide access to services which connect individual BT exchanges with customers: Local Loop Unbundling (LLU) and Virtual Unbundled Local Access (VULA) for mass market broadband

However, the cost structure for fixed broadband networks means that there are high barriers to entry to serve some areas where exchange sizes are relatively small, due to the fixed costs of installing equipment in these exchanges.

In recognition of these barriers to entry, the EC recommended relevant markets[14] also define a market for access at a higher level of the network, termed the market for Wholesale Broadband Access (WBA) in the UK. Barriers to entry are lower in this market, potentially allowing competition at a retail level even where LLU/VULA not viable.

In this section, we discuss the regulation of the WBA market and the motivation behind the chosen remedies. We then discuss the appropriateness of the regulation given the market circumstances and outline how profits in this market have been high and increasing.

4.1 A charge control on an anchor pricing basis was set to encourage investment

The WBA market is currently under review[15], the last review having been completed out in 2014[16].

Three distinct geographic markets were defined based on the differences in competitive conditions:

- Market A: exchanges where there are no more than two providers present or forecast to be present, which accounts for 9.5% of UK premises.
- Market B: exchanges where there are three or more providers present or forecast to be present, which accounts for 89.8% of UK premises.
- the Hull Area: 0.7% of UK premises.

BT was found to have SMP in the provision of WBA services in Market A but not in Market B.[17]

Within Market A, BT offers two types of products: IPStream, which provides standard broadband only based on legacy technology, and Wholesale

[14] Those markets where there is considered to be a strong risk of market failure absent regulation.

[15] https://www.ofcom.org.uk/__data/assets/pdf_file/0013/103180/wba-consultation.pdf

[16] https://www.ofcom.org.uk/__data/assets/pdf_file/0032/78863/volume1.pdf

[17] Ofcom also noted that absent SMP remedies in the WBA market, there would not necessarily be an effective common pricing constraint at the retail level, and wholesale prices for WBA services would therefore be likely to reflect local competitive conditions. Note that in its current review, Ofcom suggests that retail competition in Market B should constrain pricing in Market A, and so, justifies the removal of a price control in Market A. See Section 6.

Broadband Connect (WBC), which uses current technology to provide both standard and SFBB services (based on FTTC technology).

Ofcom adopted an "anchor pricing" approach for the charge control in Market A, only regulating the price of IPStream services and regulating the price of these services to reflect the costs of a hypothetical ongoing network. The RFS shows that this was based on an assumption that the value of investments in the latest year (i.e. the Mean Capital Employed) would be £311 million more than actual Mean Capital Employed[18]. This implies that prices were set to allow BT to recover a hypothetical £311 million of additional investment that it was not to required (and did not) make.

Ofcom considered that it was inappropriate for the charge control to directly control the prices for WBC, which delivers services using the current and forward-looking technology. The rationale was to incentivise BT to undertake investment required to improve service characteristics when customers had a willingness to pay for improvements in quality (both in terms of service characteristics and generation of technology). Ofcom considered that this would incentivise efficient investment in WBC and fibre in Market A.

4.2 BT's returns have consistently been in excess of the benchmark rate

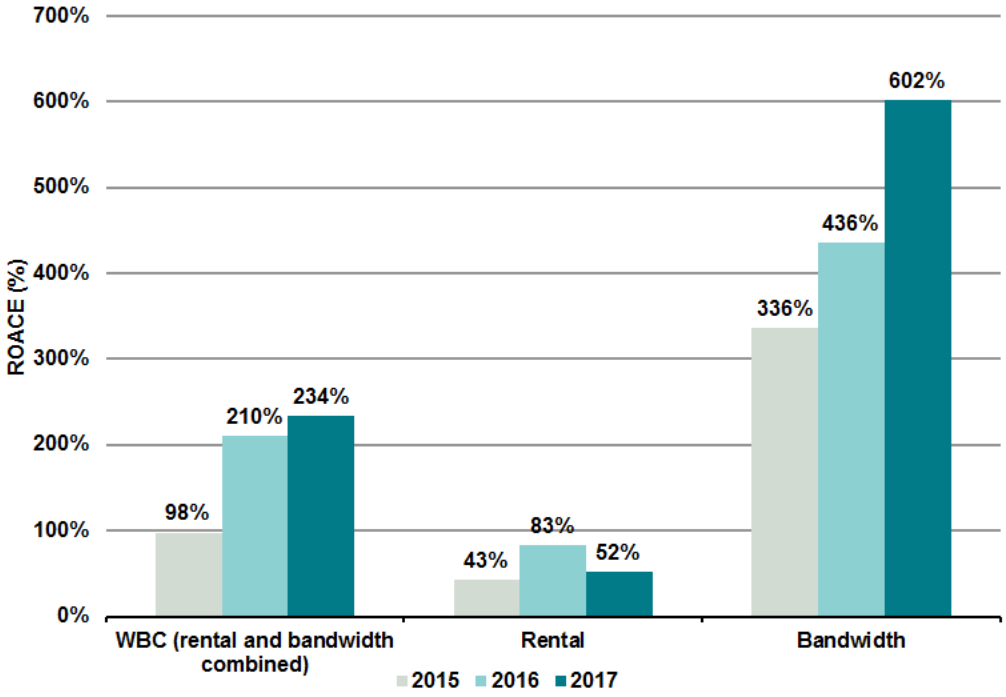
Since the market review in 2014, BT's Return on Average Capital Employed (ROACE) for Market A has been consistently above its benchmark rate. [19] This is especially true for WBC, as shown in the figure below. For example, the ROACE for the bandwidth charge[20] for WBC was in excess of 600% in 2017.

[18] http://btplc.com/Thegroup/RegulatoryandPublicaffairs/Financialstatements/2017/RRD2017Final.pdf

[19] The RFS documents from 2014 to 2017 indicate a WACC for the WBA market at 10.8% until 2016, and 9.8% in 2017. Sources: 2014 http://btplc.com/Thegroup/RegulatoryandPublicaffairs/Financialstatements/2014/Current_Cost_Financial_Statement_2014.pdf ; 2015 - http://btplc.com/Thegroup/RegulatoryandPublicaffairs/Financialstatements/2015/RevisedCurrentCostFinancialStatements2015.pdf; 2016 - http://btplc.com/Thegroup/RegulatoryandPublicaffairs/Financialstatements/2016/CurrentCostFinancialStatements2016.pdf; 2017 - http://btplc.com/Thegroup/RegulatoryandPublicaffairs/Financialstatements/2017/RRD2017Final.pdf

[20] The WBC products have separate charges for a broadband connection and for the traffic (bandwidth) over this connection.

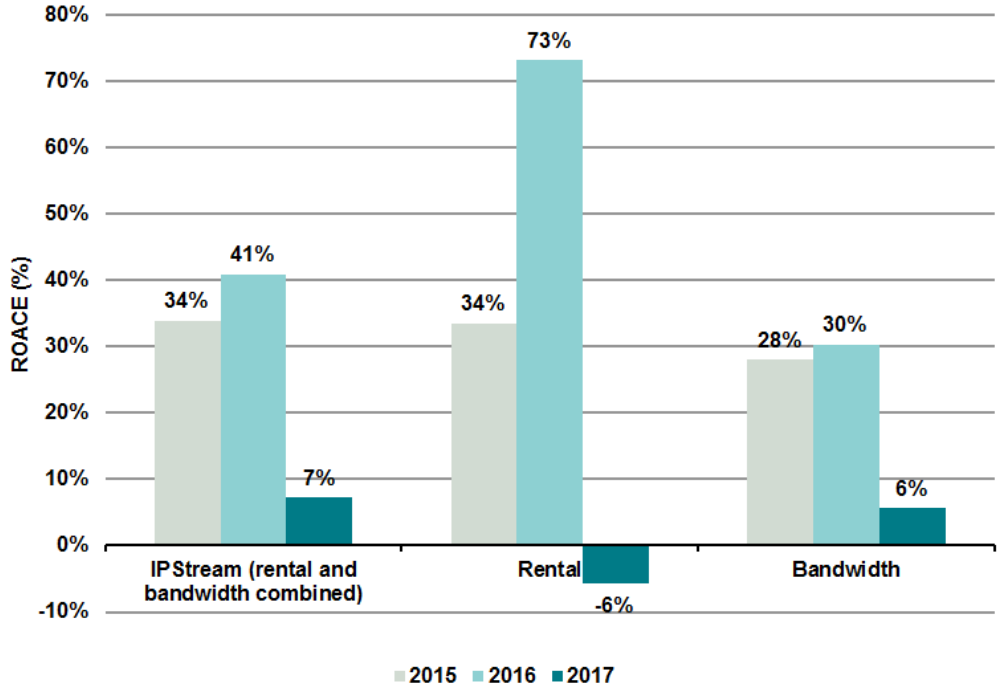
Figure 5 ROACE (%) for WBC



Source: Based of BT regulatory financial statements, Frontier analysis

The figure below shows the ROACE for IPStream, which has been in excess of the benchmark rate in 2015 and 2016.

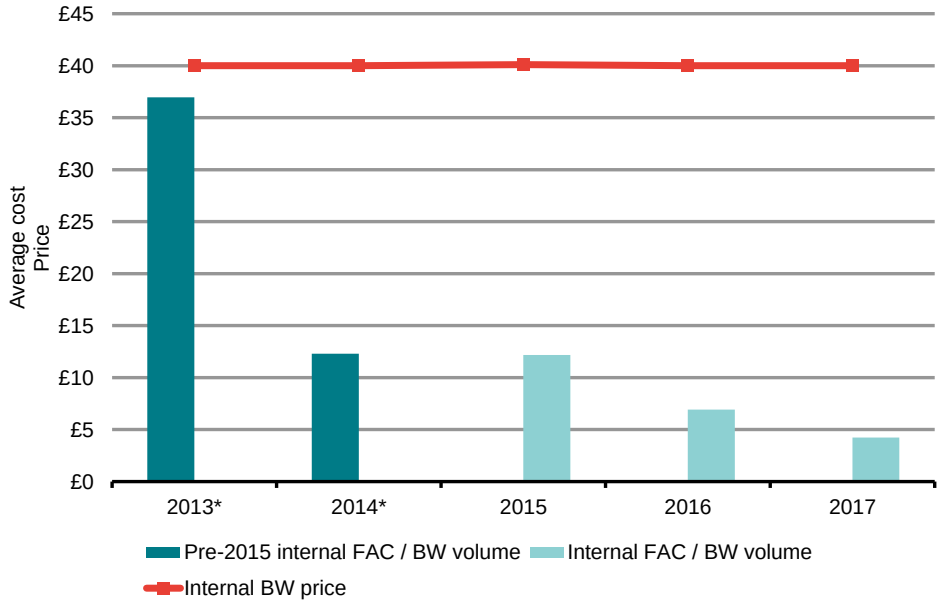
Figure 6 ROCE (%) for IPStream



Source: Based of BT regulatory financial statements, Frontier analysis

These returns can be explained by the movement in costs relative to prices for WBC and IPStream. The average costs[21] of both WBC rental and bandwidth (Figure 7 and Figure 8) have fallen significantly since 2013, mainly as a result of increased volumes. [22] However, corresponding prices have not fallen, and in the case of WBC bandwidth, have remained unchanged, leaving a growing disparity between average costs and prices which has driven returns in this market.

Figure 7 Average cost vs prices for WBC bandwidth volumes

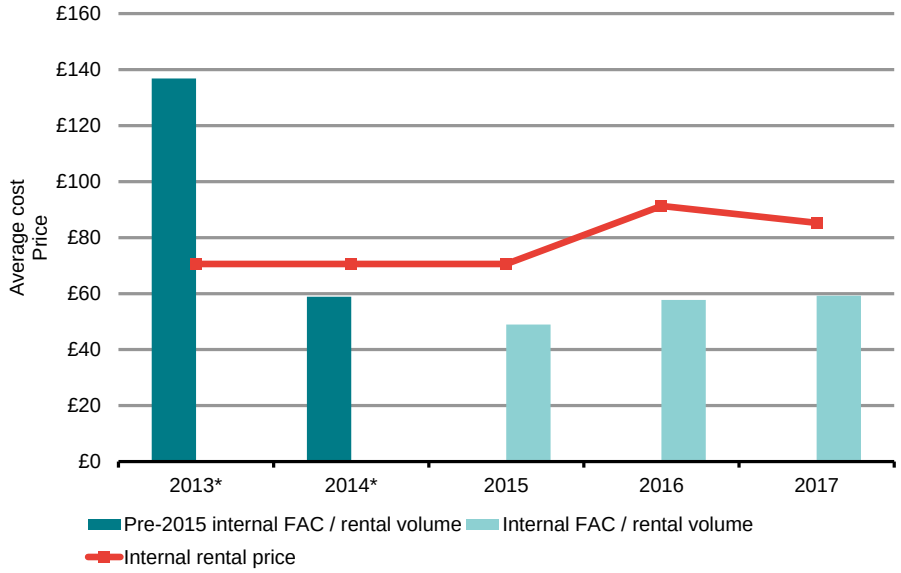


Source: Based of BT regulatory financial statements, Frontier analysis

[21] The average cost within a market can be calculated by taking the Fully Allocated Costs and dividing by the total number of customers, where Fully Allocated Costs (FACs) are defined as the total cost for a particular service.

[22] Although the overall volume of lines rented in the WBA market is declining, the share of Wholesale Broadband Connections (WBC) within it has been increasing; it has gone up from 16% in 2013, to almost 60% in 2017. Within this growing WBC segment, BT's share has increased from 92% in 2013 to 99.5% in 2017. This has driven BT's increase in retail market share in the WBA market.

Figure 8 Average cost vs prices for WBC rental volumes

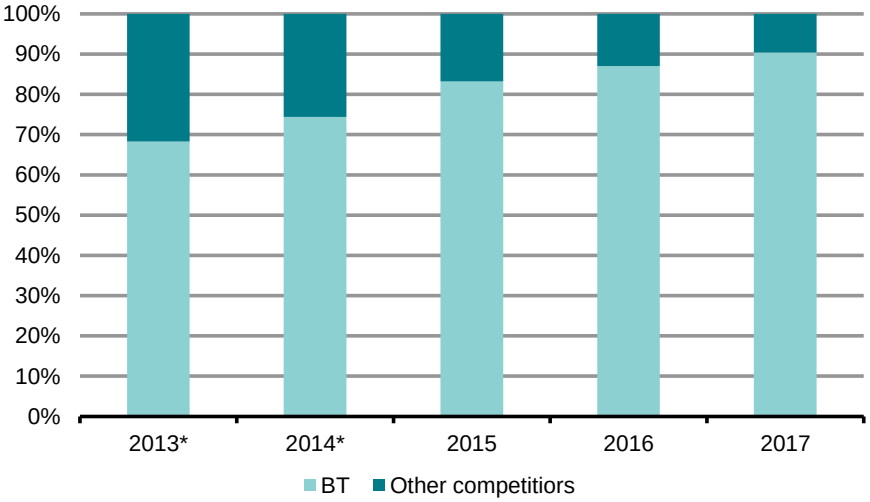


Source: Based of BT regulatory financial statements, Frontier analysis

At the same time, the composition and number of retail providers in Market A has changed. For example, Virgin Media and TalkTalk have withdrawn from use of BT's WBA products. It appears that Sky intends to shortly stop offering retail services based on BT's WBA services to new customers. Therefore, there are fewer customers of regulated WBA products than was the case in 2014.[23]

This has led to an increase in BT's share of demand for these products to almost 90% in 2017, which can be seen in Figure 9 below.[24]

Figure 9 WBA Market A retail shares using BT bitstream products



Source: Based of BT regulatory financial statements, Frontier analysis

[23] See Section 2, 2017 WLA Consultation. Available at https://www.ofcom.org.uk/__data/assets/pdf_file/0013/103180/wba-consultation.pdf

[24] BT's regulatory financial statements split the accounts into internal and external volumes. Internal volumes are BT's market share (including EE and PlusNet), whilst external volumes are other competitors, and have therefore been labelled as "BT" and "Other competitors" in this figure.

*Note: * Pre-2015 data based on old market definitions*

4.3 The market circumstances suggest that an anchor pricing approach may not have been appropriate

As discussed above, Market A was defined as exchanges with either no other or one other provider than BT. These exchanges are clearly in parts of the country where it is expensive for competitors to BT to enter, as revealed by the lack of alternate providers; barriers to entry are very high.

Ofcom set prices for IPStream services on the basis of a hypothetical continuing network, i.e. forecasting costs as if legacy equipment was replaced at the end of its assumed accounting asset life. Ofcom believed the allowing pricing flexibility for WBC services would incentivise BT to invest in WBC equipment to the extent that customers were willing to pay a premium for WBC services.

However the engineering life of communications equipment is much longer than the accounting asset lives. As such to continue supplying the legacy IPStream services BT has not had to invest significantly in replacing equipment but has been able to "sweat" the existing fully depreciated assets. This provides a disincentive for BT to invest to migrate to new technology as it would forego the high cash flows generated by the legacy services, even if BT could charge a premium for the WBC services.[25]

Indeed, migration to WBC has occurred, but only in the context of BT earning returns of 234% on WBC products, i.e. much higher returns than it was previously earning on IPStream services.

At the same time, the degree of competition in the retail market has declined as BT has over 90% share of the market.

4.4 Outcomes may not meet consumers' expectations on quality

Ofcom correctly identified the need for increased investment in those parts of the market where there was lower competition than in the rest of the UK, to improve broadband quality. However, the "anchor pricing" mechanism chosen by Ofcom did not provide BT with strong incentives to increase quality, and resulted in BT earning excessive profits while not meeting customers' expectations on quality.

[25] BT's ability to charge a premium for WBC based services in Market A, even if retail customers have a willingness to pay for higher quality services is also limited by the fact that downstream retail prices are geographically averaged. Given that Market A only accounts for around 10% of the subscribers, prices in Market A may to a large degree reflect conditions in the more competitive Market B.

5 THE WHOLESALE LOCAL ACCESS MARKET

In this section, we discuss the regulation of the Wholesale Local Access market, the motivation behind the chosen remedies and the appropriateness given the market circumstances. We also outline the returns earned by BT following this choice of remedies.

5.1 A "utility-like" approach was applied to the MPF/WLR charge control

Both price and quality were regulated

The Wholesale Local Access (WLA) market is currently under review[26], the last review having been carried out in 2014[27]. The approach to regulation for the Metallic Path Facility (MPF) and Wholesale Line Rental (WLR) products in the 2014 review was similar to that in utility markets. These products are based on legacy copper technology and so, there is no new entry in this market (although prices will be constrained to a degree by other technologies). Accordingly, the suite of remedies included the following:

- The obligation to offer WLR and LLU services, including such ancillary services as are reasonably necessary to enable and support their provision;
- Charge controls of key WLR and LLU services; [28]

From 2014 Ofcom imposed regulatory QoS requirements for the first time. This is because there was evidence of a decline in Openreach's performance in relation to line provision and repair activity. This underperformance caused acute problems for end-consumers in 2012 when poor responsiveness to faults and speed of provisioning deterred consumers from switching, harming competition. This could suggest that in the absence of binding quality of service requirements, BT reduced quality, in part by reducing investment.

The QoS conditions imposed included:

- minimum standards on fault repair and provisioning (requiring an engineer to visit a customer's home or business) for WLR and MPF.
- the obligation to report of a wider range of and more granular Key Performance Indicators (KPIs). A subset of these KPIs (specifically in relation to the installation of new lines, repair of faults and late installations and fault repairs) was to be published with unrestricted access on a BT Group website.
- the obligation to include Service Level Agreements and Service Level Guarantees in the Reference Offers for specified elements of certain services.

[26] https://www.ofcom.org.uk/__data/assets/pdf_file/0033/99636/Vol1-Market-review.pdf

[27] https://www.ofcom.org.uk/__data/assets/pdf_file/0032/78863/volume1.pdf

[28] A basis of charges obligation for electricity charges for LLU services to ensure charges reflected changes in energy prices.

However, profits remain above the cost of capital

BT's returns have remained materially above the WACC, which may have been driven by actual costs being lower than the forecasts:

- MPF rental charge control was submitted as £89.26, but in 2017 the actual FAC was £81.92 – 8% below the charge control rate.
- Shared Metallic Path Facility (SMPF) rental charge control was submitted as £4.84, but in 2017 the actual FAC was £3.99 – 18% below the charge control rate.
- WLR rental charge control was submitted as £86.70, but in 2017 the actual FAC was £78.91 – 9% below the charge control rate.

This over-forecasting of costs appears to be predominantly due to Ofcom basing the forecast use on RFS data that applied inappropriate cost allocation bases. These were corrected from the 2016 RFS. Now that the RFS have been corrected, the forecast unit costs are well above the actual costs.

5.2 Lighter regulation was implemented for superfast broadband

As with the regulated WBA market in the past, pricing flexibility for regulated VULA was allowed to incentivise investment

The 2014 review defined the WLA market to include the provision of copper loop-based, cable-based and fibre-based wholesale local access at a fixed location.

BT was found to have SMP in the WLA market outside of the Hull area and regulated remedies included:

- pricing flexibility on VULA prices, with BT being required to provide VULA on fair and reasonable terms, conditions and charges and on the basis of Equivalence of Inputs and no undue discrimination;
- a charge control of £11 for a migration of a VULA customer from one CP to another; and
- a reduction in the minimum contract period following a VULA migration to one month.

Specific access remedies to support competition and investment in NGA were imposed, alongside continued regulation of LLU. However, pricing flexibility was allowed to support BT's business case to invest in SFBB and to provide the incentive to continue to deploy and upgrade its SFBB network.

Ofcom considered that there was significant risk of regulatory failure with setting cost-based charges as the level or structure of any cost-based charge control could harm incentives for efficient investment. This was particularly because there remained uncertainty about the level of unit costs as the expected level and pace of VULA take-up was unclear.

Ofcom also considered that even if it sought to incorporate a higher rate of return into the price control, there remained the risk that it would err and set prices at an

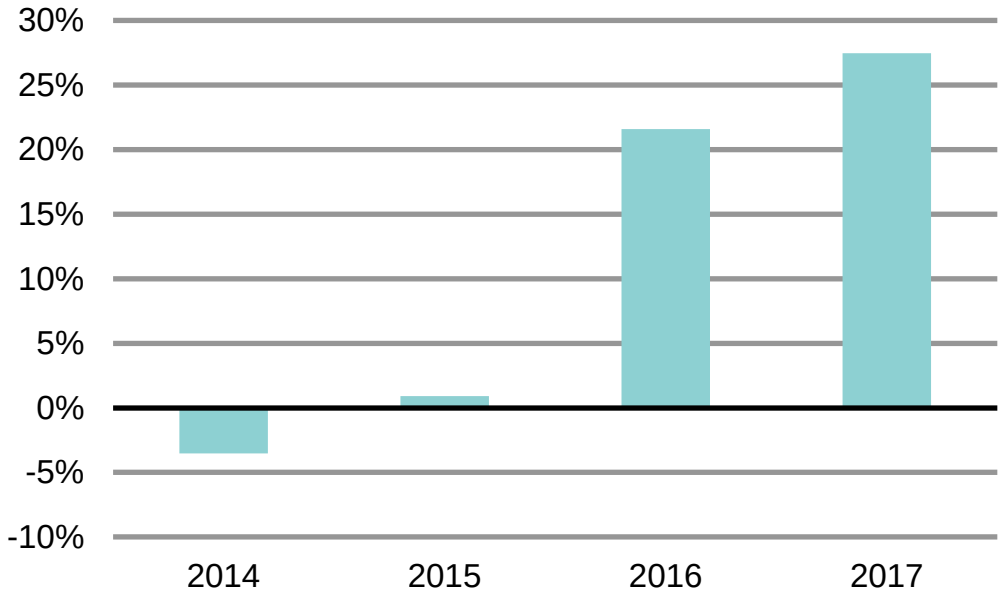
inappropriate level. Similarly, it considered there was a risk that limits on the structure of prices would reduce BT's ability to experiment on price to increase NGA take-up.

Thus, pricing flexibility was allowed in both the level and structure of VULA charges.

Returns have remained above the cost of capital since 2016

As Figure 10 shows, VULA returns were below the cost of capital in 2014[29] and 2015, reflecting the lack of economies of scale in the early years of roll out. Since 2016, these returns have grown to 22%, and then to 27% in 2017. Over the past four years, the sum of returns over the cost of capital has been £780 million.

Figure 10 VULA ROACE

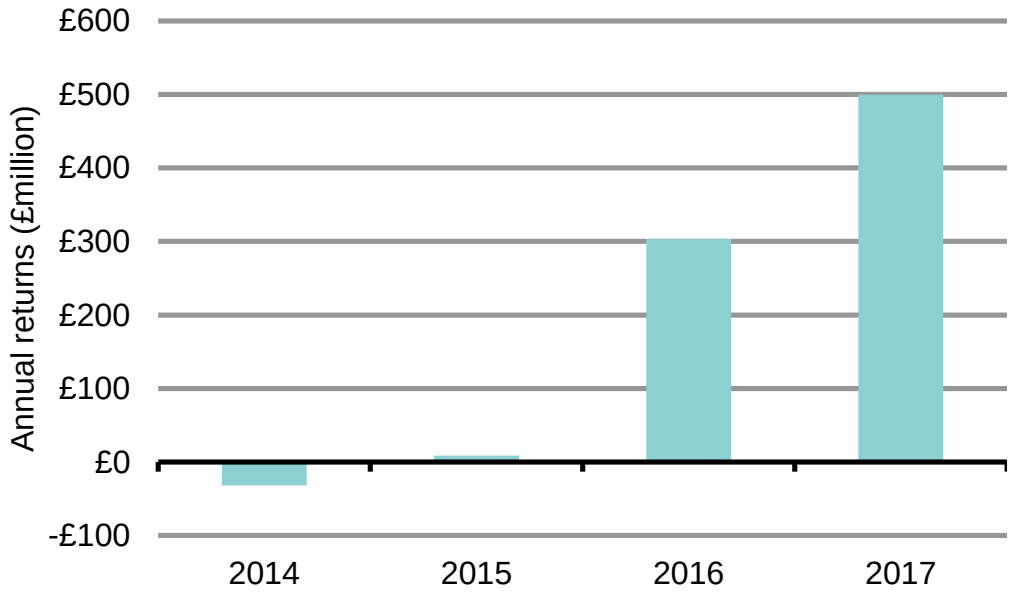


Source: Based on BT regulatory financial statements, Frontier analysis

[29] The RFS documents from 2014 to 2017 indicate a WACC for the VULA market at 8.6% until 2016, and 8.8% in 2017.

Sources: 2014 http://btplc.com/Thegroup/RegulatoryandPublicaffairs/Financialstatements/2014/Current_Cost_Financial_Statement_2014.pdf ; 2015 - http://btplc.com/Thegroup/RegulatoryandPublicaffairs/Financialstatements/2015/RevisedCurrentCostFinancialStatements2015.pdf; 2016 - http://btplc.com/Thegroup/RegulatoryandPublicaffairs/Financialstatements/2016/CurrentCostFinancialStatements2016.pdf; 2017 - http://btplc.com/Thegroup/RegulatoryandPublicaffairs/Financialstatements/2017/RRD2017Final.pdf

Figure 11 VULA absolute returns



Source: Based on BT regulatory financial statements, Frontier analysis

While arguably these outturn returns reflect a greater take-up of SFBB than was expected by Ofcom and BT,[30] and as such do not necessarily reflect the expected returns at the time the investments were made, they also do not reflect a complete picture of the incremental returns generated by the SFBB investment:

- They do not reflect the "defensive" value of the SFBB investment enabling BT to attract and retain a greater market share in those areas where there is (or could have been) competing infrastructure investment; and
- They do not show the incremental margin to BT in downstream wholesale (WBA) and retail markets.

While there may have been demand uncertainty when the initial investments were made, as the high consumer demand for SFBB became evident, BT accelerated the roll out of SFBB meaning the later tranches of investment were not subject to the same potential downside risks

Market circumstances suggest that much of the SFBB investment may have taken place anyway

The characteristics of this market are those described as "contestable" in Section 3.1.3, with Virgin Media also offering NGA services in some parts of the country.

In areas where Virgin Media was present, it is likely that BT would have needed to upgrade its network to compete with Virgin Media even if returns on the investment were constrained by regulation. Delaying the investment to wait for more information on willingness to pay for SFBB could then have had a significant cost in these areas due to the loss of wholesale and retail customers to Virgin Media. Given the high fixed costs of the Openreach network and the

[30] See for instance, https://www.ofcom.org.uk/__data/assets/pdf_file/0018/59121/statement.pdf

enduring effect of market share loss given that customers typically remain with their fixed broadband providers for a number of years, the cost of delaying entry in terms of profitability foregone would be large. This would have reduced the value of any option to “wait and see” as delay in rolling out would have allowed Virgin Media to increase its market share.

However, allowing pricing flexibility increased the expected return relative to the hurdle rate and incentivised investment at the margin. Also, high prices in the market appear to have encouraged entry and expansion by competitors; Virgin Media has embarked on Project Lightning to expand its fibre coverage while other providers such as City Fibre and TalkTalk Group have since experimented with rolling-out fibre in some locations.

Therefore, the market circumstance may have created some inherent incentive for BT to invest due to the need to differentiate/compete effectively in the market. At the same time, there may also have been some need to further incentivise investment.

5.3 Returns for current and next generation products have been above the benchmark rate

Thus, as seen in Sections 5.1 and 5.2, BT’s returns have been above the benchmark rate.

For MPF and WLR services, this is due to Ofcom setting charge controls based on cost data that was later determined to be inflated. On VULA services, pricing flexibility was allowed and so, returns above the benchmark rate were a potential outcome. However, the extent to which this has resulted in incremental investment is unclear compared to a more stringent charge control; it is likely that competitive circumstances would have incentivised BT to invest in rolling out FTTC to some extent even in the absence of pricing flexibility.

6 THE BUSINESS CONNECTIVITY MARKET

In this section, we discuss the regulation of the Business Connectivity market and the motivation behind the chosen remedies. We describe how in determining regulation, due consideration was taken of the market context and the consequent appropriateness of increasing/reducing regulation.

6.1 Price controls and QoS regulation were introduced to encourage entry and expansion

The Business Connectivity Market Review (BCMR) was completed in April 2016.[31] This included reviewing the regulation for Modern Ethernet and Wave Division Multiplexing (WDM) services, collectively to Contemporary Interface (CI) and legacy services, referred to as Traditional Interface (TI).

For CI services, separate markets were defined for Central London, London periphery and Rest of the UK (excluding Hull) as the degree of choice available in these sub-markets differed, thereby affecting the competitive dynamics.

For legacy TI services, a separate market was defined as Ofcom considered that there was little prospect of competitive entry as their volume was declining. Two geographic markets were defined for TI services; the whole of UK except Hull, and Hull.

Ofcom erred on the side of de-regulation for the CI market in Central London

The market for CI services in Central London was found to be competitive as Ofcom considered that there was sufficient choice of alternative infrastructure even though returns were above the cost of capital.

Ofcom found that BT's market share was consistent with single firm dominance and that BT's pricing and profitability in this segment was also consistent with a finding of SMP. However, Ofcom placed greater weight on the fact that there was rival infrastructure which could support competition for CI services. For instance, Ofcom found that nearly 98% of businesses had at least five providers (other than BT) within 200m and 93% had at least four other providers within 100m.

Price and quality regulation was introduced in the markets where BT had SMP

BT was found to have SMP in the following markets:

- Market for CI services in the London Periphery;
- Market for CI services in the Rest of UK (excl. Hull); and
- Market for TI services in the UK (excl. Hull).

[31] https://www.ofcom.org.uk/__data/assets/pdf_file/0015/72303/bcmr-final-statement-volume-one.pdf

In addition to the suite of general remedies (requirements to provide access, to not discriminate, accounting separation, etc.) which were largely similar to the remedies in place at the previous review, noteworthy changes were introduced to price and quality regulation. Furthermore, a passive access obligation was introduced.

Ofcom noted that BT's returns in both CI and TI markets were significantly in excess of its cost of capital. Therefore, significant reductions were introduced to both Ethernet (CI) and TI charges. This included immediate reductions in charges rather than just a glide-path for reductions over the period of the next price control. Furthermore, BT's pricing flexibility was curtailed to a certain extent through the implementation of a series of sub-baskets and sub-caps.

In terms of QoS regulation, Ofcom had found that Openreach's service performance in the provision of Ethernet services had deteriorated materially and was inadequate in several respects. Therefore, the following remedies on QoS were introduced:

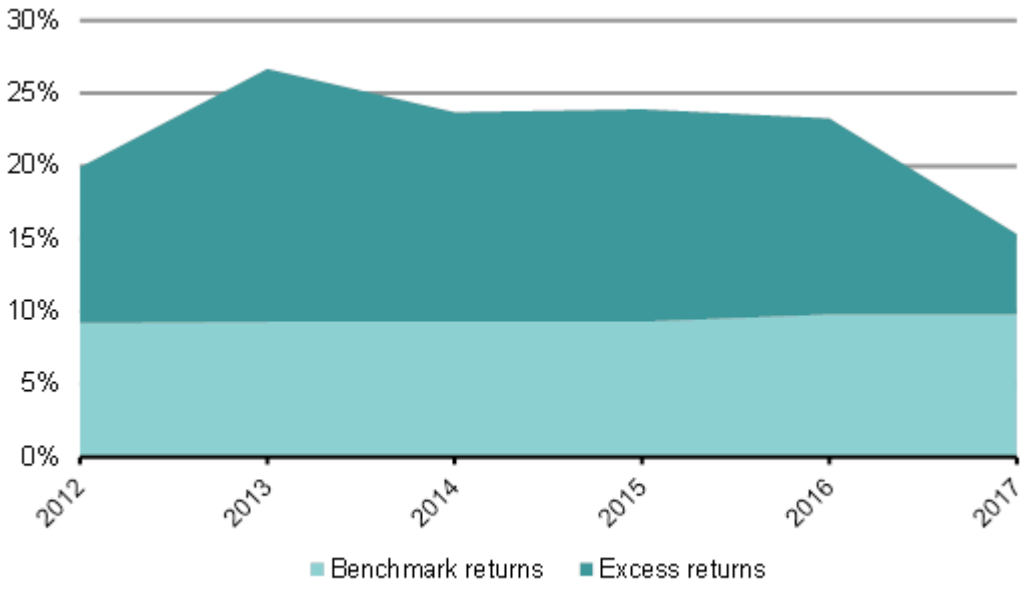
- A new quality of service SMP condition requiring BT to comply with any quality of service requirement;
- a direction requiring BT to comply with minimum quality of service standards in relation to various stages in the delivery of wholesale Ethernet services:
- a requirement on BT to provide specified quality of service KPIs; and
- a direction concerning the Service Level Guarantees BT must provide for in its terms and conditions for the provision of Ethernet services

Dark fibre access was also introduced as a new remedy as Ofcom considered that this would facilitate innovation by competing providers. Dark fibre was to be subject to a price control with prices set on an "active minus" basis wherein priced would be set equal to the price of the active service (or basket of services) minus the relevant incremental costs attributable to the active service.

6.2 The first year of the charge control appears to have been effective in moving BT's prices towards costs

Since Ofcom's review in 2016, after implementing the Year One starting adjustment and annual charge reduction BT's returns have fallen from 23% in 2016 to 15% in 2017. Whilst one data point is not enough to fully assess the success of a three year regulatory regime, it is an indicator of the effects a strong first year charge control has on excess returns. Figure 12 shows a positive decline in the size of excess returns in the context of previous profit changes.

Figure 12 Business connectivity: benchmark and excess returns[32]



Source: Based on BT regulatory financial statements, Frontier analysis

6.3 Regulation appears to have taken account of market circumstances

As discussed in Section 3, in markets with high barriers to entry, even regulated incumbents may retain the incentive to maximise profits by cutting quality of serve (and so, costs). BT was found to have SMP in the CI markets in the London Periphery and the Rest of the UK (excl. Hull) and the TI market. BT's returns were significantly higher than the cost of capital in these markets; this also points to the exercise of market power. At the same time, quality of service was found to have deteriorated, as one might expect of a provider with significant market power. Thus, the imposition of a stricter price control and QoS regulation was considered both necessary and appropriate.

Several providers existed in the market for CI services in the Central London Area. This could be considered a "contestable market" and although further entry may not be efficient, Ofcom considered that there were sufficient credible players to constrain any market power BT may have. Therefore, Ofcom erred on the side of deregulation.

Setting aside the fact that the Competitions Appeals Tribunal has considered that Ofcom erred with the market definitions in the BCMR (and so, remedy implementation has been put on hold) the outcomes in the market so far have been positive: returns were converging to the cost of capital and the QoS had improved. This could indicate that market circumstances were well accounted for when determining the regulation necessary.

[32] Benchmark returns for BC market were updated in the 2015 market review. This is outlined in Annex 30 of that report https://www.ofcom.org.uk/__data/assets/pdf_file/0032/54977/final-annexes-29-30.pdf

6.4 Returns have declined following recent regulatory intervention

Following the starting charge adjustment and the annual charge reduction, BT's returns have declined significantly in the first year of the current price control but still remain above the cost of capital. Over the remaining period of the charge control the combination of a stringent charge control with adequate quality of service safeguards should protect customers while allowing BT to continue to invest in the market.

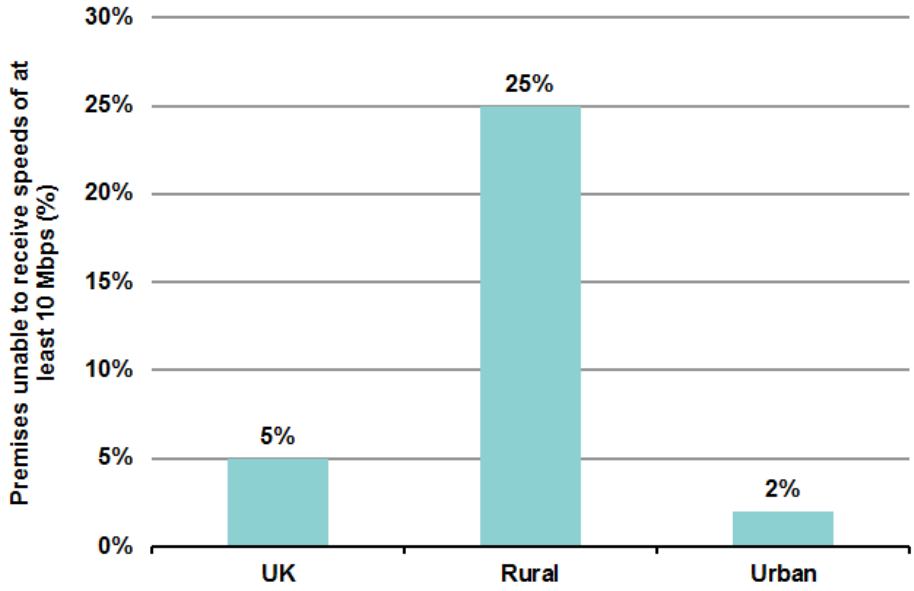
7 INVESTMENT IN BROADBAND MARKETS

Having discussed the returns earned by BT (i.e. pricing), we now discuss overall consumer outcomes in the broadband market in terms of quality. In particular we outline that although SFBB coverage has increased in recent years, there still remain parts of the country that receive speeds below 10 Mbps, i.e. below the speeds enjoyed by most customers on standard broadband. Furthermore, the trend in quality of service on mature technologies has not shown improvements recently.

7.1 Some customers continue to receive low speeds

Superfast broadband is available to 89% of premises in the UK. 1% of premises are unable to receive speeds of even 2 Mbps and 5% of premises are unable to receive speeds of 10 Mbps.[33] As can be seen in Figure 13 below, the majority of the 5% that do not receive 10 Mbps are in rural areas.

Figure 13 Premises with download speeds of less than 10Mbit/s



Source: Ofcom

Note: https://www.ofcom.org.uk/__data/assets/pdf_file/0035/95876/CN-Report-2016.pdf

SFBB has not been rolled out throughout the UK on a totally commercial basis; a government-funded programme (Broadband Delivery UK (BDUK)) has been necessary to support increased SFBB coverage and universal availability of basic broadband.[34]

It is also possible that an obligation will be imposed on BT to offer at least 10 Mbit/s universal broadband.[35] In parallel, Ofcom is consulting on amending the

[33] http://researchbriefings.files.parliament.uk/documents/SN06643/SN06643.pdf

[34] https://www.gov.uk/guidance/broadband-delivery-uk

[35] https://www.gov.uk/government/news/universal-broadband-to-reach-every-part-of-the-uk

VULA charge control to include additional charges to recover the cost of this expansion.[36] The charges, if incorporated in the charge control, would therefore lead to returns that would be incremental to the excess returns earned in previous years, outlined in the sections above.

7.2 Quality of service on mature technologies has not shown significant improvement

Historically, BT was able to reduce the fault rate (i.e. the percentage of customer who had a fault on the line in any one year) on copper lines over time through investment in preventative maintenance[37].

However in recent years, despite BT earning returns at or above its cost of capital for copper based products, as can be seen in Figure 14 quality of service in terms of the level of faults has not improved significantly.

Ofcom's experience in other aspects of quality of service shows that in the absence of regulatory intervention, BT may not have strong incentives to improve quality of service despite earning excess profits on the corresponding services.

Ofcom introduced QoS standards in 2014 to deal with shortcoming in Quality of Service in terms of provisioning and fault repair. In the current WLA review, Ofcom is consulting on imposing further QoS requirements.[38] This is because it found that despite the introduction of standards in 2014, performance had not improved sufficiently. For instance, Ofcom states that Openreach has not performed beyond the necessary minimum in the case of repairs. Furthermore, Ofcom considered that BT's capital expenditure had been lower than its forecast over recent years. [39],

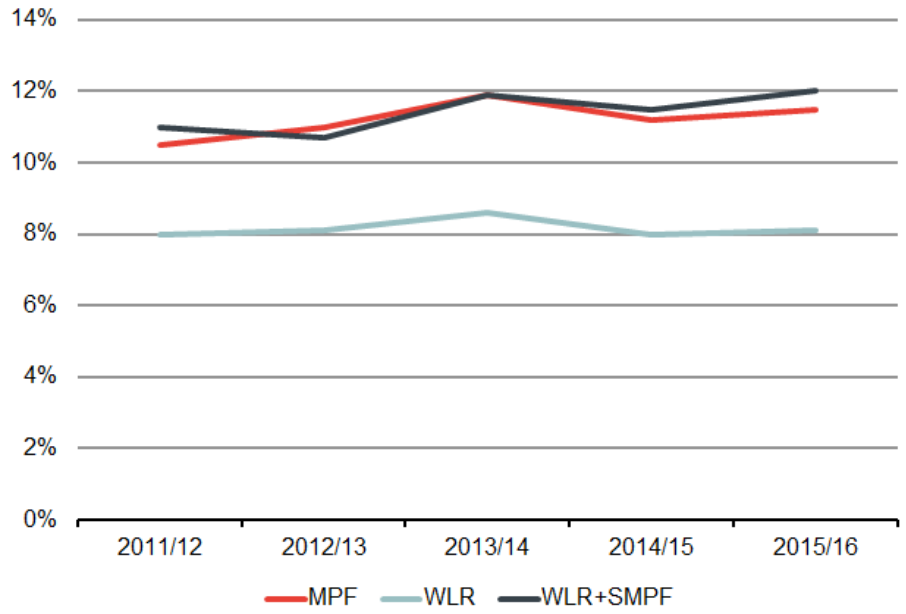
[36] https://www.ofcom.org.uk/__data/assets/pdf_file/0022/105682/Recovering-the-costs-of-investment-in-network-expansion.pdf

[37] See for example chart A10.1 in : A New Pricing Framework for Openreach Second Consultation Publication date: 5 December 2008

[38] https://www.ofcom.org.uk/__data/assets/pdf_file/0033/99645/QoS-WLR-MPF-GEA.pdf

[39] *Ibid.*

Figure 14 Annual fault rates (%)



Source: *Approximated from Ofcom analysis*
Note: *https://www.ofcom.org.uk/__data/assets/pdf_file/0033/99645/QoS-WLR-MPF-GEA.pdf*

7.3 Outcomes do not seem to be in line with Ofcom's objectives

As seen in previous sections, BT's profits have been above the cost of capital for several years. At the same time, consumer outcomes in terms of quality of service and the need for the Universal Service Obligation indicate that the level of investment has been below the level required to meet policy goals. There is also some evidence of a decline in downstream competition, specifically in Market A, with BT's share of retail services having increased since the last market review.

These outcomes are unlikely to be in line with Ofcom's objective to further the interests of citizens and of consumers.[40]

[40] https://www.ofcom.org.uk/about-ofcom/what-is-ofcom

8 CONCLUSION

As has been discussed, high profits do not automatically imply high investment or quality improvements; market circumstances have a large part to play in determining the incentive to invest. In markets with high barriers to entry, competitive circumstances can mean that the incumbent operator has an incentive to increase prices and reduce quality to maximise profits, and hence invest less than the efficient level.

The role of regulation in such a scenario can be to simulate the outcomes of a competitive market by ensuring that both price and quality approach the competitive level; having requirements around quality of service can create the incentive to invest in network upgrades and improvements.

In fixed broadband markets, regulation has attempted this optimisation of productive, allocative and dynamic efficiencies by:

- encouraging competition in sub-markets/parts of the network that have lower barriers to entry (for instance because fixed costs and so, economies of scale are lower) so that competition drives these efficiencies. Once competition has been fostered, regulation can be lightened and eventually removed; and
- implementing more stringent, “utility-like” regulation to simulate outcomes of a competitive market in sub-markets/parts of the network with high barriers to entry. This involves regulation to ensure that QoS is maintained and prices are set on true base-line cost and forecast information to prevent persistence of profits above the appropriate hurdle rate.

However, the evidence on the success of this approach appears mixed, primarily because Ofcom may not have taken sufficient account of market circumstances and inherent incentives when designing regulatory interventions:

- In markets where Ofcom has applied charge controls to constrain BT’s prices, there is evidence that in the past BT’s investment was below the level forecast by Ofcom with impacts on the quality of service offered to customers. In recent years Ofcom has implemented charge controls which have better constrained the level of profitability and include appropriate quality of service standards;
- In those geographic areas where BT was found to face little broadband competition at a wholesale level, Ofcom applied a less stringent charge control in terms of price level with no corresponding quality requirements. This does not appear to have achieved Ofcom’s objectives in terms of protecting customers from high pricing, incentivising investment or encouraging competition. Indeed, it is possible that Ofcom’s approach may have delayed the transition to FTTC/FTTP because there were still high returns to be earned on the legacy (copper) technology.

Going forward, there may be some merit in introducing stricter regulation of legacy/current generation products as this may encourage investment in the newer technologies by existing operators. For example, if the ability to earn returns above the cost of capital on VULA products is constrained, BT may be

encouraged to expand FTTP coverage as the incremental returns may be higher. Finally, further emphasis may need to be placed on improvements in quality of service within charge controls as a means to incentivise continued investment.

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