Fair rate of return for the regulated water industry in England and Wales

Report prepared for Defra

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Executive Summary

At a time of heightened public scrutiny of the water sector, this review brings together evidence on historical returns earned by investors in water companies in England and Wales, considers how best to measure these returns and asks whether those returns have been fair. This Quick Scoping Review examines in detail more than 40 of the most relevant published reports and the views of 11 expert interviewees as well as a publicly available data. It establishes a set of metrics to assess returns and asks whether evidence supports the proposition that past returns have served the public interest, particularly in comparison with returns observed in other sectors though without undertaking any formal benchmarking analysis. It then considers how regulatory changes proposed for PR19 might affect returns in the future. It does not make policy recommendations.

Widely cited figures on dividends and profits give a misleading impression of water company returns. In an analysis frequently quoted in the media, Bayliss and Hall (2017) claim that companies paid dividends of £18.1bn to shareholders from 2007-16, ‘almost all’ of the post-tax profit generated by the sector over the same period. This analysis neglects the contribution of RCV indexation to distributable returns and the practice of distributing ‘round-trip’ dividends that are used to repay loans made by regulated companies: accounting for these factors shows that dividends have been at least £3bn less than Bayliss and Hall’s figures and in fact amount to around half the value of distributable returns generated over the period.

‘Headline’ assessments of company returns should cover two potential sources of unfair or excessive returns: overly generous regulatory settlements and companies’ use of financial structures that promote shareholders’ interests over others. A regulatory settlement gives rise to excessive returns when the package of allowances, incentives and risk-sharing mechanisms means that investors (shareholders and creditors) expect to earn more than they require to achieve regulatory objectives. These objectives may include cost savings or service enhancements that benefit customers in the short term, as well as the revelation of information on costs that benefits customers in future settlements. In addition, shareholders can earn excessive returns if the company’s capital structure, at the regulated or unregulated holding company level, distributes profits in ways that reduces financial resilience at others’ expense, raising risks to customers, taxpayers or pension fund holders to a level they are unwilling to bear.

Key metrics to understand the generosity of regulatory settlements are regulated equity (RORE) and valuation premia. Ofwat’s Monitoring Financial Resilience (MFR) report, published annually since 2016, shows companies’ RORE, which measures profitability in a manner that is comparable over time and with other regulated sectors, making it more informative in assessing the generosity of regulatory settlements than reported accounting profits. Historical observations of RORE can be used alongside premia from stock market valuations and transactions, which provide additional information on expectations of future returns. An important limitation of both RORE and valuation premia is that they reflect the outturn of risks regulators require companies to bear in settlements, as well as the generosity of the settlements themselves.

Company credit ratings can help understand whether companies’ financial structures unduly promote shareholder interests. Company credit ratings consolidate evidence on financial resilience that, along with information in annual performance reports on protections for other stakeholders, show the alignment
between company capital structures with the public interest. This can be supplemented with information on dividend yields in Ofwat’s MFR report, which shows the distribution of company profits more reliably than dividends reported in financial statements and can be compared to regulatory benchmarks.

**Companies have earned returns greater than required to finance their functions since 2010, but returns have not been out of line with those observed in other UK regulated sectors.** Valuation premia in market and transaction data show that, for most of the period since 2010, investors expected profits to significantly exceed the cost of capital. These expectations have been confirmed by outturn profits in the sector, which were at least £2.3bn above the cost of capital during AMP5 (the PR09 review period) and have amounted to £730m above the cost of capital during the first three years of AMP6 (the PR14 review period, which will continue until April 2020). These returns are equivalent to adding around £20 to an average customer bill during AMP5, or 4-5% of industry revenue, and £10 in AMP6 to date, around 2% of industry revenue. However, critical aspects of economic regulation in the sector have been no more generous to companies than the frameworks applied to other UK network industries and, at least since 2015, returns in UK energy network industries have been notably higher than in the water sector.

**Data does not allow returns to be formally decomposed into those that are necessary to promote the public interest and those that are excessive, but they can attributed to financial outperformance, totex outperformance and tax.** Financial outperformance consists of companies raising finance at a lower cost of capital than allowed by the regulator, cost or ‘totex’ outperformance involves companies spending less than the regulatory allowance, and tax windfalls can result from unforeseen changes to company tax liabilities.

**Financial outperformance stems from companies bearing risk on movements in market interest rates and the approach used to set Weighted Average Cost of Capital (WACC).** Investors bear the risk of changes in interest rates during price review periods, reflecting macroeconomic conditions: low interest rates since 2009 allowed companies to profit from cheaper debt and higher gearing than anticipated at price reviews, but returns would have been lower had rates been higher than expected. Financial outperformance can also stem from the WACC allowance itself, which Ofwat has estimated in a similar way to other regulators, but which has been generous to companies in some respects. Evidence suggests the allowed cost of debt is set including a ‘forecast error premium’ to compensate investors for bearing forecast risk, while the cost of equity places high weight on long-term evidence from stock markets that overstates the financing costs of privately owned companies operating in a low interest rate environment and investing in low risk regulated assets. The overall value of financial outperformance has been at least £1.5bn to the sector in AMP5 and between £200m and £1bn in AMP6 so far.

**Changes proposed for PR19 will substantially reduce financial outperformance.** Lower estimates of the cost of equity, which Ofwat bases on short term market evidence but others have derived from long term data, will contribute to substantially reduced returns from financing. Indexation of the allowed cost of new debt, which has been implemented in other regulated sectors, is expected to reduce forecast error premia. Additional proposals for highly geared companies to share gains from low financing costs with their customers are expected to reduce returns further.
**Totex outperformance can serve the public interest by driving long-term efficiency but components of totex allowances have led to excess profits.** The opportunity to earn higher returns can incentivise efficient behaviour by companies, which benefits customers in the long run as it allows Ofwat to impose stricter price controls in the future. The overall returns paid to companies through totex incentives during AMP6 do not appear excessive when compared to those earned by UK energy networks or US water companies. However, aspects of recent determinations have favoured companies: these include an allowance for companies to recover 50% of pension deficit repair costs from bills at PR09, which Ofwat considered necessary for companies to finance their functions, and the cost exclusion process followed at PR14, which has been made less generous for PR19. The value of totex outperformance is worth at least £500m in AMP5 and £360m in AMP6 so far.

**Windfalls to companies from changes in Corporation Tax in AMP5 will not be repeated.** Investors profited from a steep reduction in UK Corporation Tax during AMP5, worth around £300m in AMP5, but Ofwat made changes subsequently that will claw back for customers any gains from future changes in headline corporation tax or the capital allowance regime.

**Company financial structures have raised shareholder returns without affecting credit quality, but significant pension fund deficits remain and information on financial resilience is incomplete.** Companies have retained investment grade credit ratings in line with their licence obligations and there is no evidence that holding company structures have caused higher investor returns at the expense of other stakeholders. However, the sector has nonetheless taken on more debt and paid out higher dividends than Ofwat expected and companies have so far not provided sufficient evidence in viability statements to show how financial stress might affect customers or taxpayers. Many companies have significant pension fund deficits, whose repair could have been funded using returns that were disbursed as dividends. More exacting requirements on company viability statements could improve information on financial resilience, though the efficacy of this will depend on details of the arrangements as yet to be established.

**Publication of more quantitative information on the level and sources of company financial returns would allow a more detailed assessment.** Data in the sector has improved in AMP6, with new Annual Performance Reports from companies and Ofwat’s annual Monitoring Financial Resilience report that breaks down returns into component parts. However, there is no official repository of consistent, long-term data on company returns and no authoritative empirical study that comprehensively breaks down returns into profits from outperformance and profits from risk sharing arrangements. The provision of such information could improve transparency and support the sector’s legitimacy. Private, unlisted company shareholders are not required to report prices paid in transactions, which limits the usefulness of market data in assessing returns.
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1 Introduction

1.1 Background

Returns earned by privatised water companies in England and Wales have come under increasing public scrutiny. The Secretary of State for Environment, Food and Rural Affairs has raised concerns that companies have generated high profits and paid high dividends in recent years, in part as a consequence of the adoption of highly geared capital structures and the use of offshore financing vehicles, while at the same time failing to invest in ‘nationally significant supply infrastructure’ or reducing leakage (Defra, 2018). If the returns earned by water company shareholders or the financial structures that underpin them cannot be justified in public interest terms, this may call into question the legitimacy of the regulatory and institutional arrangements that govern private investment in the sector.

This work looks at how to measure returns and how to judge whether levels of returns are fair. It considers historic profits and how these compare with those observed in other sectors, the relationship between company structures and the distribution of profits, and the degree to which the level of profits can be explained by different aspects of economic regulation. The review of company structures includes those of holding companies, which lie outside the scope of economic regulation. Aspects of regulation considered include risk-sharing arrangements and incentives put in place by Ofwat at price reviews, the most recent of which (from PR14) covers the period 2015 to 2020. This study also considers the decision from Ofwat to alter the incentive and risk sharing arrangements at the next price review, PR19, so that companies keep less of any gains from reductions in financing costs and face more detailed oversight of their financial resilience, including the effect of parent company financial structures on regulated company resilience, beyond requirements already in place (Ofwat, 2018a, 2018c).

1.2 Objective

Vivid Economics undertook a quick scoping review (QSR) to understand returns earned by water companies in England and Wales. A QSR aims to provide ‘an informed conclusion of the size and type of evidence available and a summary of what that evidence indicates with respect to the question/s posed’ but does not extend to a critical appraisal of the evidence (Collins et al., 2015). The research question is:

‘Does the current regulatory and institutional framework tend to lead regulated water and wastewater companies in England and Wales to earn excess returns?’

1.3 Scope

The study considers ways in which returns may be excessive, that is, greater than a fair level. It proposes metrics that can be used to assess and diagnose excess returns and presents publicly available data on these metrics going back to 1989. Data is presented for regulated water-only and water and sewerage companies (respectively, WoCs and WaSCs) in England and Wales, and for a limited range of comparator water utilities in the US and regulated energy network companies in the UK.
The review collates evidence that explains the origins of the returns, in particular how returns stem from aspects of the regulatory and institutional arrangements and whether those arrangements have contributed to returns that are excessive. The form of evidence spans policy and regulatory documents as well as findings from expert interviews. The review presents conclusions against the research question, identifies gaps in the available evidence and considers how this relates to Ofwat’s consultation and subsequent decision ‘Putting the sector back in balance’ (Ofwat, 2018a, 2018c). Policy recommendations are outside the scope of this work.

1.4 Structure of the document

The remainder of the document is structured as follows:

— Section 2 details the research methodology;
— Section 3 presents the framework used to structure the review;
— Section 4 sets out a synthesis of the findings;
— Section 5 concludes, presenting key issues and gaps in the evidence;
— Appendices present more detailed quantitative evidence collected as part of the review.
2 Quick scoping review method

2.1 PICO structure

In line with QSR guidance, the research question follows the PICO structure (population, intervention, comparator, outcome), as set out in Table 1 below.

<table>
<thead>
<tr>
<th>PICO element</th>
<th>PICO element within this QSR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population</td>
<td>Regulated water and wastewater companies in England and Wales</td>
</tr>
<tr>
<td>Intervention</td>
<td>Situations in which regulatory cost assessment, risk-sharing, or incentive mechanisms are changed, or where constraints on the conduct of company investors differ.</td>
</tr>
<tr>
<td>Comparator</td>
<td>The current regulatory and institutional framework governing water company returns.</td>
</tr>
<tr>
<td>Outcome</td>
<td>The difference between realised returns and a benchmark ‘fair’ rate of return</td>
</tr>
</tbody>
</table>

Source: Vivid Economics

2.2 Evidence review

The QSR collates data, interviews, an automated search of Google Scholar for relevant literature and a targeted literature search. This approach covers all potential sources of published evidence and allows selected issues to be discussed in more depth with experts.

Data on water company returns, which is used for illustrative purposes in this QSR, was provided by Ofwat. Ofwat has collected regulatory accounting submissions by companies and its own price determinations since 1989. The research team used public information from regulatory accounts to produce exhibits on the return metrics of interest. Detailed analysis or quality assurance of primary data lies outside the scope of a QSR.
The automated literature review scraped Google Scholar for potentially relevant studies. The automated search identified 4,709 studies that contained key words associated with the PICO elements listed in Table 1. Through a process of screening, 3 of these studies were identified as relevant to the primary question. For a detailed explanation of the search strings used and the process of screening see Appendix 1. The evidence obtained from these 3 studies was recorded.

Interviews with experts covered all of the issues relevant to the research question. The interviewees included water company employees and investors, regulators, credit rating and debt analysts, all of whom have deep knowledge of the ways in which returns are set for regulated water companies in England and Wales or relevant comparators. Ofwat personnel were not interviewed as part of the project. Table 2 lists the interviewees, in addition to whom the project team spoke to two anonymous experts.
A manual literature review targeted known sources and emerging issues of interest. The manual literature assembled a body of evidence from known sources, principally regulatory documents on mechanisms of returns. This was supplemented with further evidence on the levels and sources of returns, which included reports by equity research and credit rating analysts. This process covered more than 20 studies, including a number that were recommended by interviewees.

The synthesis and conclusions weigh the balance of the evidence. The discussion reflects the volume of evidence in favour of and against various propositions as well as the quality of the evidence, which depends on the type of source (with official studies or peer-reviewed journal papers weighted more highly than interview evidence or grey literature) and empirical evidence. The synthesis in Section 4 presents the balance of evidence in narrative form, before the conclusion in Section 5 answers the research question, identifies gaps in evidence and considers how the findings related to Ofwat’s consultation and subsequent decision on ‘Putting the sector into balance’ (Ofwat, 2018a, 2018c). James Grayburn from NERA provided expert peer review of an initial draft of this paper.
3 Framing

This section sets out the conceptual structure used for the QSR. Section 3.1 defines fair or excessive returns, Section 3.2 states hypotheses on how excessive returns might be realised and Section 3.3 lays out metrics that can be used to test these hypotheses. The framing is based on the research team’s understanding of the sector and was refined during the course of the review through interviews and the literature review.

3.1 Fair or excessive returns

Returns to water company investors are fair when they promote the wider public interest and excessive when they enrich investors at the expense of other stakeholders. The payment of returns to water company investors is fair when the following conditions are met:

— investors are willing to provide capital under the regulatory and institutional system that governs the returns (including the obligation to carry out companies’ functions), in that the expected level, term and risk profile of returns is commensurate with those available from other investment opportunities;
— customers, considered as a collective, are willing to pay any returns above the minimum cost of capital in order to incentivise long-run service improvements or bill reductions or to transfer risk from customers to investors;
— returns are not generated through the withdrawal of payments to other stakeholders, such as taxpayers or pension fund holders, to which they are entitled.

If investors are willing to provide capital, but either the second or the third of these conditions fails to hold, returns represent a transfer to investors for which customers or other stakeholders are not properly compensated. In such circumstances returns are deemed excessive.

Ofwat has specific duties to set returns that are sufficient for efficient companies to finance their functions and to protect customer interests. Under Section 2 of the Water Industry Act (1991), Ofwat is required to ensure that companies are able to earn a sufficient return on their capital to finance their statutory duties. Though the Act is not couched in terms of ‘fair’ returns, this means that, provided Ofwat fulfils its duties, investors will be willing to provide capital to fund investment, so the first of the conditions listed above for fair returns will be met. Under the same Act, Ofwat is also obliged to protect the interests of consumers.

Returns paid by customers that are just sufficient to meet companies’ efficient cost of capital are assumed to be fair in this review. In other words, the QSR assumes that customers are willing to fund the investments that companies undertake at a cost of capital that allows them to finance their functions if they are efficient. This means that if returns are just sufficient to allow companies to finance investment, then they are taken to serve the public interest. The QSR does not address the separate question of whether customers are willing to fund the specific programmes of investment or service provision that companies commit to, much of which is in any case driven by statutory requirements.

Expected rather than realised returns determine fairness. Regulation shares risks between companies and customers and provides incentives for companies to outperform on cost efficiency and service quality.
Realised returns therefore vary from expected returns. In order to incentivise investment before returns are realised, expected returns must be sufficient for investors to supply capital.

**Expected returns above the cost of capital facing companies can be fair when they incentivise better performance.** It can be in the public interest to pay companies, collectively, more than the cost of capital in order to incentivise them to find ways to improve performance. This stems from the fact that Ofwat is at an informational disadvantage to companies as to the level of efficient costs and there is limited scope for competition. Ofwat’s mandate requires it to finance the functions of companies with efficient costs. However, since Ofwat cannot perfectly tell the difference between the more and less efficient company, it must offer ‘rents’ to efficient companies by way of an inducement to reveal the ‘information’ on their efficient costs (Laffont and Tirole, 1993). Incentives for cost efficiency and service delivery, which included totem menus and outcome delivery incentives (ODIs) at PR14, can serve the public interest by reducing bills and improving service standards over the long run even if they entail additional payments to some companies during price control periods. Ofwat’s use of ‘yardstick competition’, in which companies’ efficient costs are benchmarked against each other using econometric models, help to identify efficient costs, but not perfectly (Schleifer, 1985).

To understand whether observed returns paid to water companies and their investors are fair requires a diagnosis of the sources of returns, including an understanding of incentive and risk-sharing arrangements. A simplistic comparison of realised returns and a benchmark cost of capital cannot show conclusively whether the returns are fair. This report focuses on rationale for the incentive and risk-sharing mechanisms that have governed returns; it does not carry out a detailed assessment of the results, such as levels of operational or environmental performance that these mechanisms have produced.

### 3.2 Theories of excessive returns

The QSR considers three distinct potential mechanisms by which returns to water company investors could be excessive. These are: through the conduct of price reviews; through the financial structures of regulated companies; and through the financial structure of holding companies. These mechanisms emerged from the research team’s understanding of relevant issues for the sector, discussions with interviewees and suggestions in literature, including Ofwat (2018a) and National Audit Office (2015). This section sets out the mechanisms and considers metrics that could be used to test each of them.

#### 3.2.1 Conduct of price reviews

**Excessive returns can stem from overly generous price reviews.** Price reviews conducted by Ofwat determine, for a five year period, benchmarks, incentive rates for outperforming benchmarks and arrangements for sharing risks on variables such as inflation, interest rates and tax. The package of benchmarks, incentive rates and risk allocation strongly influences expected returns. Key benchmarks are:

- **the weighted average cost of capital** (WACC) that companies earn on spending capitalised in the regulatory capital value (RCV). This is an estimate of the cost of capital that an efficient water company would face over the duration of the review period and accounts for approximately 20% of industry revenue (NERA Economic Consulting, 2015);
— allowed totex, which is an estimate of the efficient costs of running the regulated business for the review period, including operating and capital expenditure on service delivery and enhancement plus other items. Approximately 50% of industry revenue is made up of spending within a price review period (‘pay-as-you-go’ expenditure, including retail spending), with the depreciation of historical capitalised investment accounting for a further 30% (NERA Economic Consulting, 2015);
— performance commitments for various service quality measures.

If benchmarks and incentives rates adopted at a price review are too generous to companies, this may result in excessive returns. Excessive returns might also stem from determinations that compensate companies for bearing risk, but where the public interest would be better served by alternative risk-sharing arrangements.

Returns on company RCVs greater than the WACC could be symptomatic of generous totex allowances or performance commitments. They could also reflect risk-sharing arrangements or the use of incentive mechanisms that reward outperformance in a way that benefits customers. Diagnostic metrics could therefore include the returns earned from cost or service quality outperformance, compared with benchmarks from comparator sectors with similar incentive arrangements.

Actual costs of new debt below the rate assumed in the WACC could indicate a generous cost of capital allowance, though it could also affect movements in market conditions in the price review period for which companies bear the risk. To diagnose returns from outperformance on the cost of new debt, one could compare other regulators’ estimates of the cost of debt for similar control periods and seek to understand whether changes in market conditions during the review period have tended to raise or reduce the cost of debt using bond market indices such as the iBoxx. Other components of the WACC including the cost of equity are not revealed directly in market evidence or company accounts so outperformance is less straightforward to gauge (National Audit Office, 2015), but parameter values used by Ofwat can be compared to other estimates.

3.2.2 Regulated company financial structure

Companies may pay excessive returns to their shareholders through dividends. Regulated companies that pay out a high proportion of the returns they generate to their shareholders rely on new debt rather than retained equity to finance investment. This causes companies’ gearing to increase, which leaves a slimmer equity cushion to absorb financial shocks and thus makes companies less financially resilient. Such a financial structure may be in line with shareholder preferences, since the increased risk they bear is compensated by higher returns as more expensive equity is substituted for cheaper debt finance. However, if customers or taxpayers suffer as a result of a water company entering financial distress – as has been the case in rail (National Audit Office, 2011) – then the loss of resilience as a result of dividends payments represents an increase in risk borne by other stakeholders for which they are not compensated (Ofwat, 2018a). Returns to shareholders under such circumstances would therefore be excessive.

Companies’ ability to pay excessive dividends is constrained by regulation. Under the terms of their licences, most companies are required to maintain an investment grade credit rating and are unable to pay dividends under a cash ‘lock-up’ when the investment grade status of their credit rating is under threat.
(Ofwat, 2018b). Ofwat requires Board assurance that dividend policies in company business plans reflect wider stakeholder interests and conducts and publishes annual assessments of company financial resilience.

**High gearing may also benefit customers if it leads to improved performance.** More highly geared companies pay less corporation tax, which reduces customer bills but also will tend to increase other taxes and/or reduce spending on public services. Highly geared companies also arguably face a greater imperative to reduce costs, which feeds into lower bills over the long term.

**Credit ratings consolidate information on creditworthiness.** This includes various metrics that are indicative of companies’ ability to meet obligations to lenders, such as gearing and interest cover ratios, as well as an assessment of the stability of the regulatory regime and covenancing arrangements adopted by some companies to protect creditors (Moody’s, 2018). An investment grade credit rating, which indicates a low probability of failure and which most companies are required to hold under the terms of their licences (Ofwat, 2018a), suggests that a company is financially resilient and that its dividend policy is sustainable. However, credit ratings do not directly shed light on the arrangements to protect the firm’s delivery of services to customers in the event of financial distress, nor the dividends and capital growth flowing to shareholders rather than pension fund members.

### 3.2.3 Holding company financial structure

**Holding company financial structures may give rise to excessive returns.** High gearing at the level of the holding company can increase the returns earned by its equity owners but could potentially also reduce the financial resilience of the regulated company. This could come about if holding company financial distress were to have a contagion effect, preventing the regulated company from financing its functions though, as described in Section 3.2.2, regulatory controls on financial resilience prevent parent companies from extracting dividends where regulated company credit ratings are under threat. Very high levels of holding company debt could conceivably lead to excessive returns if these covenants reduced the cost of debt only by preventing regulated companies’ management from taking risks that are in customers’ interests, such as in innovation.

**Less financial information on holding companies is available than for regulated companies** since most are privately owned and coverage by credit rating agencies is limited. This means that there is no straightforward way to assess holding company financial resilience across the whole sector.

### 3.3 Return metrics and benchmarks

#### 3.3.1 Headline measures of returns

**Widely quoted dividend and profit figures are not informative of returns.** There are three reasons for this:

— **round-trip payments**: sector-wide estimates of dividends calculated in Bayliss and Hall (2017) and subsequently cited in the press (for example, Financial Times (2018)) overstate disbursements to shareholders because they fail to account for ‘round-trip’ dividends that are disbursed to parent companies but returned to the regulated company in order to repay loans made by the regulated
company. Though historical regulatory accounts do not allow a full adjustment, stripping out such payments reduces measured dividends from 2007-16 by at least £3bn;

- **RCV indexation**: comparisons between dividends and profits, such as the observation in Bayliss and Hall (2017) that ‘almost all’ post-tax profits between 2007-16 were disbursed as dividends, can make company dividend policies appear unsustainable by neglecting returns that accrue from the inflation indexation of company RCVs. Allowing for indexation and stripping out round trip payments, companies have paid out around half of distributable returns to their shareholders from 2007-16.

- **Instability over time** can make annual comparisons of dividends and profits misleading. Annual dividend payments can fluctuate as companies merge and change their financial structures; they tend to be cyclical as pay-outs reflect performance over price review periods. For profits, changes in regulatory accounting guidelines, including the adoption from PR14 of ‘RCV run-off’ depreciation (Ofwat, 2017a), mean consistent time series are difficult to construct.

**Other metrics are more suitable for use as ‘headline’ indicators of returns.** The metrics listed below, all of which are collated in Ofwat’s annual Monitoring Financial Resilience (MFR) report, offer a more reliable overview of returns earned by companies and their distribution to shareholders. As explained in Section 3.3.2, these can also inform an assessment of whether returns have been excessive.

- **Return on regulatory equity (RORE)** is available from 2016 and allows comparisons of profits earned by water companies against regulatory expectations and those in some other UK regulated networks. RORE is calculated under ‘notional’ capital structures used by regulators in price controls: this means that company returns are directly comparable in the sense that no adjustment is required to account for the effect of variations in gearing on the level of risk borne by shareholders. However, the use of notional structures also means that RORE fails to reflect any gains to shareholders from high gearing.

- **Return on RCV and cost of debt outperformance** provides the same information as RORE on components of returns over a longer time series, as Section 3.3.2 explains in more detail. Unlike RORE, return on RCV can be calculated straightforwardly from regulatory accounts before 2016, though changes in the accounting treatment of depreciation at PR14 introduces some inconsistency over time. Pre-2016 cost of debt outperformance is more difficult to calculate from regulatory accounts as it requires some decomposition of net interest payments, but estimates are available in PwC (2017) and National Audit Office (2015).

- **Dividend yield**, adjusted in MFR for round-trip payments, measures the returns distributed to equity holders. This supplements RORE by showing the distribution of profits and measuring the effect of gearing on shareholder returns, though it is not adjusted to reflect greater risks borne by shareholders in more highly leveraged companies. As noted above, dividends can be subject to instability over time, so it is most informative to consider dividend yield over periods that cover a least a whole price review cycle.

Figure 2 and Figure 3 below show indicative data on RORE and return on RCV.
3.3.2 Metrics and benchmarks to understand excessive returns

Valuation premia can indicate excessive returns from any source. Water company valuations, evident in the enterprise values of listed water companies and the prices paid in the sale of those enterprises, reflect...
investor expectations of future returns. Significant valuation premia over and above company regulated capital values (RCVs), the value of the capital that company investors have supplied in the past net of depreciation, indicate whether investors expect excessive returns in the future. Since expectations of returns are critical in assessing fairness, valuation premia could offer useful insights. However, the inferences that can be drawn from valuation premia are limited by the following considerations:

— 3 out of 18 companies are publicly listed. While listed companies represent around 35% of the industry RCV, it is nonetheless difficult to generalise about excess returns across the whole population of companies from the performance of this sample;
— all listed companies also own non-regulated businesses, though the value of these businesses is relatively modest for two of the companies (Severn Trent and United Utilities);
— valuation premia can reflect risk sharing arrangements in the regulatory settlements. For example, lower than expected interest rates within a price control period will tend to increase company valuations.
— many past company sales are mergers between regulated water companies, in which purchasers would be expected to pay a premium in order to benefit from the potential cost savings the merger unlocks.

A variety of leading and diagnostic metrics can be used to understand water company returns. Notes on valuation premia above and on other metrics in Section 3.2 suggest the following approach:

— valuation premia can be used to detect expectations of excessive returns from any source – either in the future, using current valuation data, or in the past, using historical data. There is no straightforward benchmark as premia can reflect specific factors relevant only to the companies for which data is available, the value of non-regulated businesses, and risk-sharing arrangements of price controls. However, interviewees considered widespread, sustained premia significantly in excess of 10% as suggestive of expected returns greater than the cost of capital.
— RORE can be used to understand whether companies have outperformed regulatory benchmarks for totex, service quality and the cost of debt: RORE above the determined cost of equity can suggest that these benchmarks are set generously. However, as well as the generosity of the determination, RORE reflects outturns of risks borne by companies (such as on interest rates or input prices) and the costs associated with incentive arrangements, which can be understood by benchmarking returns against those with comparable regimes. RORE also does not account for any further gains companies attain through gearing, since it is based on a notional capital structure, and it does not account for the generosity of the cost of equity determined by the regulator, which can be assessed with reference to other estimates. Finally, Ofwat does not report RORE before AMP6: for earlier periods, post-tax returns on the RCV compared to the WACC can be used to assess the generosity of totex benchmarks and tax allowances, while the generosity of the cost of debt allowance can be assessed with reference to realised cost of debt (all with the same caveats as RORE).
— credit ratings consolidate information on company financial resilience and can be used to understand whether company capital structures generate unsustainable or excessively risky returns. This can be supplemented with information in Monitoring Financial Resilience to understand the implications of financial stress for customers, taxpayers and pension fund members.

Credit ratings provide a more holistic view of the sustainability of company capital structures than dividend yields or pay-outs. The reasons for this are twofold: first, because dividends reflect the levels of company profits as well as decisions on how these should be distributed; second, because, as noted
above, annual figures on dividends can be volatile. Nonetheless, high dividends in the context of risks to customers or large pension fund deficits can prioritisation of shareholder interests over other stakeholders.

Table 3 below summarises the return metrics and benchmarks that can be used to test for excessive returns. Indicative data collated by the research team against more of these metrics is presented in Appendix 2.
### Table 3. Metrics used to assess water company returns

<table>
<thead>
<tr>
<th>Metric</th>
<th>Use</th>
<th>Limitations</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>All sources of excessive returns</strong></td>
<td></td>
<td>Includes value of non-regulated businesses that all companies own.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Premium can reflect expected growth in RCV.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Premium can reflect incentive arrangements that serve public interest.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Valuation data: small sample with only three companies listed.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Transaction data: premiums expected in water company mergers to reflect synergies.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Transaction data: private transactions mean reliable data not always available.</td>
</tr>
<tr>
<td><strong>Valuation or transaction premia over RCV</strong></td>
<td>Premium can reflect expectation of returns greater than the cost of capital.</td>
<td></td>
</tr>
<tr>
<td><strong>Conduct of price reviews</strong></td>
<td></td>
<td>Calculated using notional capital structure so does not account for effects of gearing. Includes outturn of risks borne by investors. Some outperformance expected as cost of incentivisation.</td>
</tr>
<tr>
<td><strong>Return on regulatory equity</strong></td>
<td>Leading metric 1: returns above benchmark cost of equity suggests generous benchmark cost of debt, totex, service quality.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Includes outturn of risks borne by investors. Some outperformance expected as cost of incentivisation.</td>
</tr>
<tr>
<td><strong>Post-tax return on regulatory capital value compared to WACC, assessed over AMP</strong></td>
<td>Leading metric 2a: returns above the WACC suggest generous benchmarks or incentives for totex and service quality.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Includes outturn of risks borne by investors. Some outperformance expected as cost of incentivisation.</td>
</tr>
<tr>
<td><strong>Totex versus allowance, assessed over AMP</strong></td>
<td>Diagnostic metric: spending below allowance suggests generosity of totex benchmark.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Includes outturn of risks on input prices. Some outperformance expected as cost of incentivisation.</td>
</tr>
<tr>
<td><strong>Returns from ODIs, assessed over AMP</strong></td>
<td>Diagnostic metric: positive returns suggest generous benchmarks or incentive rates.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Includes outturn of risks on outcomes. Some outperformance expected as cost of incentivisation.</td>
</tr>
<tr>
<td><strong>Realised cost of debt compared to allowance</strong></td>
<td>Leading metric 2b: generosity of cost of debt allowance.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Includes outturn of market interest rates and inflation. Some company cost of debt is opaque, including interest payments to shareholders. Does not account for benefits of gearing.</td>
</tr>
<tr>
<td><strong>WACC compared to other that set by other regulators</strong></td>
<td>Diagnostic metric: higher WACC than peers suggests generosity of allowance.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Other sectors and regulatory regime have varying risks, which affects cost of capital. WACC estimates set at different points in time and include parameters forecast over different horizons.</td>
</tr>
<tr>
<td><strong>Returns compared to allowances earned by companies compared to other regulated sectors,</strong></td>
<td>Diagnostic metric: higher returns for companies in England &amp; Wales suggest generosity of regulation.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Other sectors allocate risks and set incentives in different ways. Comparators may allow excessive returns.</td>
</tr>
<tr>
<td><strong>Regulated company financial structures</strong></td>
<td></td>
<td>Implications of financial stress for customers, taxpayers, pension fund holders not fully accounted for.</td>
</tr>
<tr>
<td><strong>Company credit ratings</strong></td>
<td>Leading metric: investment grade ratings suggest low risk of financial distress.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>High dividends may reflect strong financial performance.</td>
</tr>
<tr>
<td><strong>Dividend yield compared to regulatory expectations, assessed over AMP</strong></td>
<td>Diagnostic metric: high dividends can reflect payments to shareholders at the expense of other stakeholders.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ambiguity in historical dividend data, with some dividends used to pay loans made by regulated companies.</td>
</tr>
<tr>
<td><strong>Gearing compared to regulatory expectations</strong></td>
<td>Diagnostic metric: high gearing indicative of reduced financial resilience.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Does not account for covenanting adopted by highly geared companies to protect creditors.</td>
</tr>
</tbody>
</table>

**Source:** Vivid Economics
4 Synthesis

4.1 Valuation premia

Historical valuation and transaction premia have been consistent with excessive returns. PwC (2017) show that since 2004, the prices paid in all transactions in the sector have included a premium to RCV and that transaction premia for both WoCs and WaSCs have been particularly high since PR14, ranging from 26% for Bournemouth Water in April 2015 to more than 50% for Dee Valley Water in December 2016 (see also ECA (2017a), which quotes similarly high, but different transaction premia). This is consistent with evidence on the valuation premia of listed companies, which averaged 26% for Severn Trent and 27% for United Utilities between April 2015 and March 2016 (PwC, 2017). Interviewees agreed that these premia reflected the expectation of significantly higher returns on regulated companies than would be required for them to finance their functions.

More recent data shows a decline in valuation premia of listed companies. At the time of the QSR interviews, valuation premia for United Utilities and Severn Trent had fallen to around 10%, which in the view of interviewees would imply a minimal return for outperformance above the cost of capital once projected RCV growth was accounted for. Reduced investor expectations of future returns may reflect aspects of Ofwat’s PR19 methodology including its consultation and subsequent decision on ‘Putting the sector into balance’ (Ofwat, 2017, 2018a, 2018c) as well as the contemporary political debate on future water company ownership.

4.2 Conduct of price reviews

Regulated companies earned at least £2.3bn (£460m per year) more than required to finance their functions during AMP5 and are expected to continue to earn returns above their cost of capital during AMP6. Estimated returns over and above companies’ cost of capital from the price review settlement at PR09 (AMP5, 2010-15) equated to approximately 4-5% of industry revenue or around £20 on the average annual bill. Available data for AMP6 shows returns of £730m greater than the cost of capital (£245m per year), excluding any overstatement of the cost of equity in the WACC. This means aggregate outperformance has been worth around 2% of industry revenue from 2015-18, or more than £10 on the average annual bill. The calculations used to derive these figures are provided Appendix 3.

The rate of return earned by water companies has declined marginally since 2000 as the allowed cost of debt and equity has fallen. Figure 4 below shows returns since 2000, net of taxation.
**Figure 4.** Post-tax return on regulatory capital value

<table>
<thead>
<tr>
<th>Years</th>
<th>Industry</th>
<th>PR04 post-tax WACC</th>
<th>PR09 post-tax WACC</th>
<th>PR14 post-tax WACC</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001-02</td>
<td>5.1%</td>
<td>4.5%</td>
<td>3.6%</td>
<td></td>
</tr>
<tr>
<td>2002-03</td>
<td>5.0%</td>
<td>4.4%</td>
<td>3.5%</td>
<td></td>
</tr>
<tr>
<td>2003-04</td>
<td>4.9%</td>
<td>4.3%</td>
<td>3.4%</td>
<td></td>
</tr>
<tr>
<td>2004-05</td>
<td>4.8%</td>
<td>4.2%</td>
<td>3.3%</td>
<td></td>
</tr>
<tr>
<td>2005-06</td>
<td>4.7%</td>
<td>4.1%</td>
<td>3.2%</td>
<td></td>
</tr>
<tr>
<td>2006-07</td>
<td>4.6%</td>
<td>4.0%</td>
<td>3.1%</td>
<td></td>
</tr>
<tr>
<td>2007-08</td>
<td>4.5%</td>
<td>3.9%</td>
<td>3.0%</td>
<td></td>
</tr>
<tr>
<td>2008-09</td>
<td>4.4%</td>
<td>3.8%</td>
<td>2.9%</td>
<td></td>
</tr>
<tr>
<td>2009-10</td>
<td>4.3%</td>
<td>3.7%</td>
<td>2.8%</td>
<td></td>
</tr>
<tr>
<td>2010-11</td>
<td>4.2%</td>
<td>3.6%</td>
<td>2.7%</td>
<td></td>
</tr>
<tr>
<td>2011-12</td>
<td>4.1%</td>
<td>3.5%</td>
<td>2.6%</td>
<td></td>
</tr>
<tr>
<td>2012-13</td>
<td>4.0%</td>
<td>3.4%</td>
<td>2.5%</td>
<td></td>
</tr>
<tr>
<td>2013-14</td>
<td>3.9%</td>
<td>3.3%</td>
<td>2.4%</td>
<td></td>
</tr>
<tr>
<td>2014-15</td>
<td>3.8%</td>
<td>3.2%</td>
<td>2.3%</td>
<td></td>
</tr>
<tr>
<td>2015-16</td>
<td>3.7%</td>
<td>3.1%</td>
<td>2.2%</td>
<td></td>
</tr>
<tr>
<td>2016-17</td>
<td>3.6%</td>
<td>3.0%</td>
<td>2.1%</td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**
- Current taxation is not available before 2001. In order to have longer time series and draw conclusions beyond short-term firm cyclical, companies that have eventually merged have been retrospectively combined from privatisation onwards.
- The sudden jump in 2009-10 is due to an increase in industry-level current cost operating profit.

**Source:** Vivid Economics using data from Ofwat and UK Regulators Network.

There is no single definitive source on the returns earned by companies or how this breaks down into components of interest. There is no official repository of consistent, long-term data on company returns. While Ofwat’s annual Monitoring Financial Resilience report decomposes returns into those from totex, service level and finance outperformance during AMP6, there is no authoritative source that disaggregates of returns into profits companies have earned through efficiencies or service improvements and profits from the outturn of risks that companies bear. Sources provide varying estimates of metrics of interest and expert interviewees report difficulties in obtaining comparable data for companies over time in which they are fully confident.

The principal sources of high returns have been companies’ outperformance of regulatory allowances for the cost of capital, totex and tax. A summary of available evidence decomposing the returns is presented in Table 4.
Table 4. Approximate annual levels and sources of returns above levels estimated at price reviews, AMP5 and AMP6

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost of debt</td>
<td>£300m</td>
<td>£70m</td>
</tr>
<tr>
<td>Totex</td>
<td>£110m</td>
<td>£120m</td>
</tr>
<tr>
<td>Tax</td>
<td>£50m-£120m</td>
<td>-</td>
</tr>
<tr>
<td>ODIs</td>
<td>NA</td>
<td>£55m</td>
</tr>
<tr>
<td>Measured annual returns over</td>
<td></td>
<td></td>
</tr>
<tr>
<td>cost of capital</td>
<td>£460m-£530m</td>
<td>£245m-</td>
</tr>
<tr>
<td>Cost of equity</td>
<td>No data</td>
<td>£0-£230m</td>
</tr>
<tr>
<td>Overall annual returns over</td>
<td></td>
<td></td>
</tr>
<tr>
<td>cost of capital</td>
<td>£460m-£530m</td>
<td>£245m-£475m</td>
</tr>
</tbody>
</table>


Note: Figures in 2012-13 prices. See Appendix 3 for explanation of assumptions used to derive the estimates.

4.2.1 Weighted average cost of capital

Ofwat sets the sector’s benchmark WACC in a manner consistent with other regulators, but all companies have outperformed on the cost of debt. Ofwat uses a comparable methodology to other UK regulators in setting the allowed WACC and at PR14 adopted a value towards the bottom of the range of recent determinations (Europe Economics, 2017; also see Appendix 2), in part reflecting the lower risks in investing in water companies compared to more competitive sectors such as telecoms and airports. Nonetheless, all companies posted returns higher than Ofwat’s WACC at PR09 and most companies are expected to outperform the PR14 cost of debt despite unexpectedly low inflation reducing debt cost outperformance since 2015 (PwC, 2017).

Companies have consistently achieved a cost of debt lower than that allowed by Ofwat, largely as a consequence of market conditions outside their control. Persistently low and generally falling interest rates since 2008 between have given companies the opportunity to raise new debt more cheaply and to profitably refinance embedded debt to a greater extent than Ofwat’s assumptions at price reviews. In addition, companies employed higher gearing than Ofwat had assumed (National Audit Office, 2015) and above-forecast inflation during AMP5 reduced the real cost of some debt. Interviewees held differing views as to whether the risk-sharing and incentive arrangements that gave rise to these returns served the public interest.

— risk-sharing arrangements raise the allowed cost of debt above the expected level. Unlike some other regulated sectors, companies bear the risk of changes in market conditions that cause deviations in the cost of debt during the price review period. Some interviewees considered this to be inefficient, since market risk can be more dispersed when shared among a large body of customers, while others took the view that company investors were better positioned to hedge these risks in their portfolios. There was, however, a consensus among interviewees and some published evidence (Ofwat, 2018a; ECA, 2017b)
that, in estimating the cost of debt for the five years of a price control, Ofwat would tend towards including a ‘forecast error premium’ above the expected cost of debt to compensate investors for bearing the risk of higher than expected market interest rates. The adoption of indexation for the cost of debt, followed by Ofgem for all energy networks, the Utility Regulator in Northern Ireland and by Ofwat for the Thames Tideway Tunnel, can align allowances with prevailing market conditions to eliminate any need for a forecast error premium (Ofgem, 2018). This may be most effectively targeted by applying indexation only to new debt, as the cost of embedded debt can be observed and accounted for directly in benchmarks, as Ofwat proposes for PR19 (Ofwat, 2018a; ECA, 2017b).

- incentives for companies to reduce debt costs can be beneficial provided they promote behaviour that is acceptable to customers. Interviewees concurred that an arrangement where companies are incentivised to find ways of raising cheaper debt can serve the public interest, as savings to companies in one price review period are passed on to customers during the next. However, some interviewees regarded the use of offshore financing vehicles for this purpose as improper and detrimental to the sector’s reputation (see also: Bayliss, 2014; Defra, 2018). Others dismissed the possibility that offshore arrangements led to any reduction in the cost of debt and highlighted the costs of unwinding these structures, which they argued outweigh any potential gain to the public.

The cost of equity for water companies is not directly observable, but there is evidence that Ofwat’s allowances exceed the costs companies face in raising equity. The PR14 WACC was lower than that applied to most UK regulated networks at the time (see Appendix 3), but the evidence suggests two reasons to support a lower cost of equity:

- the use of long-term market data on the cost of equity. Ofwat, in common with other UK regulators and the CMA, has used long-term market data on equity returns to estimate a total market return parameter used to calculate the cost of equity in the formula for the WACC (Wright and Smithers, 2014). However, PwC (2017) show that shorter term and forward-looking market data exhibit markedly lower returns, notably since 2008, a phenomenon some consider as evidence of a shift to a ‘lower for longer’ cost of equity. Appendix 3 shows how the use of short-term market evidence available at PR14 to set the cost of equity could have reduced company returns by up to £230m per year. Wright et al. (2018) argue that short-term evidence on the cost of equity of the kind set out by PwC (2017) is insufficiently straightforward to use in a regulatory setting, but nonetheless find that longer term evidence can support a cost of equity in the same range estimated by PwC, while NERA Economic Consulting (2018) provide evidence that contradicts PwC’s finding of lower short term equity market returns.

- the use of evidence from equity markets. Whereas Ofwat estimates the cost of equity in the WACC using stock market data, most water company shares are no longer traded on public markets, with many now owned privately by pension funds or institutional infrastructure funds (Bayliss, 2014). Interviewees stressed important differences between the requirements of investors in stock markets and private investors, noting in particular that the latter group place a high premium on the long term predictability of returns. Hence private investors in water companies may be willing to accept a lower return on equity than stock market data might suggest. The auction for the Thames Tideway Tunnel, where private consortia bid a cost of capital for ownership of the company licence, suggested that investors were willing to accept a cost of equity significantly below that derived from market data, though various features of the Tideway licence (a greenfield investment with single asset risk, the package of contingent
government support) make it an imperfect benchmark for the cost of equity in the wider sector (CEPA, 2015).

### 4.2.2 Cost and service levels

**Companies have consistently outperformed totex allowances since 2010.** Data collated for this project suggest that all companies bar one outperformed their AMP5 totex allowances, while current data for AMP6 suggests a higher overall rate of outperformance than in AMP5 with two thirds of companies spending less than their allowance, though this may not be representative of performance across the AMP given that overall outperformance is restricted to more cyclical capital spending (PwC, 2017). Figure 5 shows how outturn costs have compared to allowances since 2000, taking no account of how sharing mechanisms or logging-up or down affected eventual returns to companies. It shows that the sector spent more than allowances between 2000 and 2010.

**Figure 5. Wholesale expenditure relative to allowance: Industry-total**

![Wholesale expenditure relative to allowance: Industry-total](image)

*Notes:* Values are in 2012-13 prices.  
*Source:* Vivid Economics using data from Ofwat.

**Interviewees generally agree that the risk sharing and incentive arrangements that have allowed outperformance serve the public interest.** Companies bear the risk of fluctuations in input prices, which interviewees consider efficient, since companies are better positioned than customers to manage this risk, though Ofgem (2018), which has used indices to adjust allowances for fluctuations in input prices, suggests this risk-sharing arrangement can lead regulators to include forecast error premia at price reviews. Incentivising companies to cut costs can also benefit customers even if doing so requires the payment of rewards, as 50% of savings are passed through to customers during the price review period and all savings are accounted for in benchmarking at future price reviews. KPMG (2018) suggests that totex incentives have led to a significant efficiency savings in AMP6, which can benefit customers in the long run. At PR14, totex outperformance was limited through the use of a cap of 5% on the amount by which allowances...
could exceed business plan costs, though there was no limit to the amount by which outturn costs could out- or underperform allowances as Ofgem (2018) is currently considering. The PR14 limit on outperformance in business plan costs applied to one company at PR14, Thames Water (CMA, 2015b).

However, there is a consensus that the process of setting totex benchmarks can be improved and that elements of it have favoured companies. Interviewees agreed that the econometric benchmarking models used at PR14 did not accurately estimate efficient costs, which raises risks to both companies and customers, nor did Ofwat effectively account for dynamic improvements in efficiency that might be expected during the price review period, which may have raised allowances above their efficient levels (CMA, 2015a; Arup and Vivid Economics, 2017). Other evidence points towards aspects of the cost assessment that may have favoured companies at customers’ expense:

— **one-sided cost adjustment process.** PR14 allowed companies to propose cost exclusions to Ofwat. These adjustments to cost allowances account for aspects of companies’ operating environment or capital programmes that raised efficient costs but were not captured by econometric benchmarking models. Though such adjustments can be valid given the limited explanatory power of the models, in many cases an upward adjustment to one company’s allowance should trigger a downward adjustment to other companies’ allowances in order to keep average allowances in line with efficient levels. At PR14, no such downward adjustments were made to company allowances (CMA, 2015a; Ofwat, 2017).

— **monitoring of business plan commitments.** Some interviewees and literature (S&P, 2017) question whether some of the cost outperformance apparent in the sector stems from the under-delivery of business plan commitments. Ofwat has set incentives to guard against this, including through ODIs and targeted reviews of asset health (CH2M, 2017) in AMP6, a change protocol and serviceability assessments in AMP5 (Ofwat, 2016), but for these to be effective requires careful calibration of measured performance commitments against outcomes envisaged in business plans and the effective monitoring of company performance.

— **inclusion of pension recovery costs at PR09.** At PR09, Ofwat allowed companies to recover 50% of their pension fund deficits from customer bills over several AMPs. As it affirmed in PR14, companies in competitive industries typically cannot repair pension deficits by raising prices (Ofwat, 2013) and would be expected instead to make up shortfalls using shareholder equity. However, at PR09 Ofwat took the view that sharing pension deficit recovery costs with customers would allow it to meet its obligation to finance companies’ efficient functions at lower costs. Market movements since PR09 have increased pension fund deficits, with company shareholders bearing these costs.

**The use of relative totex benchmarks would limit companies’ ability to earn high returns through cost outperformance.** Mechanisms in which companies compete against each other to secure returns, as proposed by some interviewees and Ofgem (2018), maintain company incentives to reduce costs and manage risks, while also reducing the risk to customers that totex allowances are set too high at price reviews. As Section 4.2.4 below highlights, Ofgem’s proposals are made in the context of higher returns than those observed in the water sector in AMP6.

**Incentives from ODIs have not significantly affected returns.** Companies have earned modest returns on ODI incentives, including the Service Incentive Mechanism (SIM), over the first two years of AMP6: if extrapolated to the whole control period, they amount to £160m. Investors surveyed in PwC (2017)
regarded the mechanism as neutral in company valuations. However, CEPA (2018) and one interviewee note that the inability of regulators to specify all contingencies in which ODIs apply can lead to excessive returns as companies outperform in unanticipated ways that do not serve the public interest. Ofgem (2018) proposes to move to ‘outputs’ based incentives more closely associated with specific deliverables, partly in order to guard against this.

4.2.3 Tax

**Steep reductions in the rate of corporation tax during AMP5 led to higher returns for companies.** Sources quote gains of a variety of magnitudes during AMP5, as described in more detail in Appendix 3.

Subsequent changes in regulation preclude future windfalls on this scale and low tax payments by the sector are reflected in customer bills, but the issue tax continues to represent a challenge to the sector’s legitimacy. Risk-sharing arrangements in place for AMP6, to be strengthened at PR19, will ensure gains from cuts in corporation tax are clawed back for customers, while expected low rates of tax payment have always been reflected in customer bills. Despite this, there remains a lack of clear credible public information – for example an unequivocal statement from Ofwat – on the rationale or beneficiaries of current tax structures and to what extent these stem from company financial structures, which means tax remains an issue of public concern (Defra, 2018).

4.2.4 Comparison with other regulated sectors

Comparisons with other regulated sectors do not conclusively show whether the returns earned by water companies have been excessive. This reflects a lack of clarity on the breakdown of returns from risk-sharing arrangements compared to efficiency savings, the fact that returns in other sectors reflect distinctive features of regulation that do not apply to water in England and Wales, and the fact that companies in other sectors may attain different levels of cost efficiency or service than the England and Wales water companies.

**Returns earned by regulated energy networks in the UK have been notably higher than in water, but Ofgem considers these to be excessive.** Table 5 below shows returns earned by regulatory energy networks during over the period of the most recent price reviews. Despite the use of cost of debt indexation to limit the degree of financial outperformance, company returns have exceeded regulatory allowances at all price controls. In 2016-17, the only year for which comparable data is available, outperformance across the energy network price controls was worth 300 basis points of return on regulatory equity (RORE) for the average company with no instances of underperformance, whereas average outperformance by water companies was worth 90 basis points of RORE, with some underperformance (ECA, 2018; Ofgem, 2017a). However, there was a consensus among interviewees that returns in energy had been excessive: indeed, a major theme of the RIIO-2 consultation is the introduction of new mechanisms to ensure returns are ‘fair’ (Ofgem, 2018).

**Other regulators have allowed companies to recover pension fund deficits from customers.** At PR09, the Competition Commission allowed Bristol Water more than Ofwat did in for pension fund deficit recovery.
(Competition Commission, 2010). Ofgem has also allowed energy network operators to recover historical deficits at a higher rate than Ofwat (Ofgem, 2017b).

Comparisons with international water utilities are not informative on the fairness of returns in England and Wales. The closest comparator is the US, where, as in England and Wales, there are private utilities that earn a return in capital committed in an asset base, but in contrast to England and Wales, companies face much weaker incentives for operational efficiency and service improvements. From a limited sample of three listed companies from England and Wales and four listed US utilities quoted in Macquarie Research (2017) it appears that, in England and Wales, returns in regulatory allowances are lower but incentives and risk sharing arrangements have led to higher realised returns. However, interviewees and evidence from the same report suggest that service standards and operational efficiency are substantially worse in the US than England and Wales (Macquarie Research, 2017): this means that it is unclear whether higher returns in England and Wales reflect worse value for customers.

Appendix 4 presents further numerical evidence on how returns in the England and Wales water sector compare to those earned by other international utilities. The caveats set out in this section apply to any comparison of returns earned under varying regulatory regimes.
### Table 5. Drivers of RORE outperformance in the UK energy sector

<table>
<thead>
<tr>
<th>Variable</th>
<th>Period</th>
<th>Additional RORE</th>
<th>Main drivers of outperformance</th>
<th>Comments</th>
</tr>
</thead>
</table>
| RIIO-GD1 (Gas Distribution Networks) | 2013-16      | 373 basis points | Totex outperformance: 190 basis points Real price effects: 70 basis points | Gas Distribution Networks are forecasting to underspend their totex allowance by around £2.1 billion  
Forecast totex outperformance represents 51% of RORE outperformance across RIIO-GD1  
Two thirds of the underspending on totex allowance is forecast to be underspend on repex |
| RIIO-ED1 (Electricity distribution networks) | 2015-16      | 327 basis points | Outperformance on the Interruptions Incentives Scheme: 160 points Totex outperformance: 100 points | Significant variability on totex outperformance between companies: the range goes from negative returns to +290/340 basis points of additional return  
Real price effects are not estimated to have been a material source of positive or negative returns in RIIO-ED1 so far |
| RIIO-GT1 (Gas transmission networks) | 2013-16      | 35 basis points  | Outperformance in the System Operator: 100 basis points Real price effects: 80 basis points | NGGT forecasting 70 basis points RORE loss as a result of totex overspend |
| RIIO-ET1 (Electricity transmission networks) | 2013-16      | 191 basis points | Totex outperformance: 130 points across Transmission Operators Real price effects: 80 basis points for NGET | Transmission Operators are forecasting to underspend their totex allowance by around £1.1 billion |

**Note:** The figures in the table are based on the data available at the time of conducting the analysis (four years of actual data for RIIO-T1 and GD1, two years of actuals for RIIO-ED1).

**Source:** Ofgem (2018), CEPA (2018), Vivid Economics.

### 4.3 Regulated company capital structures

Companies have paid out £9.3bn in dividends since 2010, 9% more than the sector’s post-tax profit over the same period, at a significantly higher yield than offered by UK listed companies. Ofwat (2017b) shows that, stripping out dividends used to repay intra-group loans made by the regulated company, the average dividend yield for companies has exceeded Ofwat’s benchmark level of 5% (calculated in Ofwat (2018a) using 2011-17 data) in every year for which data is published (since 2013-14), with yields for three quarters of companies greater than the 5% benchmark in 2016-17. As Figure 6 below shows, dividend yields on regulated equity across the water sector have consistently outstripped those dividend yields from UK listed companies: in six out of seven years for which data is available, the average yield across companies has been higher than the fifth percentile in the FTSE 100. Interviewees stress the limitations this comparison: the range of yields observed in stock markets is expected to be narrower than for water companies because share prices adjust to reflect expected dividend payments, whereas regulated equity values do not.
Dividends paid out have been consistent with stable capital structures and the retention of investment grade credit ratings across the sector. As noted in Section 3.3 and contrary to arguments in Bayliss (2014), it is possible to pay dividends greater than income generated by the company on a sustainable basis due to the effect of RCV indexation. Published data shows that from 2007-16, companies paid around half the value of post-tax profits and gains from RCV indexation over the same period, comparable to the dividend pay-out for European equities from 2011-17, which averages 57% (Damodaran, 2018). The fact that gearing across the sector has remained stable since 2010 attests to the fact that dividends payments have not withdrawn equity from the sector (see Figure 7). Furthermore, all companies bar South West Water, which is required to certify that it would have an investment grade rating if it had one, have maintained investment grade ratings, consistent with financial resilience (Ofwat, 2017b), though at the time of this QSR two companies that held ratings only one notch above minimum level were placed on a negative outlook (Moody’s, 2018). This suggests that high dividends have principally been a consequence of the high returns described in Section 4.2, rather than a symptom of the adoption of risky capital structures.
To understand fully the effect of company capital structures on resilience requires more detailed viability statements. As noted in Section 3.2, credit ratings may provide an incomplete account of the effects of the consequences of financial distress for customers and other stakeholders. Interviewees concurred that long-term viability statements, transparently supported by evidence from rigorous stress tests, could provide such detail. However, in 2017 most viability statements produced by companies did not provide such detail or extend beyond the time horizon of AMP6 (Ofwat, 2017b). Ofwat has yet to assess viability statements submitted in 2018, some of which provide information over a ten-year horizon (for example, Thames Water, 2018).

While companies comply with statutory obligations on pensions, dividend payments do appear to have disadvantaged company pension fund members. At PR09, Ofwat agreed to fund 50% of company pension deficit repair costs through customer bills with the remainder to be funded by companies, but company contributions during AMP5 were significantly lower than forecast at the point when this settlement was reached (Ofwat, 2013). As at 2017, substantial deficits remain across the sector (Ofwat 2017b), though some companies have set out plans to fully repair these over time (see for example, Thames Water, 2018). While pension fund deficits are a liability for companies that are accounted for in their credit ratings, company decisions to make payments to shareholders rather than pension funds can disadvantage the latter.
4.4 Holding company capital structures

Holding company capital structures may have raised shareholder returns, but there is no evidence that this has been to the public detriment. There was a general consensus among interviewees that structures adopted by holding companies could be mimicked by shareholders in listed companies: for instance, shareholders in listed water companies are able to achieve higher levels of risk and return through leverage, just as holding companies can gear up. This meant that only in a limited set of circumstances could holding company structures be a particular cause for public concern.

Limited experience suggests a low risk of financial contagion from holding companies to regulated entities, but viability statements could show this holds under current company ownership. In 2001, Enron entered financial distress but was unable to extract excessive dividends from its subsidiary, Wessex Water, which did not encounter financial difficulties and whose customers were unaffected (National Audit Office, 2015). Stress test evidence in viability statements could show that customers are similarly protected under current ownership arrangements (Ofwat, 2018a).

Holding company leverage does not appear to have constrained management. Companies face stronger incentives to reduce financing costs than totex costs (Ofwat, 2018a), but all interviewees rejected the notion that companies performed trade-offs between the two objectives, for example through the use of covenants that reduce the cost of debt but affect company management’s ability to take risks. Interviewees pointed out that there is no evidence of correlation between company operational performance and ownership structures. Indeed, when Welsh Water adopted a not-for-profit model in which it would face no discipline from equity capital markets, Ofwat raised concerns on the impact for customers (Kay et al., 2007).
5 Conclusion

5.1 Main findings

This QSR considers metrics to understand water company returns in England and Wales and to detect and diagnose excessive returns. It shows that widely cited figures from Bayliss and Hall (2017) present a partial picture of company profits and dividends that does not strip out ‘round-trip’ dividends or account for the impact of RCV indexation on distributable returns. It finds that RORE and dividend yield figures published, since 2016, in Ofwat’s Monitoring Financial Resilience are more suitable metrics for ‘headline’ assessments of the generation and distribution of returns. To specifically assess excessive returns, it finds that valuation premia, RORE and company credit ratings are informative leading metrics. With these and a range of diagnostic metrics, one can understand the magnitude and source of returns and their consistency with the wider public interest.

The report then asks whether the regulatory and institutional framework leads to excess returns in the England and Wales water sector. It finds that critical aspects of economic regulation in the sector have been no more generous to companies than the frameworks applied to other UK network industries and that, to the extent that returns have been higher than earned by international comparators, it is not clear that this has been to the overall detriment of customers. However, while high profits since 2010 have to a large extent reflected risk sharing and incentive arrangements, components of regulatory allowances for the cost of capital and operating and capital expenditure have favoured companies.

Companies have earned higher profits than required to finance their functions over the last two price review periods. Valuation premia in market and transaction data observed since 2010 shows that for most of the period investors expected profits to significantly outstrip the cost of capital (though the most recent market data shows reduced premia). These expectations were borne out by actual returns, which were at least £2.3bn above the cost of capital during AMP5 and have been £730m above the cost of capital in the first three years of AMP6.

Some of the returns derive from changes in the cost of debt and tax rates outside companies’ control, some from incentive arrangements that are in customers’ long-term interests, and some from overly generous aspects of the regulatory settlement. The available evidence does not allow the effects on returns of intended risk-sharing and incentive arrangements to be disentangled from the leniency of the base settlement. A significant proportion of the returns companies have earned from outperformance on the cost of debt, worth approximately £1.5bn in AMP5 and around £200m in AMP6 to date, has stemmed from changes in market conditions over which company investors bore risk.

The WACC has been set in line with practice by other regulators, but could have been lower. First, the allowed cost of equity, which is based on long-term data from stock markets, does not reflect reduced returns demanded by institutional investors. There is also disputed evidence that more recent or forward-looking data on stock market returns suggest lower future returns in equity markets than long-term historical data. Second, because Ofwat sets a fixed cost of debt allowance for a five-year review period at the beginning of
the price control, it can err towards a high allowed rate in order to compensate investors for bearing the risk of forecast errors.

**Some components of totex settlements benefit customers while others have favoured companies.** Compared to UK energy networks and US water utilities, the magnitude of incentives for totex outperformance do not appear excessive. A degree of totex outperformance occurs in regulatory regimes that incentivise companies to be efficient, creating cost savings that can be shared with customers, an arrangement which is customers’ long term interests. However, at the two most recent price reviews components of cost allowances were generous to companies. At PR09, companies were allowed to recover 50% of pension deficit repair costs through customer bills, whereas companies in competitive industries typically pay for shortfalls using shareholder equity. The cost exclusion process followed at PR14 increased company allowances in instances where models understated efficient costs, but failed to make corresponding downwards adjustments when modelled allowances were too high.

**Companies made windfalls from changes in Corporation Tax in AMP5.** Investors profited from a steep reduction in UK Corporation Tax during AMP5, but Ofwat has changed its price review methodology so that any future tax changes will passed on to customers.

**Regulated company financial structures and dividend yields do not appear to have compromised financial resilience, but Boards have paid out dividends in excess of profits and yet have not repaired pension fund deficits.** All companies have retained credit ratings in line with their licence obligations, but many face significant pension fund deficits that could have been repaired using profits that were disbursed as dividends. So far, there is limited evidence from viability statements on how financial resilience might affect customers, but viability statements could be extended to cover this issue.

**There is no evidence that holding company structures raise investor returns at the expense of other stakeholders.** In particular, high holding company gearing adopted by securitised companies have not affected operational performance. However, there is a lack of clarity over the rationale for and beneficiaries of elaborate holding company structures adopted in the industry, particularly insofar as these affect financial resilience and UK tax receipts from investors.

### 5.2 Gaps in evidence

**The most important gap in evidence is quantitative information on the level and sources of company financial returns.** While Ofwat’s annual Monitoring Financial Resilience report has made the level and sources of returns since 2015 more visible, there is no official repository of consistent, long-term data on company returns. There is no authoritative empirical study that comprehensively breaks down returns into profits companies have earned through efficiency savings or service improvements and profits from the outturn of risks that companies bear. No analysis conducted so far has compared water company returns, risk profiles and outcomes achieved to regulated or listed company benchmarks in order to assess value for money. Private company shareholders are not required to report prices paid in transactions, which limits the usefulness of market data in assessing returns.
A study on the incentive rates applied in ODI could inform the design of future incentive schemes. This could consider how to account for non-linearity or variation in customer preference rates and the management of risks and unforeseen contingencies, as described in Section 4.2.2. CEPA (2018) covers these issues for energy networks.

5.3 Implications for the PR19 consultation

Ofwat will change the way company returns are set from PR19. Table 6 below sets out key changes contained in the PR19 methodology (Ofwat, 2017) and proposals laid out in its consultation and subsequent decision on ‘Putting the sector into balance’ (Ofwat, 2018a, 2018c). It briefly summarises how and whether changes address critical concerns uncovered during this review.
Table 6. Ofwat’s PR19 consultation: concerns, proposed reforms and impacts on returns and benefit sharing

<table>
<thead>
<tr>
<th>Category and concern</th>
<th>PR19 changes</th>
<th>Concern addressed?</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>WACC: Cost of debt includes forecast error premium</td>
<td>New debt: allowance adjusted to reflect market movements in cost of debt indices</td>
<td>Yes</td>
<td>Indexation of cost of debt likely to reduce premium on allowed cost of debt</td>
</tr>
<tr>
<td>WACC: cost of equity does not account for market evidence of lower returns or lower cost of equity for long-term investors</td>
<td>Short-term data: Europe Economics (2017) proposes to use shorter-term market evidence in setting WACC</td>
<td>Partially</td>
<td>Ofwat’s proposed TMR is consistent with reduced estimates produced using shorter and longer term data</td>
</tr>
<tr>
<td>Totex: allowances have included aspects that are generous to companies</td>
<td>Allowance setting: new totex models to be adopted, with ‘frontier’ efficiency challenge</td>
<td>Too early to tell</td>
<td>Two-sided cost assessment addresses specific concern</td>
</tr>
<tr>
<td>Tax: companies have benefited from past changes, relying on regulatory pressure</td>
<td>Tax allowances will be calculated based on the outturn financial structure so there is no gain from higher gearing than expected</td>
<td>Yes</td>
<td>But choice and use of evidence and models to set company allowances has yet to be finalised</td>
</tr>
<tr>
<td>ODI: May not account for unforeseen contingencies</td>
<td>Stronger incentives from ODI, Benchmarks set at upper quartile performance, Companies encouraged to explore incentive rates other than marginal willingness to pay, Companies not allowed to avoid penalties in event of force majeure, ODI reconciliation adjustments will be made in period or at the end of the period depending on the ODI</td>
<td>Lack of empirical evidence on the concern</td>
<td></td>
</tr>
<tr>
<td>Regulated company structure: lack of evidence on resilience, pension fund deficits</td>
<td>Company viability statements to cover longer time horizons, to set out implications of stress scenarios, Justification for dividend payments by Boards to explain consistency with pension fund repair plans, Highly geared companies to be required to share gains from reduced cost of capital</td>
<td>Too early to tell</td>
<td>Reforms are addressed to concerns but efficacy of changes to viability statement and dividend policies depend on details of application</td>
</tr>
<tr>
<td>Holding company structure: lack of evidence on financial resilience</td>
<td>Company viability statements to include stress tests for holding company</td>
<td>Yes, provided stress tests are rigorous and transparently demonstrate impacts on regulated company stakeholders</td>
<td></td>
</tr>
<tr>
<td>Transparency: lack of long-term data on levels and origins of returns, lack of clarity on rationale and beneficiaries of company financial structures</td>
<td>Expectation that companies unwind offshore structures</td>
<td>No</td>
<td>No proposals to increase data publication</td>
</tr>
</tbody>
</table>

Source: Ofwat (2017a), Ofwat (2018a), Vivid Economics
Appendix 1: Details of methodology

**Automated literature review**

The automated evidence review used an algorithmic search tool to collect relevant literature from Google Scholar. Eight keyword searches were performed. The tool identified studies which contained these terms in the ‘body’ of the paper.

The automated literature review comprised of 6 search strings with the PICO elements set out in Table 7 below.

<table>
<thead>
<tr>
<th>String</th>
<th>Population</th>
<th>Intervention</th>
<th>Comparator</th>
<th>Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Water companies OR wastewater companies</td>
<td>Return* OR regulatory capital</td>
<td>“Regulated”</td>
<td>Excess* OR fair* OR outperform*</td>
</tr>
<tr>
<td>2</td>
<td>Water companies OR wastewater companies</td>
<td>Return* OR equity</td>
<td>Benchmark*</td>
<td>Excess* OR fair* OR outperform*</td>
</tr>
<tr>
<td>3</td>
<td>Water companies OR wastewater companies</td>
<td>Return* OR “on regulatory capital value” OR “RCV”</td>
<td>Energy AND sector OR companies</td>
<td>Excess* OR fair* OR outperform*</td>
</tr>
<tr>
<td>4</td>
<td>Water companies OR wastewater companies</td>
<td>Dividends</td>
<td>Energy AND sector OR companies</td>
<td>Excess* OR fair* OR outperform*</td>
</tr>
<tr>
<td>5</td>
<td>Water companies OR wastewater companies</td>
<td>Gearing</td>
<td>Energy AND sector OR companies</td>
<td>Excess* OR fair* OR outperform*</td>
</tr>
<tr>
<td>6</td>
<td>Water companies OR wastewater companies</td>
<td>“transfer pricing”</td>
<td>Energy AND sector OR companies</td>
<td>Excess* OR fair* OR outperform*</td>
</tr>
</tbody>
</table>

*Source: Vivid Economics*

The results of each search were exported to a spreadsheet. In total they produced 104 unique findings, of which 13 had titles that were relevant to the research question. A review of the abstracts or executive summaries of the other publications revealed that one study was relevant to the research question.
Appendix 2: Data on returns metrics.

A2.1 Post-tax return on regulatory capital value

The metric is calculated as follows:

\[
Post - tax \ return \ on \ regulatory \ capital \ value = \frac{Current \ cost \ operating \ profit \ + \ current \ taxation}{Average \ year \ RCV}
\]

Figure 8. Post-tax return on regulatory capital value: Industry-level

Notes: Current taxation is not available before 2001. In order to have longer time series and draw conclusions beyond short-term firm cyclicality, companies that have eventually merged have been retrospectively combined from privatisation onwards. The sudden jump in 2009-10 is due to an increase in industry-level current cost operating profit.

Source: Vivid Economics using data from Ofwat and UK Regulators Network.
A2.2 Post-tax return on actual regulated equity

The metric is calculated as follows:

\[
\text{Post – tax return on actual regulated equity} = \frac{\text{Current cost operating profit} + \text{current taxation} + \text{net interest}}{\text{Average year RCV} - \text{net debt}}
\]

Figure 9. Post-tax return on actual regulated equity: Industry-level

Notes: In order to have longer time series and draw conclusions beyond short-term firm cyclicality, companies that have eventually merged have been retrospectively combined from privatisation onwards. Southern Water is responsible for the industry-level volatility between 2009 and 2011. Current taxation and net interest are not available before 2001.

Source: Vivid Economics using data from Ofwat and UK Regulators Network.
Notes: In order to have longer time series and draw conclusions beyond short-term firm cyclicality, companies that have eventually merged have been retrospectively combined from privatisation onwards. The volatility of Southern Water’s post-tax return on actual regulated equity is due to a drop in its regulated equity in 2006-07 and in its current cost operating profit in 2010-11.

Source: Vivid Economics using data from Ofwat and UK Regulators Network.
A2.2 Determinations on the cost of capital

Figure 11. Post-tax WACC: Recent regulators’ announcements

Source: Vivid Economics using data from Ofwat and UK Regulators Network.
Figure 12. Post-tax cost of equity: Recent regulators’ announcements

<table>
<thead>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>CP5</td>
<td>Q6</td>
<td>Q6</td>
<td>NERL</td>
<td>RP5</td>
<td>LLU</td>
<td>WBA</td>
<td>PR14</td>
<td>PC15</td>
<td>MCT</td>
<td>CMA</td>
<td>LLCC</td>
<td>LLCC</td>
<td>GD17-</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>PNGL</td>
</tr>
</tbody>
</table>

Source: Vivid Economics using data from Ofwat and UK Regulators Network.
Figure 13. **Notional gearing: recent regulators’ announcements**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>CP5</td>
<td>Q6</td>
<td>Q6</td>
<td>NERL</td>
<td>RP5</td>
<td>LLU</td>
<td>WBA</td>
<td>PR14</td>
<td>PC15</td>
<td>MCT</td>
<td>CMA</td>
</tr>
</tbody>
</table>

Source: Vivid Economics using data from Ofwat and UK Regulators Network.
A2.3 Dividend yield

The metric is calculated as follows:

$$\text{Dividend yield} = \frac{\text{Dividends paid}}{\text{Average year RCV} - \text{net debt}}$$

Figure 14. Dividend yield: Industry-level

Notes: In order to have longer time series and draw conclusions beyond short-term firm cyclicalities, companies that have eventually merged have been retrospectively combined from privatisation onwards. Dividend yield volatility is due to dividend payment decisions by individual companies, many of them reporting all dividends in a given year over the five-year periods. Unlike the data presented in other charts, no adjustment is made to account for ‘round-trip’ dividends, used by shareholders to repay loans made by the regulated company.

Source: Vivid Economics using data from Ofwat.
A2.4 Gearing

The metric is calculated as follows:

\[
\text{Gearing at regulated companies level} = \frac{\text{Net debt}}{\text{Year end RCV}}
\]

**Figure 15. Gearing: Industry-level**

Notes: In order to have longer time series and draw conclusions beyond short-term firm cyclicality, companies that have eventually merged have been retrospectively combined from privatisation onwards.

Source: Vivid Economics using data from Ofwat and UK Regulators Network.
Figure 16. Gearing: Company-level

*Notes:* In order to have longer time series and draw conclusions beyond short-term firm cyclical, companies that have eventually merged have been retrospectively combined from privatisation onwards.

*Source:* Vivid Economics using data from Ofwat and UK Regulators Network.
A2.5 Totex outperformance

The metric is calculated as follows:

\[ \text{Totex} = \text{Capex} + \text{Opex} \]

Figure 17. Wholesale expenditure relative to allowance: Industry-level

Notes: In order to have longer time series and draw conclusions beyond short-term firm cyclicality, companies that have eventually merged have been retrospectively combined from privatisation onwards. Values are in 2012-13 prices.

Source: Vivid Economics using data from Ofwat.
Figure 18. Wholesale expenditure relative to allowance: Industry-level

Notes: In order to have longer time series and draw conclusions beyond short-term firm cyclicality, companies that have eventually merged have been retrospectively combined from privatisation onwards. Values are in 2012-13 prices.

Source: Vivid Economics using data from Ofwat.
Figure 19. Wholesale expenditure relative to allowance: Company-level

Notes: In order to have longer time series and draw conclusions beyond short-term firm cyclicality, companies that have eventually merged have been retrospectively combined from privatisation onwards. Values are in 2012-13 prices.

Source: Vivid Economics using data from Ofwat.
Appendix 3: Estimation of aspects of returns

Level and composition of returns

Table 8 shows the levels and sources of returns above allowances for AMP5 and AMP6 that was reported in Section 4.2.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost of debt</td>
<td>£300m</td>
<td>£70m</td>
</tr>
<tr>
<td>Totex</td>
<td>£110m</td>
<td>£120m</td>
</tr>
<tr>
<td>Tax</td>
<td>£50m-£120m</td>
<td>-</td>
</tr>
<tr>
<td>ODIs</td>
<td>NA</td>
<td>£55m</td>
</tr>
<tr>
<td>Measured annual returns over cost of capital</td>
<td>£460m-£530m</td>
<td>£245m-£475m</td>
</tr>
<tr>
<td>Cost of equity</td>
<td>No data</td>
<td>£0-£230m</td>
</tr>
<tr>
<td>Overall annual returns over cost of capital</td>
<td>£460m-£530m</td>
<td>£245m-£475m</td>
</tr>
</tbody>
</table>


Note: Figures in 2012-13 prices. See Appendix 3 for explanation of assumptions used to derive the estimates.

The numbers are calculated as follows:

| AMP6 numbers were calculated using information provided in company 2018 APR submissions available at the time of writing (July 2018), which included all companies apart from Affinity Water. Overall RORE for companies in AMP6 was calculated, if possible, by using numbers reported in APRs or, if not, by updating information for 2015-17 reported in Ofwat (2017b) with 2017-18 numbers in 2018 APRs. AMP6 RORE was decomposed into totex, financing or ODIs using, if possible, AMP6 information reported in 2018 APRs or, if not, by updating information for 2015-17 reported in Ofwat (2017b) with 2017-18 numbers in 2018 APRs. Where no decomposition of returns is available in 2018 APRs, the decomposition from Ofwat (2017b) is carried forward.
| cost of debt. PwC (2017) estimated the RORE from financing outperformance by comparing realised versus allowed cost of debt in AMP5. This is 1.2% of RORE for an average company. Multiplying by average regulated equity in 2012-13 prices across the sector, using data received from Ofwat, gives outperformance worth £1.5bn in AMP5, or £300m per year. This calculation therefore approximates the actual value of returns by using unweighted average ROREs across the sector and average regulated equity across the price controls. AMP6 returns are calculated using company-level data on RORE from financing outperformance provided in Ofwat (2017b), extended where possible using company 2018
Annual Performance Reports. This is multiplied by each company’s average regulated equity during AMP6 and summed to produce annual average gains across the sector.

— **totex.** The same approach as for cost of debt was followed, using PwC (2017) estimates of totex outperformance worth 0.45% RORE for AMP5 and data in Ofwat (2017b) and available company 2018 Annual Performance Report submissions for AMP6.

— **tax.** Estimates from different sources are described in more detail below. A maximum value in AMP5 of £610m is from National Audit Office (2015), net of £100m out of £435m of the total benefits shared with customers (a portion of the benefits shared with customers will already be accounted within totex outperformance). The lower bound is informed by estimates from Alvarez and Marsal (2016), scaling up estimates where these cover a sample of 6 out of the 18 companies, which leads to an figure £252m below the National Audit Office figure for the AMP. The lower bound allows nets off £200m of the £435m total benefits shared with customers, leading to an estimate approximately £350m below the upper bound.

— **cost of equity.** Ofwat (2014) presents various estimates of forward-looking indicators of the total market return (TMR) that were available at PR14 (see Figure 1). It quotes the Competition Commission as having deemed, in November 2013 that placing a heavy weight on forward-looking indicators could justify the use of a real TMR in the range of 5-6.5%. Using the mid-point of this range, and using for indicative purposes PwC’s (2017) calculation of the relationship between the real TMR and company AMP6 returns (Table 19), the annual change in company returns during AMP6 could be £230m.

**Tax**

According to a report from the National Audit Office (2015), overall tax payments across the sector during AMP5 were around £710m lower than allowed for in the 2009 price review. Findings from the NAO report were later questioned by Alvarez and Marsal (2016), who found different estimates for the shares of the reduction in tax charges which can be attributed to a reduction in corporation tax and to total one-off accounting adjustments. By performing a detailed exploration of the fiscal accounts of 6 companies of the sector, they were also able estimate the implications of pensions, operating profit and financing costs on the overall tax charge. A summary of the findings from these two reports can be found in Table 9 below.
## Table 9. Comparison between actual tax and allowed tax as at PR09 as noted in the NAO and the Ofwat reports for selected categories

<table>
<thead>
<tr>
<th>Category</th>
<th>Scope</th>
<th>Reduction/increase in tax charge</th>
<th>NAO report</th>
<th>A&amp;M findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total reduction in corporation tax</td>
<td>Industry</td>
<td>Reduction in tax charge</td>
<td>£410m</td>
<td>£211m</td>
</tr>
<tr>
<td>Total unpaid group relief</td>
<td>Industry</td>
<td>Reduction in tax charge</td>
<td>£480m</td>
<td>£480m</td>
</tr>
<tr>
<td>Total one-off accounting adjustments</td>
<td>Industry</td>
<td>Reduction in tax charge</td>
<td>£320m</td>
<td>£293m*</td>
</tr>
<tr>
<td>ICR agreements with HMRC</td>
<td>Industry</td>
<td>Reduction in tax charge</td>
<td>n/a</td>
<td>£100m</td>
</tr>
<tr>
<td>Pensions</td>
<td>6 companies reviewed by A&amp;M</td>
<td>Reduction in tax charge</td>
<td>n/a</td>
<td>£98m</td>
</tr>
<tr>
<td>Difference between forecast and actual operating profit performance</td>
<td>6 companies reviewed by A&amp;M</td>
<td>Increase in tax charge</td>
<td>n/a</td>
<td>-£81m</td>
</tr>
<tr>
<td>Difference between forecast and actual financing costs</td>
<td>6 companies reviewed by A&amp;M</td>
<td>Increase in tax charge</td>
<td>n/a</td>
<td>-£143m</td>
</tr>
</tbody>
</table>

Note: *Includes £247m across the industry related to the IBA agreement and £46m of tax benefits for the two companies that adopted IAS during AMP5

Appendix 4: Benchmarks from other sectors

Valuation premia

Deutsche Bank Market Research (2016) shows the market valuation premium over regulated asset base (RAB, equivalent to RCV in England and Wales water) for listed network utilities under five regulatory jurisdictions, as at September 2016. Table 1 reports ranges from each jurisdiction, with brief commentary.

<table>
<thead>
<tr>
<th>Sector</th>
<th>Enterprise value premium to RAB</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>UK electricity transmission</td>
<td>c.55%</td>
<td>Sample consists of a single company, National Grid.</td>
</tr>
<tr>
<td>UK Water</td>
<td>c.25-45%</td>
<td>Includes Pennon, Severn Trent, United Utilities. As set out in Section 4.1, valuation premia have subsequently declined.</td>
</tr>
<tr>
<td>US</td>
<td>c.35-40%</td>
<td>Includes energy and water. Valuation premia reflect in part higher projected growth than for UK water.</td>
</tr>
<tr>
<td>Italian grids</td>
<td>c.15%</td>
<td>Includes SNAM (gas transmission) and Terna (energy transmission), which both have lower RAB growth than UK water. One interviewee flagged Italian networks as suffering from relatively high regulatory risk.</td>
</tr>
<tr>
<td>Spanish grids</td>
<td>c.-5-15%</td>
<td>Includes Enagas (gas transmission) and Red Electrica (electricity transmission). Both have significantly lower RAB growth than UK water; Enagas’s RAB is projected to shrink over the long term.</td>
</tr>
</tbody>
</table>


Return on Regulated Equity (RORE)

Deutsche Bank Market Research (2016) ranks regulatory regimes by the average projected RORE of listed companies under the regime for 2017. The sample of 27 regimes includes networks in Austria, Bulgaria, the Czech Republic, Finland, France, Germany, Hungary, Italy, Portugal, Romania, Slovakia, Spain, Sweden, the UK and the US. Sectors include: gas shipping, transmission and distribution, electricity transmission and distribution, water (for the UK and US only) and the US average for energy networks. The analysis shows:

— projected RORE across the sample ranges from around 0-15%, with a simple average of around 10%;
— UK water projected RORE is around 12%, the sixth highest in the sample;
— the only non-UK regime with a higher projected RORE than UK water is electricity distribution in the Czech Republic;
— US water projected RORE is around a percentage point below UK projected RORE.

Macquarie Research (2017) shows RORE for four listed US water utilities and the three listed UK utilities reported in Table 2 below.
### Table 2.
**RORE for US and UK listed water utilities, 2017**

<table>
<thead>
<tr>
<th>Company</th>
<th>Domicile</th>
<th>RORE</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>American States Water</td>
<td>US</td>
<td>c.12.5%</td>
<td></td>
</tr>
<tr>
<td>American Water Works</td>
<td>US</td>
<td>c.9.5%</td>
<td></td>
</tr>
<tr>
<td>Aqua America</td>
<td>US</td>
<td>c.12%</td>
<td></td>
</tr>
<tr>
<td>California Water Services</td>
<td>US</td>
<td>c.10.5%</td>
<td></td>
</tr>
<tr>
<td><strong>US average</strong></td>
<td></td>
<td>c.11%</td>
<td>No disaggregation of returns into base and outperformance.</td>
</tr>
<tr>
<td>Pennon</td>
<td>E&amp;W</td>
<td>c.14.5%</td>
<td>3% RORE from financing outperformance; 2% RORE from operational outperformance.</td>
</tr>
<tr>
<td>Severn Trent</td>
<td>E&amp;W</td>
<td>c.12.5%</td>
<td>1.5% RORE from financing outperformance; 1.5% RORE from operational outperformance.</td>
</tr>
<tr>
<td>United Utilities</td>
<td>E&amp;W</td>
<td>c.11.5%</td>
<td>2% RORE from financing outperformance; marginal operational outperformance.</td>
</tr>
<tr>
<td><strong>England and Wales average</strong></td>
<td></td>
<td>c.13%</td>
<td>Base returns of around 9.5% lower than US average return.</td>
</tr>
</tbody>
</table>

**Note:** E&W means England and Wales.

**Source:** Vivid Economics analysis of Macquarie Research (2017)
References


Ofgem (2017b). Decision on Ofgem’s policy for funding Pension Scheme Established Deficits.


Ofwat (2013). Treatment of companies’ pension deficit repair costs at the 2014 price review.


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