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# Summary

PwC has been appointed to advise Ofwat on the approach to reviewing the appropriate returns for water companies for the 2014 periodic review (PR14). This report sets out PwC's views on key practical and methodological issues relating to setting allowed returns for PR14 in the water and waste water sector. It provides a number of findings based on recent empirical evidence, regulatory precedents and developments in the water sector since PR09.

This report is structured as follows:

- Section 1 first introduces the key areas and questions that we seek to address in the report.
- Section 2 sets out developments in capital markets since PR09, how these could affect the cost of capital, and the implications for the water sector. While capital markets have been through a volatile period, the availability of debt finance is currently strong and the cost of debt is low by historical standards, which should be beneficial to efficiently financed water companies.
- Section 3 analyses water company performance during AMP5 relative to the cost of capital set in PR09. Water companies have performed broadly in line with the regulatory WACC over the past 6 years. From an investor perspective, this is a much better performance than some other regulated companies and reinforces the investor view that risks in the water sector are low. Significant, largely unanticipated, cost of debt outperformance has typically boosted equity returns, which have exceeded the cost of equity over the past 6 years for the sector as a whole. This raises questions of whether Ofwat should be concerned about highly leveraged companies, and whether companies should retain all cost of debt outperformance, which we address in Section 5.
- Section 4 sets out the implications of methodological changes for PR14 and the potential affect these will have on allowed returns. The PR14 methodology changes should have a profound impact on the way in which companies prepare business plans and manage their businesses, as well as, the way Ofwat appraises business plans. Providing companies with both greater control over their businesses and additional incentives to improve performance will impact how water companies can achieve their returns. Two significant structural changes are the separation of wholesale and retail price controls and the separation of water and wastewater wholesale price controls. The separation of controls will require allowed returns to be set at a greater level of granularity (compared to PR09) and will require appropriate checks that overall returns are appropriate.
- Section 5 considers different approaches to water companies' capital structures and how actual capital structures have changed since PR09. The biggest increase in gearing was from 2002 to 2007, with a further slight increase in 2009. Industry-wide gearing has been drifting downwards since 2009. We stress test the impact of higher debt interest costs on the industry and conclude that the water industry has not, to date, geared itself to the point where it has increased failure risks to the detriment to customers. Furthermore, the presence of the special administration regime and regulatory ring-fencing mean that failure risks should mainly be borne appropriately by providers of finance and not by customers.
- Section 6 addresses a number of specific methodological questions. Ofwat asked PwC to collect evidence from market data, academic studies and papers, and the best practice of other regulators to explore whether the evidence:
  - supports a move away from the use of a single notional gearing;
  - indicates a range of appropriate gearing;

- supports a change in Ofwat's approach to the cost of debt, taking into account the balance of risk between companies and customers;
- points towards a particular approach to setting the cost of equity; and
- suggests that capital structures in the industry pose particular risks, and if so whether it may be appropriate to take regulatory action to mitigate these risks.

## Summary views

In this Section we summarise some of our key findings and conclude with eight specific views for Ofwat's consideration.

Ofwat have made a number of changes to its methodology between PR09 and PR14, particularly the separation of price controls, greater use of outcome incentive mechanisms and greater company ownership of their business plans. However, these changes do not require a change to the cost of capital methodology and, based upon our understanding of different parts of water businesses and the proposed outcome incentives, we do not expect the methodology changes to have a significant impact on the systematic risk profile on the industry. We understand that Ofwat will need to consider any evidence presented by companies in their business plans on this issue and revisit the possibility of a risk differential between different price controls in the light of any such evidence.

**View 1: The main approach to setting allowed returns in UK regulatory price determinations is by assessing the weighted average cost of capital (WACC), with the Capital Asset Pricing Model (CAPM) used as the basis for setting the cost of equity. We have not found any evidence (market or academic), nor any changes to the PR14 methodology, which suggest a change is required to this overarching approach.**

The notional capital structure approach has served UK economic regulators well. It means that consumers benefit from the efficiency of a geared capital structure and regulated companies retain the responsibility for managing finance risk. The move to prescribing a capital structure, or basing allowed returns on a water company's actual capital structure, is inconsistent with Ofwat's stated regulatory policy of encouraging water companies to take more ownership of their business plans. It could also dampen long-term incentives for efficient financing.

**View 2: Compared to alternative ways of setting the capital structure assumption, a notional capital structure approach provides the best incentives for efficient financing.**

The risk profiles of individual water companies vary. Each water company is exposed to regional, economic and customer variations around demand, cost and weather risk. However, based upon analysis of the variations in margins, capex and betas, we consider that, from an investor perspective, this variation in risk profile is small.

**View 3: We have not found evidence to suggest that risks across the water industry are sufficiently different to require a different notional capital structure. This suggests that allowed returns in the water sector should use a single (industry-wide) notional capital structure.**

Most water companies have geared above the PR09 regulatory assumption of 57.5%, while retaining sufficient financial headroom. We consider a move to a regulatory gearing assumption of between 60% to 70% would reflect some of this increase in actual leverage levels, while allowing water companies to meet Ofwat's financeability tests and accommodating a range of capital structure options across the industry (public ownership, privately held securitised structures etc).

**View 4: Our view of the appropriate single notional gearing assumption for the water industry is between 60% and 70%. An appropriate industry-wide point estimate from within this range can be assessed after water companies have submitted their business plans.**

We find that water company performance has been robust during and following the recession of 2008/9. The water sector has delivered returns close to the regulatory cost of capital, despite significant downside economic risks. Water sector asset betas have remained persistently below the PR09 asset beta assumption of 0.4.

**View 5: We have found that water sector systematic risks are low. This suggests the appropriate asset beta for use in the cost of equity calculation for water companies maybe below the 0.4 assumption used in PR09.**

Water companies outperformed the regulatory cost of debt assumption during AMP5. Much of this outperformance was unanticipated at the time of PR09 and we do not consider such unanticipated gains should be viewed as a failure of the regulatory regime. In an incentive based regulatory regime, debt financing gains are acceptable, provided water companies are exposed to a symmetric risk of both upside and downside risk in relation to debt financing costs. Historically, Ofwat has set the cost of debt assumption above the out-turn cost of debt over the past 20 years, but this was during a period of reducing interest rates and does not invalidate the current approach.

In an incentive based regulatory regime, the cost of debt allowance should be based upon the best estimate of the cost of debt based upon market inputs (with allowance for embedded debt costs and forward looking costs of new debt issuance). While, in current market conditions, this estimate may anticipate some increase in future debt costs as a consequence of rising interest rates, current market indicators do not suggest a quick return to “normal” market conditions as lower interest rates are expected to persist for a significant period of time.

**View 6: Setting a fixed cost of debt assumption in PR14 provides a strong incentive for efficient financing, which will be in the best long-term interests for consumers. There are some advantages to the debt indexation approach, including transparency and predictability. However, such an approach could also reduce incentives for efficient debt financing and is counter to Ofwat’s PR14 principle of giving companies more ownership of how they deliver outcomes. This ownership extends to managing financial risk. There are additional practical challenges and potential unintended consequences of a pain/gain share mechanism on the cost of debt.**

Our analysis of total equity market returns suggests that equity investor return expectations have not moved as much as the yields on government or corporate bonds over the past 6 years. Given the significant movements in both government bond yields and equity risk premia over the past 6 years, a number of UK regulators and academics consider it more important to assess overall equity market return requirements (using a range of sources and techniques), and then split this out into the individual components of the CAPM formula.

**View 7: A cost of equity approach which first assesses total equity market return requirements is likely to be more stable and robust than building the cost of equity up from estimates of the component parts of the CAPM formula.**

Our analysis suggests that water companies retain significant financial headroom to withstand both financial and economic shocks. The ring-fencing of regulated entities and the special administration regime in water also provide considerable protection to consumers in the event of a water company failure. However, some highly leveraged corporate structures are relatively untested.

**View 8: We have not found evidence that Ofwat should be unduly concerned about highly leveraged capital structures, but some corporate structures are relatively untested and new risks may emerge. We have found that other UK economic regulators undertake an annual review of regulated sectors, which includes the monitoring of financial risks.**

# 1. Introduction

The cost of capital is a critical assumption in any price control for a capital intensive industry. It provides the incentives for companies to invest in repairing and enhancing networks, and it accounts for a considerable proportion of customer bills.

For PR09, Ofwat set allowed returns based on its assessment of the cost of capital for water industry companies (both the water and sewerage companies (WASCs) and the water only companies (WOCs)). The cost of capital was based on an assessment of the cost of equity, cost of debt and appropriate mix of equity and debt financing. The cost of equity was estimated using a range of evidence but expressed using the conventional CAPM approach, and the cost of debt was assessed in relation to the yields on corporate bonds of investment grade quality. This approach to calculating the weighted average cost of capital (WACC) was broadly consistent with that of other UK regulators at the time.

PwC has been appointed to advise Ofwat on the approach to reviewing the appropriate returns for water companies for PR14. This paper provides a broad review of issues relating to the cost of capital methodology used in PR09 and whether there are grounds for a change to it for PR14. Our analysis is intended to advise Ofwat for the purpose of PR14 only and any views expressed do not relate to broader regulation or to Ofwat's duties outside of PR14. We review:

- the changes in capital markets since PR09 (**Section 2**);
- the performance of water industry companies in relation to the allowed returns during the course of Asset Management Period 5 (AMP5) – the period relating to the PR09 price control (**Section 3**);
- the regulatory changes proposed to be introduced for PR14, including the separation of water and wastewater price controls and a greater range of incentive mechanisms (**Section 4**); and
- the evolution in financing structures and gearing levels across water industry companies, in particular the movement towards highly leveraged structures and whether this should be a concern to Ofwat (**Section 5**);

Ofwat asked PwC to collect evidence from market data, academic studies and papers, and the best practice of other regulators to explore whether the evidence:

- supports a move away from the use of a single notional gearing;
- indicates a range of appropriate gearing;
- supports a change in Ofwat's approach to the cost of debt, taking into account the balance of risk between companies and customers;
- points towards a particular approach to setting the cost of equity; and
- suggests that capital structures in the industry pose particular risks, and if so whether it may be appropriate to take regulatory action to mitigate these risks.

This paper does not provide an assessment of the appropriate allowed returns for PR14 including the debt, equity and tax constituents for a WACC for wholesale services and net margins for retail services. Ofwat will assess the reasonableness of the allowed returns in company business plans as part of its risk based review process. Following this assessment, Ofwat will set out its proposals for allowed returns in its draft determinations using the methodology it has set out in its statement.

In comparison to other UK regulators, the distinguishing aspects in Ofwat’s assessment of the cost of capital for PR09 were:

- the use of a high weight (at 75%) for “embedded debt”, which allowed water industry companies to recover financing costs in relation to historic debt financing costs;
- the use of a post-tax cost of equity with a pre-tax cost of debt (or Vanilla WACC). Ofwat used this formulation of the cost of capital in conjunction with a separate allowance for tax expenses based upon expected tax expenses, which were calculated using the each company’s actual projected capital structure. Tax was therefore treated as a projected cost pass-through, so that customers benefited from the considerable impact of capital allowances in the water sector which reduced effective tax rates during a period of high capital expenditure; and
- an asset beta of 0.4, which was lower than those of some other UK regulated utilities (particularly airports and telecoms companies)<sup>1</sup>.

For PR09, Ofwat set a Vanilla WACC of 5.1% using the above approach. The parameters of the calculation using a CAPM approach are set out below:

**Figure 1.1 Cost of capital for PR09**

PR09 inputs	PR09
Real risk-free rate (RFR)	2.0%
Equity market risk premium (EMRP)	5.4%
Asset beta	0.4
Gearing (Debt:RCV)	57.5%
Equity beta	0.9
Cost of equity (post-tax)	7.1%
Cost of debt	3.6%
<b>WACC – gross of tax shield (Vanilla)</b>	<b>5.1%</b>
Corporate tax rate (not given in final determination)	28%
<b>WACC – post-tax</b>	<b>4.5%</b>

Source: Ofwat

The approach in PR14 differs because companies are required to set their own appropriate allowed returns as part of their business plans and a WACC will only be used for allowed returns for wholesale services. Ofwat will review the companies’ business plans and therefore requires its own view of appropriate allowed returns for the retail and wholesale services provided by water industry businesses.

<sup>1</sup> The asset betas set by the CAA in Q5 for UK Designated airports range from 0.47 (Heathrow) to 0.61 (Stansted) . BT’s Openreach asset beta was set in the range of 0.41 to 0.55 by Ofcom in 2011.























## *The separation of price controls into retail and wholesale*

For PR14, Ofwat will allow a net retail margin for retail activities and not a WACC. This will be included in retail prices for household customers and incorporated into the default tariffs for non-household customers. This net retail margin should be sufficient to compensate for operational risks and allow a return on retail capital employed (including working capital).

This means that the wholesale allowed return via the WACC needs to be based upon wholesale risks. Provided overall forward looking risks are unchanged, it also means that cost of capital estimates drawn from integrated water industry company data need, in principle, to be adjusted to reflect wholesale only risks.

Rather than seeking to quantify the wholesale cost of capital directly, or to disaggregate the water company cost of capital into component parts, we suggest Ofwat determine the wholesale WACC from first estimating an overall company return, then deducting the element of it associated with the allowed retail net margins. In this way the separation of price controls into wholesale and retail will not itself increase or decrease water company overall allowed returns, again providing overall risks are unchanged.

## *The separation of price controls into water and wastewater*

The use of separate price controls for wholesale water and wastewater services does not require a change to the methodology for assessing returns, but it does require allowed returns to be set at the wholesale water and wastewater control level. Whether the same return should be allowed for both wholesale water and wastewater services is largely an empirical/evidential question. If water industry companies can demonstrate significantly different risk levels across their wholesale water and wastewater businesses, then we consider that the regulatory framework should be able to accommodate different allowed returns. There are a number of regulatory precedents for different allowed returns across a regulated business.<sup>12</sup>

We have undertaken a high level review of the relative risks of wholesale water and wastewater activities in Table 4.1 below.

**Table 4.1: High-level relative risk summary of water and wastewater businesses**

<b>Risk factor</b>	<b>Description of risk</b>	<b>Relative risk difference between water and wastewater</b>
Volume (demand)	Uncertainty associated with usage of water services and hence overall demand and revenues (both household and industrial). New sites with 100% metering have greater volume risk, as demand is more sensitive.	The wholesale water business may be more exposed to volume risk than the wastewater area of the business, but most customers take both water and wastewater services, which will narrow demand differences.
Customer bad debt	Reflects the proportion of bills that cannot be recovered from customers. This varies by region, with economically stronger areas generally having a lower bad debt risk exposure.	Customer bad debt risk is relevant to retail activities, but not wholesale water and wastewater price controls. Within retail, this risk is unlikely to vary between the water and wastewater portion of customer bills as customers cannot choose to pay for one component of their overall water services and not the other, unless provided by different suppliers.
Operating expenditure	Some operating risks are more systematic in nature, particularly those driven by macroeconomic factors, such as energy prices.	Based on 2012 regulatory accounts of the ten WaSCs, there is not a clear distinction as to whether operating expenditure risks are greater in the water or wastewater area of the business.

<sup>12</sup> Ofcom has disaggregated the cost of capital for BT and allows a different rate of return for different parts of BT's business (wholesale line rental, leased lines etc.). The CAA historically disaggregated the allowed returns for BAA into differentiated returns for the three London airports – Heathrow, Gatwick and Stansted.

Capital expenditure	<p>Captures risk in delivery of capex programs and associated cost overruns.</p> <p>In principle, larger capex programmes in relation to capital values have higher risk exposure.</p>	<p>Based on 2012 regulatory accounts, nine out of the ten WaSCs reported higher capital maintenance expenditure for wastewater activities compared to water activities.</p> <p>This suggests that wastewater may be more exposed to risks associated with capex, such as construction cost inflation.</p>
Operating leverage	<p>The greater the share of fixed costs in total costs, the higher the operational leverage and amplification of demand risks.</p>	<p>Based on 2012 regulatory accounts of the ten WaSCs, there is not a clear distinction as to whether operating leverage is greater in the water or wastewater area of the business.</p>
Contamination	<p>For both water and wastewater there is a risk of contamination from external sources.</p> <p>In the event of contamination, both water and wastewater will require additional treatment. In the case of wastewater, the company will be required to meet its discharge consents for treated effluent and will therefore have to remove the pollutant.</p>	<p>Contamination risks are present in both wastewater and water supplies. Furthermore, it is not clear that contamination risk is systematic in nature and therefore any difference in the incidence of risk might have limited impact on the cost of capital.</p>
Rainfall	<p>In dry weather wastewater tends to be more concentrated and may therefore be more costly to treat. Additionally sewer blockages may also occur due to lack of flow. In very wet weather sewers can overflow into watercourses, which could possibly lead to pollution events and fines.</p> <p>Water will also be affected by rainfall. Water can become more expensive in prolonged dry weather because the cheapest sources of abstraction and treatment need to be rested and more expensive sources used.</p>	<p>Both water and wastewater face risks associated with rainfall variation. However, there is not a clear distinction as to whether the water or wastewater part of the business has greater exposure to rainfall risks. Such risks are not likely to be systematic and therefore have limited impact on the cost of capital.</p>

This high-level review of relative risks does not provide a clear direction on whether wholesale water or wastewater risks are greater, but does suggest that any difference is likely to be small.

We next review the equity betas and asset betas for WASCs and WOCs to assess whether capital market information provides any insight into whether wholesale water or wastewater systematic risks are greater. Ordinarily, if there were markedly different systematic risk profile for water and wastewater activities, then we would expect a different systematic risk profile for WASCs compares to WOCs. Unfortunately, this test is limited because there is only one publicly listed WOC (Dee Valley), and we cannot be sure that any differences in its beta reflect its status as a WOC, as opposed to being specific to Dee Valley for other reasons, such as it being a smaller listed company.









If Ofwat does not assume a highly leveraged capital structure, then should it be concerned that some water industry companies are currently geared at a point substantially above the PR09 notional regulatory gearing assumption? There are two possible concerns.

Firstly, Ofwat may be allowing companies to earn an excess (and unjustified) return by permanently exceeding the notional regulatory gearing assumption. Secondly, water industry companies may be introducing a higher risk of failure through their capital structure decisions, and such a level of failure risk could be to the detriment of customers.

### **Earning unjustified returns**

On the first concern, higher leverage can increase equity returns, but it also increases equity risks because risks are spread over a smaller equity capital base. Provided water industry companies earn additional return and bear all this additional risk, then there should not be a concern about the individual financing decisions of companies. It is important to consider who bears the higher risk of companies operating at higher leverage. One possibility is that equity providers do not bear all this additional risk because at high leverage levels, in the case of a downside risk, Ofwat may consider it to be in customers' interests to support the water company (through altering price control parameters or reducing outcome requirements). Alternatively the government may be willing to provide financial or non-financial support to a highly leveraged water company in difficulty. Such support provided by the regulator or government (and ultimately customers) would limit downside risk, but water company shareholders would benefit from all the higher returns available when operating at higher leverage. This is a form of moral hazard, and analogous to moral hazard issues in the banking sector.<sup>18</sup>

To assess whether there is such a moral hazard issue in the water sector we need to test (i) whether water industry companies have geared themselves to a point which exposes the sector to significant failure risks and, if so (ii) whether it is possible for water industry companies to transfer some of this failure risk to customers (through regulatory or government protection). Without both these two conditions, we suggest moral hazard cannot be a regulatory problem for Ofwat.

### **Is the water sector overly exposed to multiple failure risk from overgearing?**

We have established in Section 3 that the water sector has been able to withstand major economic risks, as shown by its financial performance during the 2008/9 recession. But is this true of financial risks? Figure 5.3 shows that water industry companies have been able to gear themselves at higher levels, while retaining their interest cover protection. This has been helped by lower interest rates and in some cases the switch to index-linked debt (which lowers the ongoing debt service charge, but increases the debt refinancing requirement).

There remains a concern that dramatically higher interest rates could in future place a number of water industry companies in financial difficulties. We have stress tested water industry companies at a higher debt interest rate of 10%, as illustrated in Figure 5.4 below<sup>19</sup>. We assume a modest growth across the water industry, so certain water companies may have faster growth plans which require additional debt finance, but Figure 5.4 shows that the water industry is generally well insulated from a higher interest rate shock. One reason for this is the long-term debt financing profile, which means that debt refinancing risks are more limited over the short term (and in AMP6 in particular).

We conclude that the water sector to date has not significantly increased multiple failure risk through higher leverage.

This position may change in the future. New risks may emerge and the regulatory regime is changing (some of the prior regulatory protections such as the revenue correction mechanism and RPI linking of all charges are

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<sup>18</sup> The Prudential Regulatory Authority (PRA) has an extensive programme of regulatory reform which involves higher equity requirements, altering the order of loss bearing across different finance providers (through the use of bail-in capital), and resolution regimes. Much of this is designed to reduce the impact of moral hazard in banking.

<sup>19</sup> A 10% cost of debt (nominal) assumption was used as this was the approximate cost of debt for investment grade corporate during the financial crisis.



## Can water industry companies transfer risk?

The provision of the special administration regime in water, combined with the ring fencing of the regulatory business within water groups, means that continuity of supply can be maintained while a change of ownership is organised in the event of business failure.

As specified in the 2006 paper “*Financing networks: A discussion paper*”<sup>20</sup>, the special administration process is intended to achieve two goals: (1) ensure continuity of service; and (2) re-establish and transfer the business as a going concern. Under this process, the risk of financial distress should therefore be borne by shareholders and other finance providers of the company, as opposed to customers. Given the large asset bases involved, there should always be a transaction which can be carried out to pass the regulated entity to new owners, the value of which will determine losses to the previous shareholders and finance providers.

This process was successfully concluded following Enron’s collapse in 2001, which at the time was the ultimate owner of Wessex Water. Wessex Water was able to maintain its investment grade credit rating and continue to operate as a going concern during the transition to new ownership without disruption of service.

Customers are generally protected against the risks of financial distress because the special administrator and future owners are subject to the same price controls as the previous owners. This means there is little scope to increase customer bills in order to restore the companies’ financeability. However, special administration is not a costless process, and longer term planning and investment can be disrupted during transition. So while customers should not bear much of the risk of immediate business failure, some costs may ultimately fall on customers.

## *Our views on implications for the PR14 methodology*

We conclude that the water industry has not to date geared itself to the point where it has increased multiple failure risks to unacceptable levels.

Furthermore, the presence of the special administration regime and regulatory ring-fencing means that failure risks should mainly be appropriately borne by providers of finance and not by customers. The special administration regime is therefore a critical regulatory tool. Other UK economic regulators are currently developing or enhancing their failure regimes (e.g. the PRA in banking and Monitor in health). This means there may be opportunities to transfer best practices from these sectors into the water sector.

Overall we do not consider there is a need for further regulatory intervention in relation to capital structures. We address relevant considerations for capital structure assumptions in the next section.

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<sup>20</sup> *Ofwat and Ofgem, Financing Networks: A discussion paper, February 2006.*











**Table 6.1: Regulatory precedent on gearing**

Regulator	Gearing (%)
CAA March 2008 (Q5 Heathrow and Gatwick)	60.0
ORR October 2008 (CP4)	60.0
CAA March 2009 (Q5 Stansted)	50.0
Ofwat November 2009 (Water and sewerage)	57.5
Ofgem December 2009 (DPCR5)	65.0
CC August 2010 (Bristol Water)	60.0
CAA December 2010 (NATS)	60.0
Ofcom July 2011 (WBA)	50.0
Ofgem November 2011 (TPCR4 rollover)	60.0
Ofcom April 2012 (ISDN)	50.0
Ofgem December 2012 (RIIO gas distribution)	65.0
ORR 2013 (PR13 draft determinations)	62.5

Source: Regulatory determinations

## Conclusions

Based on the evidence above, we consider an appropriate notional gearing assumption for the water industry is within the range of 60% to 70%:

- A gearing range of 60% to 70% is consistent with the current average of water company gearing levels. We consider it appropriate for a regulator to set gearing assumptions below those of the most highly leveraged companies to allow for variations within the group of companies associated with cash flow and debt issuance timing. In this way, the responsibility for choosing to gear above the regulatory benchmark rests with the regulated company.
- A gearing range of 60% to 70% allows for the fact that gearing may have temporarily risen in recent years due to lower interest rates, and may need to fall back in future if interest rates now start to rise over the next few years.
- There are both publicly listed entities and privately held structures within the UK water sector which have a gearing within the range of 60% to 70%. Setting gearing within this range does not therefore discourage either form of financing structure prevalent in both private and public water companies.
- A gearing range with a top end of 70% is below the threshold where it is likely to become a challenge to meet Ofwat's financeability ratios on an industry wide basis. Ofwat will be able to refine its financeability modelling after business plans have been submitted.
- A gearing range of 60% to 70% is at the top end of regulatory benchmarks (alongside electricity distribution before the more extended RIIO control periods), which is consistent with the relative risks of the water sector compared to other sectors and the relative position of sector betas.

## Cost of debt approach

The water companies outperformed on the cost of debt during AMP5, as discussed in Section 3. This raises the question of whether such outperformance was justified, whether the level was set correctly for the cost of debt, and whether the remuneration of debt finance related risks should be changed in PR14.

Outperformance on debt finance costs during AMP5 was largely unanticipated. The substantial falls in long-term borrowing costs, partly as a consequence of QE, provided an unexpected boost to water company equity



This suggests continuing to use the existing cost of debt approach for PR14, based upon assumptions for embedded debt and the cost of new debt, drawn from market information of the debt costs for investment grade companies. In turn, the debt premium included in the allowed revenues must remunerate companies based upon them – rather than consumers – bearing and managing all of the relevant risks.

There are a number of alternative approaches to setting the cost of debt which have been suggested, or adopted by other UK regulators. We now review these approaches and assess whether we consider they are improvements on the existing approach.

### **Alternative approaches to setting the cost of debt**

Alternative approaches to setting the cost of debt alter the way in which risk is shared between water companies and customers, so that customers are more exposed to future debt market movements. One alternative approach which has this characteristic is to use an indexation approach to the cost of debt to pass through the risks to customers. Others employ more formal risk sharing mechanisms (or gain/pain share) around movements in the cost of debt. These two options are explored in more detail below.

#### *Debt indexation*

The debt indexation approach has been adopted by Ofgem as part of its most recent RIIO price determinations, which cover a longer term period over which predicting the cost of debt becomes more difficult. It involves benchmarking the cost of debt to a predefined index. Ofgem has selected the iBoxx non financials 10+ maturity indices with credit ratings of broad A and broad BBB<sup>25</sup>. It calculates a simple ten- year trailing average of this index. The cost of debt allowance is then updated on an annual basis in line with the change in this ten-year trailing average. The indices are deflated by 10-year inflation data published by the Bank of England, and Ofgem makes no additional allowances for debt issuance fees, liquidity management fees, new issue premia or the inflation risk premium.

If Ofwat was in future to implement a debt indexation approach in the water sector it could use a similar approach to Ofgem, or it could select a different index and different time period for the trailing average. If it was judged that water companies could systematically finance themselves at a cost either above or below the iBoxx index rate then an adjustment factor could be built into the index calculation<sup>26</sup>.

Some benefits of the indexation approach are clear. It provides companies and investors with a transparent basis for how the regulator would set the cost of debt allowance in allowed revenues over a sustainable period. On account of the trailing average, the cost of debt allowance changes slowly, but over the longer term companies which finance themselves at the benchmark rate should be able to recover these debt finance costs in regulated prices. There remains an incentive for companies to finance themselves cheaply – i.e. to secure finance at a cost below that implied by the iBoxx index, but market wide movements in the index are reflected in the movement in allowed costs, so companies do not bear market-wide debt cost risks.

The impact of the debt indexation approach is a shift in bearing market-wide debt finance risks from companies to customers. In the traditional RPI-X approach recalibration only occurs at the end of each price control period and all debt finance risks that materialise in between price controls are borne by companies. The debt indexation approach effectively shortens the recalibration period and should reduce the likelihood of substantial under- or over-performance compared to the regulatory cost of debt assumption.

Critics of the debt indexation approach suggest that it may alter the behaviour of company treasurers. Faced with a clear benchmark target, companies may be incentivised to shadow the index rather than seek to minimise long-term debt finance costs. The indexation approach, by removing elements of market risk, may reduce overall incentives for companies to minimise financing costs. Furthermore, market risks would be borne by customers who are unable to manage such risks.

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<sup>25</sup> Ofgem “Strategy decision for the RIIO-ED1 electricity distribution price control Financial issues”, March 2013.

<sup>26</sup> Over the past ten years the average difference between the yield of water bond issues and the prevailing iBoxx index has been -15 basis points, i.e. yields at issue have been, on average, 15 bps lower than the iBoxx index.

Whether or not to adopt a cost of debt indexation approach is not an empirical question. The difference between a debt indexation approach and a traditional reset approach at the end of the price control period will depend on the cost of debt assumption selected by the regulator and the future track of debt corporate borrowing costs<sup>27</sup>. There is no reason why the approaches will provide different figures over the longer term. If Ofwat fears that it may be overly generous in setting the allowed cost of debt (because of the asymmetric impacts of setting an allowance that is too low), then the traditional approach may result in a relatively high likelihood of company outperformance on the cost of debt over the long term. Alternatively the indexation approach may dampen long-term incentives for efficient debt financing, in which case the indexation approach may lead to a higher cost of debt borne by customers over the long-term.

The decision on whether to adopt a debt indexation approach should therefore be based upon whether Ofwat believes it can set a fair, market based cost of debt in the cost of capital calculation and whether, in principle, finance risks should be borne by companies<sup>28</sup>. On these two points we recommend that Ofwat sets a cost of debt assumption which is a reasonable reflection of embedded debt costs and likely new debt costs. Consistent with the core principles of incentive based regulation, our view is that regulated companies are best placed to manage finance related risks (including changes in the market cost of debt) and any shift to allocate more risks to customers is counter to the current direction of Ofwat's regulatory policy where companies take more ownership for delivering outcomes and managing risks. While there are arguments on both sides, we do not consider, on balance, that debt indexation is appropriate for the water sector over the period covered by PR14.

### *Risk sharing mechanism*

As observed over the past few years, there is potential for substantial variation of actual performance in relation to the cost of debt assumption in the WACC. Some of this variation may have little to do with management performance and more to do with movements in broader credit markets. This has led to suggestions that there should be more sharing of financing gains<sup>29</sup> between companies and customers.

It would be possible to design a gain/pain risk sharing mechanism in relation to the cost of debt. This could compare outturn debt financing performance with the regulatory cost of debt assumption and share any under- or over-performance – e.g. 50% of any performance variation could be added to or subtracted from allowed revenues in the next price control period. Such a risk sharing mechanism would need to be symmetric, so both under- and over- performance would be shared with customers.

We see considerable practical difficulties with such an approach. It may reduce incentives for long-term efficient financing and would also result in more variable customer prices, much like the debt indexation approach. But a risk sharing mechanism has further challenges. It would require careful specification and there would be complex reporting and analytical challenges in assessing gain and pain. There would be a risk that companies would be able to game the risk sharing mechanisms (e.g. through influencing debt issuance timing). Lastly, the risk sharing mechanism would be assessed in relation to overall cost of debt performance, regardless of whether under- or over-performance was a consequence of management action, or wider debt market trends. In this regard, the indexation approach provides a more precise allocation of risk between companies and customers, if Ofwat were to change the approach to risk allocation.

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<sup>27</sup> There may be transitional issues moving from a traditional five-year reset approach to a debt indexation approach. The transitional impact will depend upon the stage in the interest rate cycle when the switch is made. Given the decline in the cost of debt set out in Figure 6.6 and the potential for rising debt costs in next price control period, there is a risk that a shift to indexation at this point may have an asymmetric impact on companies and customers, with companies benefiting from outturn interest rates below expected rates in previous price controls and benefiting from indexation if actual interest rates are higher than expected rates in the PR14 period. While these transitional issues may be significant they should not unduly influence the decision on the appropriate long term basis for setting the appropriate cost of debt.

<sup>28</sup> Unlike Ofgem, Ofwat must make this assessment for a shorter five year period of the next price control to 2020.

<sup>29</sup> The gain share debate is summarised in this feature by Felicity Furness at Indepen Consulting. Available at: [http://www.indepen.uk.com/docs/gain-share-feature\\_220313\\_021.pdf](http://www.indepen.uk.com/docs/gain-share-feature_220313_021.pdf)

## *Cost of equity approach*

As set out in Section 4, the separation of price controls requires the assessment of the cost of equity at a greater level of granularity compared to PR09. This introduces estimation complexities and overall reconciliation complexities (so that water company returns are neither inflated nor reduced as a consequence of new price control structures).

Despite these complexities, we do not consider changes to the regulatory regime for PR14 warrant a change to the approach to setting the cost of equity. Consistent with previous Ofwat and other UK regulatory price controls, we still consider the CAPM framework to be the most appropriate basis for estimating the cost of equity.

However, given current market conditions we consider it appropriate to focus initially on the cost of equity at an overall level, before considering the component parts in the CAPM formula. Total equity market returns represent the returns available to investors for investing in the equity market as a whole. Using the CAPM framework, they can be deconstructed into the sum of the risk-free rate and the equity market risk premium (EMRP). While the component parts of the equity market return can vary across the business cycle, and are in principle difficult to estimate, aggregate equity market returns are more likely to be stable over time.

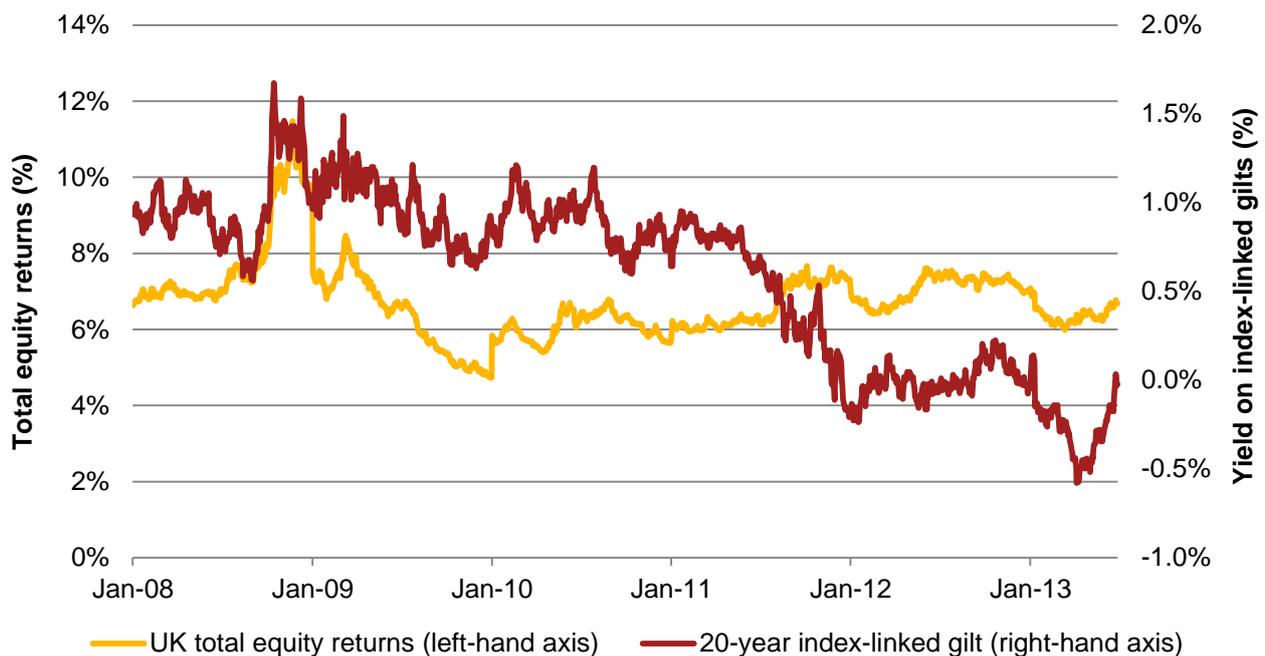
During periods of market uncertainty, investors become more risk averse. The premium for investing in risky assets typically increases and capital flows into assets that are perceived to be safer, such as government bonds. In this situation, the EMRP typically increases while the yield on government securities typically decreases. The overall expected return on equity is thus more stable than the underlying component parts of the total equity market return - government bond yields and the EMRP (See Figure 6.6)<sup>30</sup>. The relative stability in broader equity market returns is also recognised by regulators as well as the Competition Commission<sup>31</sup>.

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<sup>30</sup> See, for example, Smithers and Co Ltd (2003), "A Study into certain aspects of the cost of capital for regulated utilities in the UK", a report prepared for OFT, CAA, OFWAT, Ofgem, Oftel, ORR and OFREG; McKinsey & Company (2008), "The McKinsey Quarterly", December; and Grabowski, R (2011), "Mid-2011 Risk-free rate and ERP update".

<sup>31</sup> The Competition Commission's profitability analysis in the Aggregates market inquiry (March 2013) used a CAPM derived cost of capital and focussed heavily on assessing appropriate total equity market returns. See: [www.competitioncommission.org.uk/assets/competitioncommission/docs/2012/aggregates-cement-and-ready-mix-concrete/current\\_cost\\_accounting\\_profitability\\_assessment\\_for\\_cement\\_excised.pdf](http://www.competitioncommission.org.uk/assets/competitioncommission/docs/2012/aggregates-cement-and-ready-mix-concrete/current_cost_accounting_profitability_assessment_for_cement_excised.pdf).

**Figure 6.6 Comparison of risk-free rate and total market equity return**



Source: Bank of England, PwC Analysis. Total equity returns are calculated using a forward looking dividend growth model.

For a business with an equity beta of one, there would be no need to deconstruct the total required equity market return, but assuming that water company equity betas are not exactly one means Ofwat will need to carry out this deconstruction. Ofwat will therefore need to appraise the individual components of the cost of equity as it reviews company business plans.

Broadly we distinguish between three commonly used approaches to estimating total market returns from which Ofwat can draw upon when deciding on its own approach.

**Historical approaches**

Equity market returns can be estimated using historical approaches. Historical approaches, such as those used by Dimson, Marsh and Staunton (DMS)<sup>32</sup> and the Barclays Equity Gilts Study, analyse historical average returns on equities over a long-term period (usually in excess of 100 years). This reflects the actual historical returns investors have achieved on their equity portfolios and is, at best, an approximate guide to future returns. Economic regulators typically use arithmetic averages or short-term holding periods in using historical returns to assess expected equity returns for price controls, rather than geometric averages or long-term holding periods.

**Adjusted historical approaches**

A number of academic studies have sought to deconstruct historical returns by analysing components of the historical equity returns and then considering forward expectations on the basis of these individual components. The component parts identified include: the real dividend growth rate, expansion in the price/dividend ratio, the average dividend yield and fluctuations in the real exchange rate. Such studies help to provide a better forward looking estimate of expected returns.

<sup>32</sup> Dimson, Marsh and Staunton (2013), “Global Investment returns sourcebook 2013”, Credit Suisse, February.

## Forward looking approaches

Forward looking assessments of equity returns, for example those based on the dividend growth model (DGM), use market pricing information to provide an estimate of required future equity returns. To the extent that current market conditions are different to long-term averages, for example where future expected economic growth is different to historical trend growth, any analysis based on a forward looking assessment is likely to give a different result compared with historical approaches.

The DGM assumes that the current share price of a quoted business is equal to the present value of all future expected dividend payments. Therefore, given the current market share price and future dividend growth rate expectations, we can solve for the cost of equity implicit in the share price. The DGM can be used for the whole equity market to calculate a forward looking estimate of expected total equity market returns.

Investor surveys provide an alternative view of required returns. Any survey of the equity market risk premium needs to be interpreted carefully, because there may be inconsistencies between participants' expectations for the risk-free rate in comparison to regulatory assumptions.

## Conclusion

All three approaches have merits and therefore we conclude that it would be appropriate to draw on all three in estimating the total market return to be used in determining the cost of capital for PR14.

## *Mitigation of capital structure risks*

In Section 5, we concluded that we have not seen sufficient evidence to warrant regulatory intervention in relation to capital structures. We showed that the water sector has a low exposure to economic risks and would be able to withstand a sustained period of higher debt financing costs. The sector has not materially increased the risk of failure through higher leverage, and any moral hazard concerns can and should be dealt with through retaining an effective failure regime.

However, we also noted that new risks may emerge and the regulatory and licensing regime is changing. In particular, while the recent financial crisis had factors which had benign effects on water companies notably higher RPI inflation and lower interest rates, future financial shocks may not be so benign. We consider that it is important that the regulatory regime is robust under a range of future scenarios and that economic shocks do not necessitate ad hoc interventions or sudden policy changes, as this may undermine regulatory predictability. The water sector involves significant investment in long lived assets and, consistent with Ofwat's statutory duty to current and future consumers, it is important that financing arrangements do not raise any significant risk of unintended consequences to current and future consumers.

While setting limits on capital structures could lead to inefficiency and distort company behaviour, there is a public interest in ensuring that industry financing structures do not result in additional risks for consumers. One approach which could help to address concerns about capital structure is to develop an active financial risk monitoring regime. This would avoid the issues with setting prior limits on capital structures directly, but could provide more clarity to customers and water companies over industry gearing arrangements and the resilience of the sector to developments in financial markets. It will help inform stakeholders about the implications of industry gearing arrangements. Such an approach would be low cost and balances the risk of intervening, such as reducing incentives for efficient financing decisions, with risks associated with not maintaining an active watch over developing market conditions between price reviews.

Other sector regulators undertake similar risk reviews. For example the Financial Conduct Authority publishes a risk outlook which assesses market conditions and identifies future risks<sup>33</sup>. The health regulator, Monitor, also publishes the output from its risk framework analysis. This scores individual Foundation Trusts across a range risk areas, and those which score badly are required to submit revised business planning, or agree to more

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<sup>33</sup> FCA Risk Outlook 2013. Available at: [www.fsa.gov.uk/static/pubs/other/fcarco.pdf](http://www.fsa.gov.uk/static/pubs/other/fcarco.pdf).

interventionist regulatory actions<sup>34</sup>. Ofcom publishes an annual monitoring review of the postal market, which covers Royal Mail's financial performance<sup>35</sup>.

Such a review could be carried out on an annual basis. The scope of such a risk review could contain:

1. A review of financial performance for all water companies. This would cover profitability, returns, balance sheet strength and financeability ratios. It is important not only to assess the aggregate industry position, but also the variation across water companies. Where possible, Ofwat should seek to assess company performance on a traditional accounting view, which is familiar with investors, and also an economic basis consistent with the regulatory price control methodology. This latter presentation will enable Ofwat and water company stakeholders to understand where companies have outperformed or underperformed regulatory assumptions. This is particularly relevant in the case of financing assumptions, so cost of debt performance would be one of the key metrics to be reviewed.
2. An examination of key risks faced by the water sector. Such risks include economic and financial risks, but also environmental risks and company and project specific risks. These risks should build upon the risks assessed as part of water company business plan submissions.
3. Stress testing of water company financial performance. This stress testing, as a minimum, should quantify the impact of higher debt financing costs on key financeability ratios such as interest cover ratios (e.g. building on the form of testing undertaken during price reviews and illustrated in Figure 5.4). This could be extended to consider the financial impact of broader risks on a range of financial metrics (e.g. Return on Regulatory Equity, Adjusted Interest Cover Ratio, Gearing etc).
4. Summary of analyst views on the sector and rating agency assessments. These are available from equity analysts and the large credit rating agencies. These assessments can be combined to provide aggregate performance expectations for key financial metrics (e.g. revenue, profits, and returns).
5. Ad-hoc topics which relate to the risk environment, or water company financing structures. This will evolve across reviews, but the first annual risk review could investigate particular topics such as complex group structures and their impact on tax payments.

Ofwat would need to examine in more detail the costs and benefits of such an approach. There will be an information requirement on companies in order for Ofwat to conduct this type of annual review effectively. Ofwat would therefore need to assess which data will be required to carry out this review and whether they are collected from existing sources, following its review of the business plans in PR14.

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<sup>34</sup> [www.monitor-nhsft.gov.uk/home/news-events-publications/consultations/closed-consultations/2013/draft-risk-assessment-framework](http://www.monitor-nhsft.gov.uk/home/news-events-publications/consultations/closed-consultations/2013/draft-risk-assessment-framework)

<sup>35</sup> <http://stakeholders.ofcom.gov.uk/binaries/post/monitoring-update2011-12.pdf>

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# *Appendices*

# Appendix 1: Securitisation structures

Securitisation structures involve setting up a special purpose vehicle (“SPV”), which is usually a wholly-owned subsidiary, used to issue bonds. Another SPV is created between the water company and ultimate parent and holds the ownership of the shares in the water company. Bond payments in the financing SPV are guaranteed by a fixed charge over the operating water company shares. Bondholders are also permitted to appoint an administrative receiver to sell shares in the regulated business and pre-empt the appointment of a special administrator.

**Table A1: Water companies with securitisation structures**

Company*	Moody’s Corporate rating	S&P securitisation rating
<b>Anglian Water</b>	Baa1 (since 2002)	Class A rating: A- ; Class B: BBB
<b>Dwr Cymru</b>	A3 (since 2007)	Class A rating: A ; Class B: BBB+
<b>Southern Water</b>	Baa2 (Since 2011)	Class A rating: A- ; Class B: BBB
<b>Thames water utilities</b>	Baa1 (since 2007)	Class A rating: A- ; Class B: BBB
<b>Yorkshire Water</b>	Baa1 (since 2009)	Class A rating: A- ; Class B: BBB
<b>South East water</b>	Baa 2 (debt rating)	Class A rating: N/A ; Class B: BBB

*\*Universe of companies taken from Standard and Poor’s report: Regulation provides stability for U.K. water companies, but high leverage limits their room for manoeuvre, 20 February 2012*

There are a number of requirements, protections and constraints which are incorporated into securitisation structures. These help to manage risks to the benefit of debt providers and combinations of these measures can allow companies to achieve higher levels of leverage. Such features include:

- standstill agreements – usually 18 months;
- liquidity facilities sufficient to cover at least 12 months of debt service;
- regulatory ring-fencing within the structure;
- supporting the credit rating by restricting access to regulated entity’s cash-flows;
- contractual ring-fencing which reinforces regulatory ring-fencing provisions by preserving the credit quality of the regulated business during credit events in the group
- waterfall – sets out payment priorities in the event of default/standstill;
- limits on distributions to shareholders; and
- tight covenants allows for earlier intervention by the creditors to minimise loss or restructure.

# Appendix 2: Water company codes

**Table A2: Water company identifying codes**

Company	Code
Anglian Water Services Ltd	ANH
Welsh Water (Dŵr Cymru Cyfyngedig)	WSH
Northumbrian Water Ltd	NES
Severn Trent Water Ltd	SVT
South West Water Ltd	SWT
Southern Water Services Ltd	SRN
Thames Water Utilities Ltd	TMS
United Utilities Water plc	UU
Wessex Water Services Ltd	WSX
Yorkshire Water Services Ltd	YKY
Bristol Water plc	BRL
Cambridge Water plc	CAM
Dee Valley Water plc	DVW
Portsmouth Water plc	PRT
Sempcorp Bournemouth Water Ltd	BWH
South East Water Ltd	SEW
South Staffordshire Water plc	SST
Sutton and East Surrey Water plc	SES
Veolia Central	VCE
Veolia East	VEA
Veolia Southeast	VSE
Affinity Water	AFF





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