



Cost of Capital – Annual Update Report: 2015-16

Information Paper

Publication date: 24 March 2016





About this document

In February 2015, the UK Regulators' Network (UKRN), published an information paper entitled [Market Return and Cost of Capital: A Refresh](#) which provided a brief overview of the market returns and cost of capital project and a summary of the approaches taken by different regulators when calculating the cost of capital.

The purpose of this short information paper is to refresh last years' report, provide an update on the cost of capital decisions taken by regulators over the last year and to highlight the reasons why the decisions about certain components of the cost of capital differ from the most recent decisions made by their peers.

Participating regulators have signed up to the UKRN Cost of Capital Principles¹ to ensure continued collaboration on cost of capital issues. We have identified a number of ways we intend to continue to collaborate in the future.² Regulators have committed to producing and publishing an annual update report on the cost of capital decisions, which will be produced in line with the format of this report. This paper provides a summary of the most recent WACC decisions by each regulator and the regulator's view of the reasons for the differences between key components within the WACC.

This paper is not intended to put forward policy statements on behalf of any of the contributing regulators and if there appears to be a conflict between the material contained herein and an individual regulator's relevant price control papers then the individual regulator's own papers take precedence.

If you have any comments on this paper then please submit these to us through the [Contact Us](#) page on the UKRN website.

UKRN

UKRN is a network formed by the UK's economic regulators:

- The Civil Aviation Authority (CAA)
- The Financial Conduct Authority (FCA), including the Payment Systems Regulator (PSR)³
- Office of Communications (Ofcom)
- Office of Gas and Electricity Markets (Ofgem)
- Water Services Regulation Authority (Ofwat)
- Office of Rail Regulation (ORR)
- Northern Ireland Authority for Utility Regulation (Utility Regulator)

¹ UKRN Cost of Capital Principles - <http://www.ukrn.org.uk/wp-content/uploads/2016/03/UKRN-cost-of-capital-principles.pdf>

² UKRN Cost of Capital collaborative working - <http://www.ukrn.org.uk/wp-content/uploads/2014/05/UKRN-cost-of-capital-collaborative-working.pdf>

³ Although it has competition and consumer protection functions, the FCA is not classed by HM Government as an economic regulator



Monitor, the sector regulator for health, participates in the network and its projects as appropriate. The Water Industry Commission for Scotland (WICS), the Financial Reporting Council (FRC), the Legal Services Board (LSB) and the Single Source Regulations Office (SSRO) are contributing members which generally participate in projects as observers.

Contributors to this paper

Contributions to this paper have been made by:

- The Civil Aviation Authority (CAA)
- Northern Ireland Authority of Utility Regulation (Utility Regulator)
- Office of Communications (Ofcom)
- Office of Gas and Electricity Markets (Ofgem)
- Water Services Regulation Authority (Ofwat)
- Office of Rail Regulation (ORR)

Unless explicitly mentioned any reference in this report to “the regulators” “we” or “us” relates to the six contributors listed above.



Table of Contents

1. Summary	4
2. Setting the cost of capital.....	5
3. Recent cost of capital decisions	8
4. Upcoming price reviews.....	11
5. Comparison of recent cost of capital decisions	12

Appendices

I. Summary

Price Controls and Cost of Capital

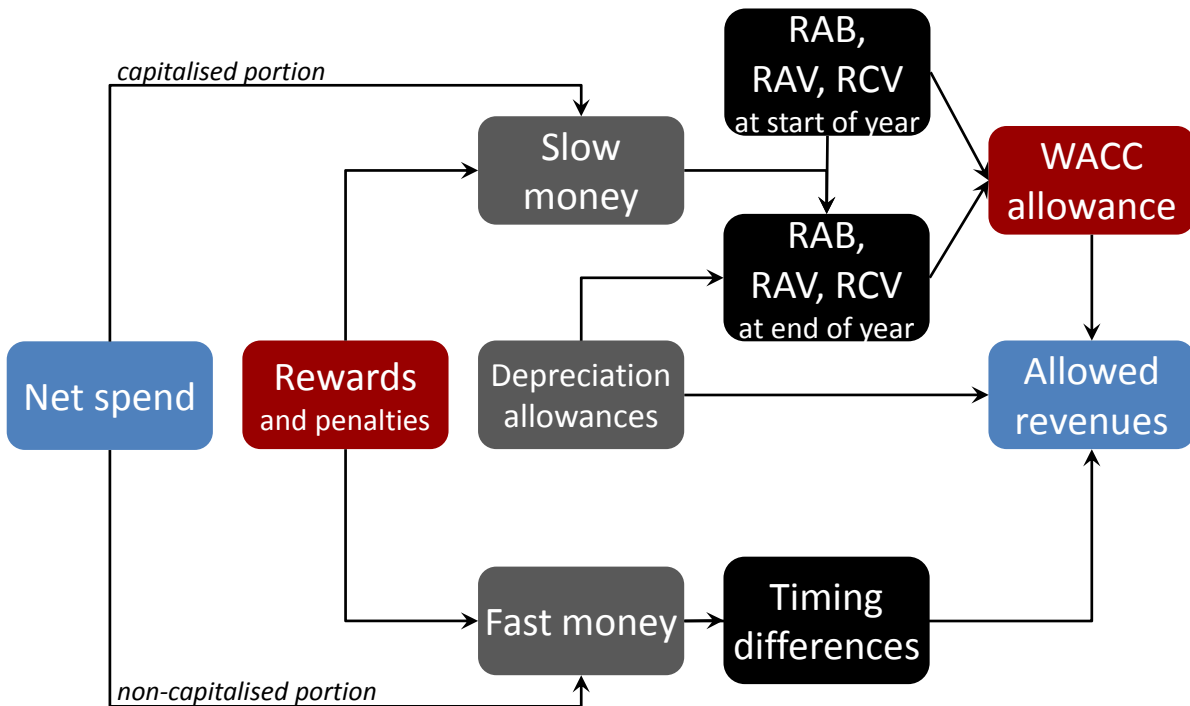
- 1.1. As a key tool in economic regulation many members of the UKRN establish limits on the prices regulated companies may charge to ensure that customers' bills in respect of essential services are maintained at an appropriate level. Through economic regulation and specifically price controls, the interests of customers can in relevant markets or sectors be protected from the consequences of insufficiently developed competition.
- 1.2. In addition to their statutory duties to customers some regulators are also required to secure that companies can finance their functions by setting an appropriate rate of return on the assets utilised in providing the regulated services. The rate of return, provided by setting a cost of capital, is considered essential to facilitate continuing investment in the infrastructure which supports the well-being of both individual customers and the wider UK economy. In assessing whether a business is and will remain financeable in delivering its regulated functions the cost of capital forms a key component of regulators price control work.
- 1.3. Regulators independently calculate a forward looking cost of capital which can then be applied during a price control period. As such, a cost of capital may and will vary between sectors and between price controls, the length of which may also vary between regulated sectors. This is inevitable in sectors that differ in many respects – for example; the level of competition, the nature and economic life of the assets concerned, and the level of various types of risk. Regulators' statutory duties also vary. In some regulated sectors, safety or other public service objectives may be of more critical importance and the associated duties may impact how regulators fulfil their duties, the influences on the level of the cost of capital and future trends.
- 1.4. Although the cost of capital may legitimately vary between regulated sectors, there are some components that would be expected to be similar if regulators were taking their decisions about the cost of capital at the same time and using a similar method (such as the Capital Asset Pricing Model). Each participating regulator has committed to contribute to the production of this annual update report where we will explain the differences in the decisions regulators have made. In addition, the UKRN Cost of Capital Working Group will support one another to make comparisons of cost of capital decisions when individual regulators are making a determination. Differences in cost of capital decisions may reflect variations in sector specific risk profiles, the timing of when decisions are made, movements in general market conditions, diverging views regarding the approach to the overall calculation of the cost of capital or a combination of these factors.
- 1.5. This paper provides a summary of the recent decisions about the cost of capital, and where published, the reasons why recent decisions vary compared to those of other regulators.

2. Setting the cost of capital

Broad Approach

2.1. Whilst there are some differences in each regulator’s duties (as set out in Appendix I) we each use a cost of capital in the calculation of some, or all, of the price controls that we set for the business activities we regulate. The approaches we take in setting the cost of capital are broadly similar, although Ofcom and Ofgem take a different approach in a number of areas. The methods adopted and the differences that arise are discussed below and further detail on the parameters used in recent price controls can be found in the appendices.

2.2. The classic building block diagram of how price controls work and where the cost of capital fits in is set out below.



Controls for which a cost of capital is set

2.3. The table below highlights the different controls the regulators set and the duration of those controls

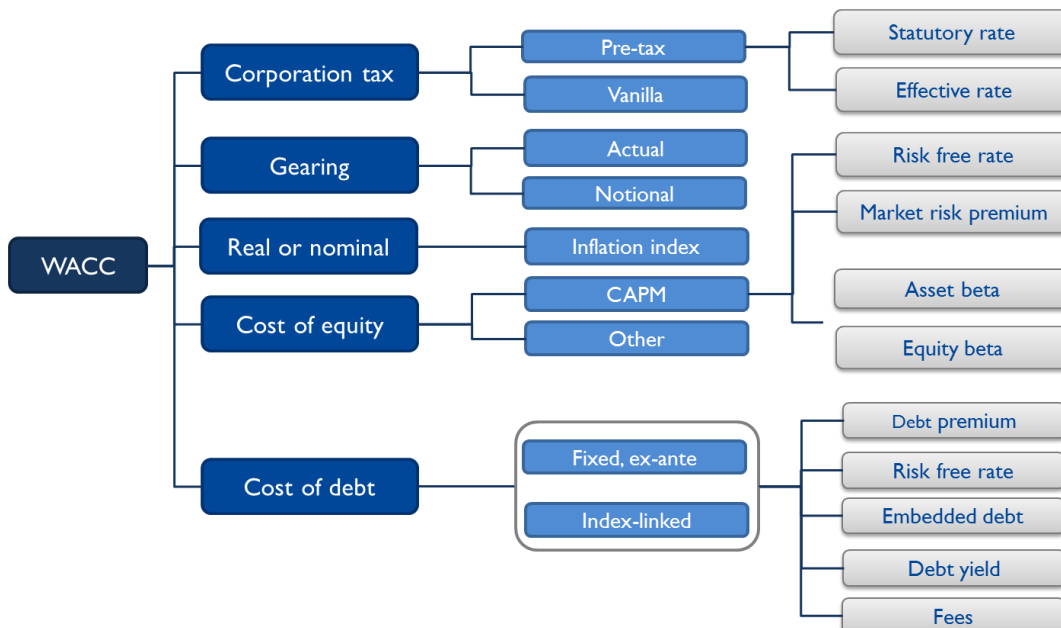
CAA	Ofcom	Ofgem	Ofwat	ORR	Utility Regulator
Heathrow 4 years and 9 months	Leased Lines 3 years	Transmission 8 years	Water & wastewater 5 years	Network Rail 5 years	Gas 6 years
Gatwick 7 years	Mobile call termination 3 years	Gas distribution 8 years	Household retail and Non household retail 5 years	HSI 5 years	Electricity 6.5 years
NATS 5 years	Wholesale Line Retail 3 years	Electricity distribution 8 years	Thames Tideway Tunnel 15 years		Water 6 years
	Wholesale Broadband access 3 years				

Weighted Average Cost of Capital

2.4. All regulators adopt a weighted average cost of capital (WACC) approach representing the cost of a blend (the gearing) of debt and equity finance.

2.5. The WACC is derived for a company or part of a company (the “regulated businesses”), this is usually by way of a notional gearing assumption which may be different to the actual gearing of the regulated company or its group.

2.6. The diagram below depicts ‘standard’ component analysis undertaken by regulators in order to determine a cost of capital.



- 2.7. The Capital Asset Pricing Model (CAPM) is used as the primary approach in estimating the cost of equity and has been reinforced by some regulators with other evidence including transaction evidence and comparison with other regulated sectors.
- 2.8. All regulators have used a cost of capital which can be expressed in real terms (which is applied for price control purposes to a Regulatory Asset Value (RAV)); although for some price controls Ofcom has used a nominal cost of capital, while Ofgem utilises a modified approach to reflect the impact of a longer price control period, as described below.
- 2.9. Further information about the approach to calculating individual components of the WACC can be found in Appendix 3.

3. Recent cost of capital decisions

3.1. The most recent cost of capital decisions made by each of the regulators, and any subsequent decisions by the Competition and Markets Authority (CMA) are set out in the table below:

Decision Year	Generic / Sector specific	2013	2014	2014	2014	2014	2014	2014	2014	2014	2014	2014	2015	2015		
Regulator		ORR	CAA	CAA	CAA	Ofcom	Ofcom	Utility Regulator	CC	Ofgem	Ofwat	Ofcom	CMA			
Sector		Rail network	Airports	Airports	Air Traffic Control	Telecoms	Telecoms	Water and sewerage	NI Electricity	Electricity	Water	Telecoms	Water			
Price control		CP5	Heathrow	Gatwick	NERL	LLU WLR	WBA	PC15	RP5	RIIO ED1	PR14	MCT	CMA -Bristol Water			
Cost of embedded debt	Specific	n/a	2.50%	2.75%	2.50%	n/a	n/a	n/a	n/a	1.29%	3.20%	Note 2	2.75%	n/a	n/a	2.95%
Cost of new debt	Specific	n/a	3.30%	3.10%	2.50%	n/a	n/a	n/a	n/a	1.09%	2.10%	Note 2	2.00%	n/a	n/a	1.60%
Weighting of new to embedded debt	Specific	n/a	50:50	50:50	n/a	n/a	n/a	n/a	n/a	34:66	10:90	Note 2	25:75	n/a	n/a	25:75
Cost of debt	Specific	3%	3.20%	3.20%	2.50%	5.5%	2.2%	6.0%	2.7%	1.22%	3.10%	Note 2	2.59%	5.4%	2.03%	2.61%
Risk free rate	Generic	1.75%	0.50%	0.50%	0.75%	4.5%	1.3%	4.5%	1.3%	1.50%	1.50%	Note 1	1.25%	4.3%	1.00%	1.25%
Equity risk premium	Specific	5.00%	5.75%	5.77%	5.50%	5.0%	5.0%	5.0%	5.0%	5.00%	5.00%	Note 1	5.50%	5.3%	5.30%	5.25%
Equity beta	Specific	0.95	1.10	1.13	1.11	0.7	0.69	1.17	1.17	0.83	0.7	Note 1	0.8	0.9	0.93	0.85
Cost of equity (post tax)	Specific	6.5%	6.84%	7.0%	6.9%	8.0%	4.6%	10.4%	6.9%	5.65%	5.00%	6.0-6.4%	5.65%	9.3%	5.81%	5.73%
Gearing	Specific	62.5%	60%	55%	60%	32%	32%	32%	32%	50%	45%	65%	62.5%	40%	40.0%	62.5%
WACC (Vanilla)	Specific	4.31%	4.65%	4.90%	4.25%	7.2%	3.8%	9.0%	5.6%	3.44%	4.1%	Note 2	3.74%	7.7%	4.3%	3.78%
Tax	Generic	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%
WACC (fully post tax)	Specific	3.9%	4.3%	4.6%	3.9%	6.8%	3.7%	8.6%	5.4%	3.3%	3.9%	Note 2	3.41%	7.3%	4.1%	3.46%
Inflation Assumption	Generic	RPI	RPI	RPI	RPI	Nom	RPI	Nom	RPI	RPI	RPI	RPI	RPI	Nom	RPI	RPI
Notes:						3,4		3,4				1,2		3,5		

Notes

- Ofgem's decision making board, GEMA, noted in its RIIO-ED1 slow track decision that there was significant uncertainty in all the numbers contributing to the WACC and that it was not therefore the intention to achieve a precise match to the actual WACC and its components for the DNOs as a group as this would represent spurious accuracy. Accordingly Ofgem do not publish a point estimate of all the individual components of their WACC calculation. The RIIO-ED1 decision provided for a cost of equity of 6.0% for slow track companies. Business plans for the fast tracked companies had been accepted on the basis of a cost of equity of 6.4%.

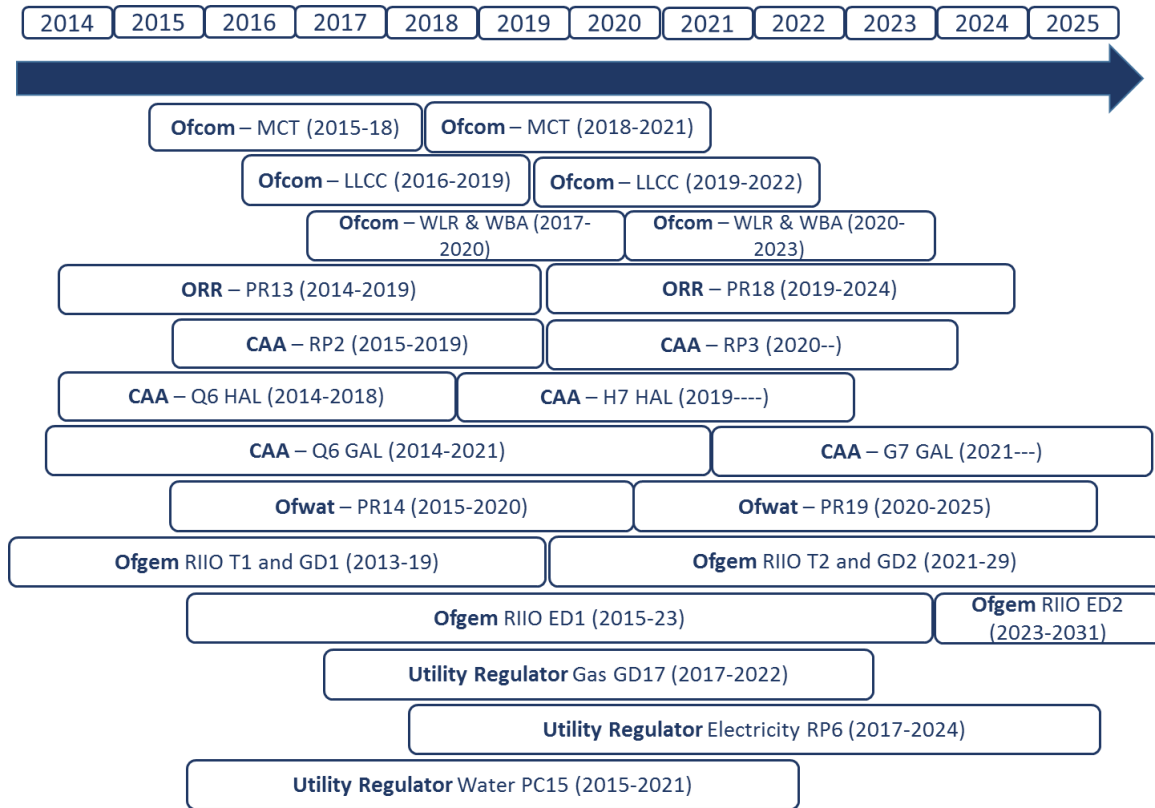


2. Ofgem updates cost of debt allowances annually using cost of debt indices. Cost of debt allowances for 2015-16 are 2.55% (Vanilla WACC of 3.76% for slow track companies and 3.90% for fast track companies). Cost of debt allowances for 2016-17 are 2.42% for slow track companies and 2.38% for fast tracked companies (Vanilla WACC of 3.67% and 3.79% respectively).
3. Ofcom publish its WACC in nominal terms, therefore in the table above we have published its nominal figures and then converted those figures into real terms by reference to their stated RPI assumptions of 3.2% for 2014 and 3.3% for 2015.
4. Ofcom presents a pre-tax WACC. For 2014 it presented a pre-tax nominal WACC of 8.6% for the LLU WLR control and 10.8% for the WBA control which are equivalent to the vanilla WACCs shown in the table above. In real terms (deflated by Ofcom's assumption of RPI) the vanilla WACCs for these two controls are 3.8% and 5.6% respectively.
5. In March 2015 Ofcom calculated a pre-tax WACC of 9.1% for MCT in nominal terms, which is equivalent to the nominal vanilla WACC of 7.7% shown in the table above. These nominal figures are not directly comparable with the real figures presented by the other regulators. The vanilla and fully post tax WACC, deflated to remove the impact of RPI inflation, are 4.3% and 4.1% respectively.
6. In addition to WACC for charge controls, Ofcom also considers WACC for other issues, such as in considering Royal Mail's financial viability and in determining financial terms for broadcasting and spectrum licences.

- 3.2. Since the publication of the last report on cost of capital by the UKRN, Ofcom has made a decision on the cost of capital for the [Mobile Call Termination Market \(MCT\)](#). They set a nominal pre-tax WACC of 9.1% which is equivalent to a real vanilla WACC of 4.3% by reference to RPI.
- 3.3. In addition, the Competition and Markets Authority (CMA) have issued a [final determination](#) in respect of Bristol Water, who asked Ofwat to refer their PR14 determination to them. In October 2015, the CMA set a real vanilla WACC for Bristol Water of 3.78% compared with Ofwat's view of cost of capital for Bristol which was 3.74%.
- 3.4. The cost of debt used by Ofgem in their RIIO ED1 price controls was appealed by two companies and referred to the CMA. The CMA reviewed the grounds for the appeals and in both cases the appeals were dismissed.
- 3.5. In August 2015, Ofwat accepted for the construction phase of the Thames Tideway Tunnel project a cost of capital of 2.497% (vanilla) which is fixed until 2030. The cost of capital bid by Bazalgette Tunnel Limited, which is lower than that determined by Ofwat for water and wastewater companies at PR14, reflects both the absence of pre-existing embedded debt costs and the inclusion of bespoke licence features during the construction phase including a liquidity allowance and a cost of debt indexation mechanism. As this cost of capital was established as part of a competitive tendering process and individual components were not set by Ofwat, we have excluded this from the analysis above.

4. Upcoming price reviews

4.1. The chart below shows the upcoming price reviews for each of the regulators involved in the cost of capital working group all of whom have signed up to the UKRN cost of capital principles.



4.2. In the next 12 months, the Utility Regulator will be determining the cost of capital that will be used in its Gas Distribution Price Controls (GD17). In line with the UKRN cost of capital principles, cost of capital for this control will undergo a peer review prior to the Utility Regulator issuing its final determination and a comparison of that cost of capital to that used in other recent price controls will be included in the next annual comparison report which will be published in 2017.

5. Comparison of recent cost of capital decisions

5.1. There have been two significant cost of capital decisions, with new quantitative data, since the UKRN published the previous report on cost of capital in February 2015. The first was Ofcom's determination in respect of the Mobile Call Termination Market in March 2015 and the second was the CMA's determination in respect of Bristol Water in October 2015.

Ofcom MCT

5.2. To enable a comparison to be made between the Ofcom MCT determination and the most recent determinations by both Ofwat and Ofgem, the table below shows the Ofcom figures translated from nominal terms into real terms using the Ofcom assumption of RPI (3.3%).

Decision Year	2014	2014	2015	2015
Regulator	Ofgem	Ofwat	Ofcom	Ofcom
Sector	Electricity	Water	Telecoms	Telecoms
Price control	RIIO EDI	PR14	MCT	MCT
Cost of debt	2.55%	2.59%	2.03%	5.40%
Risk free rate	1.60%	1.25%	1.00%	4.30%
Equity risk premium	5.25%	5.50%	5.30%	5.30%
Equity beta	0.9-0.95	0.8	0.93	0.93
Cost of equity	6.00%	5.65%	5.81%	9.30%
Gearing	65%	62.5%	40.0%	40.0%
WACC (Vanilla)	3.76%	3.74%	4.30%	7.74%
Inflation Assumption	RPI	RPI	RPI	Nominal

5.3. The cost of debt for Ofcom MCT in 2015 is lower than the cost of debt established by both Ofgem and Ofwat at the end of 2014. This lower cost of debt reflects the cost of debt facing mobile operators and the movement in the debt markets which is consistent with the CMA's findings in respect of Bristol Water (see below).

5.4. Ofcom's cost of equity is around the midpoint between the levels used by Ofwat and Ofgem and reflects the perceived different risk profiles of each industry.

5.5. The real vanilla WACC is higher overall reflecting both:

- the lower level of gearing used by Ofcom compared with that used by both Ofwat and Ofgem.
- the higher systematic risk associated with mobile operations compared to water. This higher systematic risk is reflected in the lower level of gearing assumed for mobile operators.

5.6. Further information on the approach that Ofcom took to setting the cost of capital for MCT can be found in [Appendix 10 to their final statement](#) which was published on 17 March 2015.

Ofwat/Bristol Water

- 5.7. Bristol Water rejected Ofwat's final PR14 determination (published December 2014) and asked Ofwat to make a referral of their case to the CMA.
- 5.8. The CMA reviewed the evidence put forward by both Bristol Water and Ofwat and determined an appointee vanilla WACC of 3.78% which was a small increase on the 3.74% WACC which Ofwat had determined.
- 5.9. The CMA set a cost of debt for Bristol Water of 2.61% compared to 2.59% established by Ofwat. The CMA determined that the cost of new debt was 1.6% compared with the 2% used by Ofwat due to market movements since the time of Ofwat's determination. The reduction on the cost of new debt was offset by an increase in the cost of embedded debt as the CMA allowed Bristol Water a small company premium on their debt costs.
- 5.10. The CMA also allowed a small uplift in the equity beta for Bristol Water (based on a review of market evidence) which resulted in a slight increase in the cost of equity and brings it closer to the cost of equity determined by both Ofgem and Ofcom in their recent determinations.

Appendix I: Financing Duties

Table 2.1: Summary of each Regulators' duties regarding financeability in the context of their other responsibilities

Sector	CAA		Ofcom	Ofgem	Ofwat	ORR	The Utility Regulator			
	Air Traffic Control	Airports	Communications	Gas	Electricity	Water & sewerage	Rail infrastructure	Water & sewerage	Electricity	Gas
Companies subject to price controls	1	2	5	9	17	19	2*	1	2	4
			(Companies subject to charge controls)	(Note 1)	(Note 1)	(Note 2)	(note 3)			
Primary Legislation	Transport Act 2000	Civil Aviation Act 2012	Communications Act 2003	Gas Act 1986	Electricity Act 1989	Water Industry Act 1991 as amended	Railways Act 1993 (plus amendments)	Water and Sewerage Services (NI) Order 2006	The Electricity (NI) Order 1992 & Energy Order (NI) 2003	The Gas(NI) Order 1996 & Energy Order (NI) 2003.
Structure of Duties	Primary duty, and 'have regard to...'	Primary duty, and 'have regard to ...'	Primary duty, and 'have regard to ...'	Primary duty, and 'have regard to ...'	4 Primary and 5 secondary duties	Statutory duties to funders, business and users and there is no hierarchy in our duties	Core duties (3 primary, 5 secondary duties plus general environmental and recreational duties) AND 'have regard to ...'	Primary duty, and 'have regard to ...'	Primary duty, and 'have regard to ...'	
Primary duty(ies)	Maintain a high standard of safety Has priority over other 'secondary' duties	Further the interests of users, where appropriate promote competition	Further the interests of citizens in relation to communication matters and to further the interests of consumers in relevant markets where appropriate by promoting competition	Further the principal objective: the shipping, transportation or supply of gas conveyed through pipes; the generation, transmission, distribution or supply of electricity; and the provision or use of electricity interconnectors... where appropriate by promoting effective competition	Secure that the functions of each undertaker are properly carried out Secure that they are able to finance their functions, in particular by securing reasonable returns on their capital. Protect the interests of consumers, wherever appropriate by promoting competition Securing the long-term resilience of water supply and wastewater systems and that undertakers take steps to enable them, in the long term, to meet the need for water supplies and wastewater services	No primacy within ORR's duties.	Protection of consumer interests (wherever appropriate by facilitating effective competition) Ensuring undertakers are able to finance their functions Ensuring undertakers carry out their functions properly as respects every area of N Ireland	Our principal objective in carrying out our electricity functions is to protect the interests of electricity consumers, wherever appropriate by promoting effective competition between persons engaged in, or in commercial activities, connected with, the generation, transmission, distribution or supply of electricity.	Our principal objective in carrying out our gas functions is to promote the development and maintenance of an efficient, economic and coordinated gas industry in Northern Ireland. Our principal objective must also be pursued in a way that is consistent with the objectives defined in Article 40 of the Gas Directive, the most relevant of which – in the context of carrying out price controls – are promoting an efficient market, and protecting consumers.	
'Financing duty'?	Yes, must have regard to ...	Yes, must have regard to ...	No	Yes, must have regard to ...	Yes, one of the primary duties	Yes, it must act in a manner which it considers will not render it unduly difficult for licence holders to finance their activities	Yes, one of the primary duties	Yes, must have regards to the need to secure that licence holders are able to finance their statutory activities	Yes, Ensure the Company can Finance its activities	
'Economy and/or efficiency duty'?	Yes, must have regard to ...	Yes, must have regard to ...	No	Must have regards to when carrying out its functions	Yes, one of the secondary duties	Yes	Yes, one of the secondary duties	Yes	Yes	



Note 1: Ofgem: Excluding independent gas transporters and independent electricity distribution network operators who are subject to relative price control

Note 2: Ofwat: The 19 license holders referred to are the 10 regional companies that provide both water and sewerage services and the 9 regional companies that provide water services only. Each of these companies is subject to the full period review price determinations process. Ofwat also regulates, albeit with a lighter process; 6 local companies providing either water or sewerage services or both; and 7 water supply licensees offering water services to large use customers. Ofwat also regulate the infrastructure provider in connection with the Thames Tideway Tunnel.

Note 3: ORR: As well as Network Rail, ORR conducts a periodic review of HS1 Ltd.'s charges. But HS1 is a concession and a different regulatory framework is used. In particular it is not in the scope of HS1's price control to calculate a return to shareholders as part of the revenue requirement calculation, so we have not included HS1 in this document but some of the issues involved with calculating a cost of capital do apply to HS1.

Note 4: Ofcom: Ofcom has additional duties under the Postal Services Act 2011 (PSA11) when carrying out functions in relation to postal services. These state that Ofcom must carry out such functions in a way that it considers will secure the provision of a universal postal service. In performing this duty, Ofcom must have regard to the need for the provision of a universal postal service to be financially sustainable, and the need for the provision of a universal postal service to be efficient before the end of a reasonable period and for its provision to continue to be efficient at all subsequent times.

Appendix 2: Ring Fencing

Sector	CAA		Ofcom	Ofgem		Ofwat	ORR	Utility Regulator			
	Air Traffic Control	Airports ¹	Communications	Gas	Electricity	Water & sewerage	Rail network	Electricity - SONI	Electricity - NIE	Gas ²	Water & sewerage
Restrictions on disposal of assets	✓	X	X	✓	✓	✓	✓	✓	✓	✓/X	✓
Restrictions on activity and financial ring-fencing	✓	✓	X	✓	✓	✓	✓	✓	✓	✓/X	✓
Requirement to annually provide certification of availability of resources and at each dividend declaration	✓	✓	X	✓	✓	✓	✓	✓	✓	✓/X	✓
Ultimate holding company undertakings	✓	✓	X	✓	✓	✓	✓	License Paragraphs suspended so long as the state owned EirGrid PLC remain the legal owners of SONI	✓	✓/X	N/A
Requirement to maintain an investment grade credit rating	✓	X	X	✓	✓	✓	✓	X	✓	✓/X	Deferred given deferral of domestic charging
Restrictions on indebtedness	✓	X	X	✓	✓	X	✓	X	✓	✓/X	Guidelines provided but no restrictions as such
Independent licensee directors				✓	✓	✓					
Restrictions on granting of security over network assets	✓	X	X	✓	✓	✓	✓	X	✓	✓/X	N/A
Insolvency	Special Admin	No Special Admin. Standard insolvency rules	No Special Admin. Standard insolvency rules	Special Admin	Special Admin	Special Admin	Special Admin	Special Admin Regime applies	✓	Special Admin	Special Admin

¹ Airport licences for Heathrow Airport Limited and Gatwick Airport Limited issued by CAA in Feb 2014, taking effect on 1 April 2014.

² Dependent on the ownership structure (Private or Government owned) of the licensed business, which is currently under review

Appendix 3: Components of cost of capital

WACC

All regulators calculate a weighted average cost of capital (WACC) to calculate a return for investors which represents the cost of a blend (the gearing) of debt and equity finance.

One of the most common calculations of WACC is a “vanilla” WACC which is calculated using the formula below, where gearing is the ratio of debt to equity

$$\text{WACC} = (\text{Cost of Debt} \times \text{Gearing}) + (\text{Cost of Equity} \times (1 - \text{Gearing}))$$

In the calculation above, the cost of debt is calculated pre-tax, while the cost of equity is a post-tax figure.

Alternatively regulators may elect to use a “fully post-tax” WACC, which is calculated as follows:

$$\text{WACC} = (\text{Cost of Debt} \times 1 / (1 - \text{tax rate}) \times \text{Gearing}) + (\text{Cost of Equity} \times (1 - \text{Gearing})).$$

The choice as to which approach to take is sector specific and will depend on the structure of companies within each sector and the level of tax which is paid in the sector. The regulator selects an approach which provides an appropriate tax allowance which covers companies’ tax costs while ensuring that customers are not being asked to pay for a tax allowance where no tax is being paid due to the company’s use of available tax allowances.

Gearing

Gearing is a company’s debt expressed as a percentage of its total capital. In regulated utilities this is usually calculated as debt as percentage of its regulated asset base (RAB or RCV). Other common measures include the ratio of debt to (debt plus equity) expressed as a percentage.

When setting prices most regulators use an assumed notional capital structure and a notional level of gearing.

Cost of Equity

The minimum expected return that equity investors require to prompt them to invest in companies, taking account the risks involved.

The Capital Asset Pricing Model (CAPM) is used as the primary approach in estimating the cost of equity and is reinforced with evidence from the dividend growth model, transactional evidence and comparisons with other regulated sectors.

Under the CAPM approach, the cost of equity is estimated as the risk-free rate plus (equity beta x market risk premium). The risk-free rate and the market risk premium are general non-company specific market factors.



Risk-Free Rate

The theoretical rate of return on an investment with zero risk. The risk free rate can be calculated as either a historical value or under a current market approach. Most regulators use a current market approach which looks at forward rates for gilts of differing maturities to assess the risk free rates. Regulators will also use the historic rates on government gilts to cross check the results.

Market Risk Premium

The market risk premium is a measure of the expected return, on top of the risk-free rate, that an investor would expect when holding the market portfolio. This captures the non-diversifiable risk that is inherent to the market.

Regulators employ two differing methodologies for calculating the market risk premium. They either use a standalone estimate using market indices or calculate it as the residual of the equity market return after deducting the risk free rate.

Betas

The equity beta is a company or sector-specific factor which describes the relative risk of the company or sector to the market as a whole, so variation between sectors is to be expected. The existence of directly measureable betas will depend on whether there are regulated companies with equity listings.

Cost of Debt

The cost of debt is the minimum expected return that providers of debt finance require to prompt them to lend to companies, taking into account the risks involved.

The approach to calculating a cost of debt varies between regulators but often considers the cost of embedded debt and the cost of new debt. The cost of debt is calculated using market data on traded bonds as the primary source of evidence.

The UKRN also publish a Cost of Capital [terminology buster](#) on its website.