



Final report for the Consumer Council for Water

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Executive Summary

This report has been prepared for the Consumer Council for Water (CCWater). Its main purpose is to highlight the key issues involved in the calculation of the cost of capital for the water industry in England and Wales. It therefore also embodies our views on the appropriate levels of the components of this important metric. The report has been written with an intelligent, non-expert in mind.

In this section of the report we simply summarise our main conclusions.

- The current economic environment is not a very conducive backdrop for capital raising, for companies or for governments. Although there are tentative signs that the worst aspects of the credit crunch with respect to financial market prices have passed, many financial market indicators remain at “distressed” levels. Cost of capital estimates calculated in such an economic environment will almost certainly be higher than those that would be calculated in more settled financial market conditions. We therefore urge extreme caution in using current financial market information to estimate the cost of capital for any corporation.
- However, when more settled financial market conditions do return, probably towards the end of this year, the global economy will not return to the levels of activity that accompanied the credit bubble. In most developed economies, and particularly here in the UK, taxes and public sector debt servicing costs will both rise and public spending will fall. As a consequence, economic growth will be commensurately lower over the next decade compared with the previous decade, while inflation and interest rates will, on average, be higher. In this sort of economic environment companies with regulated, inflation-proofed revenues, and that have a significant degree of market power will tend to be favoured by investors – particularly by the UK’s pension fund industry. The debt and equity of the UK’s regulated utilities will be in demand, in much the same way that technology stocks tend to be in demand during times of economic excess. Indeed, there is already evidence of an increase in the demand for water utility securities.
- One of the key components for calculating the cost of capital for water utilities is the real risk free rate of interest represented by the yield on index-linked gilts. These yields have been ‘depressed’ for some time now. But in our view rather than being likely to rise, longer-term index-linked gilt yields will remain around their current levels (around 1.0%) in the short term and are unlikely to rise sustainably above the 1.25% to 1.50% range over the medium term. Yields will be held down at these levels, because of the enormous structural demand for inflation-proof income from the UK’s Defined Benefit pensions industry, and because of the uncertainty now surrounding the outlook for inflation. For the purpose of cost of capital calculations we recommend using a figure of 1.25% as a representation of the real risk free component of the cost of corporate debt (and a figure of 4.75% to represent the nominal risk free rate).



- Corporate bond spreads have increased substantially since August 2007. For nominal debt the spread is approximately 2.5%, for real debt it is around 2.0% on average. However, prior to August 2007 the difference in spreads between one water company and the next was fairly narrow; today it is quite wide. Therefore this component of the WACC should be treated with some caution. Nevertheless, despite the dispersion of spreads across water company debt recent developments in the corporate bond market underline the intuitively plausible idea that water companies are viewed as being lower risk compared with other types of business, and also that the market continues to favour investing in such low risk companies. As credit conditions gradually return to normal over the next year or so we expect the spreads to narrow on water utility debt by more than on equivalently rated debt issued by other non-financial companies.
- Of far more importance than the cost of raising debt now however, is the fact that only around 12% of existing water utility debt needs to be refinanced between 2010 and 2015. The cost of financing existing debt is both lower than would be the cost of financing new debt and lower than was anticipated in the 2004 Price Review. As such we believe that the regulator should adopt a weighted average cost of debt approach to this issue. That is, it should use an appropriately weighted combination of the actual, real cost of issued debt and the cost of debt that is likely to apply over 2010-2015 for any new debt.
- The equity risk premium for any company comprises two components: the price of equity risk and the quantity of equity risk. The price of equity risk – the market's equity risk premium – has almost certainly risen recently. We believe that it is probably at the level last seen in the recession of the early 1990s, and equivalent to its average level of the 1970s. In our view 5.0% would be a reasonable estimate of the 'price of risk', or the market risk premium at the moment.
- The quantity of equity risk embodied in any equity is often represented by 'beta'. The beta of an equity is a measure of how much the return on that equity covaries with the return on the market. The intuition is simple. If the return on a given equity moves in such a way as to exaggerate any move in the market return, then investors will require a higher risk premium to hold that equity, and its beta will be greater than 1.0. By contrast, if it tends to move in such a way as to dampen any move in the market return, investors will require a lower risk premium to hold that equity, and its beta will be less than 1.0. Utility companies are perceived as being less risky than the average UK equity. This seems intuitively sensible. These are companies with a steady income stream that is protected by law and which is inflation-proofed. And in times of economic uncertainty investors place an even greater value on income streams of this kind. We have used various methodologies to calculate estimates of beta for the UK's water utilities, but whichever method we have used the beta for the UK's water companies tends to be significantly below 1.0. In our view it is probably closer to 0.5, and certainly no greater than 0.75.



- For a water utility with a beta of 0.5 the appropriate equity risk premium to apply for the purposes of calculating the cost of capital is 2.5% (0.5 x 5.0%).
- Financeability remains a key concern with regard to the financial health of the water industry. However, we believe these concerns are not as significant as the industry would have us believe. First, the recent move in water utility bond yields relative to the yields on similarly rated bonds, indicates that the market has recently 'upgraded' water utility debt; furthermore some are anyway comfortably within the investment grade universe. Second, since PR04 it seems that water utilities have put financeability at risk with some aggressive payout policies and by increasing leverage. The increase in leverage at a time when debt was cheap simultaneously reduced the actual cost of capital below the regulated level set in PR04, supported high dividend payouts and put financeability at risk. We believe this issue should be addressed with cuts in dividend payouts. Indeed this is exactly the kind of economic environment that tends to be supportive of such moves. Many UK companies have cut their dividends. And recently the insurance giant Aviva, saw its share price fall when it *maintained* its dividend this April. Furthermore, a less aggressive dividend policy, other things equal, would tend to improve a company's credit rating.
- Finally, the issue of the cost of capital has significant implications for millions of UK households. As a simple rule of thumb, from any given starting point for every increase in the cost of capital of 1.0% the average, annual UK water bill would increase by £20.



1. Introduction

The more debilitating effects of the credit crunch have begun to ease. Over the last few months stock market volatility, the price of corporate debt and inter-bank market spreads have all fallen. In most cases these indicators of the extent of the financial market crisis have returned to the levels that prevailed just prior to the bankruptcy of the US investment bank Lehman Brothers. The extraordinary and unprecedented policy action since then is largely responsible for this stabilisation of global financial markets and in particular the banking sector. However, market prices still imply that the deep recession that began in earnest in the first quarter of this year will persist for the remainder of this year. This is therefore not a very supportive economic backdrop for companies (or indeed governments) that wish to raise capital at this moment in time.

Because of this we would urge extreme caution in calculating the cost of capital of any entity using current market prices, particularly where this estimate will be applied for a fixed term of greater than 12 months. We anticipate that the cost of raising capital will continue to fall over the next 12 to 24 months as a semblance of normality returns to the global economy over this period.

Having said this, the purpose of this report is to provide estimates of the components of the cost of capital for the UK's regulated water utilities using current information from relevant financial market prices.

The remainder of this report is organised as follows. In Section 2 we explain the concept of the weighted average cost of capital (WACC). In Sections 3 and 4 we explain the various issues surrounding the costs of raising debt and equity respectively. In Section 5 we show the relationship between the WACC and its various components and the water bills that a typical UK household has to pay. In Section 6 we comment on the conceptually complex issue of 'financeability'. And finally, Section 7 concludes the report.

2. What is the Weighted-Cost of Capital (WACC)?

The cost of capital is presented in percentage terms, and usually represents the annual cost to a corporation of raising the financial capital necessary to conduct its business. This capital can be raised in two generic forms: by issuing equity, by issuing debt or by issuing a combination of the two. Most firms raise capital in both forms.

- A company can raise capital by borrowing from a bank or by issuing a bond. In return for making the loan or for buying a portion of the bond, the bank or investor will generally both expect a regular interest payment for the term of the loan, or a regular coupon¹ over the life of the bond. At the end of the loan term, or when the bond matures, the company usually

¹ A coupon is the annual or semi-annual payment borrowers pay on their bonds.



pays back the original loan amount, although companies will frequently do this by taking out another loan, or by issuing another bond.

- A company may also raise capital by issuing equity. This form of capital raising effectively involves the company selling a portion of the future profits (e.g. a share in the company) to investors. This profit stream is then paid to the investor in the form of a regular dividend. But, unlike the interest on a loan or coupon on a bond, which is usually fixed, the dividend from equity is not. Its size will vary with the fortunes and therefore profitability of the company over time. Furthermore, while nearly all corporate loans and bond issues are for a fixed term of borrowing, where the original amount of borrowing must be repaid to the lender usually on a pre-determined date, capital raised by selling equity is issued with the view that it will never be repaid. Usually an equity investor can only recoup, or part recoup their original investment by selling this equity stake to another investor². The company issuing the equity has no obligation to buy it back.

These two forms of capital raising – bank loan or bond issuance on the one hand and equity issuance on the other – involve different risks for the banks, investors and the company. They therefore carry different rewards too. Since, in the event of company failure, debt holders and banks have a senior claim to the company's assets, banks and bond investors are willing to accept a lower return than equity investors. So why not finance the company by only issuing bonds since it is cheaper?

The simplistic answer to this question is that as the proportion of issued debt rises the greater is the risk of bankruptcy, since banks and bond holders require that the regular fixed interest and coupon payments be paid without failure, on time. In the event that a company cannot meet these payments banks and bond holders can force the company into bankruptcy. However, if the company does not make enough profit in any year to pay a dividend, the equity holders must bear this omission as owners of the company.

Mature, large companies generally have a decision to make about the capital structure of the company³. They must decide the appropriate proportion of their capital to be made up by debt and by equity. One carries an increasing risk of bankruptcy as it grows as a proportion of the total, while the other is more expensive, which means that the cost of doing business increases as equity rises as a proportion of the total.

There are other issues that must be borne in mind too. Perhaps most important is the fact that debt embodies a tax advantage for the company compared to equity, since interest payments on debt are payable before tax, while dividends to equity holders are paid out of after-tax

² Companies can also buy back their equity from investors.

³ Under certain, theoretical conditions the decision is irrelevant. But in practice the capital structure choice is an important business decision.



income. Other things being equal then, for a mature firm with stable cashflows this tends to make debt as a way of raising capital more attractive than equity.

The cost of capital for a company is therefore some weighted combination of the cost to the company of issuing debt and equity, where the weights sum to 100%. This average cost is referred to as the Weighted Average Cost of Capital (WACC). To calculate it requires an understanding of the components that go in to determining the return required by investors on any issued debt or equity, the tax advantage of debt and the relationship between all of these components as the relative weight of debt and equity changes. As such, companies often have an “optimal capital structure” in mind. That is, the combination of debt to equity that provides the companies with the lowest average cost of capital, where “cost” in this context can embody the potential costs of bankruptcy too.

We will now explore in more detail the costs of both debt and equity by decomposing each into its component parts. By doing this we can build up estimates of their values for the UK’s regulated water utilities.

3. The cost of debt

The cost of debt, or alternatively, the rate of return demanded by investors for buying a bond issued by a corporation or the interest rate that a bank charges in return for a corporate loan, comprises two components: the underlying credit-risk-free rate and the credit spread which is specific to the individual company.

The risk free rate of interest

The rate of return that the market requires from credit-risk-free entities (entities that technically cannot go bankrupt - usually developed economy governments) can be inferred from the government bond market. In the UK this is the market for gilts⁴ issued by the UK government. This rate of return acts as a floor for corporate borrowing in sterling.

At present the UK government has a the highest credit rating of AAA/Aaa⁵, implying that the ratings agencies believe it is of the highest credit quality. No UK corporation or entity can be rated higher than this. This means that the government can generally borrow at lower rates of interest than any other sterling borrower over any maturity. So the yield on gilts provides a floor at all times for the yield that would be demanded on sterling corporate debt. It can therefore be thought of as the markets’ estimate of the credit-risk-free rate of interest.

Chart 1 shows the yield on conventional UK government bonds, known as gilts. The recent economic crisis has led to a reduction in the government’s borrowing costs, from levels that

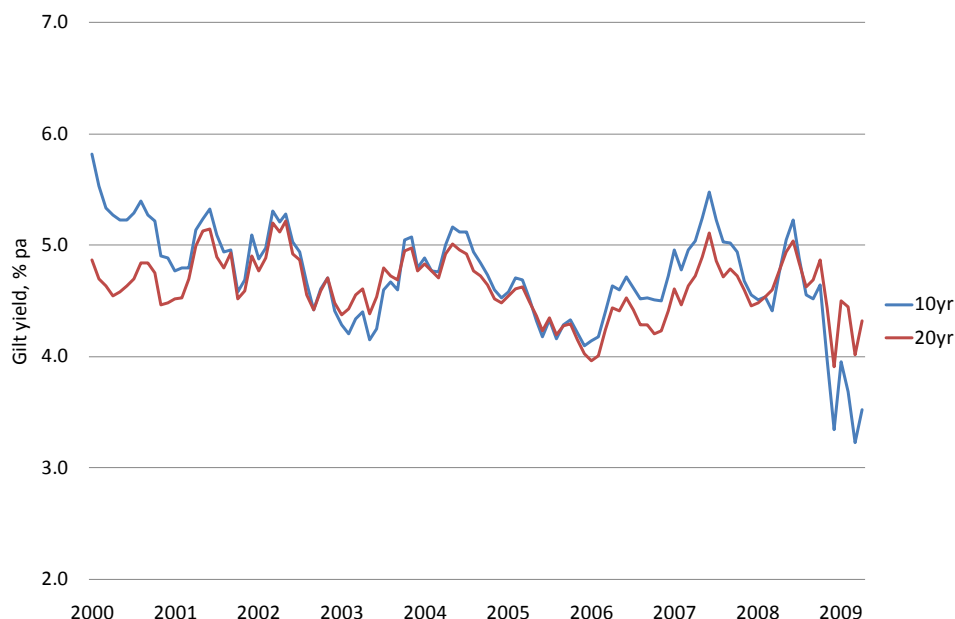
⁴ A “Gilt” is bond issued by the UK government.

⁵ Although the UK government has recently been placed on ‘negative outlook, by Standard and Pooors’. This means that there is a possibility that it may lose this prestigious AAA rating in the future.



were already low by historic standards. The financial crisis has meant that ten year gilt yields have fallen to just over 3.7% today, while twenty year gilt yields have fallen to around 4.5%.

Chart 1: The yield on conventional gilts



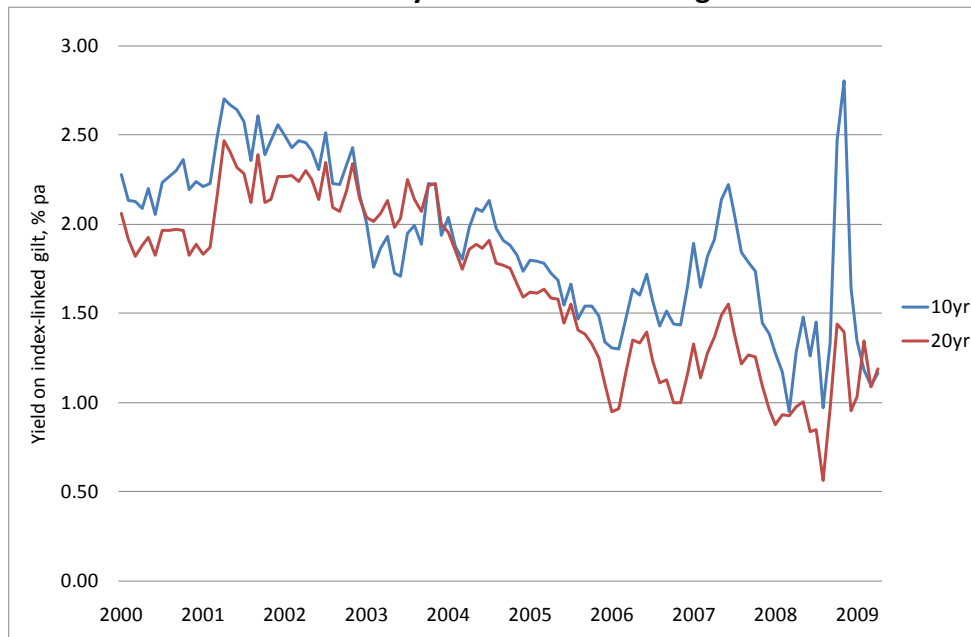
We should also note from Chart 1 that many water companies took advantage of the low historic twenty year borrowing costs in the five years prior to the current financial market crisis. These low borrowing rates for the UK government translated into borrowing costs for water utilities that were probably lower than those anticipated in the PR04 price review. As such, the UK's water utilities companies were able to lock in low borrowing costs for the long-term, to the advantage of their shareholders. We will return to this issue shortly.

As well as issuing conventional bonds, the UK government also issues bonds that pay coupons and the original borrowed amount where both are adjusted for inflation. In other words, as inflation rises, so do the coupons and final payment from these bonds. These bonds are referred to as Index-linked Gilts (ILGs), since the payments are indexed to the Retail Price Index (RPI). These bonds are special since they make payments to their investors that are inflation-proofed.

In Chart 2 we have presented the yield demanded by investors for buying ILGs. This yield represents a "real yield", that is, the return over and above inflation. So, for example, if an investor buys a ten-year ILG with a real yield of 2%, and inflation averages 3% over the next ten years, then the investor will receive an approximate total return of 5%.



Chart 2: The yield on index-linked gilts



At the time of writing both ten and twenty-year index-linked gilts had a real yield of around 1.1%, and fifty year index-linked gilts had a yield of just over 0.80%. Between 1997, when the UK formally adopted an inflation targeting regime, and 2004 the yield demanded on a ten-year index linked gilt averaged around 2.25-2.5%. So why are these bonds now offering real yields that are so remarkably low today?

Over the last few years there have been two factors that have driven real yields to such low levels, but they both relate to the 'insurance' feature of the bonds. Effectively these bonds act as insurance for bond holders against the risk of high inflation in the future. Investors are willing to pay for this insurance to mitigate this risk, in much the same way that people are willing to pay a fee for buildings and home contents insurance to insure themselves against the risk of a fire or flood in their homes.

Pension fund demand

First, at the turn of this century most UK Defined Benefit pension funds developed deficits, that is, their liabilities were greater than their assets. As a result, many schemes sought to hedge the risks they faced as far as possible in an effort to minimise the chances of scheme deficits growing further. One of these risks was (and is) future inflation. This is because around 70 to 80% on average of the pension promises made by many schemes is inflation-protected. In other words, these schemes promised to raise the pension payment in line with inflation. This means that higher future inflation will generally raise the liabilities of the scheme.

In an effort to mitigate this risk, the UK's pension fund industry sought to hold assets that made payments that would also rise with inflation. The obvious candidate was index-linked gilts. The pension fund demand for these instruments pushed yields to remarkably low levels, as they tried to match their liabilities with this asset. In fact, in January 2006 there was such a scramble



to hedge pension fund inflation exposures that the implied yields on index-linked gilts became negative!

The main problem relates to the size of the market. At present there is approximately £100bn worth of index-linked gilts in issuance. This may sound like a large sum, but consider the following facts:

- (i) At a conservative guess the total liabilities of the UK's defined pension industry are at least £1,000bn;
- (ii) of this total approximately 80% is inflation-related;
- (iii) these liabilities are also very long-dated in nature and, at best, only 50% of outstanding index-linked gilts are of sufficient maturity for matching needs;
- (iv) and finally, other investors also value the special qualities of index-linked gilts, in particular insurance companies, but also Defined Contribution (DC) pension plans as well.

In short, there is a major structural deficit of sterling-denominated, inflation-protected bonds that has led to the low yields that we see today, and that will ensure that yields remain at such low levels for the foreseeable future.

The current economic environment

As if this excess demand was not enough, there is a second factor that is currently helping to keep index-linked gilt yields down. The outlook for the macro-economy is highly uncertain at the moment. Some believe that there is a real prospect that the UK will experience a period of inflation that will be much higher than we have experienced in the past. The quantitative easing policy now in operation along with rapidly deteriorating government finances all point to the possibility of this as an outcome. In this sort of environment what sort of instrument would be most valued by investors? The answer is: *those instruments that provide the investor with a hedge against inflation*. Index-linked gilts provide the best such hedge.

In our view then, rather than rising, longer-term index-linked gilt yields will remain around their current levels (around 1.0%) in the short term and are unlikely to rise sustainably above the 1.25% to 1.50% range over the medium term. In fact, given this economic and technical background, there exists the real possibility that yields on real government bonds could fall to the levels seen in January 2006 once again for short periods.

For the purpose of cost of capital calculations we recommend using a figure of 1.25% as a representation of the risk free component of cost of corporate debt, and a figure of 4.75% to represent the nominal risk free rate.

The credit spread

The UK government issues credit-risk-free debt, since technically the UK government cannot become bankrupt. This is because if the worse came to the worst the government could always



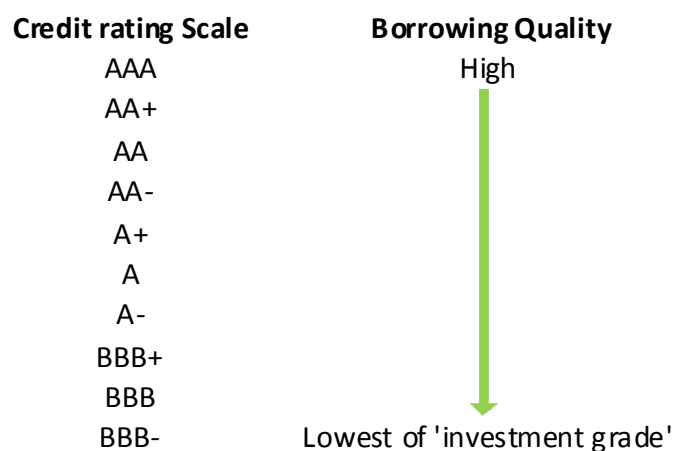
print money to meet its debt obligations. A corporation cannot do this and therefore, if it cannot meet its bond or loan payments, it may default on its debt. In such a case, bond investors and/or the banks may lose part or all of the funds which they lent to the corporation. That is why corporate borrowers must pay investors a higher return on borrowed funds than they would a developed economy government like the UK's.

This additional return is known interchangeably as the *credit spread*, *credit premium*, or *debt premium*. It is the additional amount required by investors to compensate them for the probability of a default and the likely loss that that default might imply for creditors. Less credit-worthy borrowers are required to pay a higher credit spread for their borrowing than companies that are perceived to be more likely to repay their debt.

Credit ratings agencies provide an independent assessment of a company's "ability to pay". They assess the credit worthiness of a company by talking with its managers, by gauging the competitive environment in which the company does business and by looking at the company's financial strength. Once they have completed an assessment of this kind they will provide a credit rating for the company's issued debt. They will review this rating to ensure that it remains relevant, as market conditions change.

The agencies use a series of letters to indicate the credit worthiness of each company (and government). A "AAA" rating is awarded to the highest quality borrowers, and the lowest rating is a "D" which stands for 'in default'. The highest levels of the ratings scale are shown in Chart 3. A company with one of these ratings is said to be an "investment grade" borrower. In other words, the purchase of a bond rated between BBB and AAA is seen as an 'investment' rather than as being a 'speculative' purchase that might carry a high risk of non-payment in the future.

Chart 3: Investment grade credit ratings



All of the UK's water companies that have issued debt are ranked as 'investment grade'. They are regarded by the ratings agencies as representing relatively safe investments.

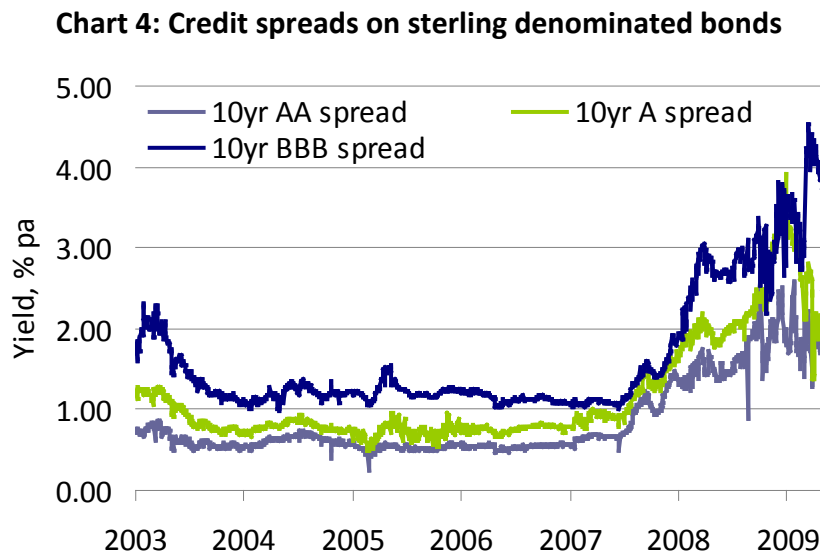


One of the key ingredients of the ratings shown above is the gearing or overall indebtedness of the company being rated. Other things equal, a highly geared company would be deemed to have higher financial risk than one with lower gearing and would therefore have a lower rating and would be required to pay higher costs to raise debt. For example, Three Valleys has gearing of 82% and is rated BBB+. It has to pay a nominal interest of around 7% for its borrowing. In contrast, United Utilities has gearing of 60%, is rated A- and pays nominal interest of just below 6% for its borrowing in the bond market.

Until recently, all investment-grade corporate bond spreads were historically very low. This is because lenders generally felt that the chances of default were low. However, the current economic crisis has changed that view.

The impact of the credit crunch on the credit spread

Credit spreads have risen for all borrowers since August 2007. Other things equal this means that the WACC for corporations will have risen too. Chart 4 shows how spreads have increased for sterling borrowers of different credit standing. Prior to the crisis the average AA, A and BBB borrowers could borrow ten year money at yields of around 0.60%, 0.80% and 1.10% above the rate charged to the UK government for the same maturity. At the time of writing these spreads have increased dramatically.



However, despite the rise in the spread demanded on BBB-rated bonds shown in Chart 4 generally, over recent weeks the spreads on water utility bonds in this ratings category have fallen. For example, this is true of bonds issued by both Wessex and United Utilities that both have BBB+ ratings. Why is this? Why would water utility bond spreads be shrinking while the spreads on other equivalently rated issuers rise?



The answer relates to the attractiveness of the cashflows of companies that are inflation-proofed, that are derived from the production of an essential product and that enjoy a monopolistic position in their market. In a world of greater economic uncertainty it is obvious why companies with such cashflows are more highly valued.

Recent developments in the market for corporate debt underline the intuitively plausible fact that water companies are viewed as being lower risk compared with other types of business, and also that the market continues to favour investing in water companies. And it is possible to interpret recent movements in corporate bond prices issued by water utilities as an indication that the market has 'upgraded' water utility debt. Credit rating agencies may eventually follow the market's lead.

Quantitative easing and the credit spread

The explicit aim of the Bank of England's policy of Quantitative Easing is to lower the cost of corporate borrowing and to keep it low. This policy is likely to remain in place until the economic recovery is clear and undoubted, a period of two years or so from now. The fund available for this programme is currently £150bn of which £75bn has already been spent. It has been recently announced that a further £50bn will be spent probably over this quarter.

Although the majority of the purchases have been gilts, the bank is aiming to use £50bn to purchase private sector assets. Since the start of the QE programme on 25th March this year, the Bank of England has purchased £7m of United Utilities' bonds, £4m of Severn Trent and £1.1m of Wessex Water' bonds; around 9% from a total of £128m corporate bonds (and also £2bn of commercial paper) purchased.

It is hard to compute exactly what the reduction will be in corporate borrowing costs from this policy, but the Bank of England's eligible corporate bond list has a total value of £59bn, and includes United Utilities, Northumbrian Water, Wessex Water and Severn Trent, which in turn comprise just over 6% of the total of eligible debt. Water utility debt is therefore likely to benefit from this policy over the next two years. A policy that will push the credit spreads on these bonds lower than otherwise would have been the case over this period.

Index-linked corporate debt

The preceding analysis has shown how the cost of borrowing has changed for those corporations that wish to issue 'nominal' bonds, that is, bonds that do not have their payments linked to an inflation index, and which are therefore not inflation-proofed. A water company issuing a nominal bond today could be asked by the market for a coupon of around 5.25% for a ten-year issue and 6.5% for a twenty-year issue. But companies, like the government, could also choose to issue index-linked debt if they felt that by doing so it would lead to lower borrowing costs.

The main reason why most UK-based corporations do not issue index-linked bonds, despite the very low yields that these bond issues command today, is that they do not want to run the risk



that their bond payments will rise in the future if inflation should turn out to be much higher than expected. The government issues these bonds because, in theory at least, it can act to change the inflation environment, where individual corporations cannot. However, there are some corporate issuers that do not need to worry so much about the future inflation environment, these are the regulated utilities that include the water companies.

Regulated utilities can issue index-linked debt because their prices are regulated to rise in line with retail price inflation. In other words, they have inflation-proofed income which means in turn that they can make inflation-linked payments on their debt, that is, issue index linked bonds. Why is this particularly relevant to the issue here? It is of importance because as we already argued above, there is currently significant levels of demand for index-linked debt. Ofwat has made a statement along the same lines:

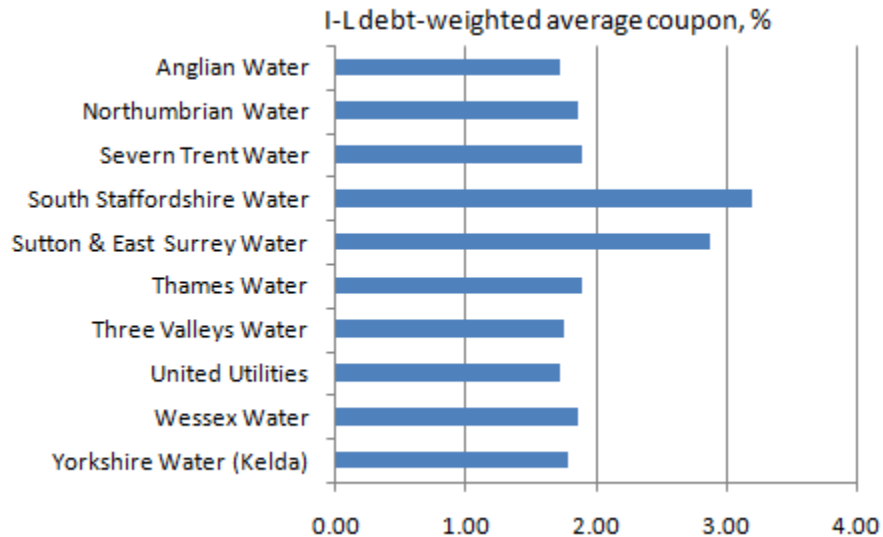
“The market appetite for long-dated index-linked debt which has developed since 2004 has allowed some [water] companies to access index-linked debt at real interest rates of below 2% locked in for periods of up to 50 years. Whilst these extraordinarily low rates may not always be available, we will consider the evidence this provides for our approach and our assessment of the cost of debt⁶.”

The UK’s water companies have already tapped into this very low cost of funding. Chart 5 shows the average coupon paid by each of these water utilities for all outstanding index-linked bonds - the real (inflation-adjusted) cost of their borrowing. For most, this is well below 2%. South Staffordshire and Sutton & East Surrey Water were innovators in this market. They have higher average costs because they issued index-linked bonds in 2001, a few years before the other water companies entered the market.

⁶ Ofwat, Setting price limits for 2010-15: Framework and approach – a consultation paper; available at [http://www.ofwat.gov.uk/legacy/aptrix/ofwat/publish.nsf/AttachmentsByTitle/pr09_methodologypaper181007.pdf/\\$FILE/pr09_methodologypaper181007.pdf](http://www.ofwat.gov.uk/legacy/aptrix/ofwat/publish.nsf/AttachmentsByTitle/pr09_methodologypaper181007.pdf/$FILE/pr09_methodologypaper181007.pdf)



Chart 5: Index-Linked real bond payments



Over the past few years the regulated water companies have benefited greatly from the low level of real yields. For example, according to United Utilities (November 2008):

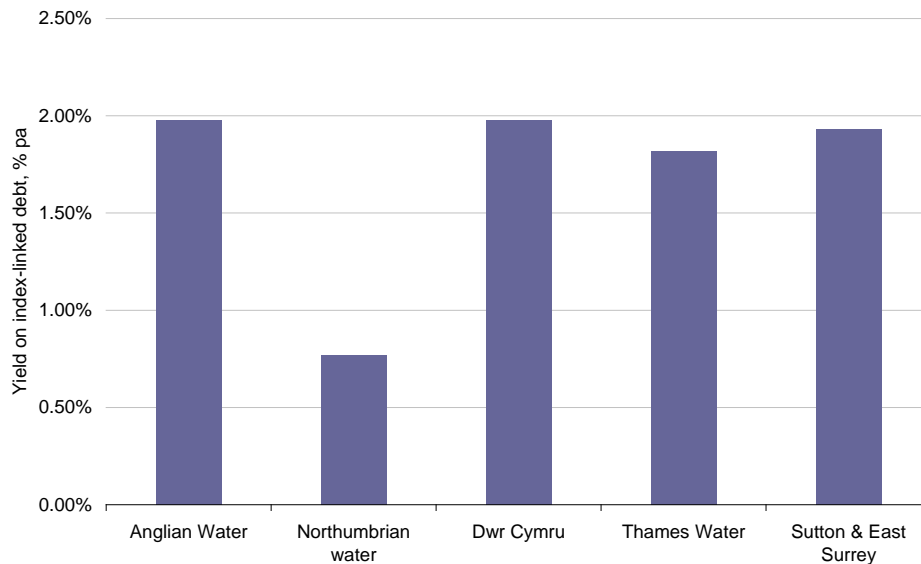
“The average cost of our £1.5bn of index-linked debt is approximately 1.8% real, compared with the current regulatory allowance of 4.3% real, locking in significant outperformance...”

This comment is quite clear confirmation that this firm believes that the actual cost of raising debt was far lower than the regulator anticipated in PR04. It was cheap because there was such very strong demand for index-linked bonds.

Chart 6 shows the spread on a range of index-linked debt issued by the UK’s water utilities compared with UK index-linked gilts. It is difficult to make real comparisons with the small subset of index-linked corporate debt, because the issuer ratings differ. But none of the bonds currently offer investors more than a 2.0% real return above the real return offered by an index-linked gilt of similar maturity. Using 2.0% as a proxy for the generic spread on real water utility debt would seem to be relatively conservative as an input to the WACC for water utilities.



Chart 6: Current spreads on water utility index-linked debt



The mounting cost of debt – the burden of history

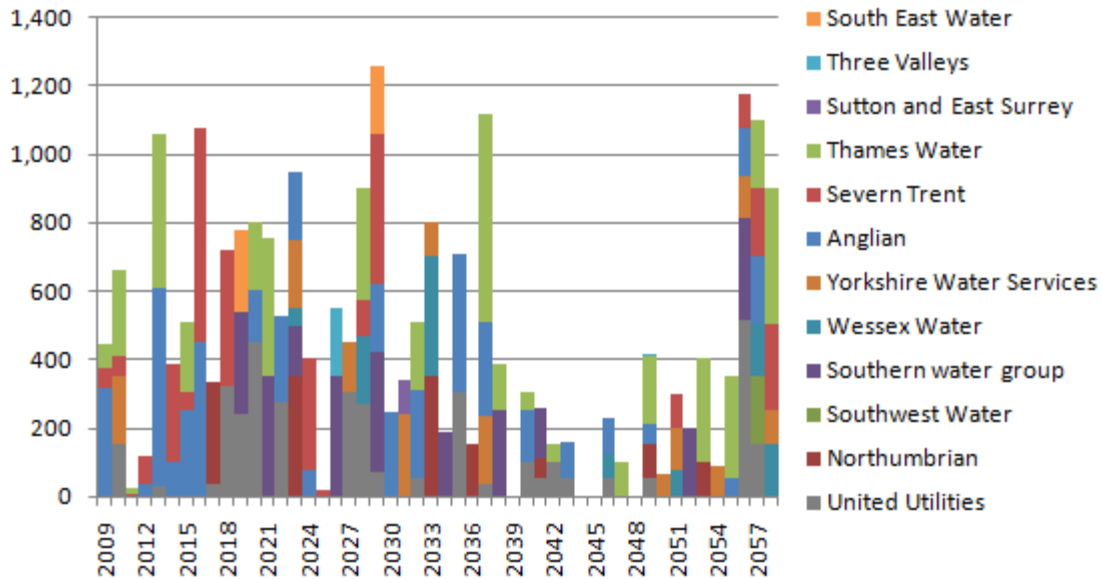
As the previous section highlighted, the low costs of debt in the five or six years prior to the bursting of the credit bubble in August 2007, meant that regulated water utilities managed to fund their capital at rates of interest significantly below those expected in the PR04 Final Determination. Furthermore, the maturity of these historic debt issuance programmes means that these low costs have been locked in for many years to come. For example, many index-linked bonds were issued at real yields in the range of 1.8% to 2.0%.

This low funding opportunity was so good that a large number of borrowers locked in more than half of their borrowing needs at these low levels for the next twenty years. As we can see in Chart 7, only 12% of outstanding water utility bonds will mature in the 2010 to 2015 period, which in turn suggests that funding costs are unlikely to change substantially whatever the price paid to borrow during the 2010-15 period.



Chart 7: Around 12% of outstanding bond debt to mature in the 2010-15 period

bond debt outstanding, £mns



The fact that so little of the water utility debt is due for refinancing over the next pricing period is significant. In our view the low cost of this debt should be taken into account in the setting of any new cost of debt estimate for PR09. It would make little sense to us to base any new cost of debt estimate for PR09 based on current market conditions and apply this to 100% of the debt raised by the industry.

Table 1 shows the actual cost of the current outstanding bonds issued by United Utilities and Severn Trent over the 2007/08 accounting period. Some consideration should be given to the actual cost of this debt and the amount of this debt that will need to be refinanced over the forthcoming pricing period in setting any new level for the cost debt in PR09.



<i>year ended Mar 31st 2008, £mns</i>	United Utilities	Severn Trent
Long term borrowings	3,788.9	3,627.7
Short term borrowings	878.4	459.5
Total debt	4,667.3	4,087.2
Gross finance expenses	331.6	294.5
<i>effective interest rate</i>	7.10%	7.21%
Earnings before tax	478.3	292.2
Tax	62.0	56.2
<i>effective tax rate in 2008</i>	13.0%	19.2%
Effective interest post-tax	6.18%	5.82%
<i>RPI yoy in Mar 2008</i>	3.77%	3.77%
Real debt interest paid in 2008	2.41%	2.05%

Source: Fathom/Company annual reports, adjusted for underlying earnings

Cost of debt conclusions

In the current market conditions it would appear that the credit premium on nominal and real 20 year water utility corporate debt are around 2.50% and 2.00% respectively. These spreads are higher than they were in the pre-credit crunch period. We should also note that the spreads vary quite widely from company to company; before August 2007, the spreads were all trading in a fairly narrow range.

Nonetheless we have already seen signs that the debt of these relatively safe, regulated utilities is preferred to that of equivalently rated debt issued by other industrial companies. This is not surprising given the current economic environment. As credit conditions gradually return to normal we can expect the spreads to narrow further on water utility debt. Therefore setting the cost of debt for these companies using current data may lead to an inappropriately high level. Indeed the water utilities may take advantage of the shape of the yield curve at the moment. They may do this by raising new finance at the very low yields available for say three year debt. Three year yields are approximately 3.5% in nominal terms while five year yields are currently just over 4.0%. They may then be able to refinance this shorter-dated debt for longer-dated debt when the yield curve normalizes. This would obviously represent a risk, but if successful this strategy could significantly reduce the average cost of debt over the forthcoming pricing period.

But of far more importance than the cost of raising debt now and over the next five years is that only a small proportion of this debt needs to be refinanced between 2010 and 2015. And the current cost of financing the debt that has already been issued and that will not need to be refinanced over the next few years is both lower than would be the cost of new debt and lower than was anticipated in the 2004 price review.



As such we believe that the regulator should adopt a weighted average cost of debt approach to this issue. That is, using a combination of the actual, real cost of issued debt and the cost of debt that is likely to apply over the 2010-2015 for any new debt that will need to be issued.

4. The cost of equity

To arrive at a measure of the cost of equity, many researchers use an approach that combines elements of the Dividend Discount Model (DDM) with the Capital Asset Pricing Model (CAPM). This approach effectively says that the return required on any equity will be equal to the return that they could achieve by investing in a risk-free asset, such as a conventional government bond, plus a risk premium to compensate them for the possibility that the company issuing the equity might fail, and for the uncertainty surrounding future dividend payments. This premium is made up of two components, that can broadly be described as the “price of risk” and the “quantity of risk”:

- The price of risk is generally thought of as being the extra return investors require from investing in the equity market as a whole. We refer to this here as the Market Risk Premium (MRP). Researchers and practitioners generally arrive at an estimate of this by using the DDM - which relates the current value of the equity market to the stream of discounted dividend payments that that market is likely to produce in the future, where the discount rate captures the risk premium charged for holding equities.
- The quantity of risk is the amount of risk embodied in a particular equity. Researchers and practitioners generally arrive at an estimate of this by using the CAPM. The CAPM says that the quantity of risk can be captured by the relationship between the return on the equity and the return on the market. This is known as the equity’s beta (β).

Putting all this together, it implies that the cost of raising capital by issuing equity will be greater than the risk-free rate (the yield on government bonds) to the extent that the market requires a premium on equities in general (the MRP, derived from the DDM), multiplied by the extent to which an individual equity covaries with the equity market as a whole (the beta for that company, derived from the CAPM). Note that this general framework is equally applicable to equity in unquoted as in quoted companies.

We will now go on to discuss the issues relating to the price of risk and the DDM, and then the quantity of risk and the CAPM.

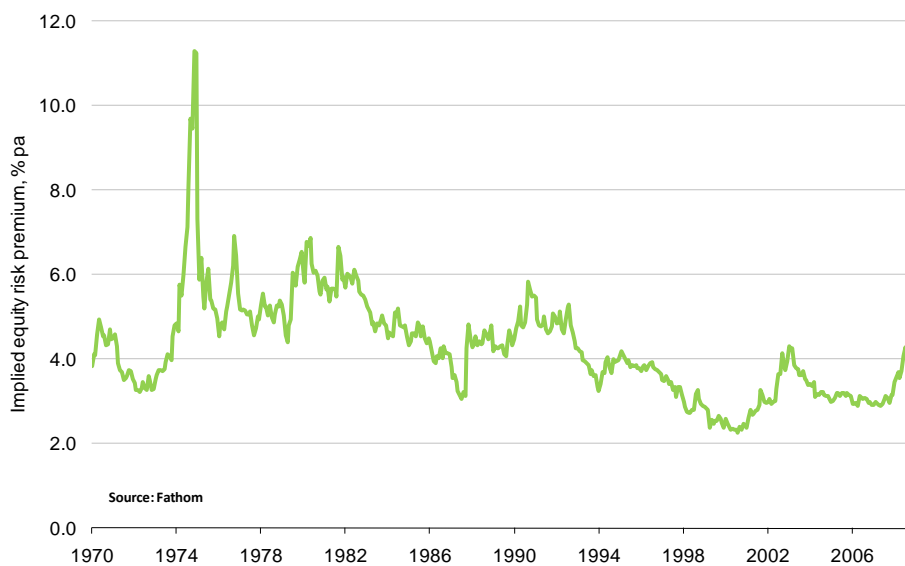
The price of risk and the DDM

The DDM states that the value of an equity market is the sum of the discounted value of all the future dividends that the equity market will generate for its investors. The rate at which those future dividends are discounted is the risk-free rate plus the equity Market Risk Premium (MRP). We have already discussed the evolution of the risk free rate above. Chart 8 shows how the MRP has evolved in recent years in the UK.



The calculations imply that investors are looking for a return of around 5% in excess of the return they expect on long-term government bonds. This is similar to the premium requirement in the early 1990s (the last time the UK went into recession); is roughly equivalent to the required premium during the turbulent 1970s on average; and is also approximately equal to the ex post level of outperformance of UK equities over gilts over the last 100 years. As the chart also shows, it is significantly higher than the average premium over the ten years preceding the bursting of the credit bubble in August 2007.

Chart 8: An estimate of the UK equity market risk premium



We believe that 5.0% would be a reasonable estimate of the ‘quantity of risk’, or the market risk premium at the moment.

So if the market is willing to pay, on average, a premium of 5.0% to UK equity investors, how much is it willing to pay to those investors that provide equity capital to the UK’s water utilities?

The quantity of risk and the CAPM

The “beta” of an equity is a measure of how much the return on that equity covaries (moves) with the return on the market. The intuition is simple. If the return on a given equity moves in such a way as to exaggerate any move in the market return, then investors will require a higher risk premium to hold that equity, and its beta will be greater than 1. By contrast, if it tends to move in such a way as to dampen any move in the market return, investors will require a lower risk premium to hold that equity, and its beta will be less than 1.

That is the concept of beta. But here is where the problem starts. Over what period should we estimate the relationship between the returns to a particular equity and the market returns?



What data periodicity should we use: daily, weekly or monthly data? Unfortunately there is no correct way of calculating betas.

We have used various methodologies to arrive at typical beta estimates for the UK's water utilities. We have used different sample periods and different data frequency (that is, daily, weekly and monthly price data). But whichever method we have used the beta for the UK's water companies tends to be significantly below 1.0. We have produced some example beta estimates in Table 2 and in Chart 9.

	<u>United Utilities</u>		<u>Northu W Group</u>		<u>Severn Trent</u>	
	Raw	Adj.	Raw	Adj.	Raw	Adj.
Daily Data						
1 year	0.66	0.44	0.51	0.35	0.66	0.46
2 years	0.67	0.45	0.56	0.38	0.66	0.46
5 years	0.66	0.44	0.58	0.40	0.65	0.45
All data	0.63	0.42	0.55	0.38	0.62	0.43
Weekly Data						
1 year	0.78	0.52	0.72	0.49	0.83	0.58
2 years	0.77	0.52	0.71	0.49	0.80	0.56
5 years	0.75	0.50	0.70	0.48	0.76	0.53
All data	0.61	0.41	0.64	0.44	0.51	0.36
Monthly data						
1 year*	0.45	0.30	0.01	0.01	0.28	0.20
2 years*	0.51	0.34	-0.10	-0.07	0.39	0.27
5 years	0.54	0.36	0.20	0.14	0.47	0.33
All data	0.57	0.38	0.24	0.16	0.44	0.31

Adj indicates the Beta when adjusted for leverage
* insufficient data points
Source: Bloomberg/Fathom

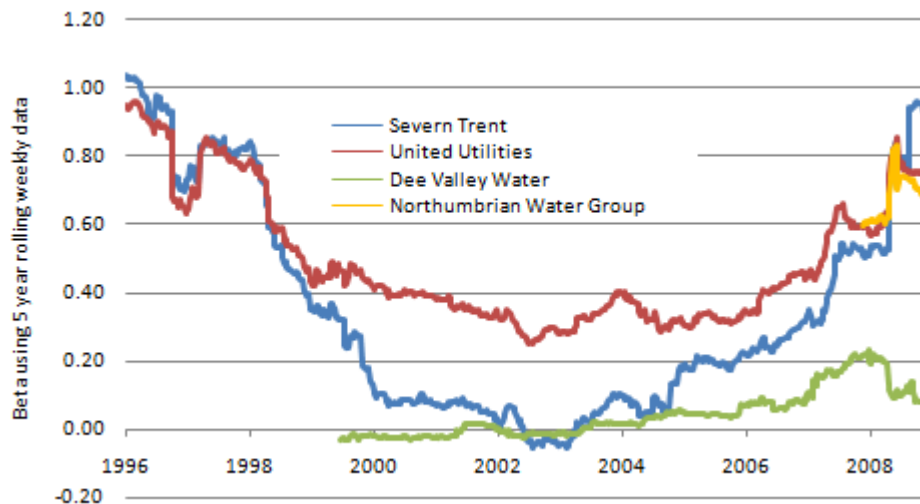
These results can be taken to mean that the market views the water utilities to be far less risky than the average UK company.

OFWAT has also recently suggested⁷ that it is more open to the idea that beta is much lower than 1.0. They quote research that suggests that the beta for utilities is around 0.5. We would strongly endorse such a view with regard to the water utilities.

⁷ Setting price limits for 2010-15: Framework and approach pp 49.



Chart 9: Equity betas average around 0.5 over time



Our results are in sharp contrast to the research produced by Severn Trent⁸. This report argues that its beta is close to 1.0. We find it hard to justify a beta of 1.0 for this or any of the other water companies. In our view there is neither statistical, nor intuitive justification for this claim. The markets clearly regard regulated water companies as low risk.

In general terms, almost regardless of the methodology, water companies are perceived as less risky than the average UK equity. This seems intuitively sensible. These are companies with a steady, income stream that is protected by the law, and inflation proofed. And in times of uncertainty, such as now, we believe that investors are placing an even greater value on income streams of this kind. We believe that the forward-looking beta on utility stocks is probably much lower than even that estimated using historic data. As such, the WACC should be commensurately lower, other things being equal.

The cost of equity conclusions

It is certainly true that the market risk premium has risen over the past two years or so; probably from around 3.0% to closer to 5.0% today. However, the same risk aversion which has driven the overall premium up has almost certainly led to a reassessment of the risks embodied by water utility equity. Water companies are seen in the market as being 'defensive' investments, in other words they tend to be the sort of equity that performs relatively well in tough economic conditions. There is no doubt that we are currently facing tough economic conditions. As a consequence the beta on a regulated water utility which was always probably lower than 0.75, is probably closer to 0.5 today.

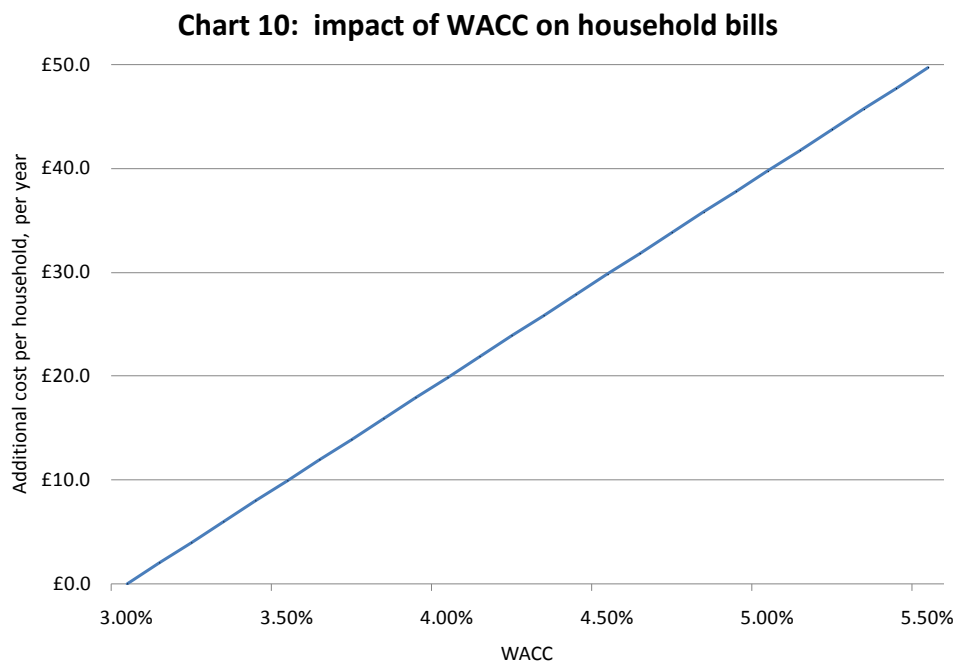
This means that for a water utility with a beta of 0.5 the appropriate equity risk premium to apply for the purposes of calculating the cost of capital is 2.5% (0.5 x 5.0%).

⁸ The world has turned: but which way? http://www.severntrent.com/upload/pdf/Cost_of_capital_for_web.pdf



5. What difference does it make ?

It is our understanding that the WACC estimate to be agreed under PR09 will apply to approximately £50bn of regulated water utility capital. Using this value and the associated fact that the industry's costs will ultimately be borne by 24m UK households we can calculate the marginal impact of the WACC on the annual bills of the UK household's. The calculations serve to underline just how important it is to get these estimates right.



From a starting point of 3%, Chart 10 shows how the annual cost per household rises with every one basis point (0.01%) increase in the WACC. This suggests that a 1.0% increase in the WACC from any given starting point will add around £20 to the average annual water bill. Given that unemployment in the UK is likely to continue to rise for the next twelve to eighteen months to levels last seen in the early 1990s, every penny will count for UK households in the foreseeable future.

6. The issue of 'financeability'

Financeability is a difficult concept⁹. To ensure the stability of the industry and in particular that water supply should not be interrupted by a corporate failure, Ofwat has insisted that regulated water utilities should maintain an investment grade credit rating (see Chart 3). As such these companies must maintain certain financial ratios, or risk a downgrade from a credit rating agency. For example, other things equal, as the amount of debt that a company takes on rises so does the likelihood of a downgrade, or similarly, as the strength of the firm's cashflow weakens the probability of a downgrade increases too. At the same time as having to maintain

⁹In fact it is so difficult that it is not a word that can be found in any normal lexicon; it is unique to the world of regulated capital.



their investment grade rating, water companies have the responsibility of investing in ageing water and sewerage infrastructure. The capital expenditure programmes required of them put understandable strains on their financial ratios.

To ensure that these two competing aims are met as part of the PR04 settlement, the water industry were effectively given a one-off cash sum of £430m, an injection of funds that was over and above the funding level implied by the WACC set at the same time. These additional funds were raised via higher water bills, and hence represented a literal transfer of cash from water consumers to water and sewerage companies.

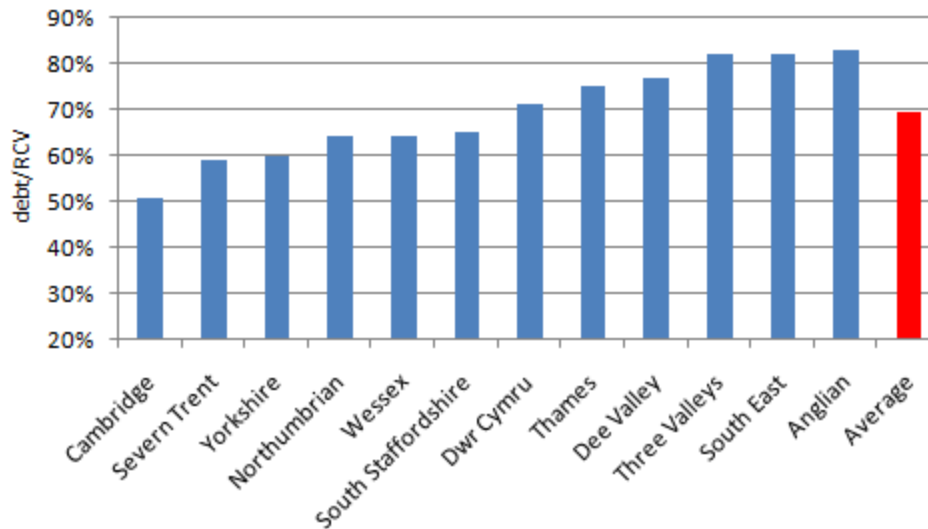
Generally a company that is subject to normal competitive forces and that is short of capital will raise additional funds by issuing more equity, perhaps through a rights issue, or by issuing a bond. However, a company that is a monopoly supplier of an essential product can always raise the funds by charging its customers a higher price. In the case of water companies, they have been able to exercise their positions as monopoly suppliers. In our view, the burden of raising such capital should at least be shared between customers and shareholders.

It seems likely to us that as part of PR09 the industry will try to gain additional funds directly from water customers yet again, by claiming that whatever WACC is eventually agreed will put financeability at risk. Since it is effectively 'free money' it is difficult to envisage a situation where they would not ask for an additional 'financeability' payment.

However, we believe these financeability concerns are not as significant as the water industry would have us believe and, as stated above, we do not believe that any justifiable financeability claims should be borne entirely by consumers. First, most water companies remain above the lower bound of the investment grade spectrum. The recent move in water utility bond yields relative to the yields on similarly rated bonds, indicates that the market has recently 'upgraded' water utility debt. Second, it seems from our calculations that water utilities have put financeability at risk with some aggressive payout policies and which have been paid for at least partially by increasing leverage. Chart 11 shows the leverage for a range of water utilities. It averages 69%, well above the 55% level used in Ofwat's modelling exercise for PR04. For three of our sample companies it is above 80%.

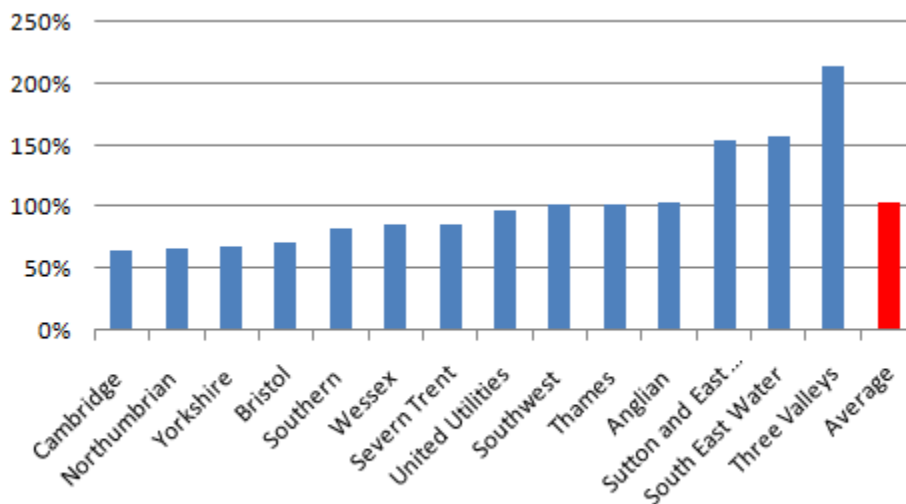


Chart 11: Current leverage of the UK's water utilities



The increase in leverage at a time when debt was cheap simultaneously reduced the actual WACC below the regulated level set in PR04, supported high dividend payouts and put financeability at risk. The average payout ratio for the UK equity market since 1970 is 55%. In Chart 12 we present the average payout ratios of some water utility companies. The vast majority of these payout ratios are significantly above 55%. The average is just under 100%.

Chart 12: Average pay-out ratios of the UK's water utilities



We believe the issue of financeability could be addressed, at least partially, with cuts in dividend payouts. Indeed this is exactly the kind of economic environment that tends to be supportive of such moves. Many UK companies have cut their dividends recently, while the insurance giant Aviva, saw its share price fall when it maintained its dividend this April. Furthermore, a less aggressive dividend policy, other things equal, would tend to improve a company's credit rating.



7. Conclusions

In this paper we have produced broad guidelines for setting the WACC for the UK's regulated water utilities. In Table 3 we have produced some example calculations of the WACC for a UK water company under different scenarios: based on the issuance of nominal and real debt; based on three levels of leverage; and using two betas. We have also used a very conservative estimate of the nominal debt premium, for example many water utility bonds trade well below 7%. As we pointed out earlier, companies could take advantage of the current shape of the yield curve and issue nominal debt at the shorter end of the maturity spectrum and achieve nominal funding costs at much lower rates than 7%. Our estimates of the WACC range from 2.35% (Panel A) to 3.40% (Panel D). These are the kind of figures that we would see as being reasonable estimates of the cost of capital of the UK's water utilities for any new capital that needs to be raised. As we argued earlier it would not be appropriate to apply these figures to capital that has already been raised at much lower rates and which does not need refinancing over the 2010 to 2015 period.

Table 3: The WACC for a water company

Panel A		Panel B	
<u>Cost of Equity</u>		<u>Cost of Equity</u>	
Nominal Risk-free rate	4.75%	Real Risk-free rate	1.25%
Equity Risk premium	5.00%	Equity Risk premium	5.00%
Equity Beta	0.50	Equity Beta	0.50
	<u>7.25%</u>		<u>3.75%</u>
<u>Cost of debt</u>		<u>Cost of debt</u>	
Nominal Risk-free rate	4.75%	Real Risk-free rate	1.25%
Nominal debt premium	2.50%	Real debt premium	2.00%
Effective tax rate	28%	Effective tax rate	28%
	<u>5.22%</u>		<u>2.34%</u>
Gearing	69.00%	Gearing	69.00%
Nominal WACC:	<u>5.85%</u>	Nominal WACC:	<u>2.78%</u>
Long-term Inflation	3.50%	Long-term Inflation	0.00%
Real Cost of Equity	3.75%	real Cost of Equity	3.75%
Real Cost of Debt	1.72%	real Cost of Debt	2.34%
Real WACC	2.35%	Real WACC	2.78%



Panel C

<u>Cost of Equity</u>	
Nominal Risk-free rate	4.75%
Equity Risk premium	5.00%
Equity Beta	0.75
	<u>8.50%</u>
<u>Cost of debt</u>	
Nominal Risk-free rate	4.75%
Nominal debt premium	2.50%
Effective tax rate	28%
	<u>5.22%</u>
Gearing	60.00%
Nominal WACC:	<u>6.53%</u>
Long-term Inflation	3.50%
Real Cost of Equity	5.00%
Real Cost of Debt	1.72%
Real WACC	3.03%

Panel D

<u>Cost of Equity</u>	
Real Risk-free rate	1.25%
Equity Risk premium	5.00%
Equity Beta	0.75
	<u>5.00%</u>
<u>Cost of debt</u>	
Real Risk-free rate	1.25%
Real debt premium	2.00%
Effective tax rate	28%
	<u>2.34%</u>
Gearing	60.00%
Nominal WACC:	<u>3.40%</u>
Long-term Inflation	0.00%
real Cost of Equity	5.00%
real Cost of Debt	2.34%
real WACC	3.40%

Panel E

<u>Cost of Equity</u>	
Nominal Risk-free rate	4.75%
Equity Risk premium	5.00%
Equity Beta	0.50
	<u>7.25%</u>
<u>Cost of debt</u>	
Nominal Risk-free rate	4.75%
Nominal debt premium	2.50%
Effective tax rate	28%
	<u>5.22%</u>
Gearing	65.00%
Nominal WACC:	<u>5.93%</u>
Long-term Inflation	3.50%
Real Cost of Equity	3.75%
Real Cost of Debt	1.72%
Real WACC	2.43%

Panel F

<u>Cost of Equity</u>	
Real Risk-free rate	1.25%
Equity Risk premium	5.00%
Equity Beta	0.50
	<u>3.75%</u>
<u>Cost of debt</u>	
Real Risk-free rate	1.25%
Real debt premium	2.00%
Effective tax rate	28%
	<u>2.34%</u>
Gearing	65.00%
Nominal WACC:	<u>2.83%</u>
Long-term Inflation	0.00%
real Cost of Equity	3.75%
real Cost of Debt	2.34%
real WACC	2.83%



Appendix: author biographies

Professor Andrew Clare

Andrew Clare is the Professor of Asset Management at Cass Business School and the Associate Dean responsible for the business school's MSc programme. He is also the chairman of Fathom Consulting. He has worked as a Senior Research Manager in the Monetary Analysis wing of the Bank of England where he was responsible for the Bank's equity market and derivatives research. Andrew also spent three years working as the Financial Economist at Legal & General Investment Management, which is the fund management arm of one of the UK's largest insurers. He has been recently appointed as a trustee to the GEC Marconi pension plan. Over the years Andrew has published extensively in both academic and practitioner journals on a wide range of economic and financial market issues, including those surrounding the issue of the cost of capital. In a recent survey Andrew was ranked as the ninth most prolific finance author of the past fifty years.

Mr Chris Apostolou

Chris Apostolou holds a BSc in Economics from the University of Surrey. He is a Financial Analyst at Fathom where he conducts both financial market and economic research, including cost of capital analyses. He has worked in the economics research department of JPMorgan where he focused on the UK and related asset prices. At Mizuho International he underwent a formal training programme in financial markets and specialised in credit research for corporate bonds and credit derivatives. Following this he worked in the Kaupthing group of companies where he worked on structured products such as CDOs, as well as advising on investments in corporate bonds and credit derivatives.