

# The world has turned: but which way?

Financing water investment in changing capital markets: the macroeconomic and market drivers behind the cost of capital calculation for PR09.



SEVERN  
TRENT

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The new, more uncertain, economic environment could have profound consequences

Severn Trent believes that Ofwat’s determination of the Water Industry’s cost of capital will be critical in ensuring that sufficient investment is attracted to the Industry in order to continue to deliver high standards to customers. Given this, it is essential to set the cost of capital with reference to prevailing market indicators.

The market turbulence since Summer 2007 most probably represents the end of a period of economic stability, unprecedented in recent history, characterised by very low debt costs and inflation and the free availability of investment capital. It would appear likely that, at a minimum, we are entering more “normal” economic conditions in line with long-term trends. However, the threat of further, and more significant, changes to the world economic outlook is such that there could be dramatic and sudden changes in global capital flows, risk appetite and in the relative attractiveness of industrial sectors to investors. In future the cost of capital could therefore vary significantly from that of the recent past, and be considerably more volatile.

For the water sector in England and Wales, with a large and continuing requirement to make capital investments in infrastructure, the new, more uncertain, economic environment could have profound consequences and presents both the Industry and its regulator with some difficult decisions as the next Periodic Review approaches. We estimate that debt for the Water Industry in England and Wales could rise from around £30 billion today to almost £90 billion by 2035.

The Ofwat approach to setting the cost of capital used since privatisation, and most recently in 2004, has served the Industry well. When the current price review period is concluded in March 2010, the cost of capital determined by Ofwat for the five-year period may prove to have been broadly correct in the context of the financial markets over the whole period. It has ensured that finance could be raised for the investment programme in Asset Management Period 4 (AMP4), the five-year period to 31 March 2010, without overall excessive equity price gains. The challenge for AMP5 is for an appropriate rate of return on capital to be set allowing appropriate returns including dividends to investors while achieving the lowest possible charges to customers.

In this paper we have drawn on the work of Oxford Economics and Deloitte, as well as information collected from our bankers and financial advisers. We set out Severn Trent’s views of macroeconomic factors which recently have influenced the cost of capital for the Water Industry in England and Wales, and also potential future trends, which should guide Ofwat when it sets prices for AMP5.

The cost of debt

Since the mid-1990s a range of macroeconomic factors – stable growth and inflation, high confidence in financial stability and strong demand for gilts – reduced the Real Risk Free Rate. More recently, between 2003 and 2007, these same factors, combined with greater financial innovation, also resulted in a convergence in debt premia for borrowers of varying credit quality. Arguably this resulted in the market underpricing risk.

Our assessment, based on those of our economic consultants and others, such as the UK Treasury and the European Central Bank, is that the balance of probability is the Real Risk Free Rate, as measured by the return on medium-term UK government securities, will rise to be in line with the UK’s long-term economic growth rate of 2.0% to 2.5%. In addition, following the Credit Crunch, we expect that debt premia and the differentiation between low and high quality credit issuers will increase compared to the period before the Credit Crunch because:

- the valuation of new and innovative financial products has become uncertain; and
  - investors are far more risk averse.
- We note that:
- debt premia have already sharply increased; and
  - the differentiation between borrowers of varying credit quality has already increased.

We believe the range of debt premia for an ‘A’ rated company lies from 1.0% – 1.7%, which when added to a Risk Free Rate of 2.0% to 2.5%, and transaction costs and commitment fees from 0.2% – 0.3%, lead to a real cost debt of between 3.2% - 4.5%.

In today’s environment the lower end of the range appears unlikely to be sufficient to finance the substantial borrowing requirements of the Water Industry and we identify a plausible range of between 4.1% – 4.5%.

For the cost of debt we identify a plausible range of between 4.1% and 4.5%

	Theoretical Low %	Plausible Median %	Plausible High ‘A’ rated %	Theoretical ‘BBB’ rated %	Ofwat 2004 %
Risk Free Rate	2.0	2.3	2.5	2.5	3.0
Premium	1.0	1.5	1.7	2.5	1.3
Transaction fees	0.1	0.1	0.1	0.1	0.0
Commitment costs	0.1	0.2	0.2	0.2	0.0
	3.2	4.1	4.5	5.3	4.3

Section 1: Overview and summary continued

Any decision on the cost of capital should reflect the need to pay appropriate levels of dividend

The cost of equity

We have estimated the cost of equity primarily through the Capital Asset Pricing Model, through which we obtain the results below. The very wide range of values depends in particular upon the period of time used to measure the Equity Risk Premium and the Equity Market Beta.

We believe that a range for the value of the Equity Market Beta is between 0.6 and 1.0, the higher number representing Severn Trent's Equity Market Beta over the last two years, and the lower representing the Equity Market Beta value over a longer period of the last seven years. We believe that the more recent figures are especially valid because Severn Trent, in common with the rest of the Water Industry, has only recently shed its non-water activities. This, and regulatory precedent, point to the higher

end of the range. In respect of the Equity Risk Premium, we have noted the evidence that this lies in a range of between 4% and 6%.

Overall, we believe that a plausible range for the cost of equity lies between 7.3% and 8.5%.

We believe that our shareholders consider the cash dividends paid to be an important component of their total shareholder return and is a key reason why they invest in Severn Trent. It is important therefore that any decision on the cost of capital should reflect the need to pay appropriate levels of dividend.

	Theoretical Low %	Plausible Median %	Plausible High %	Ofwat 2004 %
Risk Free Rate	2.0	2.3	2.5	3.0
Equity Risk Premium	4.0	5.0	6.0	4.7
Equity Market Beta	0.6	1.0	1.0	1.0
Overall	4.4	7.3	8.5	7.7

Water Industry specific factors

Substantial amounts of new money need to be raised by the Water Industry to fund planned investment, such that Industry aggregate debt could rise to £90 billion by 2035. Some of the traditional sources of capital are now no longer available, or are severely limited:

- **The amount of the debt requirement is such that commercial bank loans and the European Investment Bank (EIB) can only provide a part of the funding.**
- **Having issued substantial amounts of index-linked debt over the early part of the AMP4 period, the Industry can no longer rely on access to the index-linked debt market following the Credit Crunch and the decline of the monoline credit insurers.**
- **Leasing was historically an important source of funds, now opportunities are limited.**

Given this backdrop it is clear that bond markets will remain the key source of funding for the water sector. Credit quality is also likely to play a more important role than in the recent past with only the best-rated issuers being certain of raising sufficient, competitively priced, funds.

Although the Water Industry has significant embedded debt, there is a substantial exposure to floating interest rates. Interest rate management is a part of companies activities to manage risk. Generally companies fix a significant proportion of their interest costs five years in advance, consistent with AMP periods, for example using 'swaps'. Consequently, at the end of each AMP period, the cost of a significant proportion of embedded debt will change. At the end of AMP4 this debt is very likely to become more expensive, as the swaps entered into when interest rates were lower than at present expire.

In order for water companies to retain strong investment grades it is crucial that providers of capital to the Industry are confident of regulatory stability. In addition, it should not be forgotten that there exists asymmetric risk in the selection of the cost of capital by Ofwat – too high and shareholders experience good returns for five years – too low and, more seriously, the Industry could face major difficulties in financing investment for a significant period of time.

Bond markets will remain the key source of funding for the water sector

In today's market conditions the plausible range for Severn Trent's cost of capital lies between 4.7% and 5.3%

Conclusion

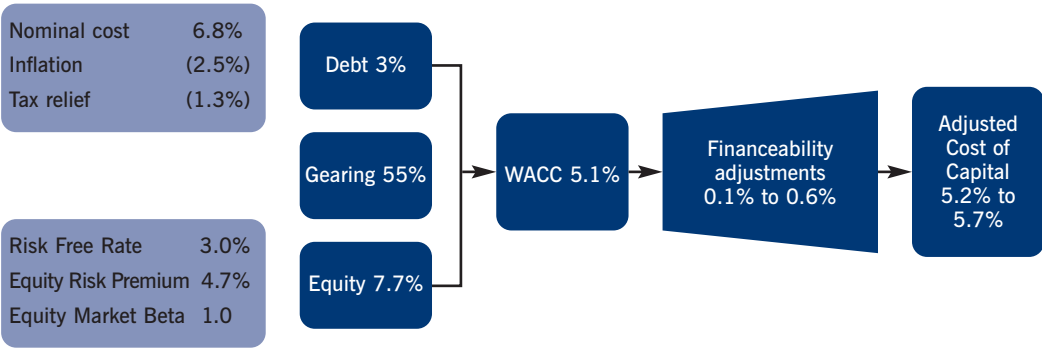
Taking account of all the above, we set out below the theoretical and plausible range for the real cost of capital for Severn Trent.

	Theoretical Low %	Plausible Median %	Plausible High 'A' rated %	Theoretical 'BBB' rated %	Ofwat 2004 %
Cost of equity	4.4	7.3	8.5	8.5	7.7
Cost of debt pre tax	3.2	4.1	4.5	5.3	4.3
Cost of debt post tax	2.3	3.0	3.2	3.8	3.0
WACC at 60% gearing	3.2	4.7	5.3	5.7	5.1

Given the macroeconomic uncertainties, the present cost of raising debt, and the large borrowing requirement of the next 25 years, we believe that a reasonable estimate of Severn Trent's cost of capital in today's market conditions lies between the median and high points of the range, for an 'A' rated company i.e. between 4.7% and 5.3%, assuming gearing of 60% to RCV (Regulatory Capital Value).

This range compares to an AMP4 figure of 5.1% before financeability adjustments, as shown below.

Figure 1: How WACC was calculated in AMP4



Severn Trent welcomes the opportunity to discuss the issues raised in this paper. Please contact any of the people below if you would like to do so.

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The purpose of this paper is to set out Severn Trent's view of the macroeconomic factors which have driven the cost of capital over recent years, and where these factors might lead in the future. It also sets out the company's initial view of the plausible range of its cost of capital for the AMP5 period.

A key component of the price control of water companies in England and Wales is the Ofwat assumption about the regulated cost of capital. Ofwat has indicated that it will derive its regulated cost of capital for the 2009 Periodic Review (PRO9) using the Weighted Average Cost of Capital (WACC) calculated for the Industry, primarily using the Capital Asset Pricing Model (CAPM) to establish the cost of equity, in line with previous reviews.

For the Water Sector in England and Wales, with a large and continuing requirement to make capital investments in infrastructure, the new, more uncertain, economic environment could have profound consequences and presents both the Industry and its regulator with some difficult decisions as the next Periodic Review approaches.

The remainder of this paper is structured as follows:

- Section 3 discusses the economic drivers behind the cost of debt;
- Section 4 reviews the cost of equity;
- Section 5 brings these together to show the calculation of the WACC;
- Section 6 considers the specific factors influencing the Water Industry in England and Wales; and
- Section 7 considers the sensitivities to funding the Water Industry in more uncertain times.

When carrying out our work to understand the macroeconomic factors driving the cost and availability of debt and equity finance, and the effect these factors might have in the future, we employed two groups of economic financial consultants, Oxford Economics (Adrian Cooper and Adam Slater) and Deloitte (Robin Cohen and Enese Lieb-Doczy). We also consulted with our bankers (HSBC, RBS and Barclays) and corporate finance advisers (Rothschild and Citigroup) to assist with market analysis. Please note that, although the aforementioned have assisted with our analysis, the views expressed here are entirely those of Severn Trent, unless stated to the contrary.

The more uncertain economic environment could have profound consequences



## Section 3: Economic factors in uncertain times: the cost of debt

The cost of debt is a very important factor in water companies overall cost of capital

### 3.1 Introduction

For water companies in England and Wales, which typically have significant gearing, the cost of debt is a very important factor in their overall cost of capital. Given that Ofwat also typically assumes a significant element of gearing in Periodic Reviews, it is also a key component of the regulated cost of capital.

The cost of debt is typically divided into three components:

- the Risk Free Rate;
- the debt premium; and
- transaction fees and commitment costs.

### 3.2 The Risk Free Rate

The path of the Risk Free Rate (in real terms), as represented by UK 10-year index-linked gilt yields, is shown in Figure 2.

The picture is one of a steep fall between the mid-1990s to 1999, followed by a rise around 2002, followed by reductions to

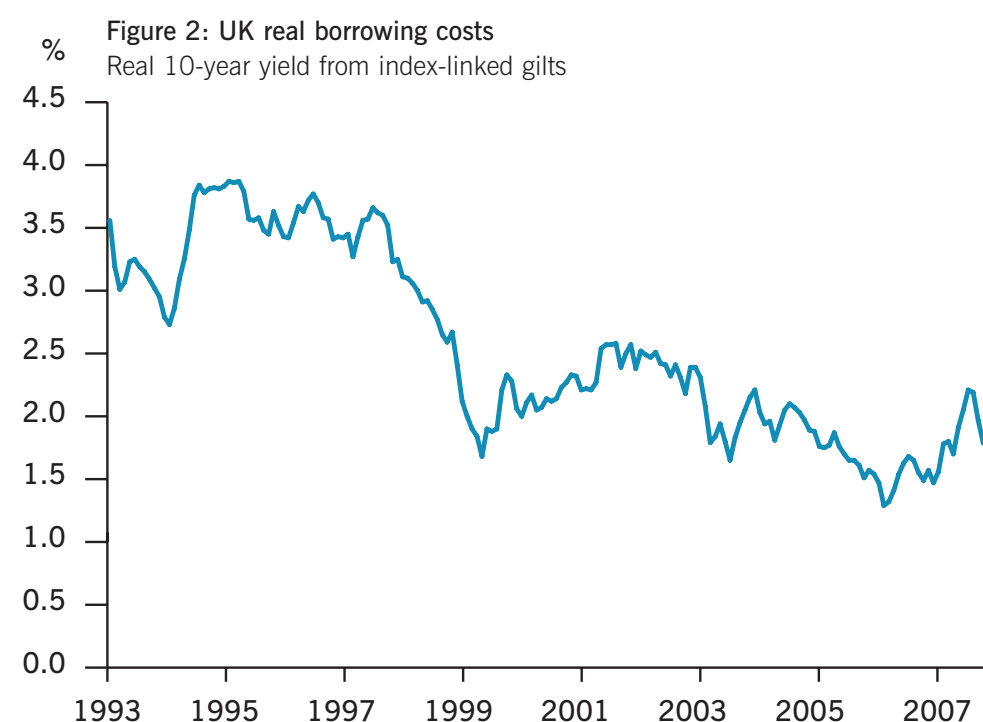
within a range of 1.5% to 2% thereafter, as set out in Figure 2.

We consider below what has caused the fall in real risk free borrowing costs in the UK, how long this trend can continue and what the implications would be of a reversal.

The key factors which would be expected to drive the Risk Free Rate are:

- investor expectations of GDP growth and inflation;
- the quantity of global savings and foreign flows;
- asset and liability matching – the behaviour of UK pension funds;
- the degree of investor risk aversion; and
- monetary and fiscal policy.

Of these factors, the first three appear to be structural in nature, whereas the last two appear more cyclical. Each is considered below.



Source: Oxford Economics/Haver Analytics

### 3.3 Investor expectations of GDP growth and inflation

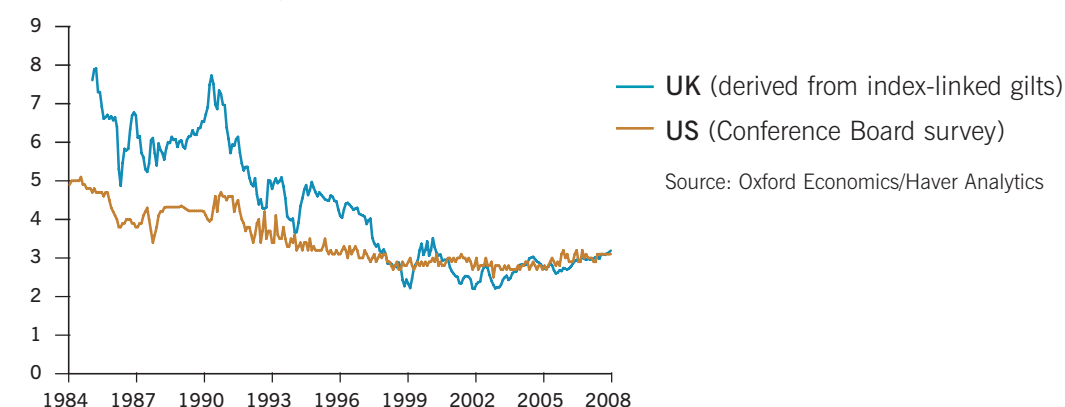
It would be expected that the cost of finance should tend toward the level of real return provided by the economy. If growth is viewed as equivalent to the real return on capital, then a rise in real returns ought to induce an increase in the demand for capital, driving up its price. Consequently, the higher the expected level of economic growth, the higher the expected cost of finance throughout the economy.

In addition, investor expectations of inflation are strongly-linked to the credibility of the anti-inflation policies of central banks, in

which there has been a major improvement in recent years, both in the US and the UK. Uncertainty over the future rate of inflation leads to investors seeking a “risk premium” on their returns. In the UK, inflation expectations (measured as the difference between index-linked and conventional gilts on 10-year stock) have fallen from around 8% in 1985 to a range of 2-3% from the late 1990s onwards, as demonstrated in Figure 3.

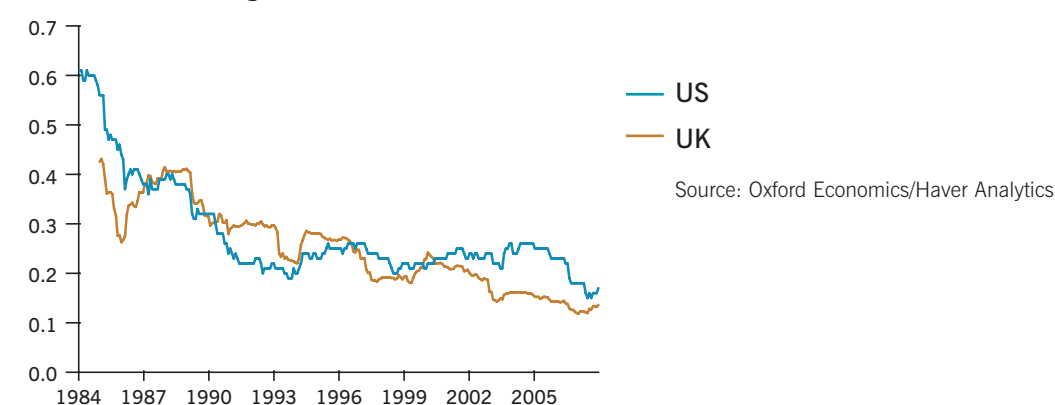
In addition, the credibility of the central banks’ anti-inflation stance is underlined by the reduction in the volatility of long-term interest rates over the same period, as shown in Figure 4.

**Figure 3: US & UK long-run inflation expectations**  
10-year inflation expectations, %



Source: Oxford Economics/Haver Analytics

**Figure 4: US & UK 10-year yield volatility**  
36-month rolling standard deviation



Source: Oxford Economics/Haver Analytics

Uncertainty over the future rate of inflation leads to investors seeking a “risk premium” on their returns

Section 3: Economic factors in uncertain times:  
the cost of debt (continued)

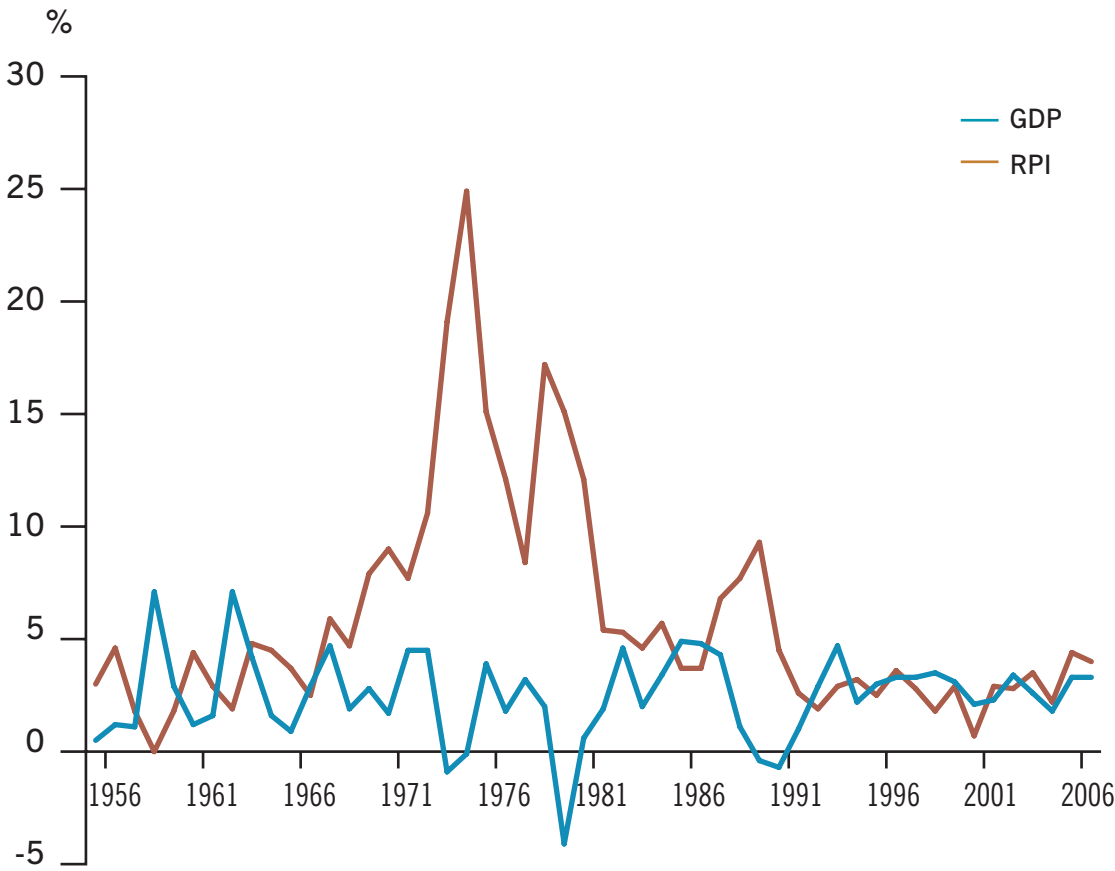
Since the recovery from the last recession in the early 1990s, GDP and inflation figures have exhibited unprecedented stability

One explanation of the current low risk free rates is to argue that Western industrialised countries have achieved a new and favourable macroeconomic equilibrium characterised by strong, synchronised global economic growth, favourable inflation trends, anchored inflation expectations and low volatility across asset markets. On this account the ensuing “great moderation” is characterised by reduced volatility in key macroeconomic indicators, especially GDP growth and inflation, as demonstrated in Figure 5. Between 1956 and 1991 the UK economy went through several boom and bust cycles and experienced periods of high

inflation in the 1970s. Since the recovery from the last recession in the early 1990s, GDP and inflation figures have exhibited unprecedented stability.

It is likely that such economic stability has been due, not only to the improved credibility of monetary policy as noted above, but also to the lack of major economic shocks (such as the oil price shocks of the 1970s), structural changes in the industrial sector, and a more efficient financial sector, due to banking deregulation and financial market globalisation.

Figure 5: UK GDP and RPI 1956 to date



Source: Deloitte

3.4 The quantity of global savings and foreign flows

A factor which has played a particularly important role in holding down global interest rates in recent years has been the global savings ‘glut’ and the related heavy purchase of “advanced country” securities by official foreign investors – mostly central banks. The increased global supply of savings over the last five years has two main sources:

- a rise in savings in some rich countries (e.g. Japan and Germany) with ageing populations (to make provision for a later sharp rise in retirees); and
- the shift of developing countries from being large importers of global capital to large net suppliers of it.

The second of these factors has been the most important. Over the last decade, countries in East Asia have adopted a policy of building up large foreign exchange reserves, in part to guard against a repeat of the destabilising capital outflows they experienced in 1996-1997. This has necessitated running large current account surpluses, which by definition means having national savings rates higher than investment rates. In addition, since 2004, there has been a further addition to global savings supply that has resulted from the surge in oil and other commodity prices. These price rises have boosted the current

account surpluses of oil and other commodity exporters, many of whom have a low capacity to absorb the additional revenue domestically. The overall result has been that the savings rate in emerging markets has risen to around 33% of GDP, up from 23% a decade ago.

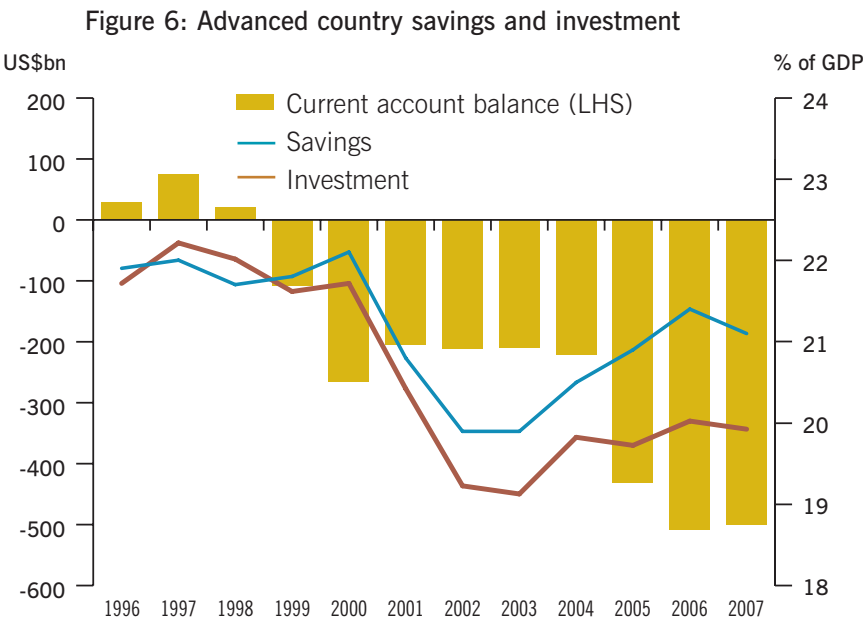
The rising supply of savings has been met with an unusually low level of investment. In the advanced countries, investment rates fell after the bursting of the dot com bubble and have not regained their previous cyclical peak. This may in part be due to factors such as cheaper capital goods and demographics, for example fewer profitable investment opportunities with slow growing workforces and an already high level of capital per worker. Investment rates in many emerging countries have fallen too, East Asian investment rates are notably lower than a decade ago, and investment rates in oil producers also remain low. Although China and a few others have bucked this trend, the net result has been that the gap between savings and investment rates among emerging countries has widened sharply.

Figures 6 and 7 show how advanced countries have run growing current account deficits over the period 1996 to 2007, funded by emerging countries with savings rates significantly higher than investment rates.

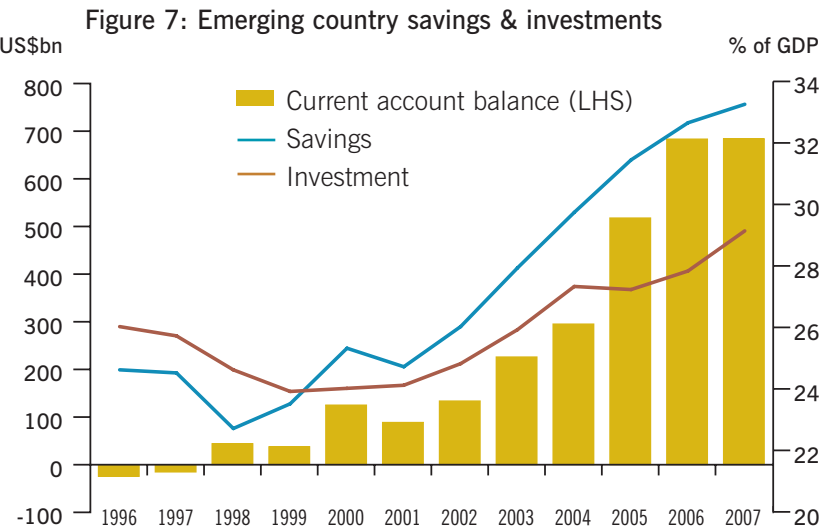
Global interest rates have been held down by the global savings ‘glut’ and purchases by official foreign investors

Section 3: Economic factors in uncertain times:  
the cost of debt (continued)

UK gilt yields  
have been  
dampened by  
foreign investors



Source: Oxford Economics/Haver Analytics



Source: Oxford Economics/Haver Analytics

Much of the global flow of capital has been to the US. For example, foreign holdings of US Treasury securities rose from 12% of the total in 1978 to 52% by 2005. However, there is also likely to have been a knock on effect in the UK, via arbitrage, and in addition there have been direct purchases of UK gilts by foreign investors. Both factors will have dampened UK gilt yields.

IMF data shows that since the start of 2002, the value of sterling-denominated global Foreign Exchange reserves has more than quadrupled from US\$42 billion to US\$182 billion. Sterling's share of global Foreign Exchange reserves has risen over the same period from 2% to 3%, suggesting countries in surplus have been diversifying the currency composition of their reserves towards sterling assets, as shown in Figure 8.

Sterling's  
share of  
global Foreign  
Exchange  
reserves has  
risen to 3%



Source: Oxford Economics/Haver Analytics



## Section 3: Economic factors in uncertain times: the cost of debt (continued)

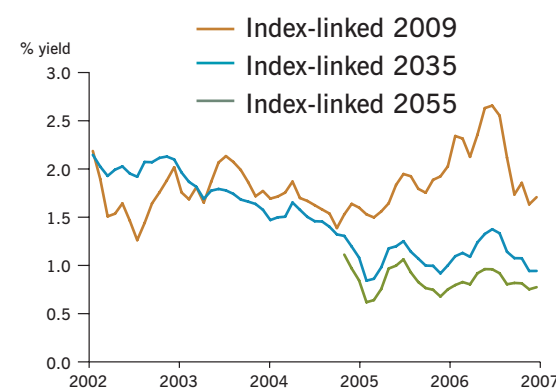
UK Pension Funds have driven real yields on long-dated gilts to below 1%

**3.5 The behaviour of UK pension funds**  
Real yields in the UK have been very low for long maturities in recent years, frequently below 1%. Such low real yields seem difficult to rationalise in the context of a growth rate trend for the UK above 2% and the inherent risk associated with such long-term assets. The obvious implication is that there are some special factors at work, and these appear to be UK-specific factors. For while UK index-linked gilts with a 20-year maturity have yielded 1-1.5% since 2005,

despite strong economic growth and latterly some upward pressure on inflation, the equivalent 20-year securities in the US (the 20-year TIPS) have yielded 2-2.5% over the same period. This is much more in line with long-term US growth potential.

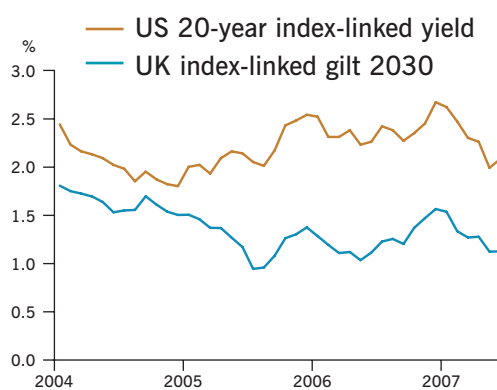
Figure 9 shows the yields on short, medium and long-dated UK index-linked gilts from 2002 to 2007, and in Figure 10 the contrast between the UK and US history.

Figure 9: Real UK yields based on index-linked gilts



Source: Oxford Economics/Haver Analytics

Figure 10: UK and US long-term rates



Source: Oxford Economics/Haver Analytics

In the view of Oxford Economics, it appears likely that the unusual compression of real yields at the very long-end of the UK yield curve can be traced to the investment behaviour of pension funds. In recent years pension funds have been buying up very long-dated gilts in an attempt to close pension fund deficits, a trend accelerated by changes in accountancy practice and pensions regulation. Long-dated gilts, pension funds have reasoned, represent an asset that will yield sufficient funds to match their long-term liabilities, with less risk than equities. Index-linked bonds have appeared especially attractive given that many pension funds' liabilities are indexed to inflation.

The shift in asset allocation that has resulted from this trend can be seen from annual surveys run by Mercer Investment Consulting. The share of equities in pension fund portfolios dropped from 68% to 61% from 2002-2006, while the share of bonds rose from 31% to 36%. Given the huge volume of assets UK pension funds dispose of (over £800 billion) this represents a very substantial rise in net demand for UK gilts – especially at the very long-end of the curve where supply is relatively limited.

ONS data show pension funds bought a net £9.6 billion of gilts in 2006, some 41% of their total investments, but the share slipped back to 20% in the first three-quarters of 2007. This may indicate that the shift toward bonds is losing momentum, perhaps because to some extent the recent heavy investment in bonds has been self-defeating. By driving down long-term yields, the value of pension fund liabilities has actually been inflated (the discount rate being lower). Perhaps in light of this, Oxford Economics argue that there is some evidence that pension funds have been shifting towards investments in 'alternative' assets such as property, commodities, and even hedge funds.

Reflecting the uncertain future outlook, Deloitte agreed with Oxford Economics view of the past and present behaviour of UK Pension Funds, but had a different view of the future. In their opinion, the pressure on gilt yields and the trend towards long-dated bond investment by pension funds is likely to persist.

The shift toward bonds may be losing momentum

Section 3: Economic factors in uncertain times:  
the cost of debt (continued)

Real yields are currently at an all-time low

Some, or all, of the favourable trends could reverse quite quickly and dramatically

3.6 The degree of investor risk aversion

The more risk-averse investors are, the more demand there will be for government bonds, exerting downward pressure on bond yields. Investors can be seen to become more risk-averse at times of financial and political crisis, such as the Credit Crunch which started in Summer 2007, or in the run up to the start of the Second Gulf War in March 2003.

3.7 Monetary and fiscal policy

Central bank policy should have a significant impact on developments in real interest rates, raising or lowering the cost of funds at the short-end of the curve should also move longer term rates up or down. There is some evidence, especially for periods before 2004, that there is a reasonable relationship between short-term and longer-term borrowing costs across the economic cycle.

In theory, fiscal policy would also be expected to have an impact on longer term yields. Increased demand by government

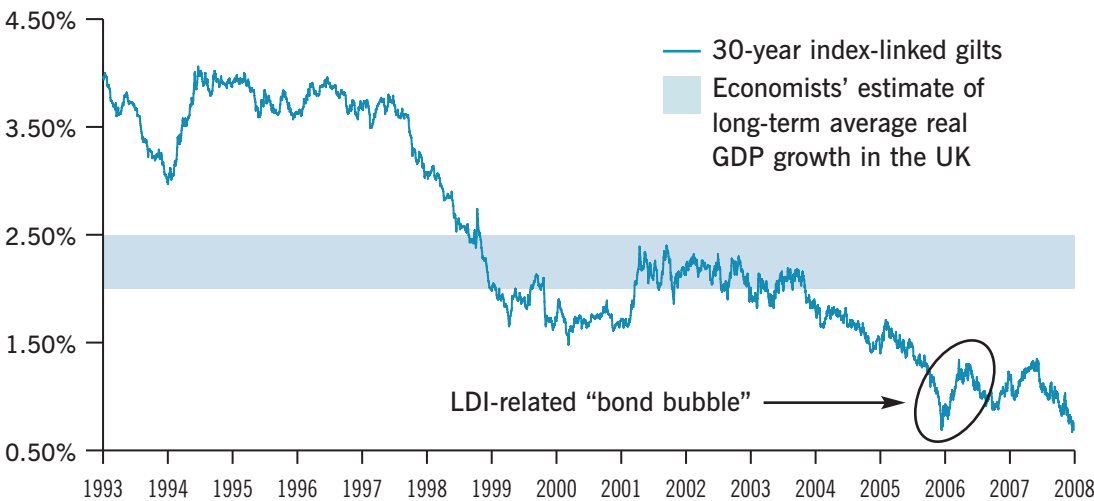
for funds should drive up the price (interest rate), whereas an improved budgetary position should have the opposite effect. However, since 1984 for the US, this relationship, if any, would appear weak.

There is of course no certainty that some, or all, of these favourable trends will persist and indeed some, or all, could reverse quite quickly and dramatically, with consequent impact on the Risk Free Rate.

Since the mid-1990s, macroeconomic factors have reduced the return on medium term government securities through:

- stable economic growth;
- low and stable inflation;
- improved confidence in financial stability;
- strong demand from risk averse sovereign investment funds; and
- especially in the UK, pension fund investment trends.

Figure 11: 30-Year GBP real yields: time series



Source: HSBC

Figure 12

	Low %	Median %	High %
Risk Free Rate	2.0	2.3	2.5

3.8 The plausible range of real yields looking forward

Real yields are currently at all-time lows. Figure 11 shows that the range of real yields on 30-year gilts has been as high as 4.0% and as low as 0.7% during the last 15 years.

Based on fundamentals, long-dated real yields are generally expected to track expectations of long-term real GDP growth (estimated to be at least 2.0% to 2.5% on average in the UK).

However, in recent years, the combination of supply-demand factors mentioned above has forced the yield on long-dated gilts down to below the expected level.

Taking a medium to long-term view, the long-run Risk Free Rate should lie in the range between 2%-2.5%, as illustrated in Figure 12.

3.9 Debt premia

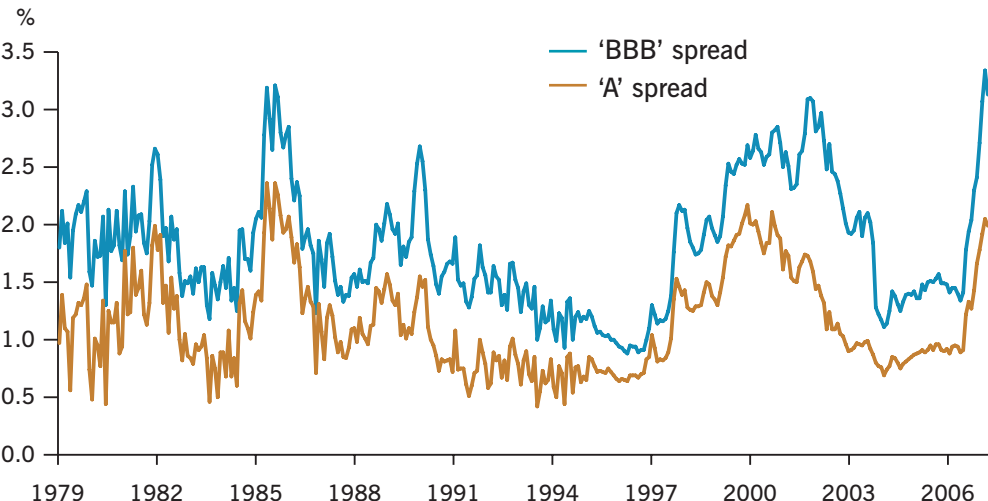
Debt premia constitute the excess cost of debt, payable to debt investors, as compared to the Risk Free Rate.

The recent history of debt premia in the US over comparable gilts is shown in Figure 13. The figures are from the US in order to obtain a long-run data series, which is not available in the UK.

The pattern over the last 38 years is one of peaks and troughs for both 'A' rated and also 'BBB' rated debt. The 1980s were a period of some volatility, followed by relative stability over most of the 1990s. In the US, during this decade, the lowest spreads were under 0.5% for 'A' rated debt, and under 1.0% for 'BBB' rated. A further peak followed in the period around 2000, after which spreads were low and stable until Summer 2007, at which point spreads have risen to their highest levels of over 2% for 'A' rated debt and approaching 3.5% for 'BBB' rated.

In the US spreads have risen to their highest levels of over 2% for 'A' rated debt and approaching 3.5% for 'BBB' rated

Figure 13: US corporate spreads, long-term



Source: Oxford Economics/Haver Analytics

## Section 3: Economic factors in uncertain times: the cost of debt (continued)

GDP growth is likely to be a key driver of corporate profits

Comparing the spreads on 'A' and 'BBB' rated debt, the gap varies between almost 0% in 1997 to nearly 1.5% in late 2007.

What has caused this pattern and what might the future hold?

The macroeconomic factors that affect debt premia are:

- economic conditions as represented by GDP growth and inflation;
- investor risk aversion;
- global capital flows; and
- financial innovation and the Credit Crunch.

### 3.10 GDP growth and inflation

Corporate bond yields fluctuate over business cycles, debt premia widening when economic conditions are weak and narrowing during periods of economic growth. Therefore GDP growth is likely to be a key driver of corporate debt premia. Weak GDP growth is frequently associated with a worsening financial position of the corporate sector, with worsening cash-flows, increasing leverage levels and hence increasing default risk.

High inflation would be expected to increase debt premia spreads because it would be detrimental to corporate profits – high inflation being followed either by central banks raising interest rates or by government tightening fiscal policy, both of which would be expected to harm profits.

### 3.11 Investor risk aversion

As stated earlier, at times of political and financial crisis investors become more risk-averse avoiding higher risk assets, such as those with weaker credit ratings, favouring government bonds and strong investment grades. Spreads were enhanced by the Credit Crunch which started in Summer 2007, and in the run up to the start of the Second Gulf War in March 2003.

### 3.12 Global capital flows

The level of global capital flows could also affect the level of debt premia depending, crucially, on overseas investors' level of aversion to risk. To date, their investment has been largely in gilts (see Section 3.4), but could in future extend to assets seeking to provide higher returns, such as investment banks.

### 3.13 Financial innovation and the Credit Crunch

Financial globalisation is made possible and supported by financial innovation. The increasing importance of non-bank intermediaries such as private equity and hedge funds, as well as the development of new financial instruments such as structured products are global phenomena. There are observers who suggest that the joint phenomena of globalisation and innovation have increased the danger of cross-border contagion and contributed to a growing asymmetry of information in financial markets, making risk assessment more difficult.

A good example of financial innovation reducing transparency and leading to cross-border contagion is the current Credit Crunch in US, and also UK, credit markets, which originated from the US subprime mortgage market. Technological advances which improved information processing and financial innovation in the form of the originate-to-distribute model (under which debts are bundled into rated structured products and then sold on) reduced the costs of lending to higher-risk households. However, the originate-to-distribute model weakened lenders incentives to maintain strong underwriting standards. Furthermore, these structured credit products and related products, such as asset-backed commercial paper, were complex and opaque, resulting in a situation where many investors in these products failed to do their own

valuations and due diligence and simply relied on the ratings provided by rating agencies. When default rates in the sub-prime market increased significantly, financial market participants lost confidence in their ability to value associated financial instruments and demand for these products reduced dramatically in Summer 2007.

Due to the practice of warehousing now un-sellable structured credit products in off-balance sheet conduits, many financial institutions ended up holding significant 'bad debt' off balance sheet. This raised concerns about the credit quality of financial counter-parties (for example in bank-to-bank lending) and led to a retrenchment by investors generally, leading to significant deterioration in the functioning of the financial market.

The reduction in liquidity originating from the subprime mortgage crisis was the result of lenders feeling less confident in being able to screen out bad credit risks, leading to a situation where even creditworthy financial institutions, corporates and households might find it difficult to access credit and the interest rates they have to pay increase. Figure 14 shows the difference between UK base rates and 3-month money

rates and its widening due to the Credit Crunch in Summer 2007. The marked narrowing in December 2007 was the result of a round of central bank interventions. Nonetheless, it illustrates how relations in money markets can change unexpectedly.

### 3.14 Conclusion on historic debt premia

Between 2003 and early 2007 debt premia were relatively low and converged between borrowers with varying credit quality. This was due to:

- stable economic growth;
  - stable (and low) inflation; and
  - financial innovation
- which led to the underpricing of risk.

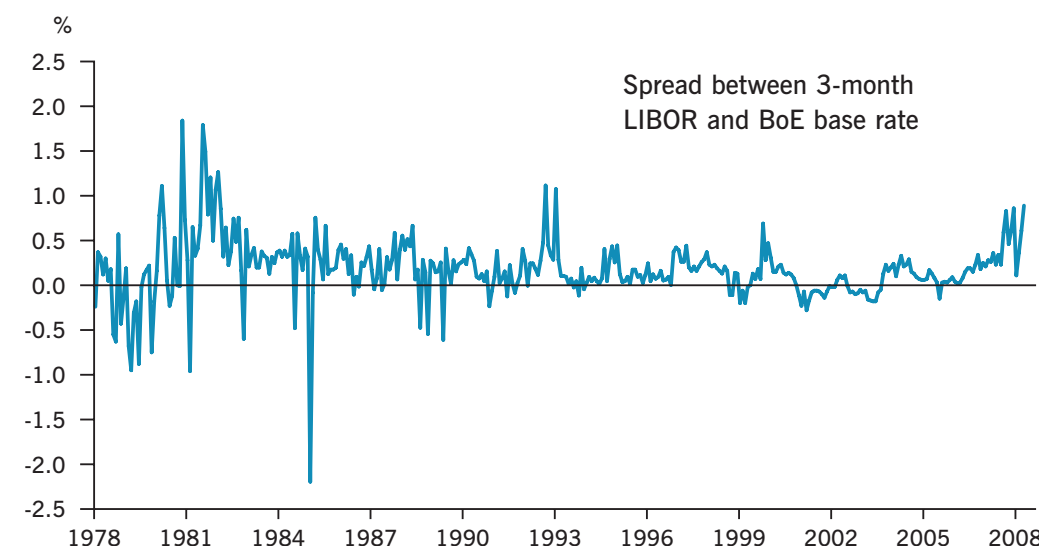
Since the Credit Crunch of mid-2007, the position is very different:

- the valuation of new and innovative financial products has become uncertain;
- investors are far more risk-averse;
- debt premia have sharply increased; and
- the differentiation in premia for companies of varying credit quality has grown.

Were the stability of economic growth and inflation to be questioned, this would be expected to further increase debt premia.

Between 2003 and 2007 risk was underpriced

Figure 14: UK: money market rates and base rates



Source: Oxford Economics/Haver Analytics

Section 3: Economic factors in uncertain times:  
the cost of debt (continued)

A rating  
downgrade  
would increase  
cost of debt  
significantly

The plausible  
range of debt  
premia for  
single 'A' rated  
entities would  
seem to lie  
between around  
1% and 1.7%

3.15 Evaluation of the future  
macroeconomic factors

From the foregoing analysis it is clear that many of the macroeconomic drivers are the same for the Risk Free Rate and debt premia.

As to where the conflicting pressures from GDP growth and inflation, investor risk aversion, global capital flows and the Credit Crunch might lead, Deloitte believed that the balance of pressures were pointing towards an increase in the cost of capital from the position as at 14 February 2008. At this point, Severn Trent Water, with an 'A' rating, was about to issue eight-year Eurobonds at a cost, excluding fees, of 6.3% (6.4% including fees).

Oxford Economics saw borrowing costs as being higher than those of the last five years, with Risk Free Rates and debt premia both rising towards their long-term averages. Oxford Economics also produced a table of where they saw potential Risk Free Rates, borrowing costs for single 'A'

and 'BBB' rated entities, and associated probabilities, as set out in Figure 15.

Compared to their view of a year previously, Oxford Economics saw the weighted average cost of debt as around 0.1% higher than before, with greater downside and less upside risk.

Taking all the above factors into account the plausible range of debt premia in different economic circumstances for single 'A' rated entities typically seems to lie between around 1% and 1.7%. The range for 'BBB' rated entities is much greater, the high end of this range, (assuming that debt was actually available for this rating in tight economic circumstances), based on historic data, typically being around 2.5%.

In addition, it is clear that, should the company experience a rating downgrade, its cost of debt (assuming it was still available) would increase significantly.

Figure 15

Scenario	Probability	Real Risk Free Rate	Nominal Risk Free Rate	Nominal 'A' rated borrowing rate	Nominal 'BBB' rated borrowing rate
Base	53%	2.2	5.0	6.2	6.9
Risk Premium rise	15%	2.2	5.0	6.4	7.2
Deeper Credit Crunch	5%	1.4	3.7	6.0	7.0
Central bank credibility collapse	2%	3.6	7.4	9.0	9.7
Inflow collapse	5%	3.2	6.0	7.7	8.4
Higher inflows	20%	1.8	4.6	5.5	6.2
Weighted average		2.2	5.0	6.2	6.9

3.16 Transaction costs

Typical transaction costs for bond or similar debt issues depend upon the state of the capital markets, the tenor of the debt issue and the credit rating of the issuing company. If the debt issue is underwritten, which is most likely for large or more complicated transactions or those of lower rated issuers, the cost would be higher. Transaction costs typically include arranging bank fees, underwriting commissions, legal fees, rating agency charges, printing and marketing costs. We estimate that these costs may be equivalent to 0.10% of the annual interest cost.

3.17 Cost of carry on cash deposits and commitment fees

All water companies have audit and regulatory requirements to demonstrate adequate liquidity and compliance with the going concern licence condition. Licence Condition 6A.2 states *"The appointee shall, at the same time as it complies with subparagraph 9.3 (submission of accounting statements) submit to the Director a Certificate in the following terms: (1) that in the opinion of the Directors the Appointee will have available to it sufficient financial resources and facilities to enable it to carry out, for at least the next 12 months, the Regulated Activities (including the investment programme necessary to*

*fulfil the Appointee's obligations under the Appointment)"*.

There is a cost to holding either cash balances or undrawn committed bank facilities that are sufficient to meet the cashflow needs for the next 18-24 months. This is equivalent to the borrower's debt margin above LIBOR, today as much as 1% for drawn funds and potentially 0.20% or more on undrawn bank facilities. In the current environment the larger UK water companies would need to hold reserves of several hundred million pounds to satisfy the requirements. The cost of this could add up to 0.2% to the total overall funding costs of the business.

This cost of holding cash and having undrawn bank facilities may seem significant. However, the alternative does not bear thinking about. If financial market conditions are very difficult access to finance becomes more of a constraint to companies than the cost of capital. The value of finance to an illiquid company becomes almost infinite as the alternative is insolvency.

3.18 Overall

Summarising the above, the theoretical and plausible range for each component of debt cost is shown in Figure 16.

Figure 16

	Theoretical Low	Plausible Median	Plausible High 'A' rated	Theoretical High 'BBB' rated	Ofwat 2004
	%	%	%	%	%
Risk Free Rate	2.0	2.3	2.5	2.5	3.0
Margin	1.0	1.5	1.7	2.5	1.3
Transaction fees	0.1	0.1	0.1	0.1	0.0
Commitment costs	0.1	0.2	0.2	0.2	0.0
	3.2	4.1	4.5	5.3	4.3

The value of  
finance to an  
illiquid company  
becomes almost  
infinite as the  
alternative is  
insolvency



Section 4: Economic factors in uncertain times:  
the cost of equity

Empirical evidence of the Equity Market Risk Premium is not straightforward to interpret

Severn Trent's share price volatility is... on a par with utilities as a whole, and the FTSE 100

4.1 Introduction

When estimating a company's cost of equity, finance practitioners and regulatory authorities typically place great weight upon the Capital Asset Pricing Model (CAPM).

Under CAPM, the cost of equity to a company is represented by the Risk Free Rate (provided by gilt yields) plus a premium representing the relative risk of a company relative to the market as a whole. The more a company's share price moves with the market, the greater the risk as measured by Equity Market Beta. An Equity Market Beta value of 1 implies perfect correlation with the market.

The formula for CAPM is as set out below:

Cost of Equity =  
Risk Free Rate + (Equity Market Beta x  
Equity Market Risk Premium) OR  
 $K_e = R_f + (\text{Equity Market Beta} \times \text{EMRP})$

4.2 The Risk Free Rate

The economic factors driving the Risk Free Rate, and the plausible range of values, were described in Section 3 above.

4.3 The Equity Market Risk Premium

The Equity Market Risk Premium (EMRP) is the additional average return compared to the average risk free return to compensate an average investor for investing in equities of average risk.

- In principle, the level of the EMRP is driven by:
- supply and demand of savings and capital;
  - GDP growth;
  - inflation; and
  - macroeconomic volatility.

Unlike for the Risk Free Rate, or the cost of debt, empirical evidence of the EMRP is not straightforward to interpret, and neither is the effect of the macroeconomic factors driving the level of the EMRP easy to quantify.

The EMRP is always taken from historical data. The length of the time series selected can make a significant difference to the rate calculated. Over different periods EMRP has varied between 4% and 6% and has been as high as 10%.

Valuation practitioners typically use a range of between 4% and 6%.

4.4 Equity Market Beta

The Equity Market Beta measures the correlation between the individual stock and the market as a whole. The data is essentially backwards looking and therefore may not be a good predictor of future market behaviour. Equity Market Betas for the water sector and for Severn Trent have moved towards a value of 0.9 over the last two years. Further back in time, values as low as 0.6 can be observed. It is quite likely a simplified assumption of 1.0 would be used again by a regulator, particularly as the Beta is also subjective.

The evidence suggests that the volatility of Severn Trent's share price is at least on a par with utilities as a whole, and also the FTSE 100. However, for most of this period, the observations are for more than Severn Trent Water, as the holding company also owned Biffa and Severn Trent Laboratories. The other UK water companies have also divested their non-core activities and hence short time series Equity Market Betas are more useful than longer historical data.

The shortage today of publicly quoted UK water companies makes the calculation of Equity Market Betas difficult and potentially unreliable as a guide for the whole Industry.

Summarising the above, the plausible figures for the cost of equity are in the range 7.3% to 8.5% as set out in Figure 17.

Figure 17

	Theoretical Low %	Plausible Median %	Plausible High %	Ofwat 2004 %
Risk Free Rate	2.0	2.3	2.5	3.0
Equity Risk Premium	4.0	5.0	6.0	4.7
Equity Market Beta	0.6	1.0	1.0	1.0
Overall	4.4	7.3	8.5	7.7

4.5 Other methods of evaluating equity returns

In addition to CAPM other techniques can be used to assess the cost of equity such as:

- discounted cashflow modelling;
- assessing the level of buy-out premia; and
- assessing the level of share price premia compared to RCV.

Discounted cash flow valuation models are dependent upon the cash flow modelling assumptions used, in particular the estimate of real water price increases over the plan life which are partly dependent on Ofwat's WACC assumption. It becomes circular trying to calculate a return on equity for the Industry using this method.

Buy-out activity has been at a premium to regulated capital values, although this at least in part has been fuelled by access to cheap debt before Summer 2007, which is no longer available. In addition, transaction data is often not publicly available and prices are in any case influenced by assumptions about future regulatory settlements.

In respect of the share price premia to RCV, Figure 18 shows this over the period from January 2003, in the run up to the 2004 Periodic Review, to the present.

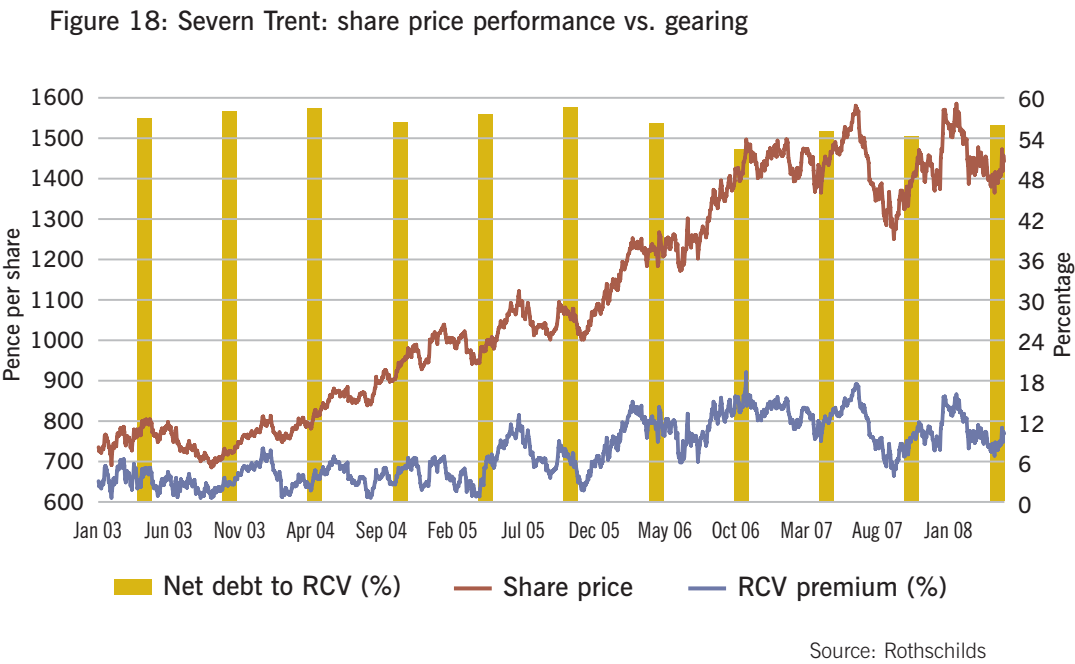
The chart shows that since early 2003, Severn Trent has typically traded at a single figure premium to RCV.

Although this method of indicating the cost of equity is not ideal, because market values are affected by investor expectations of the future regulatory allowance for the cost of capital, it is a useful cross-check. This suggests that Ofwat's estimate of the cost of capital at PRO4 (of 5.1% plus financeability adjustments) was not unreasonable.

Ofwat's estimate of cost of capital at PRO4 was not unreasonable



Section 4: Economic factors in uncertain times:  
the cost of equity (continued)



4.6 Conclusion

Using the Capital Asset Pricing Model:

- We observe a Equity Market Beta value of between 0.6 and 1.0.
- The evidence suggests an Equity Market Risk Premium between 4% and 6%.
- We have already estimated the Risk Free Rate between 2.0% and 2.5%.
- Combining the above leads to a Cost of Equity between 4.4% and 8.5%.

The evidence, including the low premium to RCV at which Severn Trent has traded, suggests that the cost of equity lies towards the higher part of the range.

Section 5: Summary and the market today

From the conclusions of Section 3 and 4, the potential range of values for the Weighted Average Cost of Capital for the AMP5 period is set out in Figure 19.

Based on current market conditions, and assuming markets in future behave in a similar manner to in the past, our theoretical WACC range is between 3.2% and 5.3% for an 'A' rated entity, and our plausible range is:

- between 4.7% and 5.3% for an 'A' rated entity; and
- up to 5.7% for a 'BBB' rated entity.

To place the issue in context, in Section 6 we set out the specific factors relating to the Water Industry in England and Wales.

The plausible range for the WACC is between 4.7% and 5.3% for an 'A' rated entity

Figure 19

	Theoretical Low	Plausible Median	Plausible High 'A' rated	Theoretical High 'BBB' rated
		%	%	%
Cost of Equity	4.4	7.3	8.5	8.5
Cost of debt (pre tax)	3.2	4.1	4.5	5.3
WACC at 60% gearing	3.2	4.7	5.3	5.7

## Section 6: Water Industry specific factors

The level of investment will require further substantial borrowing

### 6.1 Introduction

The Weighted Average Cost of Capital is an important part of the regulatory price settlement. Based on a RCV that will be around £6.5 billion over the next five year AMP, WACC of 5% would be worth approximately £1.6 billion in stakeholder returns for Severn Trent. A 0.25% variation in WACC can make a difference of £75 million over five years. This could represent the difference between Severn Trent being a stable well-funded business or one experiencing difficulties in satisfying its lenders and shareholders whilst it attempts to fund its investment plan. The reasons why the cost of capital is so important for Severn Trent and the rest of the Water Industry in England and Wales are set out below.

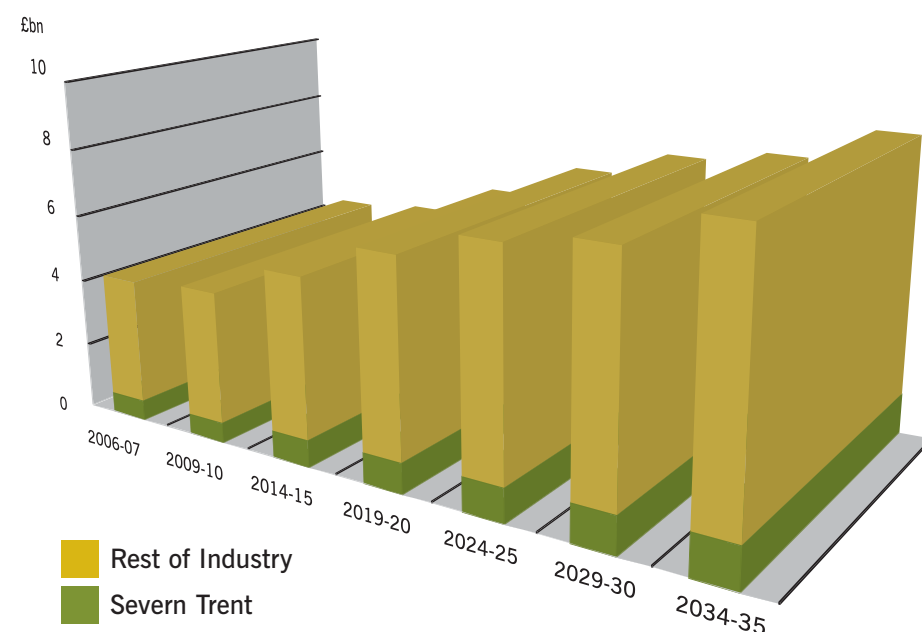
### 6.2 Investment volumes

From our own Strategic Direction Statement, and the picture provided by other companies in England and Wales, it would seem likely that the drivers of the Water Industry's investment programme, such as the adoption of private sewers, climate change, and the need for increased network resilience, will continue. This means the level of investment required will not reduce in the foreseeable future but require further substantial borrowing.

Figure 20 shows Severn Trent's estimate of our own, and total Industry, investment over the next 25 years. Figures for Severn Trent are taken from our Strategic Direction Statement. Figures for the remainder of the Industry assume that the proportion of Industry investment carried out by Severn Trent is held constant.

The chart shows that Severn Trent views it likely that its level of investment will rise to over £1 billion per annum by 2035, with the Industry figure approaching £9 billion annually in nominal terms.

Figure 20: Annual Industry investment



Source:  
Severn Trent estimate

### 6.3 Debt volumes

The scale of the investment programme for the Industry in the 18 years since privatisation, around £70 billion (source Ofwat presentation 2007), coupled with the fact that customers pay for improvements typically over many years, has led to the providers of debt, rather than customers, funding the investment programme.

The level of debt for Severn Trent, and the whole Industry in England and Wales, is shown in Figure 21. Figures for Severn Trent were taken from the modelling underlying our Strategic Direction Statement, assuming 60% gearing. The increase in debt of the remainder of the Industry has been pro-rated in line with the increase in Severn Trent's debt.

The chart shows that Industry debt is projected to rise from nearly £30 billion at the end of 2006/7, to approaching £90 billion by 2035. However, the debt which is required to be financed is not just the additional debt of around £60 billion. Much of the debt existing at 2006/7 will mature and need to be refinanced, some of it several

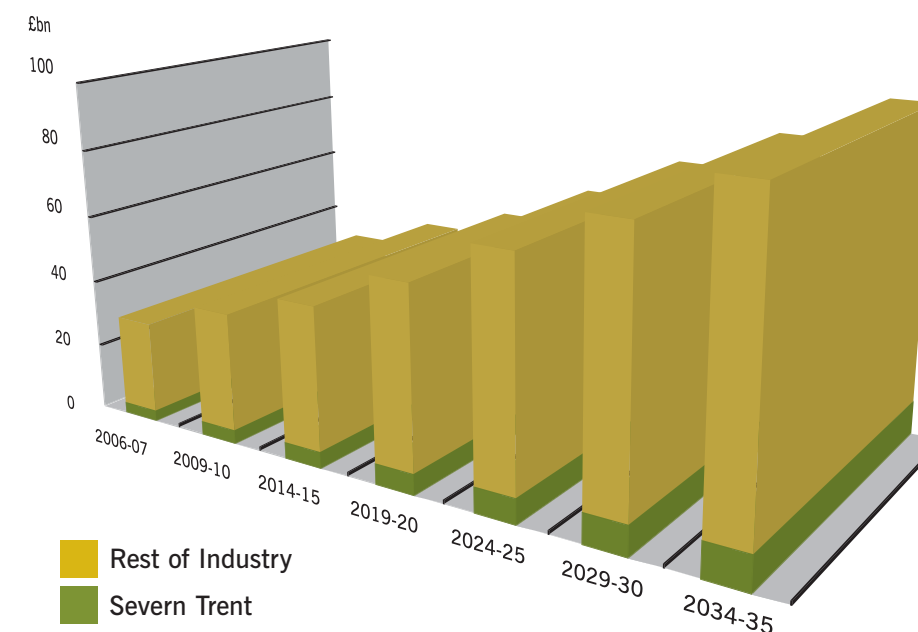
times over the same period. Consequently, based on these projections, the amount of debt finance which the Water Industry in England and Wales will need to attract is closer to £90 billion than £60 billion.

Looking at this in a different way, for Severn Trent the amount of debt is likely to rise from around £1,000 per customer today to around £2,600 by 2035, and for the Industry as a whole to around £6,500 per customer by 2035. In addition the interest cost is likely to rise from around £100 per customer in 2006/7 to nearly £400 in 2035, all in nominal terms.

Severn Trent's debt is lower than the Industry average because it has lower gearing and lower RCV per customer than most companies. Severn Trent's RCV per customer is relatively low because post privatisation capital programmes for the rest of the Industry have typically included a significant element of sea outflow water quality improvement. Severn Trent has no coastline.

Figures for Severn Trent and the Industry are shown in Figure 22.

Figure 21: Industry debt



Source:  
Severn Trent estimate

Severn Trent's debt per customer is likely to rise to £2,600 per customer by 2035

Section 6: Water Industry specific factors (continued)

It is likely index-linked insurance will still be available for UK water companies but will be far less significant

Figure 22: Projected levels of debt Strategic Direction Statement 60% geared outturn prices

		2007		2035	
		SVT	Industry	SVT	Industry
Debt	£/customer	987	2193	2600	6500
Bill	£/customer	264	291	600	700
Interest per customer	£/customer	45	106	160	380

Source: Severn Trent estimate

6.4 Developments in the debt market for UK water companies

As was seen above, large amounts of debt are likely to be needed by Severn Trent and the rest of the Water Industry to finance investment. What are the potential sources of funds? There seem to be a number of potential sources as follows:

- index-linked debt;
- leasing;
- bank loans;
- the European Investment Bank; and
- bond markets.

Each is considered in turn below.

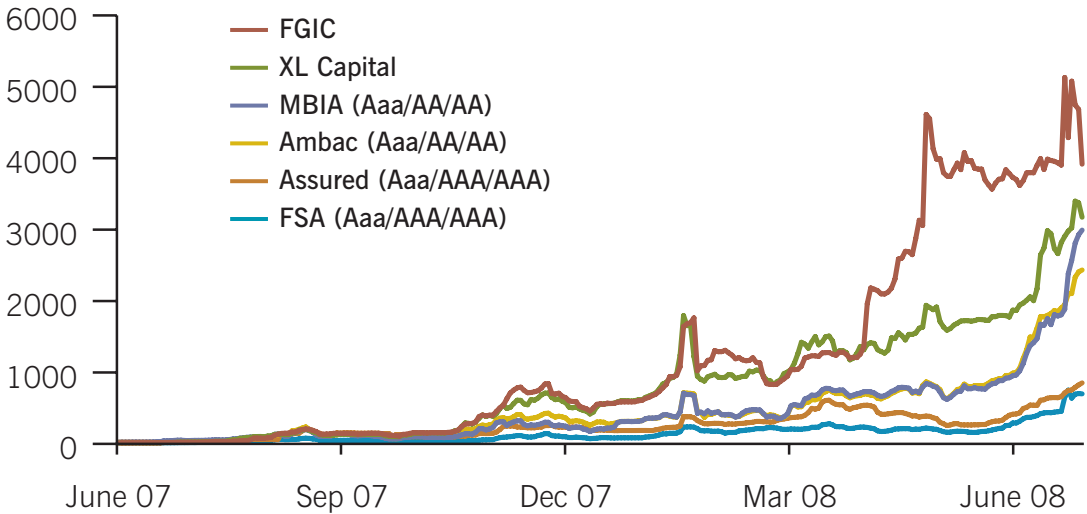
6.5 Growth in index-linked debt market

In AMP4, the use of index-linked debt has been popular. Some water companies have transformed their interest exposure profile by borrowing as much as 60% of their debt in this form. Facilitated by the underlying low rates on long-dated gilts (see Section 3) the Industry was able to borrow significantly using very long-dated index-linked bonds, with maturities

of up to 60 years. This enabled issuers to benefit from the inverse shape of the UK interest rate yield curve and demand from LDI motivated pension fund investors. The debt was mainly acquired by structured financiers, who utilised monoline insurance cover to enhance the credit ratings to 'AAA' and isolate themselves from any regulatory or licence loss risk. This market has been severely disrupted by the difficulties in the monoline insurance sector as shown in Figure 23.

The cost of monoline insured transactions has increased to the point that it is now cheaper to issue without the credit wrapper. It is likely that index-linked issuance will still be available for UK water companies, however with 20 to 30 year maturity and without credit investor protection. This market may now also only be available to highly rated UK water companies and not to 'BBB' rated issuers. The market window seen in 2007 for lower rated and long-dated index-linked debt, has now effectively closed, and appears unlikely to revive.

Figure 23: Monoline insurer credit default swap spreads Source: MarkIT



6.6 Leasing

The leasing market was a significant source of finance in the early years after privatisation of the Water Industry. However, tax changes and the development of alternative sources of funding now make this a much less significant source of funding for the future. Pricing of lease finance will generally be expected to reflect the underlying capital market spreads or bank margins for the borrower, depending upon the quality of security, credit rating and any tax benefits still available.

6.7 Bank loans

The bank market can provide a relatively cheap source of funding to UK water companies, pricing at a set percentage over LIBOR. Banks generally make low returns on their direct loans to investment grade businesses. Loan facilities have therefore been used to provide back-up committed borrowing capacity or bridge funding in anticipation of capital market transactions. Figure 24 below shows the margin over LIBOR for different credit ratings over the last seven years.

Overall, the cost of bank finance will depend upon market conditions and company credit ratings.

As would be expected, the margin over LIBOR is higher for lower-rated issuers than for higher-rated issuers, and follows a similar path to the premia in bond markets shown in Figures 13 and 25, although the spreads are typically less wide.

Under difficult market conditions, margins in the bank loan market tend to be more resilient than the corporate bond market – banks usually price facilities based on “overall relationship”.

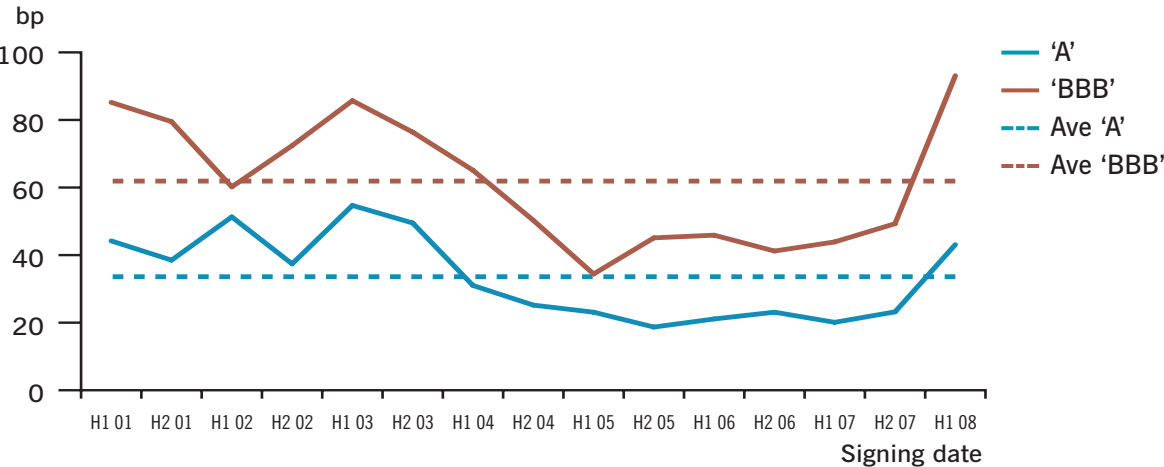
Whilst margins have widened as a result of a general readjustment in the pricing of risk, money markets have suffered markedly, thus driving LIBOR to higher levels.

Capacity and portfolio considerations mean that it is unlikely that bank loans will provide a more prominent share of water companies' finances in future, and that as debt in the water sector rises, bank debt will not rise proportionately.

In addition to bank loans, the banks also provide currency swap lines to companies, which are necessary for prudent risk management when borrowing in non-sterling markets.

The cost of bank finance will depend upon market considerations and company credit ratings

Figure 24: Investment grade loan margins over swaps Source: Dealogic; Loanware\*



\*All rated investment grade Euromarket loans excluding financial institutions with a signing date from 2001 to H1 2008. All loans rated BBB- to BBB+ and A- to A+ have been grouped into BBB and A bands respectively and also into half year periods. The data includes all publicly available pricing information but is limited to rated corporates of which there are very few in certain periods. The data will include transactions for a multitude of maturities, structures and purposes including both general corporate purposes and acquisition financings.

The most likely source of loans for water companies will be bonds

6.8 European Investment Bank

The European Investment Bank (EIB) has been a useful source of finance for the UK Water Industry. It has a remit to support infrastructure investments across the EU and lends at margins that reflect its own quasi-governmental cost of capital. The EIB is constrained by portfolio considerations from providing more than a small proportion of the capital required by the UK Water Industry, in the case of Severn Trent around £500 million. It typically lends for maturities of between five and ten years.

6.9 Bond markets

The most likely source of loans for water companies will be the bond markets. This will be true both for the investment grade companies and those where securitisation transactions are involved. Bonds can be either issued via public offers or through private transactions. They will be priced similarly. Lending margin ‘spreads’ had narrowed significantly since 2000. However the credit crisis in Autumn 2007 has pushed up spreads from a minimum of 0.7% for an ‘A’ rated issuer to approximately 2.0% in Spring 2008, as seen in Figure 25.

6.10 The importance of credit ratings

Figure 25 makes clear the differential between ‘A’ and ‘BBB’ issue spreads in the bond market, which has moved from as few as 0.15% to as many as 1.25%. This is clearer than for the bank market, where terms and covenant changes were also evident.

The credit rating is extremely important in determining access to bond market funds, and the price to be paid.

We believe Credit Rating Agencies will come under significant pressure to become more cautious in their ratings as a result of their involvement in the factors leading up to the Credit Crunch.

6.11 Sector debt capacity limits

The total borrowing requirement may reach sterling sector capacity limits. This means that the water sector will have to seek alternative capital sources, including issuing more debt in Euro and US dollars, which represent far larger markets as set out in Figure 26. There will initially be costs to opening these sources of funding and to swapping debt issues back to sterling. These may be offset by the deeper liquidity in the larger Euro and US dollar capital markets. However, as has been noted above, derivative credit counterparties are necessary.

The credit rating is extremely important in determining access to bond market funds, and the price to be paid

Figure 25: Credit spreads for ‘A’ and ‘BBB’ rated debt

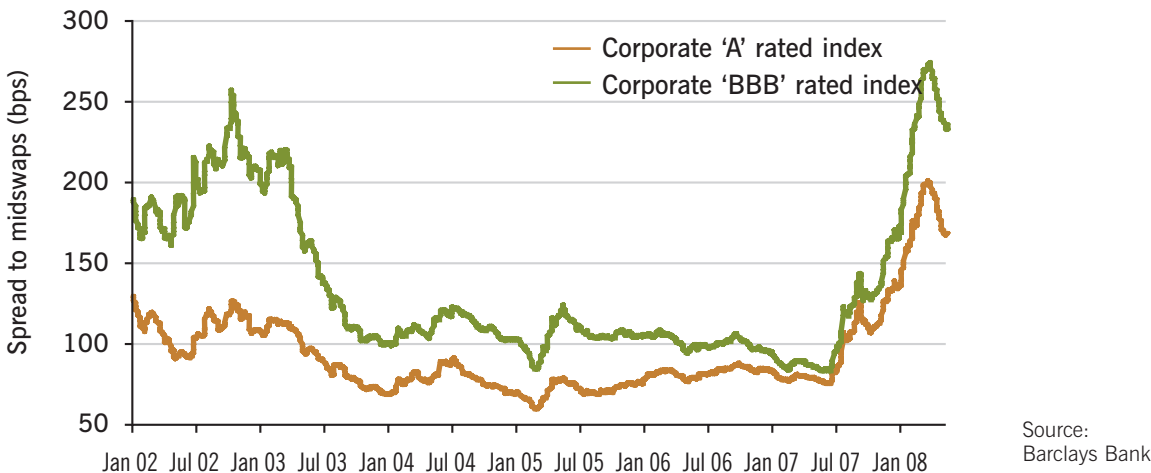
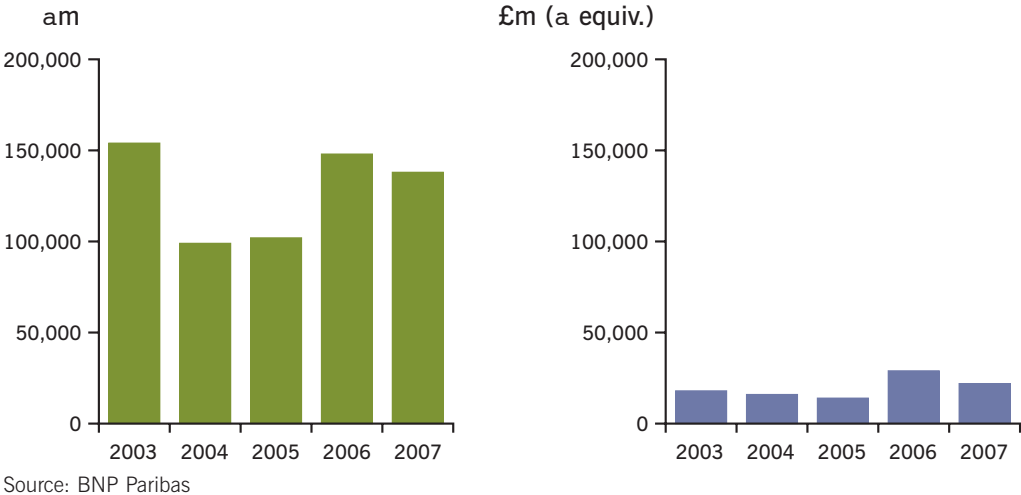


Figure 26: Issuance volume





The bulk of the water sector has retained an 'A' grade credit rating

6.12 Water company ratings as at 4th February 2008

Figure 27 shows the issuer credit ratings of the ten water and sewerage companies in England and Wales.

Figure 27	S&P	Moody's Bond rating	Moody's Family Corporate rating
Severn Trent Water	A	A2	n/a
Anglian Water Services	A-	A3	Baa1
Northumbrian Water Limited	BBB+	Baa1	n/a
South West Water	N/R	N/R	N/R
Southern Water Services	A-	A3	Baa1
Thames Water Utilities	BBB+	A3	Baa1
United Utilities Water	A-	A3	n/a
Welsh Water	A	A3	Baa1
Wessex Water Services	BBB+	A3	n/a
Yorkshire Water Services	A-	A2	n/a

Source: RBS

Of the nine companies with a credit rating six have a rating of 'A' or 'A-', and three are rated as 'BBB+'. For access to debt funding, and its cost, the bulk of the water sector in England and Wales has retained an 'A' grade credit rating.

The total to be raised before the end of AMP5 is around £2 billion

6.13 Embedded debt

Severn Trent's business plan assumes that in excess of £200 million of new debt will need to be raised in each year to the end of AMP5. Debt maturities will mean that a further £200 million per year will be needed for refinancing. In total around £2 billion is to be raised before the end of AMP5.

Only around half of the debt that Severn Trent will have in 2015 has already been raised. Half of this is in the form of 50- and 60-year maturity index-linked notes.

Today 70% of Severn Trent's debt portfolio is at fixed rates of interest. This will fall significantly by the end of AMP5. Interest is fixed via embedded terms in bond issues, or as a result of interest rate swaps, aiming

to secure interest costs below current market variable rates.

The use of interest rate derivatives is common in the water sector, as companies seek to minimise interest rate risks. These are often concentrated on the current AMP period. This means that exposure to variable interest rates will come earlier than the underlying debt maturity profile.

There is a significant probability that much higher average interest rates could be paid on existing debts during AMP5, as swap portfolios are replaced at higher market rates, or companies pay floating LIBOR based interest costs. In short, interest rates achieved in AMP4 may not continue into AMP5.

6.14 Equity and debt mix in the UK water sector

During AMP4, several UK water companies have been acquired by financial investors, who have increased the proportion of debt in their capital structures. This was partly to arbitrage the target gearing (55% of RCV) implicit within the 2004 pricing settlement.

The credit rating of water operating companies in these groups may be better than that of their group holding companies. This is due to the requirement of Ofwat to maintain investment-grade credit ratings for the regulated businesses. As a consequence the holding companies may include much more risky classes of debt or equity, which are subordinated to the claims of creditors of the operating companies.

In benign financial markets there has been demand from investors for financial instruments issued by holding companies in the expectation of higher returns than from the operating company. However, in difficult markets, these leveraged capital structures may prove hard to refinance, which in turn could place stress on the credit ratings of the operating businesses.

6.15 The importance of regulatory stability

A crucial factor in allowing the water sector to maintain its strong credit ratings is the perception of regulatory stability. Should there be a major change to the regulatory regime, or a pricing regime that is seen as establishing a new, much tougher, environment for the Industry, the ratings could suffer. This would in turn place more pressure on investment as the availability of debt would reduce and its cost rise.

Ofwat has historically used financeability adjustments to fine tune returns in light of water company capital spending plans. This is largely a factor determined by reference to individual business plans and is a valuable tool in funding and regulation.

6.16 Conclusion

- Substantial amounts of new money need to be raised by the Water Industry to fund planned investment.
- Industry aggregate debt could rise to £90 billion by 2035
- The Industry cannot rely on access to the index-linked debt market following the Credit Crunch and the decline of the monoline credit insurers.
- Leasing was historically an important source of funds, now opportunities are limited.
- The amount of the debt requirement means that commercial bank loans and the EIB can only provide a part of the funding demanded.
- Bond markets will remain the key source of funding for the water sector.
- Credit quality will become increasingly important as only the best-rated issuers will be certain of raising sufficient competitively priced funds.

Credit quality will become increasingly important to be certain of raising sufficient competitively priced funds



The outlook for economic growth and inflation is worsening

7.1 Introduction

As set out in Sections 3 and 4, the key macroeconomic drivers affecting the availability and cost of finance are:

- GDP growth and inflation;
- global capital flows;
- the Credit Crunch; and
- asset liability matching.

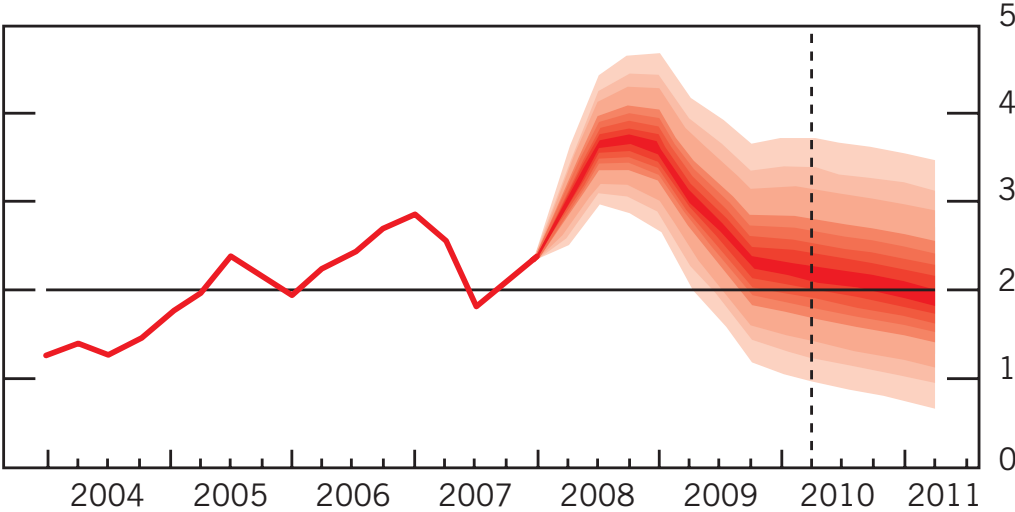
Where might these be heading?

7.2 GDP growth rates, inflation rates and their volatility

Sections 3 and 4 set out how stable growth and stable, low inflation have led to reductions in the cost of borrowing for both government and corporations.

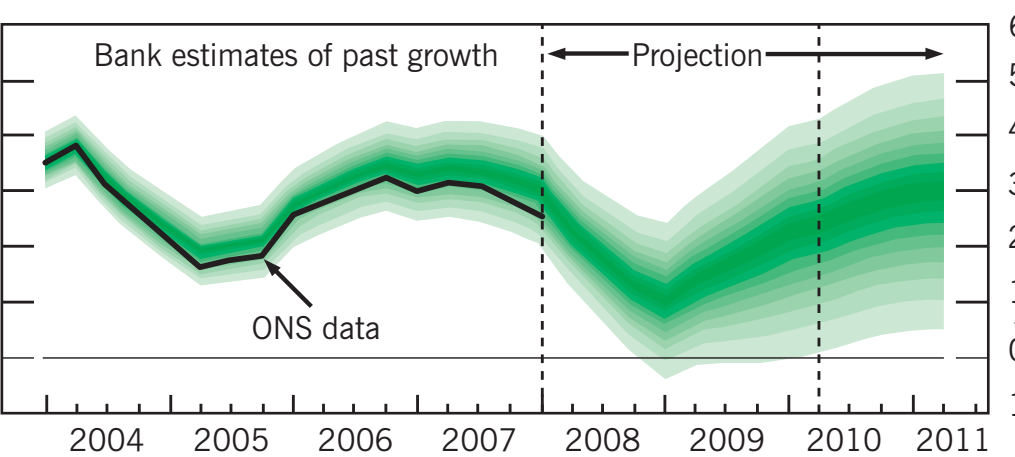
Figures 28 and 29 show charts from recent publications (May 2008) from the Bank of England which confirm that the outlook for both economic growth and inflation are worsening, at least in the next year or two.

Figure 28: CPI forecast



Source: Bank of England

Figure 29: UK economic growth forecast



Source: Bank of England

In addition to the UK, the picture seems to be worsening in the Eurozone. The Governor of the European Central Bank (ECB) stated in December 2007 that: *"It is the view of the ECB Governing Council that the risks to this medium-term outlook for price developments are fully confirmed to lie on the upside, mainly relating to possible further rises in oil and agricultural prices, increases in administered prices and indirect taxes beyond those foreseen thus far."*

Similarly the ECB's GDP growth expectation for the Eurozone is associated with significant downside risk, as J-C Trichet states: *"... in view of the potential impact of ongoing financial market volatility and re-pricing of risk on the real economy, this assessment remains surrounded by a high level of uncertainty. And in the Governing Council's view, the risks surrounding this outlook for economic growth lie on the downside."*

Reflecting the current market uncertainty, both Oxford Economics and Deloitte saw the pressure from economic growth, inflation rates and volatility as likely to increase the cost of capital over the next few years, as compared to the period from 2003 to 2007. However, Oxford Economics in particular believed it unlikely that the "great moderation" of the preceding decade would largely unwind.

One possible, though very bad, outcome would be for a combination of high inflation, low growth and rising unemployment, in which case politicians could challenge central bank independence, which has been an important factor in obtaining recent economic stability.

7.3 The Credit Crunch

Sections 3.9 and 3.13 set out how the Credit Crunch has reduced the availability of debt finance, and increased its cost – most markedly for poorly rated corporations. The key questions are whether the Credit Crunch will deepen, and will it be a short or long-term effect.

Again, reflecting an uncertain future outlook, Deloitte did not express a view on the likelihood of the Crunch deepening and persisting for many years. Oxford Economics, however, viewed the probability of the Credit Crunch getting significantly worse and persisting, Japanese style, for many years, as being unlikely.

However, since our consultants' reports were received in January and February 2008, the Credit Crunch does seem to have worsened. Severn Trent has issued 8-year bonds at a higher cost than that expected by Oxford Economics in their base case (6.3% before costs, as compared to Oxford Economics 6.2%), and there have been indicators that borrowing is becoming typically more difficult, rather than less. For example, in the wake of the Halifax's decision to tighten its lending criteria, The Times of 4th April, p52, reported "The total number of home loan products available has fallen by 13% since Monday, with lenders pulling deals that were attracting too much business, or leaving the market altogether. There are now only 4,679 mortgages available, compared to 15,599 at the beginning of July."

There is clearly great uncertainty over whether the Credit Crunch will continue to deepen, and for how long it may last. However, it would seem unwise to expect any return to the credit conditions prevailing in the period before the Crunch began.

There is uncertainty over whether the Credit Crunch will deepen

## Section 7: Outlook and sensitivity (continued)

There is uncertainty regarding global capital flows. The ability of companies to raise finance could well deteriorate

### 7.4 Global capital flows

Section 3.4 set out how, in the recent past, we have experienced an historically highly unusual situation in which net international capital flows flow ‘uphill’ – that is from developing countries to developed economies. Much of this capital is from sovereign wealth funds investing into Western government bonds and so exerting a downwards pressure on risk-free interest rates.

Deloitte did not express a view on whether global capital flows were likely to increase or reduce, but Oxford Economics believed that the flow of funds was likely to reduce as countries such as China and the Gulf States were likely to move towards more flexible exchange rate regimes, the effect of which would allow the sterling Risk Free Rate to rise over time. The extent to which foreign investors became less risk-averse would also affect the balance between the cost of debt and the cost of equity.

There is a great deal of uncertainty in this area.

### 7.5 Asset liability matching

As discussed in Section 3.5 it appears likely that the unusual compression of real yields at the very long-end of the UK yield curve can be traced to the investment behaviour of pension funds.

Oxford Economics believed that the effect might decline, suggesting that there is some evidence of pension funds shifting towards investments in ‘alternative’ assets such as property, commodities, and even hedge funds.

Demonstrating the current uncertainty, Deloitte had a different view of the future. In their opinion, further tightening of accountancy practice and guidance from The Pensions Regulator, would seem likely to continue the pressure on gilt yields and the trend towards long-dated bond investment by pension funds would continue.

Again, uncertainty prevails.

### 7.6 Cost and availability of finance

From the above it is clear that the macroeconomic landscape is unlikely to be as favourable for raising finance as it has been in recent years. Factors such as the continuing (and worsening) Credit Crunch, and the likely reduction in “uphill capital flows” mean that the ability of companies to raise finance are at best uncertain, and could well deteriorate.

What does this mean for Ofwat in considering the level of the Cost of Capital to set in PR09?

### 7.7 The Water Industry context

Section 6 demonstrated how the Water Industry is likely to need to borrow or refinance towards £90 billion over the years to 2035 to finance its investment programme and refinance existing debt.

It showed the crucial importance of retaining a strong credit rating to be confident of being able to attract debt finance at an acceptable cost, in a variety of market conditions.

In this environment, lower-rated water companies will face more difficult access to finance, particularly where markets are uncertain.

### 7.8 Importance of credit ratings

The rating agencies, Moody’s and S&P, evaluate each industry sector and its risk profile as part of their consideration of all rated companies. In the case of the UK Water Industry agencies place reliance on the strong and supportive regulatory regime and in particular on the obligation to ensure that the Industry can be financed.

It is possible that the whole sector could be downgraded by the Credit Rating Agencies, if a highly geared company were to fail to refinance debt it had taken out when market conditions were more favourable. This could occur, for example, if the market believed the company poorly placed to survive in a newly competitive environment.

A further consequence of the Credit Crunch is that the rating agencies will be under pressure to be more cautious in their approach. This could result in lower credit ratings for companies and business sectors.

### 7.9 Regulatory asymmetry of setting WACC

In this context of the macroeconomic uncertainties, and given the context of the Water Industry, with its need for debt finance and strong credit ratings, Ofwat should consider erring on the side of caution when selecting WACC. The decision on an appropriate return is asymmetric.

Although a WACC which, with the benefit of hindsight, was too high will result in profits for the Industry being higher than Ofwat expected, a WACC that is too low could have severe consequences for the Water Industry and its ability to finance its investment programme.

Both of these circumstances have occurred in recent years. At PR99, the WACC selected was seen as severe and share prices of water companies fell. In 2004 the WACC set was regarded by some commentators as having been beneficial to water companies. However, the financial market conditions in the run up to the 1999 settlement were benign and worsened after the AMP3 pricing announcement. Conversely, in 2004 the volatile markets of 2001 and 2002 were followed by three very stable years.

In summary, in both PR99 and PR04, the regulator’s WACC choice was heavily influenced by recent history. In the event, markets behaved in a different way in the following years.

The challenge in 2009 for Ofwat is to select a WACC that will be suitable for raising finance in the following years, even if the market deteriorates.

Credit defaults by any company could damage the whole sector

A WACC that is too low could have severe consequences for the Water Industry

7.10 What should the WACC allowance be?

Section 5 summarised the plausible range for the WACC as set out below.

Figure 30

	Theoretical Low	Plausible Median	Plausible High 'A' rated	Theoretical High 'BBB' rated
		%	%	%
Cost of equity	4.4	7.3	8.5	8.5
Cost of debt (pre tax)	3.2	4.1	4.5	5.3
WACC at 60% gearing	3.2	4.7	5.3	5.7

Given the macroeconomic uncertainties, the present cost of raising debt, and the large borrowing requirement of the next 25 years, we believe that a reasonable estimate of Severn Trent's cost of capital lies between the median and high points of the range for an 'A' rated company i.e. between 4.7% and 5.3%.

		Theoretical Low %	Plausible Median %	Plausible High 'A' rated %	Theoretical High 'BBB' rated %	Ofwat 2004 %
Risk Free Rate		2.0	2.3	2.5	2.5	3.0
Equity Market Risk Premium		4.0	5.0	6.0	6.0	4.7
Equity Beta		0.6	1.0	1.0	1.0	1.0
		4.4	7.3	8.5	8.5	7.7
Weighting	40%	1.9	2.9	3.4	3.4	45% 3.5
Risk Free Rate		2.0	2.3	2.5	2.5	3.0
Margin		1.0	1.5	1.7	2.5	1.3
Transaction fees		0.1	0.1	0.1	0.1	
Commitment costs		0.1	0.2	0.2	0.2	
		3.2	4.1	4.5	5.3	4.3
Tax relief	28%	(0.9)	(1.1)	(1.3)	(1.5)	30% (1.3)
		2.3	3.0	3.2	3.8	3.0
Weighting	60%	1.4	1.8	1.9	2.3	55% 1.7
WACC		3.2	4.7	5.3	5.7	5.1
Long-term inflation		2.5	2.5	2.5	2.5	
Implied long-term debt rate		5.5	6.3	6.7	7.5	

Appendix 2: Regulatory precedent of WACC 2003 to date

	Feb-03	Dec-03	Nov-04	Dec-04	Nov-05	Dec-05	Dec-06	Mar-07	Dec-07	Sept-07
Regulator	CAA(1)	ORR(2)	Ofgem(3)	Ofwat(4)	Ofgem(5)	CAA(6)	Ofgem(7)	CAA(8)	Ofgem(9)	CC
Company	BAA	Network Rail	DNOs	WoC/ WaSCs	NGET	NATS	NG	BAA (Heathrow)	GDNs	BAA (Heathrow)
Gearing (D/(D+E))	25%		57.5%	55%	60%	64%	60%	60%	63%	60%
D/E	33%		135%	122%	150%	178%	150%	150%	167%	150%
Tax Rate	30%		30%	30%	30%	11%	30%	30%	30%	28%
Risk-Free Rate	2.5%- 2.75%		2.75%	n/k	2.75%	2.5%	2.5%	2.0%	n/k	2.5%
Equity Risk Premium	2.5%- 4.5%		4.75%	n/k	4.75%	3.5%- 5.0%	5.2%	4.5%	n/k	2.5%- 4.5%
Asset Beta	0.6-0.75		0.4	0.45	0.4	0.6	0.35	n/k	n/k	n/k
Equity Beta	0.8-1.0		1.0	1	0.9	1.7	0.9	1.13- 1.26	n/k	0.90%- 1.15%
Post-tax Cost of Equity	4.5%- 7.25%		7.5%	7.7%	7.0%	8.3%- 10.3%	7.0%	7.1%- 7.7%	7.25%	4.8%- 7.7%
Debt Premium	0.9%- 1.2%		1.35%	n/k	1.0%	1.4%	1.25%	1.0%	n/k	n/k
Pre-tax Cost of Debt	3.4%- 3.95%	2.75- 3.25%	4.1%	4.3%	3.75%	3.9%	3.75%	3.0%	3.55%	3.55%
Real pre-tax WACC	7.75%	6.5%- 7.0%	6.9%	7.3%	6.3%	6.75%	6.3%	5.9%- 6.2%	5.9%	4.8%- 6.4%
Real Post-tax WACC (net of debt tax shield)	5.4%	4.6%- 4.9%	4.8%	5.1%	4.4%	6.0%	4.4%	4.1%- 4.3%	4.3%	4.5%

The chart shows the component parts and overall WACC out-turn of recent regulatory settlements.

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