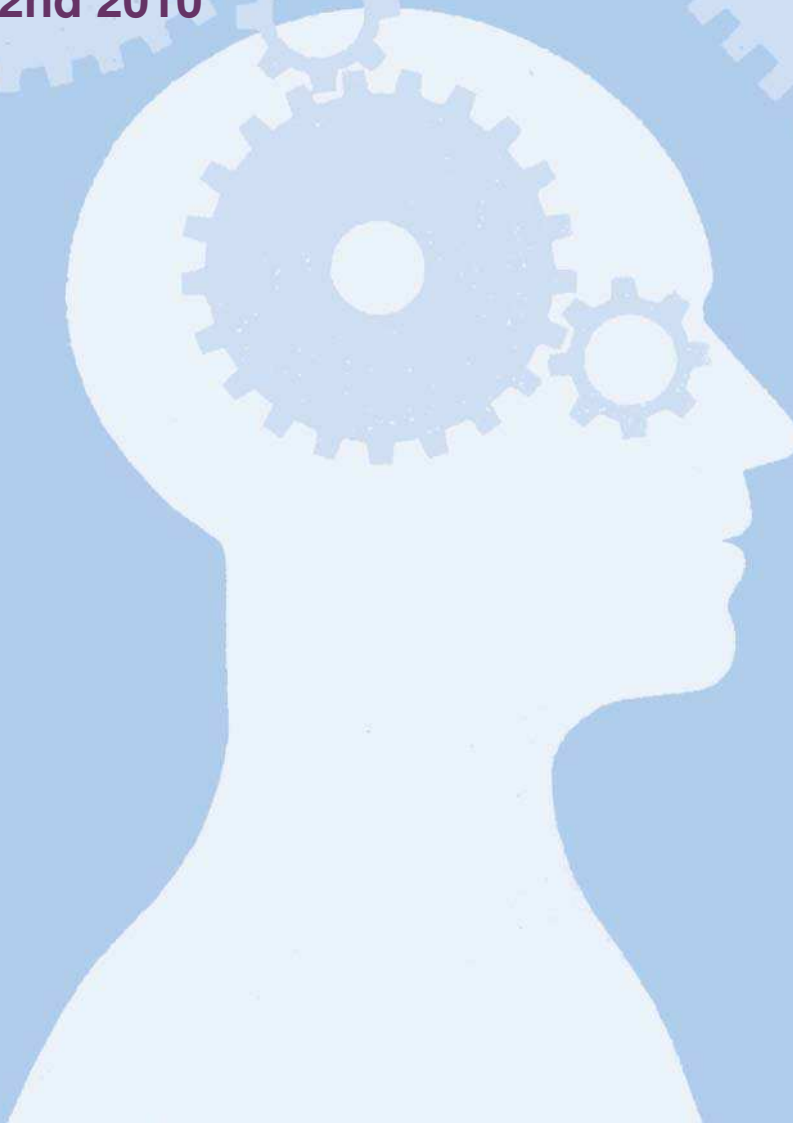


Updating the WACC for energy networks

Methodology paper

Prepared for Energiekamer

February 2nd 2010



Oxera Consulting Ltd is registered in England No. 2589629 and in Belgium No. 0883.432.547. Registered offices at Park Central, 40/41 Park End Street, Oxford, OX1 1JD, UK, and Stephanie Square Centre, Avenue Louise 65, Box 11, 1050 Brussels, Belgium. Although every effort has been made to ensure the accuracy of the material and the integrity of the analysis presented herein, the Company accepts no liability for any actions taken on the basis of its contents.

Oxera Consulting Ltd is not licensed in the conduct of investment business as defined in the Financial Services and Markets Act 2000. Anyone considering a specific investment should consult their own broker or other investment adviser. The Company accepts no liability for any specific investment decision, which must be at the investor's own risk.

© Oxera, 2010. All rights reserved. Except for the quotation of short passages for the purposes of criticism or review, no part may be used or reproduced without permission.

Contents

1	Introduction and summary	1
2	Inflation	4
2.1	Assessment criteria	4
2.2	Analysis and market evidence	7
2.4	Conclusion	14
3	Gearing	16
3.1	Assessment criteria	16
3.2	Analysis and market evidence	20
3.3	Conclusion	29
A1	Sources	31

List of tables

Table 1.1	Inflation range for the assessment of the WACC	2
Table 2.1	Current forecasts (%)	10
Table 2.2	Sources of inflation assumptions	12
Table 2.3	Inflation estimates for the Netherlands (%)	13
Table 2.4	Inflation estimates for the Eurozone (%)	13
Table 2.5	Inflation range for the assessment of the WACC	14
Table 2.6	Cross-check on risk-free rate estimates (%)	15
Table 3.1	Relationship between gearing and the pre-tax WACC (illustration) (%)	19
Table 3.2	S&P issuer rating of comparable network companies—history	24
Table 3.3	Summary of regulatory precedent: rating assumption for UK regulated utilities	25
Table 3.4	Debt/RAB of comparators	28
Table 3.5	Summary of regulatory precedent: gearing assumptions for UK and European regulated utilities	29
Table 3.6	Equity issuances by utilities	29
Table 3.7	Source of evidence on gearing	30
Table 3.8	Pre-tax WACC estimates for different gearing assumptions	30

List of figures

Figure 2.1	Building blocks of nominal returns	5
Figure 2.2	Nationality of investors participating in recent Dutch issuance	6
Figure 2.3	Inflation expectations and pricing data	7
Figure 2.4	Inflation in consumer prices in the Eurozone and the Netherlands (year-on-year growth)	8
Figure 2.5	Historical inflation forecasts for the Dutch CPI/HCPI (%)	9
Figure 2.6	Historical inflation forecasts for the Eurozone HCPI (%)	9
Figure 2.7	Implied inflation derived from yields on French sovereign bonds	11
Figure 3.1	Gearing and the WACC (theoretical relationship)	17
Figure 3.2	Gearing and financeability (illustration)	18
Figure 3.3	Bond issuances by European companies by rating, all sectors (€ billion)	22
Figure 3.4	Yields and spreads on bond indices, BBB to AA ratings, ten-year maturity	22
Figure 3.5	Bond issuances by European companies by rating, energy and utilities (€ billion)	23
Figure 3.6	S&P issuer rating of comparable network companies	23

Figure 3.7	Gearing levels for rated utilities companies—book value (2008)	27
Figure 3.8	Gearing levels for rated utilities companies—market value (2008)	27
Figure 3.9	Gearing levels for rated companies in the utilities sector—market value (2000–08)	28

1 Introduction and summary

Energiekamer has asked Oxera to review the methodology previously applied to estimating the gearing and the expected inflation in the estimation of the WACC for energy networks.

An earlier version of this report, appended to EK's initial consultation in September 2009, presented Oxera's preliminary findings.¹ This present report is an updated version of the September 2009 report. It is based on market evidence updated to December 1st 2009 and provides additional commentary and explanations on certain specific issues, notably with regard to the use of realised data in the inflation assumption (section 2.3) and the rating assumption underlying the assessment of gearing (section 3.2.1).

The main findings are as follows.

Inflation

- In principle, the inflation assumption used to adjust the WACC should capture the inflation expectations that investors have incorporated into the price of securities used to estimate the different components of the WACC (and notably the risk-free rate).
- Because EK estimates the WACC using returns on securities with relatively long maturities (ten years) averaged over several years (two and five years), it is necessary to take a medium- to long-term view on inflation to ensure overall consistency in the estimation exercise.
- In practice, investors form their expectations of inflation on the basis of different observations: outturn inflation observed in previous years; independent forecasts published by monetary authorities or research centres; implied inflation inferred from differences between real and nominal yields; and inflation targets used by monetary authorities.
- Each of these sources of information has its conceptual and practical advantages and disadvantages. In practice, they yield different estimates over the short term, but they tend to converge towards a narrower range when measured over a longer time horizon (around 2%). This is consistent with the notion that investors formulate rational expectations and that inflation forecasts do not depart significantly from realised inflation, on average.
- Against this backdrop, the proposed approach to inflation for this exercise is to use an average of realised annual inflation rates over the period used to measure the risk-free rate and the debt premium (two and five years) and the forecast inflation rate for the year ahead as estimated by the Bureau for Economic Policy Analysis (Centraal Planbureau, CPB) (Table 1.1). The range produced by this approach is 1.6–1.7%.
- The weight placed on realised inflation under this approach ensures transparency and objectivity, while the inclusion of inflation forecasts ensures that current conditions are taken into account.
- While the proposed approach places some weight on historical data, the results are broadly consistent with forward-looking estimates of inflation. The results are also

¹ Oxera reports: Oxera (2009), 'Updating the WACC for energy networks: Methodology paper', September 22nd.

consistent with the observation that, over the medium term, inflation in the Netherlands has been below, but close to, the ECB's monetary target.

Table 1.1 Inflation range for the assessment of the WACC

	2005 realised	2006 realised	2007 realised	2008 realised	2009 realised	2010 forecast	Average
Two-year estimate				1.8	2.4	1.0	1.7
Five-year estimate	1.4	1.5	1.3	1.8	2.4	1.0	1.6

Note: Realised annual inflation is calculated as the average of monthly year-on-year inflation rates from June to May.

Source: Statistics Netherlands; CPB; Oxera calculations.

Gearing

- In previous decisions, EK adopted a gearing assumption of 60%, based on the observation of gearing levels for comparator companies and regulatory precedent.
- A higher gearing assumption implies a lower pre-tax WACC but, all else being equal, it might also imply a higher level of financial risk, with potential implications for the ability of companies to finance their activities on reasonable terms. In principle, the gearing assumption must reflect a trade-off between these two sets of regulatory objectives.
- The precise optimisation of this trade-off is difficult in both theory and practice. Therefore, a reasonable working objective is to adopt a gearing that would enable Dutch energy networks to achieve and maintain a credit rating comfortably within investment grade, while limiting distortions on tax, given how the networks are remunerated for tax allowances.
- From the empirical perspective, debt markets have undergone considerable turbulence recently, implying some uncertainty in terms of the ability of companies with a credit rating just above the investment-grade level (BBB) to raise finance.
- These market developments, together with an examination of comparators and regulatory precedent, indicate that the appropriate rating reference for this assessment should be in the low 'A' range.
- An examination of comparator companies, recent regulatory decisions and recent corporate transactions indicates that gearing levels of between 50% and 60% would be consistent with a credit rating within the A range. A range of 50–60% can therefore be used for the assessment of WACC.
- It must be emphasised that when performing their assessment of creditworthiness, ratings agencies typically evaluate a wide range of quantitative and qualitative indicators, of which gearing is only one. The range indicated in this study provides a useful initial guide to understanding which gearing policy might be consistent with the reference credit rating, but can only be taken as indicative at this stage.
- The adoption of a range, rather than a point estimate, reflects the notion that there is currently some uncertainty with respect to the financing policies that credit rating agencies would judge consistent with the reference rating in the Netherlands, especially given the recent turbulence in capital markets.
- Moreover, the range for the notional gearing produced by this approach is consistent with the new financeability framework, and provides energy networks with some

headroom to finance additional CAPEX with debt before hitting the indicative and mandatory caps placed on their indebtedness.

2 Inflation

In previous decisions, EK's inflation assumption was based on forecasts of CPI growth published by the CPB. This assumption was chosen owing to its availability over a suitable timeframe and the reputation of the CPB. EK also verified that the resulting estimate of the deflated risk-free rate was consistent with alternative estimates of the real risk-free rate.

EK has asked Oxera to review its treatment of inflation in the estimation of the WACC. In particular, EK is cognisant that its methodology for estimating the parameters of the WACC (notably, the risk-free rate and the debt premium) relies on two- to five-year historical averages. There is, therefore, a presumption that the inflation assumption used to deflate the WACC should be consistent with this aspect of the methodology.

This section starts by outlining possible assessment criteria (section 2.1) before considering options in light of these criteria (section 2.2).

2.1 Assessment criteria

The economic issue underlying the inflation adjustment in the calculation of the WACC can be summarised as follows.

- Most of the market data used to inform the estimation of the WACC is expressed in nominal terms. A proportion of these nominal returns is meant to compensate investors for the effect of inflation on their purchasing power.
- Because the regulatory regime compensates investors for the effect of inflation through other mechanisms (the indexation of allowed revenues and the revaluation of the RAB), it is necessary to strip out the implied inflation assumption from the observed market returns in order to set the allowed WACC.
- To this end, it is necessary to form a view on the inflation expectations that investors have incorporated into their pricing decisions.

This section examines these questions, and draws some conclusions for the appropriate treatment of inflation in the estimation of the WACC.

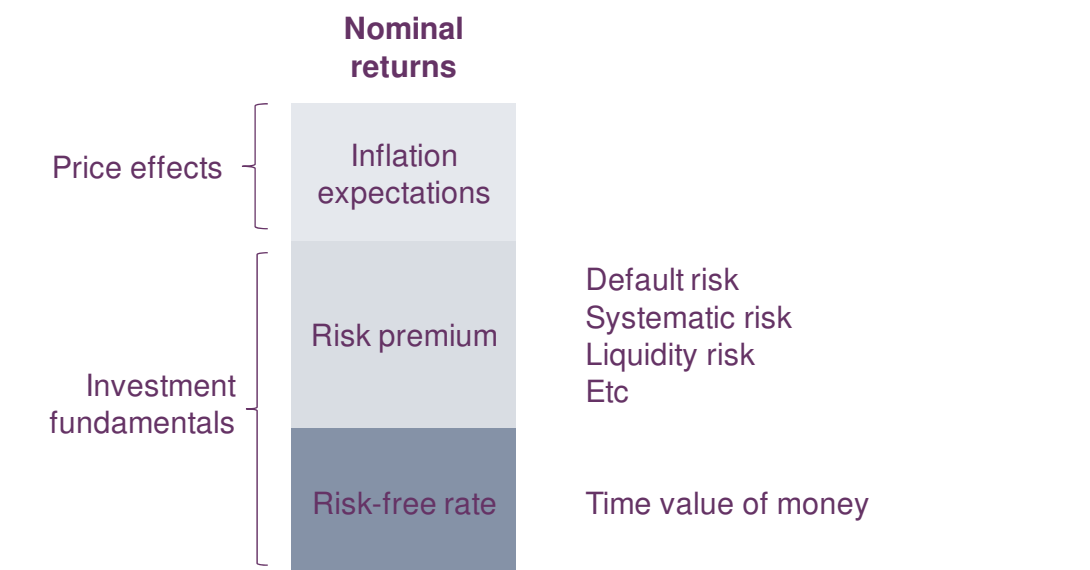
2.1.1 What are the components of nominal returns?

In the methodology employed by EK, the market data that supports the estimation of the WACC (debt yields, equity returns, etc) is expressed in nominal terms. Nominal returns incorporate compensation for:

- **investment 'fundamentals'**—investors expect to be compensated for the time value of money (the risk-free rate), and for the risk undertaken (default risk, systematic risk, liquidity risk, etc);
- **inflation**—investors expect to be compensated for the effect on their purchasing power of changes in the level of prices—ie, expected inflation.

Figure 2.1 below provides a simplified illustration of these building blocks.

Figure 2.1 Building blocks of nominal returns



Source: Oxera.

The price control regime for Dutch energy networks provides a degree of protection against inflation through:

- the indexation of allowed revenues within price control periods;
- the indexation of companies’ asset bases at each price control review.

These two mechanisms provide protection against changes in consumer prices. This implies that the WACC value used in the price control calculations does not need to include compensation for inflation expectations.

2.1.2 What is the appropriate methodology for removing the inflation component in nominal returns?

To strip out the inflation component in nominal returns, it is necessary to form a view on the inflation expectations that investors have incorporated into their pricing of the securities used as references for the assessment of the WACC. In other words, the relevant question is not ‘what level inflation can be expected in the next price control period?’, but rather ‘what level of inflation did investors expect in the past, when they priced and traded securities on capital markets?’ This question has two dimensions, as examined below.

Reference index

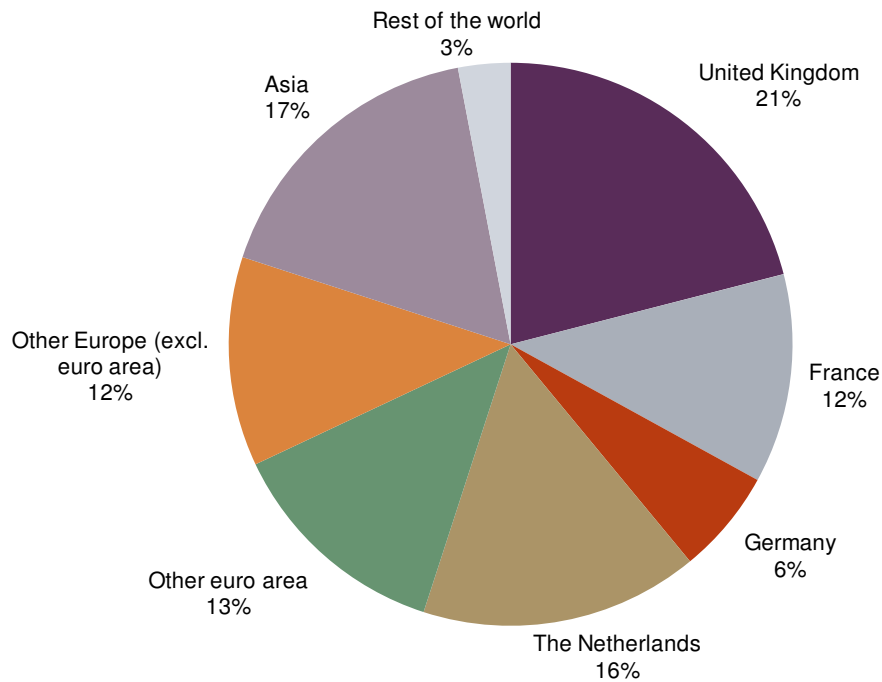
First, it is necessary to choose the relevant reference index. Although consumer price indices (as opposed to producer price indices) are commonly used for this exercise, this may raise a question about the appropriate geographical scope—ie, whether the appropriate assumption should capture inflation expectations for the domestic market (the Netherlands), or for a wider jurisdiction (eg, the Eurozone).

According to the purchasing power parity (PPP) principle, under the assumption of small or negligible transaction costs and import tariffs, the difference in nominal interest rates between two countries would then be equal to the difference in expected inflation. In other words, if there is a positive inflation differential and arbitrage is possible, PPP requires that the nominal interest rates differ by the difference in inflation such that real interest rates in the two countries remain equal. This implies a focus on domestic inflation when deflating the WACC.

Against this backdrop, it is of note that capital markets are increasingly integrated within Europe. Trading patterns in sovereign securities illustrate this point. For example, Figure 2.2

shows that only 16% of those investors that participated in a recent auction of Dutch sovereign bonds were of Dutch nationality.

Figure 2.2 Nationality of investors participating in recent Dutch issuance



Source: Dutch Treasury Agency (2009), '6.2 billion euros issues in new five-year bond', press release, July 7th.

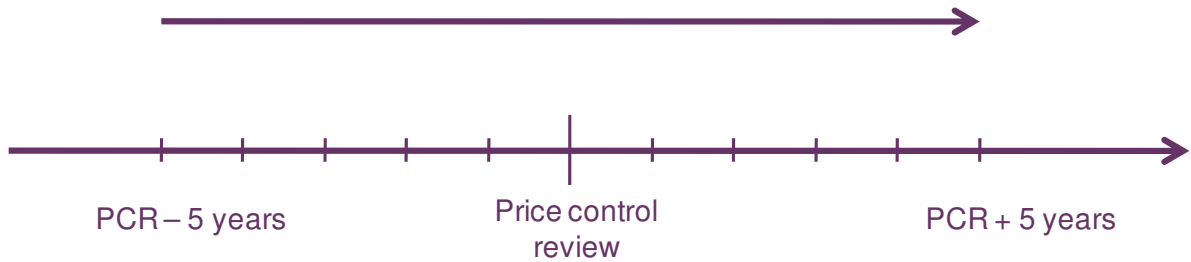
On balance, it seems appropriate to focus on inflation in the Netherlands when deflating the WACC in accordance with the PPP. However, it might be appropriate to place some weight on inflation in the Eurozone to take account of the growing integration of Eurozone economies and capital markets.

Timing

Second, it is necessary to decide on the relevant timing specifications for this assumption, in terms of the point at which inflation expectations are measured, and the time horizon of such expectations. In principle, these specifications should reflect the other parameters of the estimation. If, for example, the purpose of the exercise is to estimate the real risk-free rate embedded in the nominal yields observed five years ago on a ten-year Dutch government bond, then it is necessary to make an assumption about the level of inflation expected by investors five years ago for the next ten years (Figure 2.3). In principle, current inflation forecasts are only relevant when considering spot yields.

Figure 2.3 Inflation expectations and pricing data

In order to strip out the inflation expectations incorporated in the nominal yield on a ten-year bond measured five years before the PCR, it is necessary to find out what level of inflation investors were expecting five years ago for the next ten years



Source: Oxera.

Assessment criteria

This analysis suggests two criteria for the adoption of an appropriate inflation assumption.

- For the reasons set out above, there should be a legitimate presumption that the assumption reflects the inflation expectations that investors have incorporated into their pricing decisions. In particular, it should reflect inflation in the appropriate geographic zone (the Netherlands and Eurozone) and over the appropriate time horizon (ten years).
- Because this assumption is used in an evidence-based regulatory process, the assumption should be as transparent, objective and readily available as possible.

The next section assesses options in terms of these criteria.

2.2 Analysis and market evidence

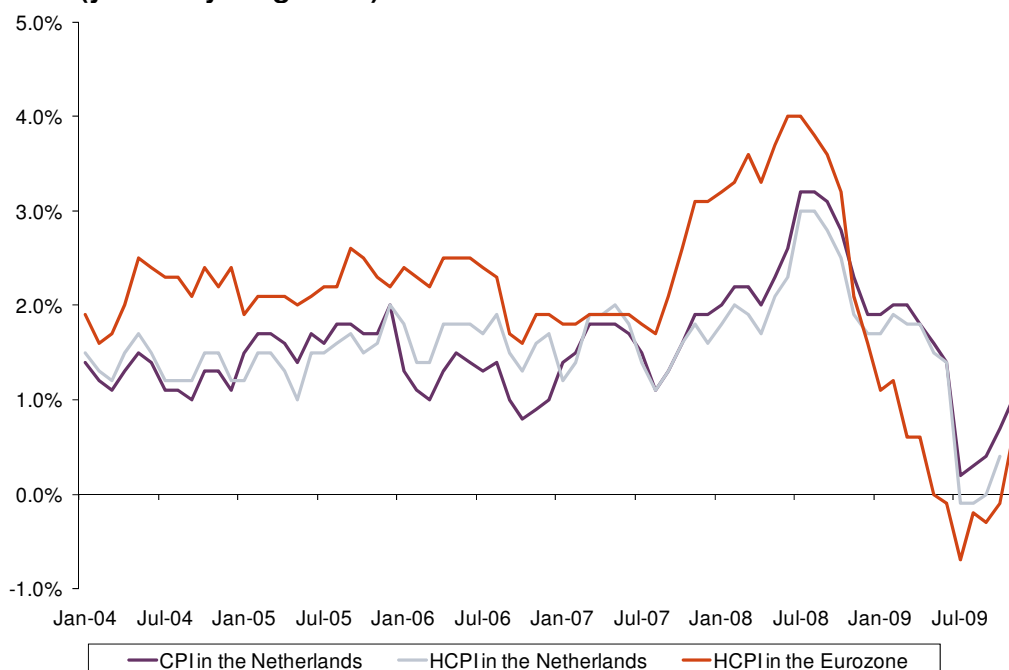
This section reviews four possible sources of inflation assumptions—realised inflation, forecast inflation, implied inflation, and target inflation—and assesses the consistency of these estimates with the two criteria set out above.

2.2.1 Realised inflation

The first option is simply to use realised inflation—ie, the historical level of inflation measured by the relevant authorities.

Figure 2.4 below shows year-on-year growth in the Harmonized Consumer Price Index (HCPI) for the Netherlands, the HCPI for Eurozone, and the Consumer Price Index (CPI) for the Netherlands. It shows that inflation in the Netherlands has been consistently below inflation in the Eurozone, except over the past year.

Figure 2.4 Inflation in consumer prices in the Eurozone and the Netherlands (year-on-year growth)



Source: Statistics Netherlands, Eurostat. Updated data as at December 2009.

The main advantage of this option is that the relevant data is readily available, widely understood, and compiled from measurable observations rather than disputable assumptions. A possible qualification to this option is that it implicitly relies on the notion that investors' expectations of future inflation are based on historical values (which might seem problematic at times of macroeconomic volatility and structural changes in the economy). However, this same notion also underpins the estimation of other WACC parameters. For instance, the use of historical equity returns to calibrate the ERP also relies on the idea that investors' expectations of future market returns are informed by historical levels.

Furthermore, in a regulatory context, the use of realised inflation to deflate the WACC would, to some extent, mirror the adjustment made to the RAB, which is also based on realised inflation. If, for instance, realised inflation drops below investors' initial expectations, the RAB value is lower than expected by investors, but conversely the deflated real WACC could be higher than expected. On balance, this might ensure that investors see less variability in their nominal returns over the lifetime of the assets.

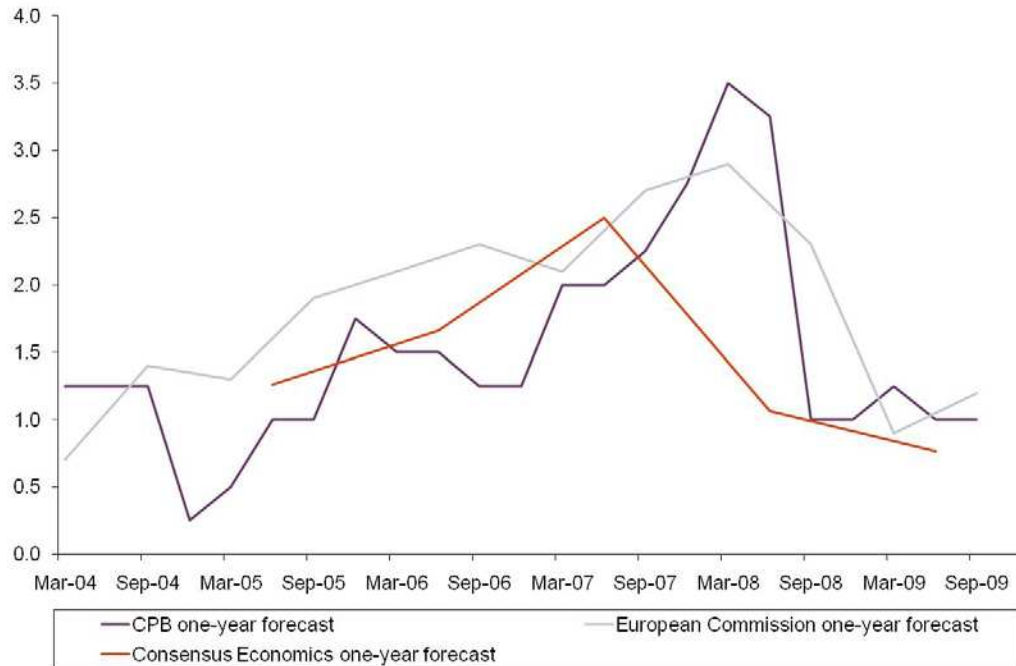
2.2.2 Forecast inflation

The second option is to use independent forecasts of inflation published by government agencies, central banks and research centres. Certain organisations (the CPB, the European Commission, the IMF) produce independent forecasts on the basis of structural models of national economies. Other organisations (the ECB, Consensus Economics) do not produce independent forecasts, but conduct surveys of professional forecasters at regular intervals to arrive at an estimate of the 'market consensus' on inflation. For example, the ECB asks a panel of approximately 75 professional forecasters on a quarterly basis for their expectations of inflation in the Eurozone, while Consensus Economics surveys nine professional forecasters in the Netherlands.²

² ECB (2007) 'The ECB survey of professional forecasters (SPF) – A review after eight years' experience', Occasional Paper No.59; and Consensus Economics (2008) 'Consensus Forecasts', November. The forecasters surveyed by Consensus Economics are: ING, NIBC, Theodoor Gilissen, ABN AMRO, Economist Intelligence Unit, Fortis Bank, Moody's Economy, Rabobank, Kempen & Co.

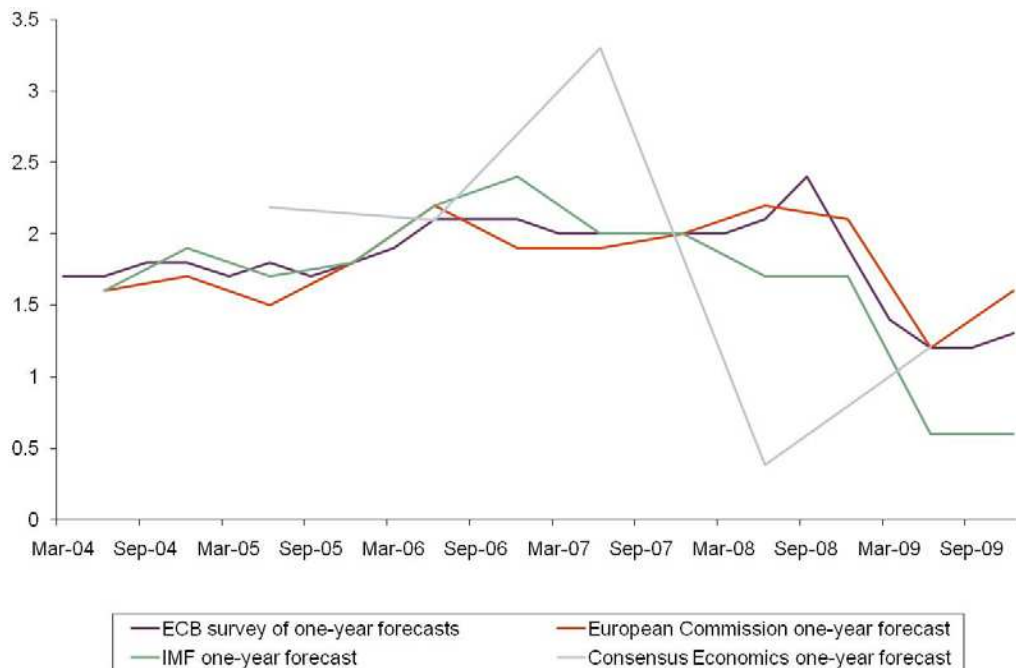
Figures 2.5 and 2.6 show historical predictions of inflation for the Netherlands and the Eurozone, respectively, and Table 2.1 and Box 2.1 summarise current forecasts.

Figure 2.5 Historical inflation forecasts for the Dutch CPI/HCPI (%)



Source: European Commission; Central Planbureau. Updated data as at December 2009.

Figure 2.6 Historical inflation forecasts for the Eurozone HCPI (%)



Note: The ECB also publishes a survey of independent forecasts for a five-year time horizon—this is very stable over time (between 1.9 and 2.0% per year)

Source: ECB; European Commission; IMF. Updated data as at December 2009.

Table 2.1 Current forecasts (%)

Source	One-year forecast	Five-year forecast
Dutch CPI/HCPI		
CPB	1.0	n/a
European Commission	1.2	n/a
Eurozone HCPI		
ECB	1.3	1.9
European Commission	1.6	n/a
IMF	0.6	1.9

Note: The numbers have been updated to reflect forecasts as at December 2009.
Source: Organisations' websites.

Box 2.1 ECB inflation forecasts

Over the coming months the outlook for annual HICP inflation will continue to be shaped mainly by upward base effects relating to the drop in commodity prices in the second half of 2008. At the same time, developments in economic fundamentals are expected to weigh on developments in the HICP.

Later on over the policy-relevant horizon, inflation is expected to remain moderate, with overall price, cost and wage developments continuing to be subdued due to the slow recovery in demand in the euro area and elsewhere.

Source: *ECB Monthly Bulletin*, December 2009.

The main advantage of this option is that it provides an assumption that is explicitly forward-looking at the point in time at which the price signal is observed—ie, it might provide a legitimate measure of expectations held by investors previously. Where a presumption exists that investors' inflation expectations might depart from actual inflation, this option might be appropriate.

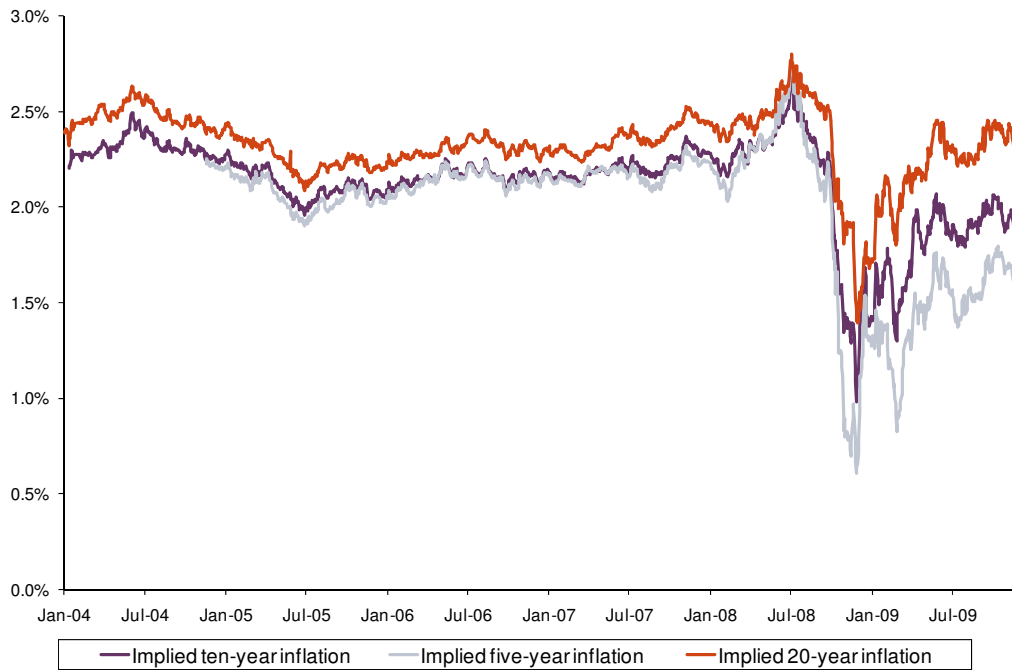
The main disadvantage of this option is that inflation forecasts tend to vary depending on the source used, and the selection of a particular source necessarily involves a degree of judgement. Moreover, inflation forecasts are typically available for short- to medium-term time horizons only (although it can be assumed that longer-term expectations are in line with medium-term forecasts).

2.3.1 Implied inflation

The third option is to use the inflation expectations implied in the difference between yields on conventional debt and yields on index-linked debt. In the Eurozone, the French government issues sufficient amounts of index-linked debt to provide a basis for this exercise.

Figure 2.7 below shows inflation estimates derived from a comparison of yields on French conventional bonds and yields on French indexed-linked bonds (indexed on the Eurozone HCPI) for different maturities. Since 2004, implied inflation has varied between 2.0% and 2.5%, until the second quarter of 2008 when it dropped to lower levels. While the implied inflation for short maturities (of up to ten years) currently remains at low levels, the implied inflation for longer maturities (of 20 years) has moved back to levels consistent with historical trends.

Figure 2.7 Implied inflation derived from yields on French sovereign bonds



Source: Agence France Trésor; Oxera calculations.

The main attraction of this approach is that it seeks to provide a direct measure of the inflation expectations that investors have incorporated into their pricing decisions (rather than an ‘external’ measure of inflation expectations that investors may, or may not, have used). Furthermore, implied inflation can be derived from market data in an objective and transparent manner, and is available with a degree of granularity (in terms of frequency of observations and time horizons) that facilitates WACC calculations.

The main qualification to this option is that its validity relies on the efficiency of the underlying price signals. In its previous determinations on the risk-free rate, EK rejected the use of index-linked bonds on the grounds that the market for such securities was immature and illiquid. If the observed yields on these securities do not reflect equilibrium demand and supply then the efficient market principle is violated and the assessment biased.

2.3.2 Target inflation

The fourth option is to use the inflation target used by the monetary authorities. The stated objective of the European Central Bank with respect to price stability is to keep inflation at a level ‘below, but close to 2% in the medium term’.³

This option provides a legitimate benchmark of investors’ expectations in the medium to long term. Realised inflation might be below or above the monetary target over certain periods of time (see Figure 2.4 above), but forecast inflation for medium-term horizons is typically aligned with this target (see Table 2.1 above). Arguably, this option is only valid when applied to long-term estimates of market returns.

2.3.3 Summary of options available

In terms of the methodology, Table 2.2 below summarises the pros and cons of each source of inflation data against the assessment criteria set out in section 2.1.2. To facilitate comparison, a mark is assigned to each option and for each criterion, where ‘++’ denotes a criterion that is fully met, and ‘+’ denotes a criterion that is partly met.

³ ECB institutional presentation, available at: http://www.ecb.int/ecb/educational/facts/monpol/html/mp_001.en.html.

Table 2.2 Sources of inflation assumptions

Inflation assumption	Is there a legitimate presumption that this assumption reflects investors' past inflation expectations?	Is this assumption transparent, objective, and readily available?
Realised inflation	<p>+</p> <p>Pros: there is a legitimate presumption that, on average, inflation expectations for long time horizons do not depart significantly from historical values measured over the medium term</p> <p>Cons: this presumption might not hold for short time horizons or at times of macroeconomic volatility and structural change in the economy</p>	<p>++</p> <p>Pros: data is readily available, objective, and widely understood</p> <p>Cons: none</p>
Forecast inflation	<p>+</p> <p>Pros: provides an indirect measure of inflation expectations incorporated into asset prices</p> <p>Cons: is only available for short to medium time horizons. Given historical averages used for WACC estimation, the relevant forecasts include forecasts in the past for periods for which realised inflation is now known (rather than just the current forecasts).</p>	<p>+</p> <p>Pros: synthetic indicators of 'consensus' forecast available</p> <p>Cons: the selection of a particular source involves a degree of judgement</p>
Implied inflation	<p>++</p> <p>Pros: provides a direct measure of inflation expectations incorporated into asset prices</p> <p>Cons: is only available for Eurozone HCPI (and other national indexes)</p>	<p>+</p> <p>Pros: can be derived from market data in an objective and transparent manner</p> <p>Cons: may be affected by liquidity issues in indexed-linked debt markets</p>
Target inflation	<p>+</p> <p>Pros: there is a legitimate presumption that inflation expectations for long time horizons should not depart significantly from the target pursued by monetary authorities</p> <p>Cons: this presumption might not hold for short time horizons or at times of macroeconomic volatility and structural change in the economy; the target concerns Eurozone HCPI</p>	<p>++</p> <p>Pros: is readily available and transparent</p> <p>Cons: none</p>

Source: Oxera analysis.

In terms of the quantified estimates, Tables 2.3 and 2.4 summarise possible inflation assumptions for the Netherlands and the Eurozone, and show that:

- current inflation is very low by historical standards;
- current short-term forecasts are also low, albeit they present some dispersion.

This suggests considerable uncertainty regarding short-term inflation estimates, and a degree of divergence between the Netherlands and the rest of the Eurozone.

However, these tables also show that:

- current long-term forecasts and implied inflation are more reflective of historical levels;
- when measured over a two- to five-year period, and excluding outliers, most measures of inflation are within a narrower range, of 1.5–2.0%.

This implies that there is less uncertainty involved in selecting an inflation assumption that reflects longer-term trends (ie, reflecting longer horizons, and measured over longer periods).

Overall, current economic conditions have led to a significant drop in inflation and to considerable uncertainty regarding short-term developments. However, the indicators examined in this section seem to indicate that market participants did not anticipate this development, and that they expect this disruption to be short-term in nature. One explanation of this conundrum is that market participants might be expecting that the current monetary policies geared towards increasing the money supply will lead to higher inflation in the future.

Table 2.3 Inflation estimates for the Netherlands (%)

	Latest	Two-year average	Five-year average
Realised inflation			
Statistics Netherlands (CPI)	1.0	1.9	1.6
Eurostat (HCPI)	0.4	1.7	1.6
Forecast inflation (one-year horizon)			
CPB	1.0	1.8	1.6
European Commission	1.2	1.8	2.0
Consensus Economics	0.8	0.9	1.5

Note: The figures have been updated as at December 2009. The latest Statistics Netherlands figure is for November 2009, although this is provisional, as is the latest Eurostat figure, which is for October 2009. Source: As shown.

Table 2.4 Inflation estimates for the Eurozone (%)

	Latest	Two-year average	Five-year average
Realised inflation			
Realised (Eurostat HCPI)	0.6	1.9	2.0
Forecast inflation (one-year horizon)			
ECB	1.3	1.7	1.8
European Commission	1.6	1.8	1.8
IMF	0.6	1.2	1.7
Consensus Economics	1.2	1.7	1.8
Forecast inflation (five-year horizon)			
ECB	1.9	2.0	1.9
IMF	1.9	1.9	n/a
Implied inflation			
Five years	1.6	1.8	2.0
Ten years	1.9	2.0	2.1
Target inflation			
Target	2.0	2.0	2.0

Note: The numbers are as at December 2009. Consensus Economics' forecasts are available for the period 2006–11 only. The 'latest' figure for realised inflation is that for November 2009, although this is a provisional and estimated figure. The most recent figure confirmed by Eurostat is September 2009. Source: As shown. Implied inflation for the Eurozone is obtained from Agence France Trésor.

2.4 Conclusion

This section has argued that the inflation adjustment in the WACC calculation should seek to capture the inflation expectations that investors have incorporated into the price of securities that are used to estimate the components of the WACC. This general principle gives rise to the following implications for the relevant inflation assumption.

- In terms of geographical scope, inflation in the Netherlands should remain the primary reference. Nevertheless, it might be appropriate to consider inflation in the Eurozone in order to reflect the notion that the capital markets and real economies within the Eurozone are increasingly integrated.
- In terms of the time horizon, the assumption should reflect inflation expectations for the medium to long term (to the extent that it is available). This is because the estimation of the risk-free rate and the debt premium focus on securities with a maturity of ten years.
- In terms of the measurement period, the assumption should reflect expectations held by investors over the past two to five years, the period over which sovereign and corporate yields are measured in the WACC estimation.

Furthermore, Oxera understands that EK is keen to base its inflation assumption on economic data that is transparent and objective, and leaves minimum scope for arbitrary choice.

In principle, the inflation estimate is seeking to capture investors' expectations for a ten-year horizon over the past five years. Since this variable cannot be observed, it must be approximated. Importantly, the methodology chosen should be not only reasonable from the economic perspective (ie, backed by sound economic rationale and supported by empirical evidence) but also transparent (ie, consistent with the appropriate standard of evidence and transparency). To strike a balance between these issues, the proposed methodology places some weight on realised inflation (in addition to available forecasts).

More specifically, the proposed approach is to combine the two- and five-year averages of realised inflation rates with the most recent forecast of the CPB. The two- and five-year averaging methodology is consistent with the approach taken to estimate the risk-free rate in the WACC, and the incorporation of current forecasts ensures that current economic conditions are taken into account. This gives a range of 1.6% to 1.7% (see Table 2.5).

Table 2.5 Inflation range for the assessment of the WACC

	2005 realised	2006 realised	2007 realised	2008 realised	2009 realised	2010 forecast	Average
Two-year estimate				1.8	2.4	1.0	1.7
Five-year estimate	1.4	1.5	1.3	1.8	2.4	1.0	1.6

Note: Realised annual inflation is calculated as the average of monthly year-on-year inflation rates from June to May. 2010 forecast data is updated as at December 2009.

Source: Statistics Netherlands; CPB; Oxera calculations.

This assumption is consistent with historical inflation levels in the Netherlands in the recent past, which have been below, but close to, the European average. It is also consistent with more forward-looking measures of inflation.

Applied to the updated estimate of the nominal risk-free rate, this assumption would produce estimates of the real risk-free rate that are slightly above the yields on index-linked bonds (see Table 2.6). This is consistent with the notion that yields on indexed-linked bonds have been depressed by the lack of liquidity and supply in this segment of the debt markets, and provides comfort that the overall result is prudent.

Table 2.6 Cross-check on risk-free rate estimates (%)

Averaging period	Yield on ten-year Dutch sovereign bonds	Inflation assumption	Estimated real risk-free rate	Yield on ten-year French index-linked bonds
Two years	4.0	1.7	2.3	2.0
Five years	3.9	1.6	2.3	1.9

Note: Yields on Dutch sovereign bonds and French index-linked bonds based on trading data up to December 1st 2009.

Source: Datastream, Agence France Trésor and Oxera calculations.

3 Gearing

In previous decisions, EK stated that the financing structure assumed in the WACC determination should enable Dutch regulated networks to maintain a healthy financial position, while minimising costs. To determine a gearing assumption that would meet these criteria, EK and their advisers considered three factors:

- consistency with other regulatory decisions;
- consistency with actual gearing levels in comparator companies;
- consistency with investment grade credit rating.

On this basis, EK adopted a gearing assumption of 60%.

EK has asked Oxera to review this parameter of the WACC. Since EK has finalised its price determinations for energy networks, a number of developments have occurred that could affect the gearing assumption.

First, the recent financial crisis might have implications for the risks and benefits of different financing policies. In the short term, the drop in equity prices will automatically lead to an increase in observed gearing levels for companies (if equity value is measured at current market prices). In the longer term, however, the experience of multiple failures in the banking sector and the occurrence of repeated disruptions in capital markets might lead companies and regulators to reassess the sustainability of highly leveraged structures, albeit the precise implications of these developments for utilities are as yet unclear.

A difficult exercise in periods of stability, the determination of the gearing assumption is surrounded by considerable uncertainty in the present environment. While current developments will undoubtedly affect the financing choices of companies in the future, it is their medium- to long-term implications, rather than their immediate consequences, that matter for the analysis.

Second, the financeability rules prescribed by the Dutch Unbundling Act (the Act) provide a new framework for the analysis of gearing. Oxera understands that the Act prescribes a maximum gearing level of 60% for energy networks, with the possibility of stretching this limit to 70% to accommodate exceptional investment needs. This legal framework provides upper bounds for the gearing assumption, although it leaves some scope for the interpretation of what constitutes a prudent or efficient level of gearing below these binding caps.

This section examines the suitability of the 60% gearing assumption in light of these new developments. It starts by outlining a possible analytical framework (section 3.1) before applying it to Dutch energy networks (section 3.2).

3.1 Assessment criteria

The purpose of this section is to outline the implications of the gearing assumption for the price control determination and to set out a possible approach for the analysis.

3.1.1 How does the gearing assumption affect the price control determination?

Gearing is the ratio of debt to total capital. The gearing assumption is used in two instances in the price control determination: in the determination of the WACC; and in the assessment of financeability.

Gearing and the WACC

The gearing assumption is used in the WACC estimation in two instances: first, when transforming the asset beta into an equity beta; and second, when calculating the capital structure weights in the WACC formula. The gearing assumption might also affect the debt premium, insofar as it determines the level of financial risk to which creditors are exposed.

The pre-tax WACC formula used by EK actually comprises two components: an allowance for the 'vanilla WACC' (ie, the cost of capital excluding tax); and an allowance for corporation tax. The latter is calculated by reference to the share of equity returns in the vanilla WACC.⁴

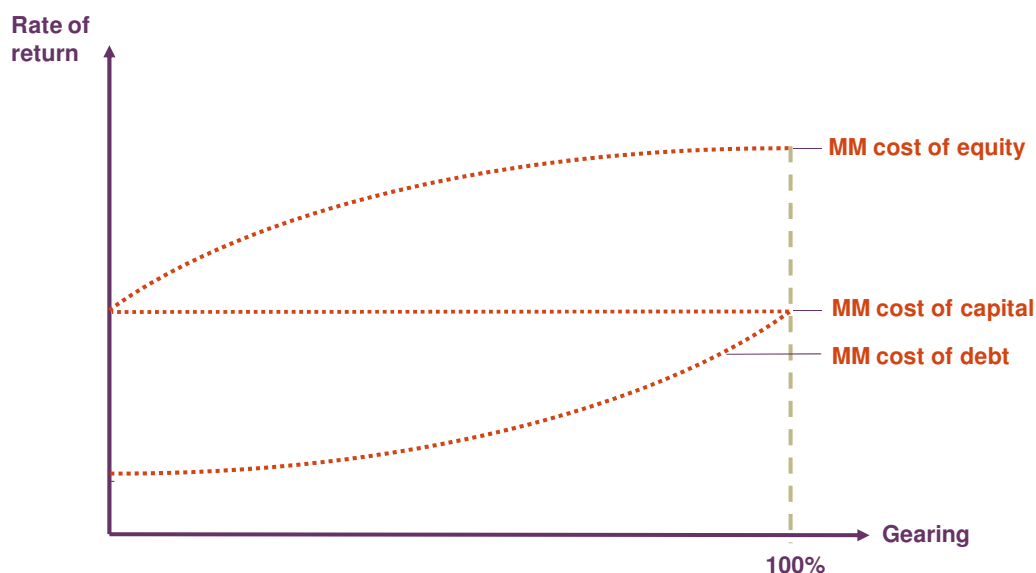
The impact of gearing on the tax allowance is fairly straightforward: an increase in gearing leads to a reduction in the share of equity returns in the cost of capital and, therefore, to a reduction in tax costs. Hence, the higher the gearing, the lower the tax allowance included in the WACC.

The impact of gearing on the vanilla WACC is perhaps more complex, and deserves further explanation. If a company gears up, two effects are triggered, working in opposite directions:

- on the one hand, a higher gearing augments the proportion of 'cheap' debt relative to 'expensive' equity in the financing structure (which, all else being equal, reduces the WACC);
- on the other hand, a higher gearing also implies a higher level of financial risk and, therefore, a higher cost of debt *and* a higher cost of equity (which, all else being equal, increases the WACC).

If capital markets were 'perfect'—ie, without tax, bankruptcy costs, transaction costs or agency issues—the second effect would offset the first, and the vanilla WACC would be left unchanged. This result is known in corporate finance theory as the Modigliani–Miller theorem (see Figure 3.1).

Figure 3.1 Gearing and the WACC (theoretical relationship)



Source: Oxera.

In the real world, the assumptions underpinning the Modigliani–Miller proposition may not hold, and there might be some scope for companies to optimise their financing structure

⁴ The formulae for WACC definitions used in regulatory determinations are: WACC (vanilla) = $k(d) \times g + k(e) \times (1-g)$; and WACC (pre-tax) = $k(d) \times g + k(e) \times (1-g) / (1-t)$, where $k(d)$ is the cost of debt, $k(e)$ the cost of equity, g the gearing, and t the tax rate.

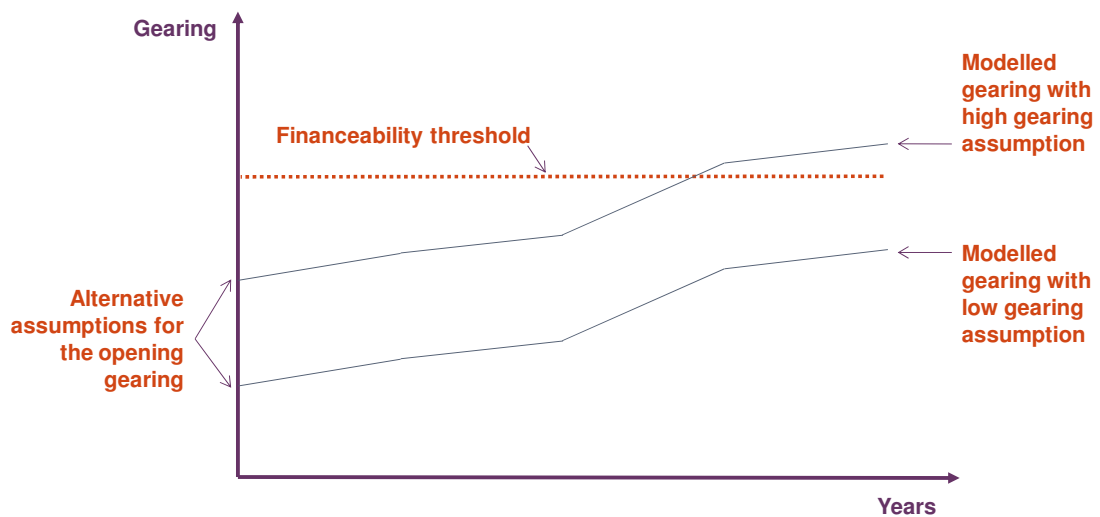
depending on factors such as bankruptcy costs, transaction costs and monitoring costs. There is no completely unified theory on the determinants of optimal capital structures, and the practical significance of these factors is subject to debate. However, most market participants tend to assume that there is an optimal gearing that minimises the WACC.

For these reasons, most regulators do not attempt to second-guess an ‘optimal’ gearing that would incorporate all possible determinants of financing policies. Instead, they seek to set a ‘reasonable’ assumption that does not imply an excessive level of financial risk and that is not evidently inefficient, given market conditions.

Gearing and financeability

Oxera understands that, under certain circumstances, EK tests whether its price control determinations enable regulated companies to maintain a financial profile consistent with the financeability thresholds prescribed by Dutch law. Oxera also understands that, in precedent cases, EK has conducted these tests on the basis of a modelling exercise that assumed a notional financial structure for the companies.⁵ If the opening gearing in this notional structure reflects the WACC determination, a higher gearing assumption makes it more likely that financeability thresholds will be breached (see Figure 3.2).

Figure 3.2 Gearing and financeability (illustration)



Source: Oxera.

To sum up, a higher gearing assumption might reduce the pre-tax WACC (which, all else being equal, would lead to lower charges), but might also increase the risk that financeability thresholds will be breached (which, all else being equal, might lead to higher charges). Conversely, a lower gearing assumption would increase the pre-tax WACC and increase the possibility of companies being over-compensated for tax purposes (ie, having tax allowances above their true tax payments), but would also reduce the probability that financeability thresholds will be breached.

Incentives to increase gearing in a pre-tax WACC regime

The approach taken to gearing and the cost of capital in the price control decision might also affect the actual financing choices of companies. More specifically, the pre-tax approach to the cost of capital used by EK might generate an incentive to increase gearing for companies. This is because the pre-tax WACC formula provides companies with a tax allowance calculated on the basis of a generic tax wedge, which companies can then under- or over-recover depending on their own gearing.

⁵ For example, in Mazars (2008), ‘Onderzoek financeability regionale netbeheerders’, April 24th.

If, for example, a company adopts a lower gearing than that assumed in the determination, the value of the tax shield provided by its interest charges will be lower than that implied in the allowed pre-tax WACC. This can happen even if the vanilla WACC of the company is in line with regulatory assumptions (see Table 3.1). Conversely, if a company adopts a higher gearing, it might over-recover its tax costs and outperform the pre-tax WACC assumed in the determination.

Table 3.1 Relationship between gearing and the pre-tax WACC (illustration) (%)

WACC component	WACC assumed in determination	WACC of company with lower gearing	WACC of company with higher gearing
Cost of debt	4.00	3.80	4.20
Cost of equity	6.00	5.80	6.20
Gearing	60	50	70
Tax	30	30	30
Vanilla WACC	4.80	4.80	4.80
Pre-tax WACC	5.83	6.04	5.60

Source: Oxera.

UK regulators have seen this incentive to exceed the gearing assumption as one of the factors driving the generalised increase in debt financing observed in the period following the privatisation of UK utilities. To remedy this issue, the energy regulator, Ofgem, has moved to a 'post-tax approach' to the cost of capital, which includes an allowance for the cost of capital based on the vanilla WACC (ie, excluding tax), and a separate allowance for tax costs. The financial model used to calculate tax costs assumes a specific level of capital allowances for each company (in line with each company's tax liabilities) and a generic level of gearing across the sector (in line with the WACC determination). Ofgem intends to claw back, ex post, any tax benefit that companies might achieve by adopting a level of gearing above the regulatory assumptions.⁶

The water regulator, Ofwat, has also moved to a post-tax approach to the cost of capital, the main difference with Ofgem's methodology being that Ofwat takes into account the actual gearing of each company when calculating the tax allowance. Ofwat justified its policy as follows.

Our approach assumes that price limits should include only a forecast of companies' expected tax liabilities rather than a notional tax liability linked to our assumptions on capital structure ie customers should only pay in their bills the actual level of tax faced by a company. Generally highly geared companies pay less tax because interest payments are deductible from taxable profits.⁷

Notwithstanding these nuances, the main purpose of the post-tax approach is to mitigate a possible incentive to increase gearing for regulated companies. In addition, the post-tax methodology enables regulators to capture more precisely the tax implications of the specific accounting and depreciation rules applied by the companies. On the downside, the post-tax approach involves complex tax modelling exercises by regulators.

Further research would be necessary to establish the costs and benefits of applying a post-tax approach in the case of the Dutch energy networks. On the one hand, the pre-tax approach used by EK delivers the same incentive to increase gearing and outperform the

⁶ Ofgem (2004), 'Electricity distribution price control—final proposal', November. This approach has been confirmed in more recent determinations, including Ofgem (2009), 'Electricity Distribution Price Control Review Final Proposals – Allowed Revenues and Financial Issues', December.

⁷ Ofwat (2004), 'Future Water and Sewerage Charges 2005–10: Final Determinations'. This approach has been confirmed in Ofwat (2009), 'Future Water and Sewerage Charges 2010–15: Final Determinations', November.

regulatory tax allowance as did the regulatory regime that existed in the UK before the 2004 reforms. On the other hand, the regulatory framework in the Netherlands also provides a cap on the effects of such incentives, in the form of the binding financeability ratios.

3.1.2 What constitutes a prudent and efficient level of gearing?

Because the estimation of an 'optimal' level of gearing is fraught with difficulties (see section 3.1.1), most regulators tend to satisfy themselves that a gearing assumption can be deemed efficient and prudent if it is consistent with a credit rating 'comfortably' within investment grade. The precise interpretation of this requirement has varied, however, and the analysis must address two separate questions:

- what is the appropriate target credit rating?
- what gearing assumption is consistent with this target credit rating?

These two questions are addressed next in light of market evidence and regulatory precedent.

3.2 Analysis and market evidence

3.2.1 What target credit rating is appropriate?

A 'comfortable' or 'solid' credit rating should enable companies to absorb some downside shock and still retain a credit rating within the investment grade category. It should also enable companies to access finance on reasonable terms over a range of market conditions.

The following evidence can inform the choice of an appropriate rating reference.

- **Market data on issuance volumes and costs**—before 2007, the debt market appeared to be liquid for all categories of investment-grade debt (see Figure 3.3), and the spread between BBB- and A-rated debt was relatively modest (see Figure 3.4). Under these circumstances, a credit rating within the BBB category could appear as prudent and efficient. Since the financial crisis began, however, the cost of BBB-rated debt has risen substantially above that of A-rated debt, and the volume of new issuances of BBB- rated debt has decreased significantly over certain periods.⁸ In other words, the benefits of 'moving down' the rating scale have decreased, while the risks of doing so have, arguably, increased. Data on utilities issuances also show that the vast majority of new debt issued by energy and utility companies is rated in the A category (see Figure 3.5).
- **Credit ratings of comparator companies**—the proportion of issuer ratings for regulated networks in Europe appears to be evenly distributed across rating categories from BBB to AA (see Figure 3.6). It is of note, however, that only UK companies are rated within the BBB range, and that the increase in leverage for these companies has been a cause of regulatory concern and debate.⁹ An examination of rating levels over time does not reveal any clear trend (see Table 3.2). The recent rating downgrades of Energinet, Terna and Bord Gáis are due to the large capital programmes and diversification policies of these companies. Essent's recent credit downgrade from A+ to A reflected the divestment of its regulated network operations as a new company, Enexis.
- **Credit ratings for unbundled Dutch energy networks**—following the unbundling of the regulated energy networks in the Netherlands, the rating agencies have confirmed the investment-grade credit rating of these businesses. Alliander, the former network arm of Nuon, has retained a credit rating of A, and has announced that it will continue to

⁸ The yield difference between BBB and A averaged 90 basis points (bp) over the three months to December 1st 2009. Despite a recent fall from the peak in December 2008, this is still considerably higher than the pre-crisis levels (the yield difference between the same credit ratings averaged 30bp during 2007).

⁹ See, for instance, Ofgem and Ofwat (2006), 'Financing Networks: A discussion paper'.

target a 'solid A rating profile'.¹⁰ Similarly, Enexis, the former network arm of Essent, has announced that it would retain a credit rating of A from S&P, and of Aa3 from Moody's.¹¹ At the same time, unbundling has had negative effects on the rating of the non-regulated generation and supply businesses of the former integrated groups (see Box 3.1).

- **Recent regulatory decisions**—few regulators outside the UK (and, indeed, not all regulators in the UK) make their rating reference explicit. Among UK regulators, there is currently no consensus on the impact of the current crisis on what constitutes a 'solid' or 'comfortable' investment grade credit rating (see Table 3.3). On the one hand, the Competition Commission (CC) and the Civil Aviation authority (CAA) have moved from a reference of BBB+ for the price control of Heathrow and Gatwick in 2008 to a reference of A– for the price control of Stansted in 2009 (with corresponding downward pressure on the cost of debt). On the other hand, in its recent final determination, Ofwat retained a minimum of BBB+ for its assessment, but noted that it targets financial ratios consistent with an A–/A3 credit rating under a notional capital structure.

... companies with A category ratings appeared to have been less affected by the credit crunch [than companies with BBB category ratings] and are better placed to raise new capital at a reasonable cost. Given that there was an inevitable degree of uncertainty about the way that debt market conditions will evolve in the coming years, this suggested to us that an efficiently financed company might seek to target an A3/A– rating in the current market climate.¹²

For our final determinations, at the point at which we consider financeability, we have targeted financial ratios under our notional structure that are consistent with an A–/A3 credit rating. Most companies are in this position. If one particular indicator (and in a small minority of cases, two key indicators for one rating agency) does not meet our required threshold, we ensure that it meets the criteria for a strong BBB+/Baa1 credit rating as a minimum. Our approach is consistent with a view expressed to us that the capacity of investors to invest appears to be less sensitive to the difference between high BBB and low A range ratings where utilities are concerned.¹³

On balance, while there are examples of BBB-rated network companies, these remain a minority, and the sustainability of this model has not been fully tested in an environment of capital market uncertainty and high CAPEX. Hence, a BBB rating may not meet the required standard of efficiency and/or constitute a reasonable economic assumption.

These considerations broadly point to an appropriate rating reference towards the low end of the A range.

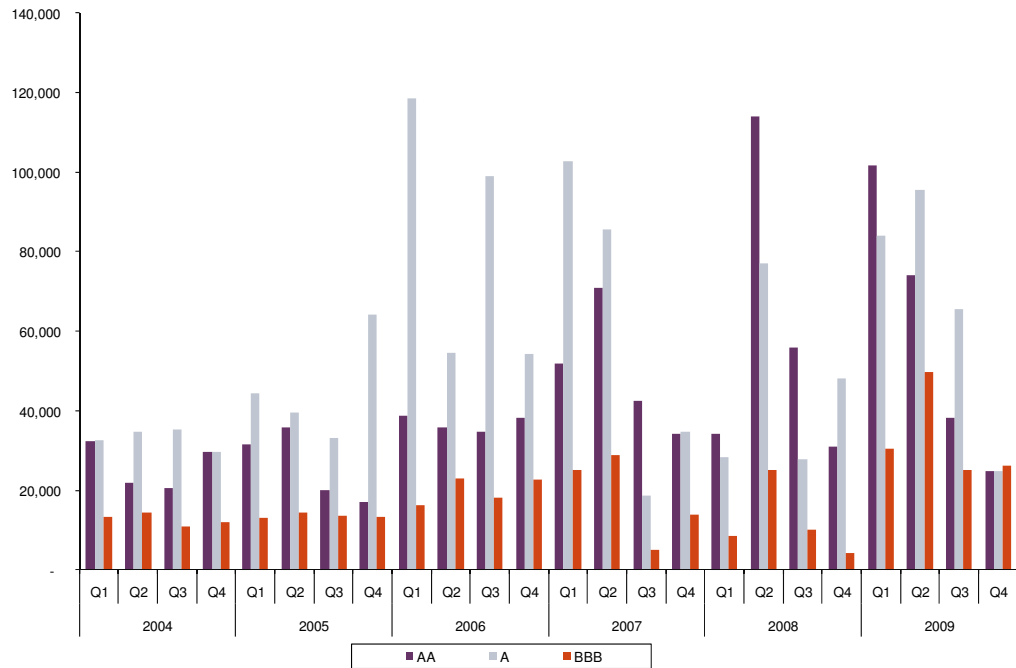
¹⁰ S&P reports, December 18th 2009, Alliander; Alliander's website: <http://www.alliander.com/en/alliander/investors/financial-policy/index.htm>

¹¹ Enexis press release: Enexis (zeer) kredietwaardig bevonden, December 12th 2009

¹² Competition Commission (2008), 'Stansted Airport Ltd: Q5 price control review', October 23rd, Appendix L.

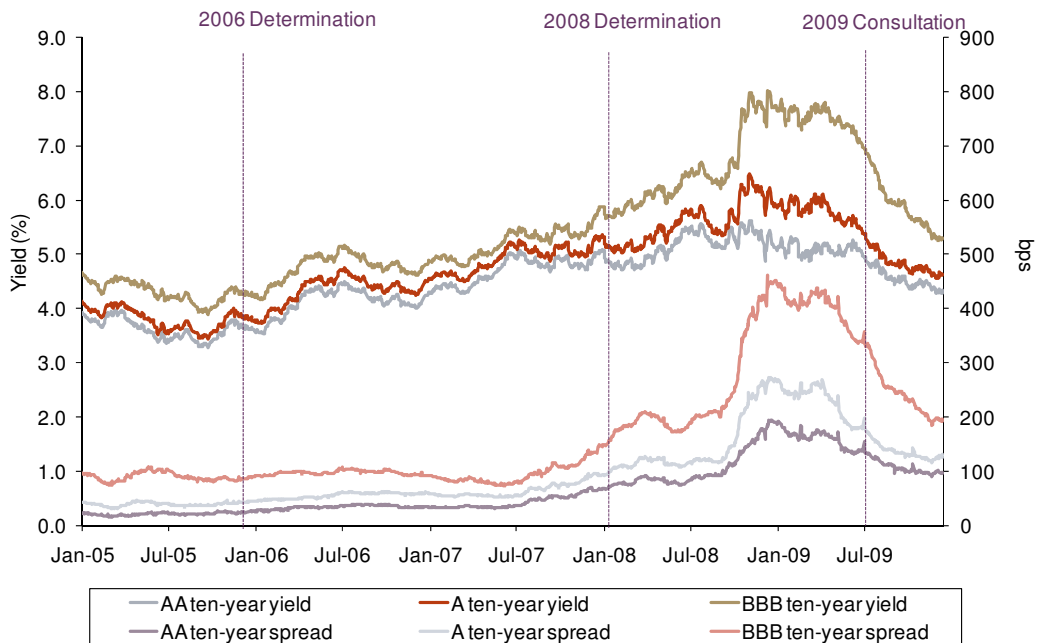
¹³ Ofwat (2009), 'Future Water and Sewerage Charges 2010–2015: Final Determinations', November, pp. 137–138.

Figure 3.3 Bond issuances by European companies by rating, all sectors (€ billion)



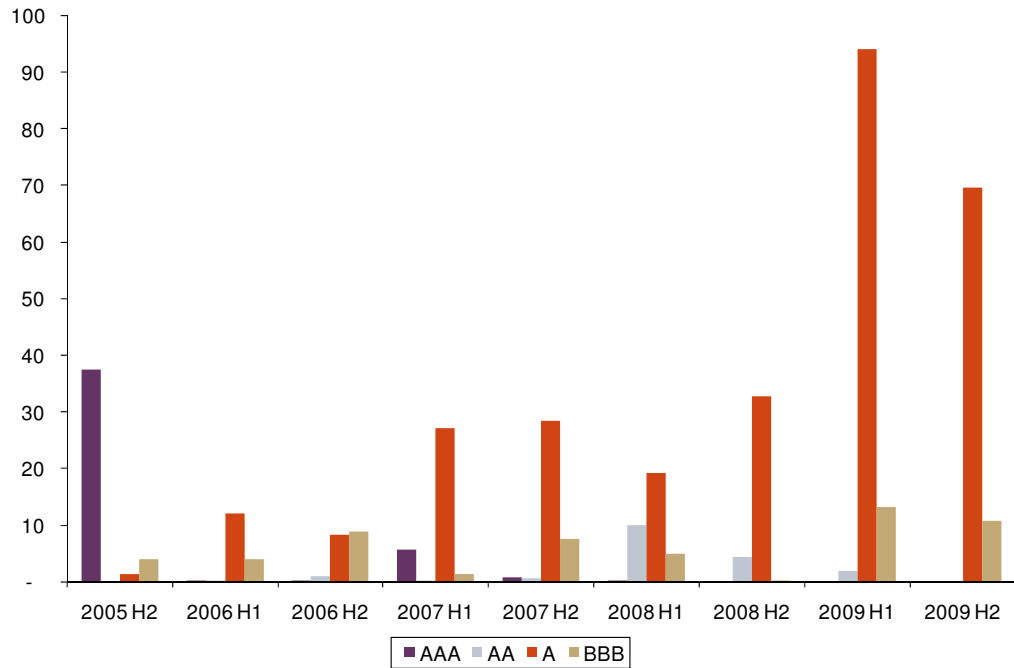
Note: Q4 data for 2009 includes issuances up to December 1st 2009.
Source: Datastream and Oxera analysis.

Figure 3.4 Yields and spreads on bond indices, BBB to AA ratings, ten-year maturity



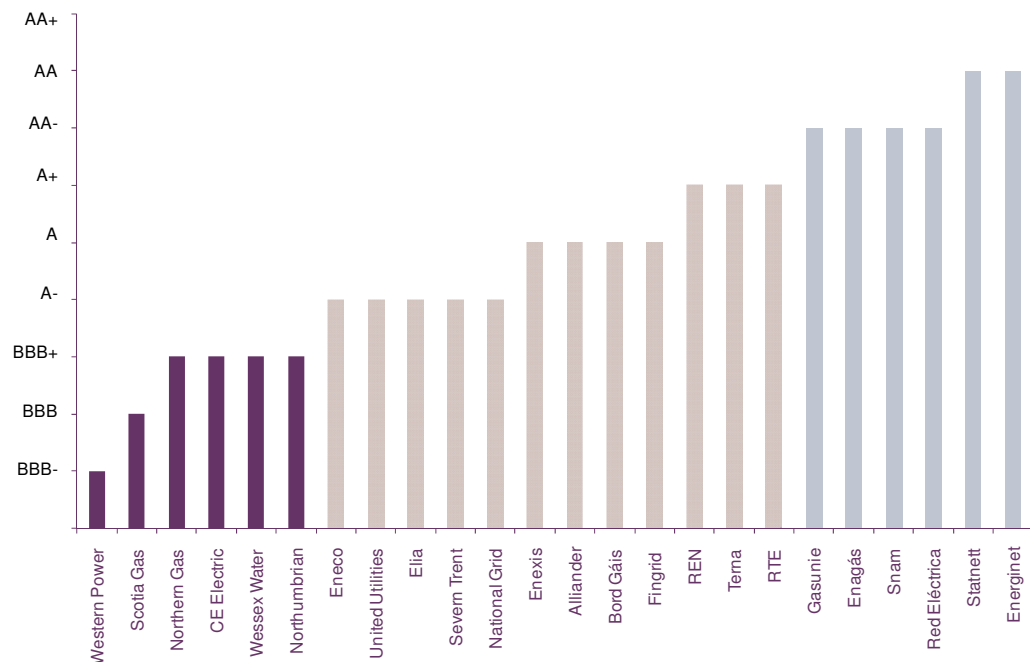
Note: '2009 Consultation' refers to the consultation published by EK in September 2009, which is based on data as at July 2009.
Source: Bloomberg and Oxera analysis.

Figure 3.5 Bond issuances by European companies by rating, energy and utilities (€ billion)



Note: H2 data for 2009 includes issuances up to December 1st 2009.
Source: Datastream and Oxera analysis.

Figure 3.6 S&P issuer rating of comparable network companies



Note: All ratings are as at December 2009. This sample is made up of companies that S&P presents as 'peers' in the energy network sector, and the three largest Dutch utilities: Alliander, Enxsis and Stedin. S&P has not yet confirmed the Stedin's rating—the rating reported here reflects the integrated businesses.
Source: S&P reports, Oxera analysis.

Table 3.2 S&P issuer rating of comparable network companies—history

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Fingrid Oyj								A+	A+	A
National Grid	A+	A	A	A	A	A	A	A-	A-	A-
Bord Gáis Eireann			A-	A-	A-	A-	A-	A-	A+	A
REN									A+	A+
Severn Trent	A+	A+	A+	A	A	A	A	A	A-	A-
Elia					A-	A-	A-	A-	A-	A-
United Utilities	A-	A-	A-	A-	A-	A-	A-	A-	A-	A-
Terna					AA-	AA-	AA-	AA-	AA-	A+
CE Electric				BBB-	BBB-	BBB-	BBB-	BBB-	BBB+	BBB+
Wessex Water	BBB+	BBB+	BBB+	BBB+	BBB+	BBB+	BBB+	BBB+	BBB+	BBB+
Northern Gas Networks						BBB+	BBB+	BBB+	BBB+	BBB+
Northumbrian Water			A-	BBB	BBB	BBB+	BBB+	BBB+	BBB+	BBB+
Scotia Gas						BBB	BBB	BBB	BBB	BBB
Western Power				BBB-	BBB-	BBB-	BBB-	BBB-	BBB-	BBB-
Nuon/Alliander		AA-	AA-	A+	A+	A+	A+	A+	A+	A
Essent		A+	A+	A+	A+	A+	A+	A+	A+	A
Eneco			A+	A+	A+	A	A	A	A	A-
Median	A	A+	A	A-	A-	A-	A-	A-	A-	A-

Note: All ratings are as at December 2009.
Source: Bloomberg, S&P and Oxera analysis.

Box 3.1 S&P comments on network unbundling in the Netherlands

Alliander N.V. (December 18th, 2009): The ratings on Dutch electricity and gas network company Alliander N.V. (Alliander) reflect the credit **quality of its regulated electricity and gas distribution network business**, including its stable and predictable operating cash flow, its high quality network assets, and adequate operating performance. [...] The stable outlook reflects our expectations that Alliander will continue to post stable and predictable cash flows from its regulated business, while performing adequately within the incentive-based Dutch regulatory framework.

Enexis (December 9th, 2009): 'The ratings on Dutch distribution network company Enexis Holding N.V. and its subsidiary Enexis B.V. (jointly Enexis) reflect our view of its **low-risk regulated electricity and gas distribution network business**, stable and predictable operating cash flow, high quality network assets, and stable operating performance.'

Eneco (December 10th, 2009) 'The ratings on Eneco reflect the **credit quality of its regulated network business**, which we understand will generate about 90% of its earnings after the unbundling. At present, the strengths of the network business are offset by the competitive energy business, which we consider to be much weaker. The ratings also reflect our understanding that the network company will carry the majority of all external rated debt after the unbundling, and our view that this, in combination with the network company's sizable capital expenditure (capex) program, would likely result in an increase of its leverage toward 50%.'

Essent N.V. (August 19th, 2009): 'The **downgrade** reflects that Essent has now **unbundled** and now only **focuses on unregulated generation & supply operations** essentially in The Netherlands...'

Nuon (May 19th, 2009) 'The ratings on Dutch utility group N.V. Nuon (Nuon) reflect the **credit quality of its regulated electricity and gas distribution network business**, including its stable and predictable operating cash flow, its high quality network assets, and a strong operating performance.'

Source: S&P reports.

Table 3.3 Summary of regulatory precedent: rating assumption for UK regulated utilities

Review	Year	Stated rating reference
Ofgem Electricity Transmission Price Control Review (UK—transmission)	2006	BBB+
CC/CAA (UK—Gatwick and Heathrow)	2008	BBB+
Ofcom (UK—telecoms)	2008	BBB+
ORR (UK—rail)	2008	A–
CC/CAA (UK—Stansted Airport)	2009	A–
Ofwat (UK—water)	2009	A– (targeted) BBB+ (minimum)
Ofgem (UK—energy)	2009	'investment grade'

Note: Ofwat's rating reference is updated to reflect its view in the final determination. Ofgem's stated rating reference in 2009 reflects its view from the final determination of the electricity distribution price control review published in December 2009.

Source: Indicated in Appendix 1.

3.2.2 What gearing level is consistent with the target credit rating?

The following evidence can inform the choice of a gearing assumption consistent with the rating reference.¹⁴

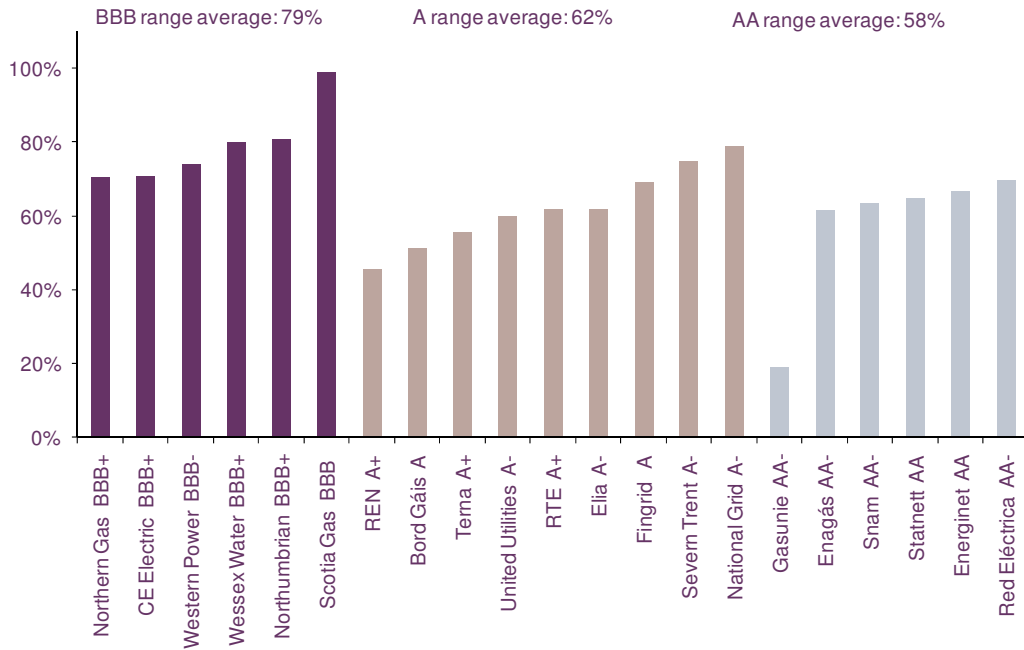
¹⁴ It is important to note that gearing does not determine the credit rating of companies in a mechanistic way—ratings will also be affected by other financial ratios as well as by qualitative considerations.

- **Observed gearing for rated companies (book value)**—the average gearing of European network companies rated in the A category is 62% when measured on the book value of their assets (see Figure 3.7). However, because most companies report their asset values at historical costs (or only revalue their assets at infrequent intervals), this measure of gearing might overstate the underlying gearing based on market value.
- **Observed gearing for rated companies (market value)**—it is possible to obtain a measure of gearing based on the market value of equity for the sample of companies used for the estimation of beta (see Figure 3.8).¹⁵ The average gearing of the companies rated in the A category is 48%, and the average gearing of the companies rated BBB is 53%. The average gearing of these companies has increased over 2008 due to the drop in equity prices (see Figure 3.9). This measure of gearing might provide a better estimate of the economic gearing of the companies, although it varies with short-term movements in equity prices.
- **Observed gearing for rated companies (RAB)**—it is possible to obtain a measure of gearing based on the RAB for companies that focus exclusively on regulated activities and for which the quality and frequency of regulatory disclosure is sufficient (Table 3.4). In this sample, the average gearing of the companies rated in the A category is 60%, and the average gearing of the companies rated BBB is 67%.
- **Observed gearing of Alliander and Enexis**—Oxera understands that the two Dutch energy networks that have recently been unbundled from the integrated group (Alliander and Enexis) have stated their intention to adopt a gearing of 60%.
- **Regulatory precedent**—most European regulators have adopted gearing assumptions between 50 and 60% in recent years (see Table 3.5). Ofwat has recently adopted a gearing assumption of 57.5% for the next price control period, up from 55% in its last determination. The higher gearing recently assumed by Ofgem (65%) is partly driven by debt held by the holding companies outside of the regulatory ring-fence.
- **Financing policy**—the examination of recent corporate transactions in the utilities sector does not reveal any major shift in financing policies, but it is of note that several utilities have chosen to issue additional equity to finance transactions or to repay some of their debt (Table 3.6).

These considerations broadly point to an appropriate gearing reference of 50–60%.

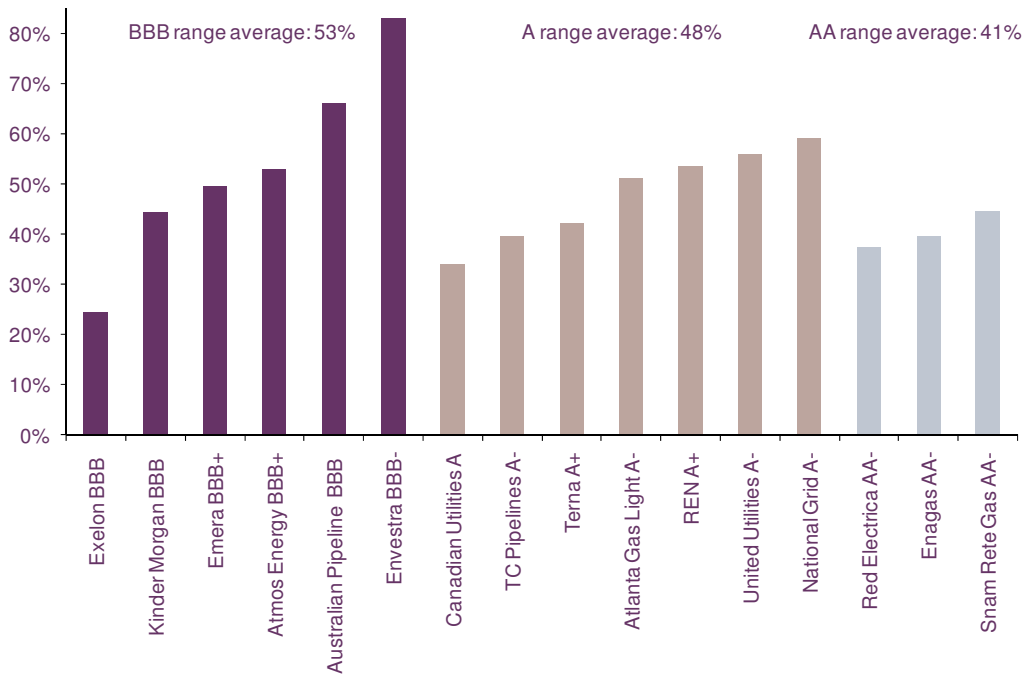
¹⁵ Because the market value of debt is difficult to observe or measure when it is not traded, the gearing estimates provided in this section combine the market value of equity and the book value of debt.

Figure 3.7 Gearing levels for rated utilities companies—book value (2008)



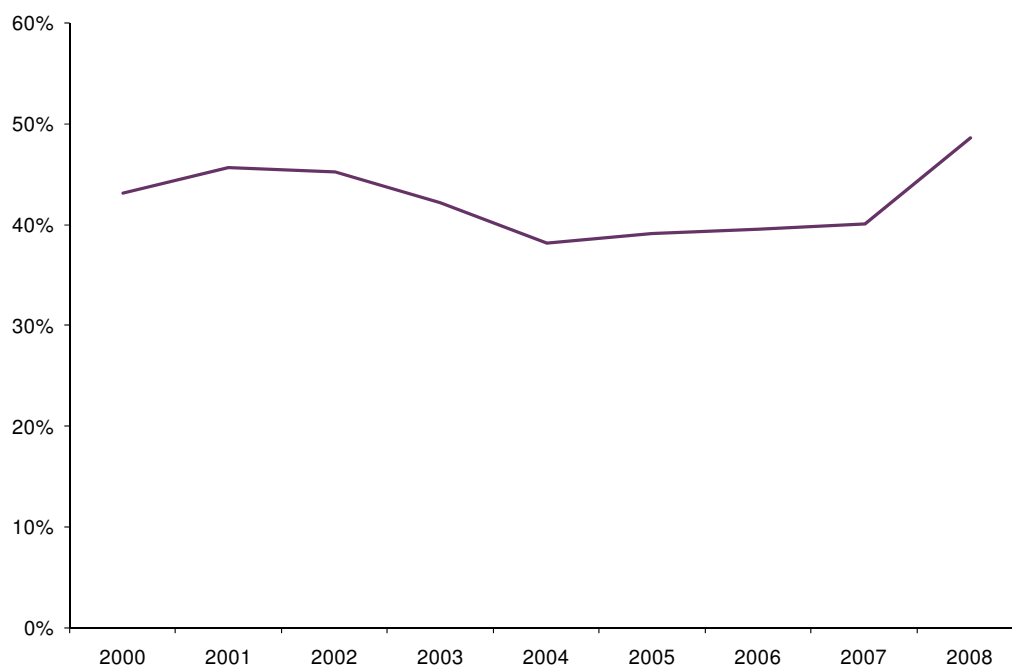
Note: All ratings are as at December 2009.
Source: S&P reports, Oxera analysis.

Figure 3.8 Gearing levels for rated utilities companies—market value (2008)



Note: All ratings are as at December 2009.
Source: S&P report, Bloomberg, Oxera analysis.

Figure 3.9 Gearing levels for rated companies in the utilities sector—market value (2000–08)



Note: The companies included in this sample are those listed in Figure 3.8 above.
Source: S&P report; Bloomberg; Oxera analysis.

Table 3.4 Debt/RAB of comparators

Company	Sector	Rating	Debt/RAB (%)
REN	Energy	A+	70
National Grid	Energy	A–	49
United Utilities	Water	A–	68
Severn Trent	Water	A–	61
Terna	Energy	A+	54
Northumbrian Water	Water	BBB+	60
Wessex Water	Water	BBB+	71
Northern Gas Networks	Energy	BBB+	67
Scotia Gas Networks	Energy	BBB	68

Note: All estimates for debt/RAB are for 2007–08 with the exception of United Utilities, Severn Trent, Northumbrian Water and Wessex Water, which are reported as at March 31st, 2009. These latest figures are from Ofwat’s final determination published in December 2009. The debt/RAB ratio for Scotia Gas Networks is estimated using the sum of net debt and RAB values for Southern and Scotland Gas Networks.
Source: Annual accounts; investor day presentations; company websites and company press releases; Ofwat (2009), ‘Financial performance and expenditure of the water companies in England and Wales 2008–09’.

Table 3.5 Summary of regulatory precedent: gearing assumptions for UK and European regulated utilities

Review	Year	Gearing (%)
Ofgem fourth electricity distribution review (UK—electricity distribution)	2004	57.5
Ofgem fourth electricity transmission review (UK—transmission)	2006	60
AEEG (Italy—energy networks)	2007	44–47
CER (Ireland—gas transmission and distribution)	2007	55
Ofgem gas distribution price control review (UK—gas distribution)	2007	62.5
ComReg (Ireland—telecoms)	2008	40
CRE (France—electricity transmission and distribution)	2009	60
Ofwat (UK—water)	2009	57.5
Ofgem(UK—energy)	2009	65

Note: Gearing estimates by Ofwat and Ofgem in 2009 are taken from their final determinations, published in November and December 2009, respectively.
Source: Indicated in Appendix A1.

Table 3.6 Equity issuances by utilities

Company	Date	Amount (m)	Stated purpose
Centrica	Dec 2008	€2,251	Funding of acquisitions
Scottish and Southern	Jan 2009	£479	Funding of CAPEX programme
Envestra	Feb 2009	€87	Debt consolidation
Enel	March 2009	€8,000	Maintain credit rating
Snam	May 2009	€3,470	Funding of acquisitions (Stogit, Italgas)
Iberdrola	June 2009	€1,250	Maintain credit rating
Emera	Jul 2009	€141	Debt consolidation

Source: Company websites and news announcements.

3.3 Conclusion

In previous determinations, EK has sought to set the gearing assumption so as to reflect a financing policy that could be considered both prudent and efficient. A reasonable working definition of this objective is the adoption of a gearing assumption that is consistent with a credit rating comfortably within investment grade. In the current market context, this can be taken to mean the low end of the 'A' range.

Energy network companies rated within the A range exhibit different levels of gearing, depending on the sample considered and the measurement standard adopted: Table 3.7 below summarises the evidence on gearing gathered in this section. While there is no automatic relationship between gearing and credit rating, taken together this evidence suggests that a gearing of 50% to 60% could be consistent with a credit rating within the 'A' range.

Table 3.7 Source of evidence on gearing

Company	Average	Min.	Max.
Book value gearing for A-rated network companies	62%	46%	79%
Market value gearing for A-rated network companies	48%	34%	59%
RAB value gearing for A-rated network companies	60%	49%	70%
Assumptions adopted at regulatory reviews	56%	40%	65%

Note: Estimates for gearing based on RAB value gearing for A-rated network companies and on assumptions adopted at regulatory reviews have been updated to reflect the latest figures from Ofwat and Ofgem's final determinations, published in November and December 2009, respectively.

Source: As stated in section 3.2.

The adoption of a range, rather than a point estimate, reflects the general difficulty involved in associating a gearing assumption with a particular credit rating, as well as the added uncertainty created by the current market context and its implications for the newly unbundled network operators in the Netherlands. The mid-point of this range, 55%, is five percentage points below the previous assumption.

This range is also consistent with the new financeability framework, and provides energy networks with some headroom to finance additional CAPEX with debt before hitting the indicative and mandatory caps placed on their indebtedness. The adoption of this notional assumption would not preclude companies from choosing their own optimal structure.

Table 3.8 illustrates the sensitivity of the pre-tax WACC to the gearing assumption, using the mid-point estimates of the risk-free rate, the ERP, the asset beta developed in the 'quantitative analysis' report by Oxera, and the mid-point estimates of the inflation assumption developed in this report. To illustrate the theoretical linkage between gearing and the cost of debt, this table associates the low end of the cost-of-debt range with the low end of the gearing range, and the high end of the cost-of-debt range with the high end of the gearing range. If this adjustment is taken into account, a higher gearing assumption within the range leads to a slightly higher pre-tax WACC.

Table 3.8 Pre-tax WACC estimates for different gearing assumptions

	50% gearing	55% gearing	60% gearing
RFR (nominal) (%)	4.0	4.0	4.0
Debt premium (%)	1.1	1.5	1.9
Cost of debt (%)	5.1	5.5	5.9
ERP (%)	5.0	5.0	5.0
Asset beta	0.42	0.42	0.42
Equity beta	0.73	0.80	0.89
Cost of equity (%)	7.6	8.0	8.4
Gearing (%)	50	55	60
Tax rate (%)	25.5	25.5	25.5
Pre-tax WACC (nominal) (%)	7.6	7.8	8.0
Inflation (%)	1.7	1.7	1.7
Pre-tax WACC (real) (%)	5.9	6.1	6.3

Source: EK decisions, Oxera analysis.

A1 Sources

This appendix provides the references of the regulatory decisions used for the study of regulatory precedent.

- AEEG (2007), 'Tariffe per l'erogazione dei servizi di transmission, distribuzione e misura dell'energia elettrica per il period 2008-2011—Orientamenti finali'.
- Civil Aviation Authority (2009), 'Economic Regulation of Stansted Airport, 2009–14'.
- Civil Aviation Authority (2008), 'Economic Regulation of Heathrow and Gatwick Airports, 2008–13'.
- Commission for Aviation Regulation (2009), 'Maximum Levels Charges at Dublin Airport—Draft Determinations', CP3/2005, June.
- Commission for Communications Regulation (2008), 'eircom's Cost of Capital', 08/35.
- Competition Commission (2008), 'Stansted Airport Ltd: Q5 Price Control Review'.
- Competition Commission (2007), 'BAA Ltd: A Report on the Economic Regulation of the London Airports Companies (Heathrow Airport Ltd and Gatwick Airport Ltd)'.
- Commission for Energy Regulation (2007), 'Bord Gáis Networks: Revenue Review 2007/8–2011/12'.
- Commission de Régulation de l'Énergie (2009), 'Proposition de la CRE du 26 février 2009 relative aux tarifs d'utilisation des réseaux publics de transport et de distribution d'électricité'.
- Ofcom (2008), 'A New Pricing Framework for Openreach'.
- Ofgem (2004), 'Electricity Distribution Price Control Review: Final Proposals', 265/04, November.
- Office of Rail Regulation (2008), 'Determination of Network Rail's Outputs and Funding for 2009–14'.
- Ofwat (2009), 'Future Water and Sewerage Charges 2010–15: Final Determinations', November.

Park Central
40/41 Park End Street
Oxford OX1 1JD
United Kingdom

Tel: +44 (0) 1865 253 000
Fax: +44 (0) 1865 251 172

Stephanie Square Centre
Avenue Louise 65, Box 11
1050 Brussels
Belgium

Tel: +32 (0) 2 535 7878
Fax: +32 (0) 2 535 7770

Thavies Inn House
7th Floor
3/4 Holborn Circus
London EC1N 2HA
United Kingdom

Tel: +44 (0) 20 7822 2650
Fax: +44 (0) 20 7822 2651