An Estimate of the GT17 Cost of Capital for GNI (UK)

Prepared for the Utility Regulator

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1. Introduction

This report contains First Economics' estimates of the cost of capital for GNI (UK)'s licensed pipeline assets. It is intended to inform the Utility Regulator's calculation of allowed returns for the new GT17 price control, covering the period starting 1 October 2017.

The paper is structured into six main parts:

- section 2 outlines the methodology that we have used in our work;
- section 3 assesses the risk that an investor in GNI (UK) carries and puts forward an estimate of beta;
- section 4 proposes a figure for gearing;
- section 5 provides a calculation of the cost of debt;
- section 6 contains estimates of the two generic parameters in the cost of equity calculation – the risk-free rate and the expected return on the market portfolio; and
- section 7 brings all of the preceding inputs together into an overall estimate of the cost of capital.

2. Approach

The cost of capital that we consider in this paper is a forward-looking estimate of the real, RPI-stripped rate of return that the GNI (UK) pipelines need to provide to investors in order to attract and retain capital within the business. In line with the terms of reference that were given to us by the Utility Regulator, and consistent with regulatory practice more generally, we have deliberately sought to estimate this cost of capital independently from GNI (UK)'s current ownership arrangements so that the return on offer through the price control is capable of supporting any reasonable and efficient investor set.

The cost of capital is a weighted average of two components: the cost of equity (K_e); and the cost of debt (K_d), where the weightings (gearing or g) reflect the relative importance of each type of financing in a firm's capital structure.

$$vanilla\ WACC = g\ .\ K_d + (\ 1 - g\ )\ .\ K_e$$

The prevailing market cost of debt is directly measurable and in the analysis that follows we explain how the Utility Regulator might use empirical evidence to set an appropriate value for K_d. The cost of equity, by contrast, cannot be directly observed and we have instead modelled the returns that we would expect a shareholder to demand in exchange for holding shares in the GNI (UK) business. The primary tool that we have used in our analysis is the CAPM, which relates the cost of equity to the risk-free rate (R_f), the expected return on the market portfolio (R_m), and a business-specific measure of investors' exposure to systematic risk (beta or β_e):

$$K_e = R_f + \beta_e\ .\ (R_m - R_f)$$

The two equations together show that our cost of capital calculation is based on estimates of five parameters: g, K_d, R_f, R_m and beta. In putting specific figures against each of these inputs we have sought to draw as far as possible on primary market data. We have also taken account of recent regulatory precedent, giving particular attention to the views that the Competition Commission (CC), now the Competition & Markets Authority (CMA), expressed in its 2014 determination of NIE's electricity network price controls. Inevitably, in many areas we have had ultimately to exercise a degree of judgment in order to be able to select precise numbers from the evidence we have collected, but we have tried in the analysis that follows to give a clear explanation for these judgments and to make our thinking as transparent as possible in order to assist the parties to the GT17 price control review.

3. Riskiness and Beta

We start deliberately with an assessment of GNI (UK)'s risk profile and beta on the basis that the analysis that follows will also be a key input into a number of the other cost of capital assumptions.

3.1 Preliminaries

Methodology

A firm's equity beta is a measure of the riskiness of a firm – or more specifically, a measure of the systematic risk that a firm presents – relative to the market portfolio. Firms that exhibit a beta of more than 1 can be considered more risky than the average firm in the portfolio and need to pay their investors a higher-than-average return; firms with a beta of less than 1 are less risky and warrant lower returns; and firms with a beta of exactly 1 are seen by investors as being of equal risk to the market portfolio and are expected to generate a return in line with R_m.

Empirical estimates of beta are usually obtained by measuring the covariance between movements in a company's share price and movements in the value of the stock market as a whole. However, in this report we are interested in obtaining beta estimates for an unlisted business and cannot use market data directly. The next best alternative that we have is to collect beta estimates for companies that look to be in some sense similar and to make a judgment about the value of GNI (UK)'s beta on the basis of this comparator evidence. This is an approach that has been deployed in an increasing number of periodic reviews, including several CC/CMA inquiries, during recent years as the number of regulated companies with a stock market listing has declined, and is regarded as a robust and reliable way of assessing beta in the absence of direct stock market data.

Asset beta

When comparing the betas of different firms, one has to be careful to take account of the different gearing levels that firms choose since, all other things being equal, a firm with higher gearing will exhibit a higher equity beta. Unless one controls for this effect, there is a danger of confusing the risk that comes from high leverage with the underlying business risk that a firm faces by virtue of the nature of the activities it is carrying out.

This is where the concept of an asset beta proves useful. An asset beta is a hypothetical measure of the beta that a firm would have if it had no debt and were financed entirely by equity. By comparing different firms' asset betas it becomes possible to isolate the underlying systematic

risk that a company has and carry out an assessment of the relative riskiness of different businesses.

The asset beta is calculated using the following formula:

$$\beta_a = (1 - g) \cdot \beta_e + g \cdot \beta_d$$

where β_a is a firm's asset beta, g is gearing and β_d is the firm's debt beta.[1]

A firm's actual gearing is something that is easily calculated using reported debt figures and the firm's market capitalisation, but a firm's debt beta is not something that is directly observable. We have assumed in our work that β_d is a constant of 0.1 (a value that the Utility Regulator, the CC and Ofgem have used in reviews of companies with approximately the same gearing as we identify in section 4).

Confidence intervals

This provides a complete description of our methodology for estimating asset betas. The only other point we must make is that beta estimates are exactly that: estimates. Every estimate that we identify comes with a standard error and the figures that follow must be regarded as mid-points within wider confidence intervals.

3.2 Comparator analysis

Our comparator set comprises two types of data:

- calculated betas for comparator firms with a stock market listing; and
- the beta estimates that regulators have made in recent periodic reviews.

In the first of these groups we have collected beta estimates[2] for the last remaining network-dominated companies with a UK stock market listing – National Grid, Pennon Group, Severn Trent and United Utilities – which we have averaged over the last five years to be consistent with recent CC/CMA practice.[3] The second group comprises the most recent assessments by the CC, Ofgem, Ofwat and the Utility Regulator of betas for regulated networks

The comparator data is presented in tables 1 and 2.

Table 1: Calculated asset betas

	Average asset beta
National Grid	0.35
Pennon Group	0.36
Severn Trent	0.34
United Utilities	0.32

Source: Bloomberg and First Economics' calculations using data up to July 2016.

[1] For those that have not come across this concept before, a debt beta is similar to the equity beta, but rather than measuring the systematic risk taken by the company's shareholders, it represents such risk presented to the company's lenders.
[2] Our calculations use two years of daily share price data.
[3] This approach ensures that estimates of beta are not overly swayed by short-term movements in share price data.

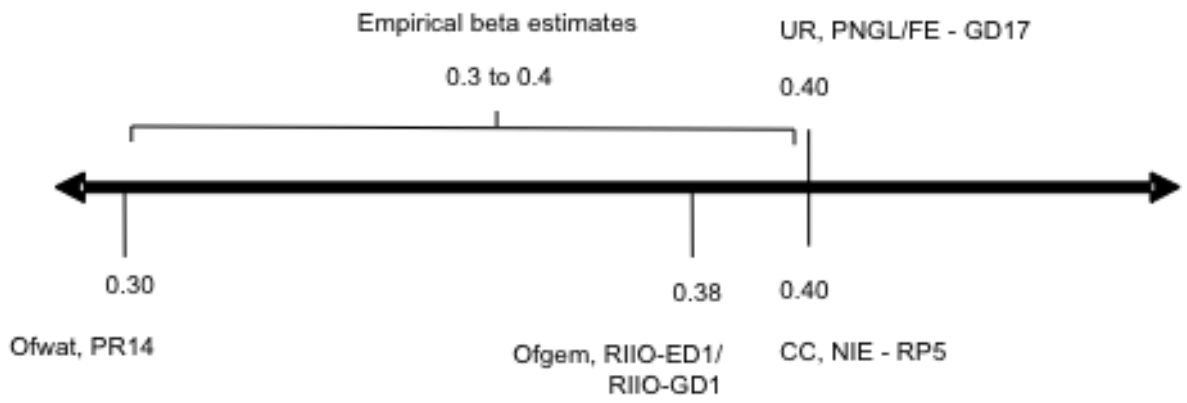
Table 2: Beta estimates used in recent periodic reviews

	Year	Regulator's estimates of asset beta
Ofgem, gas distribution networks	2012	0.38
Ofwat, water and sewerage networks	2014	0.30
Ofgem, electricity distribution networks	2014	0.38
CC, NIE	2014	0.40
CC, GB regulated networks	2014	0.31 to 0.40
Utility Regulator, gas distribution networks	2016	0.40

References: Ofgem (2012), RIIO-GD1 initial proposals; Ofwat (2014), Setting price controls for 2015-20 – risk and reward guidance; Ofgem (2014), RIIO-ED1 draft determination for the slow-track electricity distribution companies; CC (2014), Northern Ireland Electricity Ltd price determination; Utility Regulator (2016), Price control for Northern Ireland's gas distribution networks GD17 – final determination.

Figure 3 summarises the picture that emerges from these tables.

Figure 3: Asset beta estimates



The tables show that the comparator betas sit in a relatively narrow range of 0.30 to 0.40. The task that we face is to position GNI (UK) at an appropriate point relative to the comparators.

3.3 Benchmarking of the GNI (UK) beta

Approach to comparisons of riskiness

In working through this task it is useful to highlight four main determinants of the (systematic) risk that shareholders bear through their ownership of the GNI (UK) and the above-mentioned networks.

- Demand variability – GNI (UK) operates in a market where demand for its assets is very closely correlated to the overall demand for energy. This demand will in turn be sensitive to macroeconomic conditions, insofar as a downturn in the economy will cause both households and businesses to use less energy while strong growth will bring about increases in volumes.
- Cost variability – GNI (UK) employs direct and indirect staff. As labour becomes more expensive costs will go up, and as labour becomes less expensive costs will go down.

Similarly, the business is exposed to changes in the costs of other inputs like materials and business rates.

- Regulation – the two previous risk factors cannot be looked at in isolation from the important role that regulation plays in determining the way in which changes in volumes or costs translate into changes in profit. Through its design of the price controls and associated incentive mechanisms, a regulator has a significant degree of control over the degree to which shareholders are exposed to risk – a situation that distinguishes regulated companies from unregulated companies. In particular, revenue caps may offer investors quite significant protection against changes in demand, while a regulator's design of opex and capex incentives are a key determinant of exposure to cost risk.
- Cost/revenue structure – a final consideration is the sensitivity of profit to out-/under-performance against the networks' price control assumptions. In particular, it is now widely acknowledged in regulation that companies which have small regulatory asset bases (RABs) in comparison to ongoing revenues present shareholders with greater risk than companies which have large RABs in comparison to ongoing revenues.

The first three items on this list are fairly straightforward to understand, but the fourth merits a slightly more detailed explanation. In the worked example below, we depict two companies with identical ongoing expenditures. They differ only insofar as company A has a small investor capital base and company B has a large investor capital base, as measured by their RABs. Both companies set charges so as to be able to cover their expenditure plus a return on the RAB. For the purposes of this illustration, let us assume initially that both companies seek a return of 10% per annum.

Table 4: Illustrative worked example

	Company A	**Company B**
RAB	£100m	£1,000m
Expenditure	£200m	£200m
Return on RAB @ 10%	£10m	£100m
Revenues	£210m	£300m

Now consider what happens to these companies when they experience the same percentage cost overrun or the same percentage revenue loss. Although the absolute £m loss of profit is similar in both companies, the percentage loss is far greater for company A with the small RAB than it is for the company B with the larger RAB.

Table 5: Revenues, costs and profits after a 2% cost shock

	Company A	**Company B**
RAB	£100m	£1,000m
Revenue	£210m	£300m
Expenditure	£204m	£204m
Profit	£6m	£96m
Profit as % of RAB	6%	9.6%

Table 6: Revenues, costs and profits after a 2% revenue shock

	Company A	Company B
RAB	£100m	£1,000m
Revenue	£205.8m	£294m
Expenditure	£200m	£200m
Profit	£5.8m	£90m
Profit as % of RAB	5.8%	9.4%

An exactly analogous story can be told of the effects of unexpected cost reductions and about revenue gains, insofar as a given cost or revenue shock causes a greater percentage change in returns for companies with small RABs.

This provides important insights into the riskiness of different firms because it shows that the variability in out-turn profits is not just a function of the likelihood and scale of cost and demand shocks, but also the size of the capital base. Holding all other things equal, shareholders in a regulated company with a small RAB relative to ongoing costs are likely to suffer proportionately more when downside shocks occur (and gain more following upside events) in comparison to shareholders in firms whose RABs are large relative to ongoing costs.

This higher potential volatility in profits makes companies with high 'operational gearing' more risky in the eyes of shareholders. Consequently, a firm with a small RAB would not have the same cost of capital and would not seek the same return as a company with a large RAB. It would instead need to factor a higher cost of capital upfront into its charges.

Comparison of risk profiles

It follows that in order to understand how much risk the different shareholders in our sample of firms are exposed to one has to look holistically at the potential volatility in demand and costs, take the range of outcomes that one can envisage through the sector's regulatory rules and then examine the impact on each comparator's profits. It is not possible to evaluate riskiness without taking the full chain of events into account – in particular, we would caution anyone from making judgments about a business's risk profile on the basis of perceptions of pure demand and cost variability alone.

The characteristics of the UK's network companies are set out in table 7.

Table 7: Characteristics of regulated companies

	Exposure to demand risk	Exposure to cost risk	Operational gearing – average annual totex-to-RAB ratio
GB electricity distribution	Low – companies have revenue caps	Low – costs are mainly repeated opex and capital works. Costs have high labour content, with some exposure to commodity prices and the construction cycle. Price control design incorporates incentive rates of around 55%.	Low – around 15-20%

GB gas distribution	Low – companies have revenue caps	Low – costs are mainly repeated opex and capital works. Costs have high labour content, with some exposure to commodity prices and the construction cycle. Price control design incorporates incentive rates of around 60%.	Low – around 15-20%
England & Wales water and sewerage	Low – companies have revenue caps	Low to moderate – costs are mainly repeated opex and capital works, but with some major enhancement schemes. Costs have high labour content, with some exposure to commodity prices and the construction cycle. Price control design incorporates incentive rates of around 50%.	Low – around 10-15%
NIE	Low – company has a revenue cap	Low – costs are mainly repeated opex and capital works. Costs have high labour content, with some exposure to commodity prices and the construction cycle. Price control design incorporates an incentive rate of 50%.	Low – around 10-15%
NI gas distribution, FE and PNGL	Low – companies have revenue caps	Low – costs are mainly repeated opex and capital works. Costs have high labour content, with some exposure to commodity prices and the construction cycle. Price control design incorporates uncertainty mechanisms and rolling incentive mechanisms.	FE: low – around 10-15% PNGL: very low – around 5%

Source: First Economics' analysis.
Note: the totex-to-RAB metric is intended to capture the observations we made earlier about the higher riskiness of firms with small RABs/profits. A low totex-to-RAB ratio implies that profits are fairly resilient in the face of shocks and a high totex-to-RAB ratio implies that returns can be affected quite significantly by even small variations in costs and revenues.

We make the following observations about the entries in this table:

- the conventional network businesses all exhibit negligible revenue risk, relatively low cost risk, and have sizeable RABs; and
- NIE and PNGL/FE are not obviously dissimilar to the GB utilities on the three highlighted criteria, other than with respect to PNGL's very low totex-to-RAB ratio. Their slightly higher betas reflect a view, from the CC and the Utility Regulator, respectively, that the NI networks ought to be positioned at the top end of the beta range for conventional utilities due to the differences that there are in the frameworks of gas regulation in Great Britain and Northern Ireland.

The positioning of GNI (UK) depends on the regulatory framework that the Utility Regulator puts in place for GT17. We have been told to assume that the business will:

- be subject to a revenue cap, which will give GNI (UK) an income entitlement irrespective of the volumes passing through its pipelines;
- be given a five-year allowance for opex and replacement capital expenditure, and take the risk of spending more or less than this allowance; and
- have the ability to ask for a special review if it is forecasting an over-spend of more than 15% against its opex allowance. (Similarly, the Utility Regulator will be able to initiate such a review of there is a forecast under-spend of more than 15%.)

We can therefore add a further entry to the list in table 7 as follows.

Table 8: Characteristics of GNI (UK)

	Exposure to demand risk	**Exposure to cost risk**	**Operational gearing – average annual totex-to-RAB ratio**
GNI (UK)	Low – company has a revenue cap	Low – costs are mainly repeated opex and capital works. Costs have high labour content, with some exposure to commodity prices and the construction cycle. Price control design exposes company to risk of under- or over-spending against allowances up until the next price control review.	Very low – less than 5%

The key points to note here are that:

- the revenue and cost risk borne by GNI (UK)'s shareholders is not dissimilar from the risk that investors in other UK utilities carry, although the precise designs of the price control formula and associated incentive framework differ from the specifications that have been put in place in other sectors; and
- the main factor that distinguishes GNI (UK) from its peers is the company's very low totex-to-RAB ratio. Compared to other network businesses, GNI (UK) is a relatively simple business that operates a discrete set of built assets at a fairly low cost and without any of the challenges that come with expansion and growth of a network.

These observations help us to position GNI (UK) in figure 3.

- first, we can say that there is no obvious reason why GNI (UK)'s beta should not fit somewhere within the 0.30 to 0.40 range that is conventionally ascribed to regulated network businesses;
- insofar as the CC and the Utility Regulator have previously used higher beta estimates for companies whose regulatory frameworks differ from the standard Ofgem/GB model, there could be a case for looking at GNI (UK) in a similar way given the non-standard design of its price control licence conditions; however
- the Utility Regulator should also reflect upon the low risk nature of the cashflows that GNI (UK) generates as a now mature business. Although the regulator said that it finds it hard

to quantify the impact that a low totex-to-RAB ratio has on beta in its recent GD17 decision, we would suggest that the character of GNI (UK)'s business is fundamentally different from that of many of the other network companies that the Utility Regulator regulates and that there is merit in looking again at the case for a mark-down to beta in the specific circumstances of the GT17 review.

These considerations lead us to conclude that GNI (UK)'s beta should be no higher than 0.40 and could potentially sit below the NIE and PNGL/FE betas at, say, as low as 0.30. We incorporate this range into our cost of capital calculations.

4. Gearing

The assumption made about gearing affects directly the weightings of the cost of debt and cost of equity components of the weighted average cost of capital calculation. It is also an important input to the calculation of the cost of debt and cost of equity themselves as, all other things being equal, a higher level of gearing will increase the risk to both debt and equity holders, causing them to demand a higher return in exchange for making capital available.

Regulatory precedent in this area is shown in table 9. In each case the regulator concerned sought to select a figure for gearing which is consistent with the regulated company maintaining an A to BBB/Baa credit rating.

Table 9: Gearing assumptions in relevant regulatory reviews

Decision	Gearing assumption	Year
Ofgem, gas distribution	65%	2012
CC, NIE	45%	2014
Ofgem, electricity distribution	65%	2014
Ofwat, water and sewerage	62.5%	2014
Utility Regulator, gas distribution	55%	2016

The table gives a range of 45% to 65%. In comparing GNI (UK) against these other companies, it is important to be cognizant of the assessment of relative risk given in section 3. This tells us that there is no particular reason to think that the business should not be 'in the pack' with the other regulated utilities and that, if anything, GNI (UK)'s gearing, as a relatively low risk company, might lie towards the upper end of the range.

On this basis, we propose a figure of 65%.

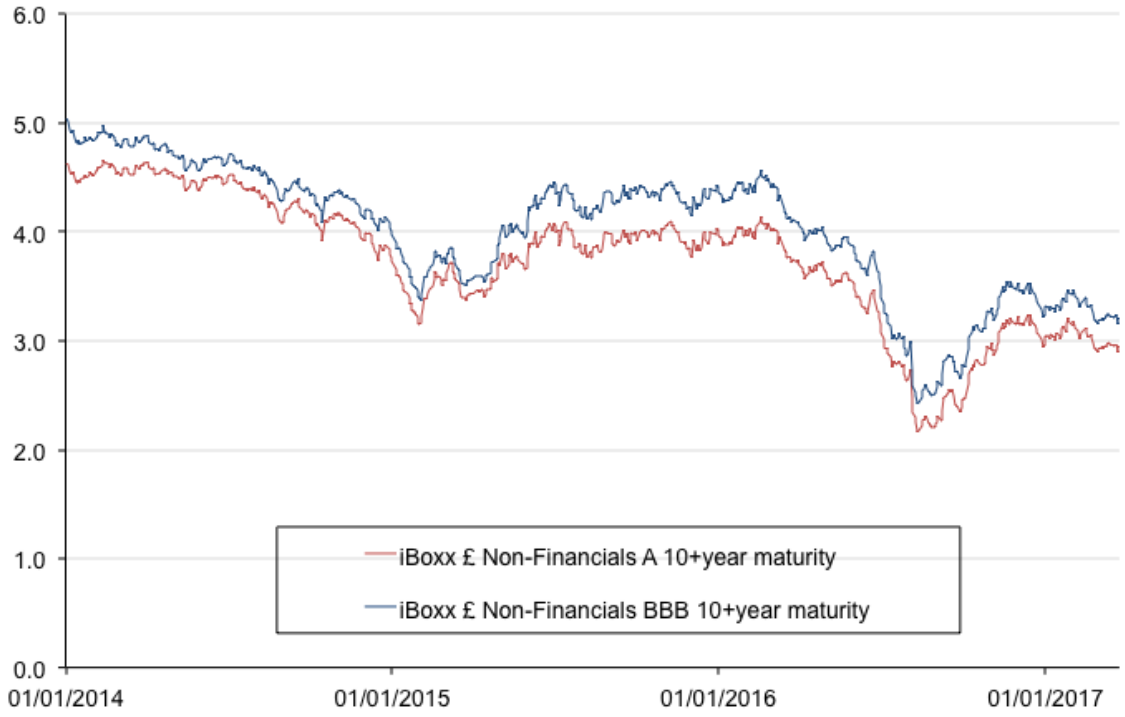
5. Cost of Debt

Our task in putting a value to the cost of debt is to use available data to estimate the interest that we would expect an efficiently financed business with an A to BBB/Baa rating to pay on its borrowings.

In previous cost of capital reports, we have expressed a preference for focusing on the interest paid by the real-life company as the natural starting point in this analysis. In this review, there is an obstacle to this approach because GNI (UK)'s debt takes the form of loans from its parent company. In the circumstances, GNI (UK)'s licence suggests that the allowed cost of debt should be benchmarked to the market interest rates that a company with GNI (UK)'s character would expect to pay if it were to borrow directly from the markets.

Figure 10 shows the yields on A and BBB rated UK corporate bonds with 10+ years to maturity.

Figure 10: iBoxx bond yield indices



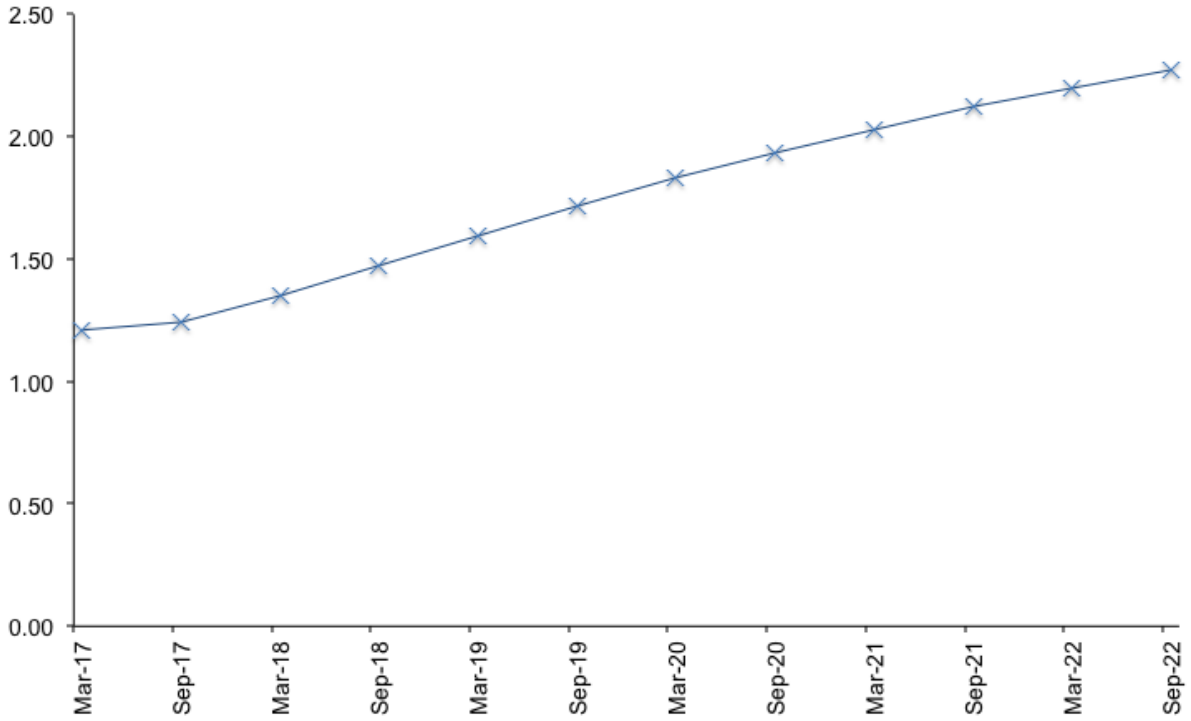
Source: iBoxx.

Prevailing yields at the time of writing are approximately 2.95% for A rated debt and 3.2 % for BBB rated debt. These are noticeably lower figures than the rates of above 4% that were seen in 2015 and at the start of 2016, reflecting the consequences that the UK's Brexit vote has had in financial markets. In its September 2016 GD17 price control determination, the Utility Regulator expressed the view that it is too early to say if figure 10 shows that interest rates have moved to a new equilibrium. While we understand the reasons for caution in the current circumstances, we also note that the regulator will issue its GT17 decision in mid-2017, by which time there will be a longer run of data with which to anchor judgments about the level of future interest rates.

We therefore recommend that the Utility Regulator can make use of the extra time that it has in this review and factor the latest available market information into its calculation of GNI (UK)'s allowed cost of debt. At the time of writing, we consider that the rates that are currently available to corporate borrowers give the most reliable starting benchmark for the GT17 period. We therefore start from a 3.1% market cost of debt in our cost of capital calculation, as the average of the current yield on A and BBB 10+ year corporate bonds.

We do, however, allow for a small move up in borrowing costs to be consistent with forward gilt rates. These are shown in figure 11.

Figure 11: Forward rates for 10-year nominal gilts



Source: Bank of England website and First Economics' calculations.

The curve shows that markets are currently pricing in a ~10 basis points increase in gilt rates by October 2017 and a ~100 basis points increase by September 2022. All other things being equal, we might expect similar upward pressure on corporate interest rates in the next few years, suggesting that it is prudent to increase the 3.1% estimate of market interest rates by a flat five-year average uplift of 0.55% to give an average nominal GT17 cost of debt of 3.65%.[4]

We also need to convert from a nominal figure to a real cost of debt for inputting into our real, RPI-stripped cost of capital computation. We advise that the conversion for inflation should be consistent with the inflation forecasts that the regulator is using throughout the GT17 review. Pending detail on what these forecasts are we use an average annual inflation rate of 3.3% for the reasons set out in annex 1. This means that we convert the nominal cost of debt into a real, RPI-stripped cost of debt of 0.35%.[5]

6. Generic Cost of Equity Parameters

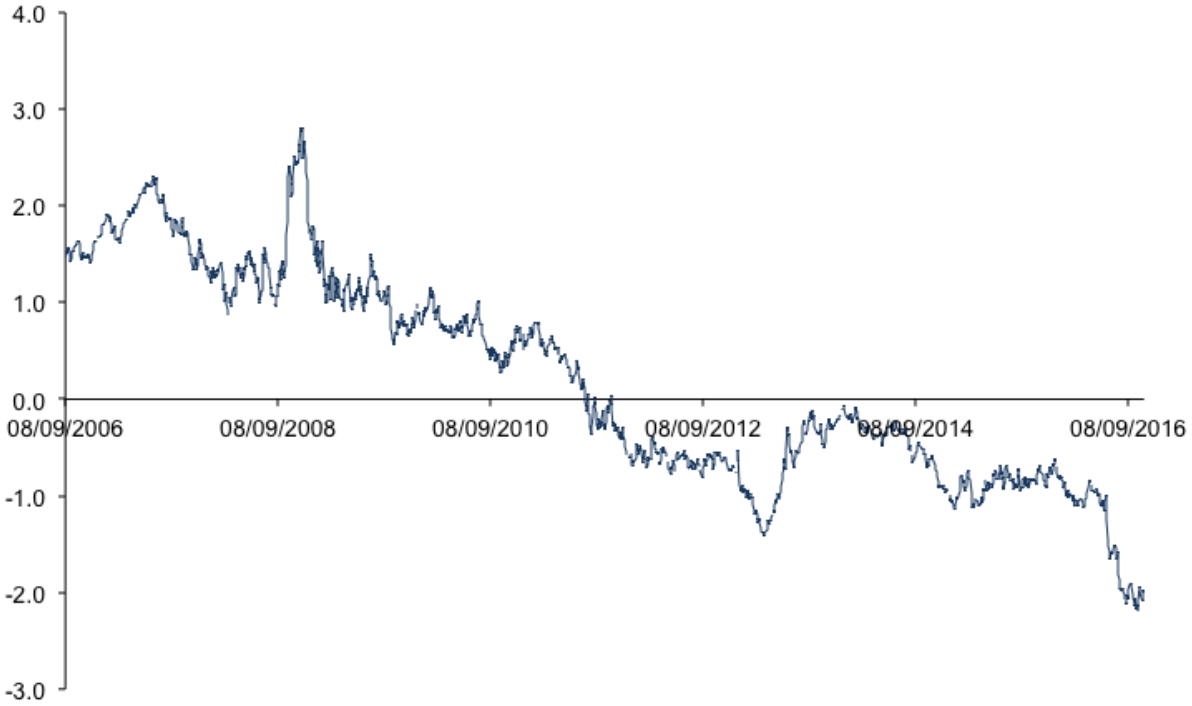
6.1 Risk-free rate

Having estimated the cost of debt directly, an estimate of the risk-free rate is needed solely for the purpose of estimating the cost of equity.

The approach used by regulators to assess the risk-free rate has in the past been to analyse yields on government-issued index-linked gilts. Figure 12 below plots the yield on 10-year index-linked gilt yields over the last decade.

[4] This 3.65% figure differs from the forward-looking costs of debt in our reports for the Utility Regulator's GD17 and RP6 due to (a) differences in the dates of our reports (b) differences in the companies' financing arrangements and (c) differences in the start and end dates for the respective regulatory periods.
[5] The conversion formula is (1 + real cost of debt) = (1 + nominal cost of debt) / (1 + forecast inflation).

Figure 12: Index-linked gilt yields



Source: Bank of England.

The chart shows that investors are currently willing to lend to the UK government at negative real (i.e. RPI-stripped) rates of interest. This is partly a function of the economic and political turbulence of recent times, and partly a function of policymakers' response to that turbulence, particularly the programme of quantitative easing – a coordinated effort by the Bank of England and other central banks to intervene in financial markets and bring the returns on low-risk assets down in an effort to divert capital to more productive uses.

It is uncontroversial to state that yields on government bonds have been distorted by these actions. The Bank of England made the following estimate in a 2011 paper:[6]

> Based on analysis of the reaction of financial market prices and model based estimates, we find that asset purchases financed by the issuance of central bank reserves—which by February 2010 totalled £200 billion—may have depressed medium to long term government bond yields by about 100 basis points

Since this time, the Bank has increased its gilt purchases to more than £400 billion.

In the circumstances, the UK's economic regulators have tended to allow for positive real risk-free rates in recent cost of capital assessments. Relevant data points are summarised in Table 13 below.

[6] Joyce, Lasaosa, Stevens, Tong (2011), The financial market impact of quantitative easing in the United Kingdom.

Table 13: Risk-free rate assumptions in recent regulatory reviews

Decision	Risk-free rate assumption	Year
CAA, Heathrow/Gatwick Airports	0.5%	2014
Competition Commission, NIE	1.5%	2014
Ofgem, RIIO-ED1	1.5%	2014
Ofwat, PR14	1.25%	2014
CMA, Bristol Water	1.25%	2015
Ofcom, BT Openreach	1.0%	2016
Utility Regulator, GD17	1.25%	2016

We do not think that there is any single 'right' answer to the question: what will the risk-free rate be in the GT17 period? Predicting market shifts is not an exact science and the table above shows that the Utility Regulator can justify a risk-free rate anywhere in the range 0.5% to 1.5% on the basis of regulatory precedent. We recommend selecting a 1.25% point estimate from within this range to align with the CMA's recent estimate.

We note that if this figure turns out to be too high or too low, the effect on the overall cost of capital calculation is small.

6.2 Market return/ Equity risk premium

The final input into CAPM is R_m, the return on the market portfolio. Some cost of capital studies arrive at a value for R_m only indirectly by estimating an equity-risk premium and adding this figure to the risk-free rate. Like the CMA, we prefer to estimate R_m directly so as to ensure that there is no inconsistency in the cost of equity calculation.[7]

Recent regulatory assumptions for the overall market return for equities are given in table 14 below.

Table 14: Equity market return assumptions in recent regulatory reviews

Decision	Equity market return assumption	Year
CAA, Heathrow/Gatwick Airports	6.25%	2014
Competition Commission, NIE	6.5%	2014
Ofgem, RIIO-ED1	6.5%	2014
Ofwat, PR14	6.75%	2014
CMA, Bristol Water	6.5%	2015
Ofcom, BT Openreach	6.3%	2016
Utility Regulator, GD17	6.5%	2016

[7] The main risk of inconsistency comes from using an R_f in the derivation of an equity-risk premium that differs from the choice of R_f that we made earlier (note that R_f appears twice in the CAPM formula and should take the same value each time). Among other things inconsistencies can arise due to the measurement of R_f over different times periods or as a result of using data from different 'risk-free' securities when deriving an equity-risk premium.

This body of precedent presents a fairly narrow range for the market return of 6.25%% to 6.75%. This is mainly a function of the statements that the Competition Commission made about the value of R_m in its determination for NIE:

> The interpretation of the evidence on market returns remains subject to considerable uncertainty. The CC said in recent regulatory inquiries that 7 per cent is an upper limit for the expected market return, based on the approximate historical average realized return for short holding periods. We think that it may be appropriate to move away from this upper limit based on historical realized returns and place greater reliance on ex ante estimates derived from historical data which tend to support an upper limit of 6.5 per cent. We note the following points in support of setting an upper limit for the market return of 6.5 per cent:
>
> (a) We consider that the return on the market is a more stable parameter than the ERP. However, it remains the case that it exhibits considerable volatility and cannot therefore be regarded as fixed over time.
>
> (b) We note that past returns necessarily incorporate, inter alia, revisions in expectations for future cash flows and discount rates. DMS (2007) attempted to address this issue directly by decomposing past realized returns. We share its view that some elements of the return, in particular the historical expansion in valuation ratios, is unlikely to be repeated in the future.
>
> (c) In applying the CAPM, we seek to derive the expected return on the market. This is not necessarily the same as the realized return, even over long time horizons, if unexpected events occur. In this regard we note that attempts to estimate the historical expected ex ante return suggest that this is considerably lower than the realized return.
>
> (d) A forward-looking expectation of a return on the market of 7 per cent does not appear credible to us, given economic conditions observed since the credit crunch and lowered expectations of returns.
>
> We consider that the appropriate upper limit for the market return is 6.5 per cent.

Given this strong steer from the CC, we do not think it is credible for us to recommend a different value to the Utility Regulator. Our proposed R_m therefore matches the CC/CMA figure of 6.5%. When taken alongside the proposed risk-free rate of 1.25%, this gives a value for the equity-risk premium of 5.25%.

7. Overall Cost of Capital Calculation and Conclusions

Table 15 combines our individual component estimates into a range for the overall real, RPI-stripped vanilla cost of capital.

Table 15: Proposed range for GNI (UK)'s GT17 Cost of Capital

	Low	**High**
Gearing	0.65	0.65
Cost of debt (%)	0.35	0.35
Risk-free rate (%)	1.25	1.25
Market return (%)	6.5	6.5
Asset beta	0.30	0.40
Equity beta	0.67	0.96
Post-tax cost of equity (%)	4.8	6.3
Vanilla WACC (%)	1.9	2.4

The calculations give a real vanilla cost of capital of 1.9% to 2.4%.

These figures are lower than the current rate of return, reflecting the shift down in market interest rates and the Utility Regulator's decision to align the return on equity to the prevailing cost of equity for a firm with GNI (UK)'s characteristics.

In selecting a point estimate from our table 15 range, our advice to the Utility Regulator is that it needs to reflect first and foremost on the analysis of riskiness that we highlight in section 3. A rate of return in the lower half of the range will be appropriate if the regulator wishes to put weight on the observations that we have made about the business's very low totex-to-RAB ratio. A rate of return at the top end of the range can be justified if the regulator considers that GNI (UK) is a more risky business in the eyes of investors when compared to GB utility companies on account of its somewhat unusual licence.

The Utility Regulatory will also wish to pay attention to movements in market interest rates after the date of this paper (27 March 2017), with a view to incorporating the best available forecast of the prevailing cost of debt into GNI (UK)'s GT17 allowed return.

Annex 1: Inflation

In our analysis of the cost of debt we need to convert a nominal rate of interest to its real equivalent. We recommend that the Utility Regulator uses the RPI forecasts that it is using across the GT17 review in this conversion; pending these forecasts, we set out below a 'holding assumption' that permits us to put forward indicative cost of debt and cost of capital calculations.

Our calculations make use of the Office of Budget Responsibility November 2016 forecasts. Although these are by no means the only possible assumptions about the future direction of inflation, they have the quality of being the underpinning to all of the public-sector forecasting currently being carried out in the UK. We think this means that they carry an authority which any alternative forecast we might otherwise choose will lack.

The November 2016 forecasts are set out in table A1 below.

Table A1: RPI forecasts

	2017/18	2018/19	2019/20	2020/21	2021/22
% change	3.3	3.5	3.1	3.2	3.2

Source: OBR economic and fiscal outlook.

The figures show quite elevated rates of inflation, due in part to the recent shift up in the 'formula effect' difference between CPI and RPI inflation and in part due to expectations that there will be a period of over-shoot against the government's inflation target during the GT17 control period.

If we average inflation over the five-year period, we find that the appropriate inflation rate for our cost of debt calculations is around 3.3%.