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# Review of NIW's Business Plan: Cost of Debt and WACC Assumptions

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## 1. Introduction and Summary

In this report, we assess Northern Ireland Water's (NIW's) approach to the calculating of its debt costs, as well as the overall weighted average cost of capital (WACC) as set out in NIW's recent Business Plan submission to the Northern Ireland Authority for Utility Regulation (NIAUR).<sup>1</sup>

In particular, this report addresses two main issues:

- § First, we examine NIW's assumptions regarding nominal new and embedded debt costs. These are used in the regulatory financial model to calculate nominal interest costs, and used, inter alia, to calculate NIW's financial ratios.
- § Second, we examine NIW's assumption for the overall WACC, which is used to derive regulated revenues. As requested by NIAUR, we calculate NIW's WACC based on Ofwat's proposed cost of equity of 7.1% as set out in Ofwat's recent Draft Determination.

Table 1.1 compares NIW's estimate of its cost of debt and WACC to NERA's best estimate of NIW's debt costs, and a WACC based on Ofwat's cost of equity.

**Table 1.1  
Nominal Debt Costs and WACC**

	<b>Model Ref<sup>4</sup></b>	<b>Parameter</b>	<b>NERA Debt Costs – Ofwat Equity Costs<sup>1</sup></b>	<b>NIW<sup>1</sup></b>
		Nominal Cost of Debt		
a	B6, R3	Nominal Cost of Embedded Debt	5.25%	5.50%
b	A2, R4	Nominal Cost of New Debt	5.25%	5.42%
		Weighted Average Cost of Capital		
c	A1, R8	Inflation Forecast	2.30%	3.50%
d	P5, R66	Real Cost of Embedded Debt $= (1+a)/(1+c) - 1$	2.88%	1.90%
e	A2, R6	Real Cost of New Debt $= (1+b)/(1+c) - 1$	2.88%	3.00% <sup>2</sup>
f	A2, R2	Real Cost of Equity (D/D+E = 60%)	7.1% <sup>3</sup>	7.70%
g		Gearing (D/D+E)	55%	60%
	NERA Calc	Vanilla WACC <sup>5</sup> (exc embedded debt)	4.8%	4.9%
	P9,R9	Vanilla WACC <sup>5</sup> (inc embedded debt)	4.8%	4.6%-4.7%

Source: NERA analysis of NIW financial model submission and NERA estimates. (1) Figures cited are averages over the PC10 period. (2) NIW's real debt cost is inconsistent with its nominal debt assumption and inflation forecast. (3) This is Ofwat's cost of equity at PR09. See Ofwat (2009) Draft Determination, p.106. (4) This is the reference to NIAUR's financial model: Worksheet, Row. (5) Vanilla WACC is post-tax cost of equity and pre-tax cost of debt.

<sup>1</sup> NIW PC10 Business Plan, Chapter B7, Section 4.2

The key points regarding NIW's nominal debt cost assumptions are as follows:

- § NIW assume a nominal cost of new debt at 5.42% at the high-end of the range of evidence. Frontier, NIW's consultants, concluded a range for the cost of the capital loan note of between 5% and 5.5%, and concluded that "*overall it seems unlikely that the cost of new debt finance will [...] differ significantly from the 5.25% rate.*"<sup>2</sup> Our own analysis of the benchmark debt instrument suggests that Frontier's proposed range is reasonable, and, as set out, we recommend a mid-point of 5.25%.
- § NIW include a nominal cost of embedded debt of 5.5% (averaged over PC10). However, we understand that NIW's embedded debt costs are fixed at 5.25%. Therefore, we propose to use this figure.
- § Overall, we believe that NIW overstate their embedded and new debt costs by around 25bps.

With regards to NIW's WACC calculations, which feeds into allowed revenues, we note the following points:

- § NIW's assume an average inflation rate over the PC10 period of 3.5% based on a report by EC Harris. This is an outdated assumption, and is higher than Frontier's assumption of 2-2.5% based on HMT forecasts at February 2009. Our preferred inflation estimate based on the very latest forecasts by HMT published in May 2009 is 2.3% on average over PC10.
- § NIW assume a real cost of new debt of 3%. However, this is inconsistent with their estimated nominal cost of debt of 5.5% and inflation rate of 3.5%, which would lead to a real cost of debt of 1.8% instead of NIW's assumed 3%. The embedded real cost of debt in NIAUR's financial model submission is low at 1.9%, which is derived by the model from the nominal embedded debt cost of 5.5% and inflation of 3.5%.
- § We calculate a consistent real cost of debt of 2.88% for both real and embedded debt (equal to our mid-point financing costs of 5.25% deflated by our inflation assumption of 2.3%).<sup>3</sup>
- § NIW's estimate of their equity costs is 7.7% based on a 60% gearing assumption. As requested by NIAUR, we have adopted Ofwat's assumed cost of equity for E&W water companies of 7.1% as set out in its recent Draft Determination and a gearing assumption of 55%.
- § Overall, NIW's regulated revenues are based on a WACC of 4.9% excluding embedded debt, and 4.6% - 4.7% including their low embedded real debt cost estimate. By contrast, we estimate a WACC – based on Ofwat's cost of equity at PR09 and our estimate of NIW's cost of debt – of 4.8% (which is the same including/excluding embedded debt).

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<sup>2</sup> Frontier (2009) op. cit. p.4.

<sup>3</sup> We calculate real figures from nominal figures using the Fisher equation:

Comparing our analysis to the WICS most recent Draft Determination for Scottish Water<sup>4</sup>, which provides a natural comparator to NIW given its similar status as a publicly-owned WaSC, we note that the WICS set a real pre-tax cost of debt allowance of 3.5% based on E&W water companies' debt costs. The WICS acknowledges that this allowance is likely to be above Scottish Water's actual debt costs. The WICS has also assumed a cost of equity of 3% or 6% (depending on its approach to setting CCD), which results in an implied Vanilla WACC (pre-tax debt, post-tax equity) of between 3.3% and 4.7%. However, the lower bound equity cost of 3% (and the implied Vanilla WACC of 3.3%) is below any reasonable lower-bound market based cost of equity or WACC.

In the remainder of this report, we first discuss NIW's approach to estimating their nominal cost of debt (Section 2). We then analyse NIW's approach to calculating their WACC (Section 3). Finally, we comment on the WICS draft determination on the cost of debt for Scottish Water (Section 4).

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<sup>4</sup> WICS (30 June 2009) Draft Determination, Staff Note 3.

## 2. Nominal Cost of Debt

NIW's estimates of the cost of debt (and equity) rely on a report by Frontier Economics for NIW, "Cost of capital and rate of return: issues paper" published in March 2009. Therefore, we have reviewed this report. We have also reviewed NIW's financial model submission to NIAUR, and note any discrepancies between the Frontier report and NIW's model assumptions.

This section is structured as follows. First we describe NIW's debt facilities (Section 2.1), and then we analyse NIW and Frontier's estimate of the nominal debt cost for the capital loan note, NIW's principal debt instrument (Section 2.2).

### 2.1. NIW's Debt Facilities

As Frontier set out, NIW has access to several types of debt facilities. We reproduce the debt facilities in Table 2.1.

**Table 2.1**  
**NIW's Debt Facilities**

	Amount	Share of Total	Interest Rate
Overdraft	£20m	1.5%	LIBOR + 35bps
Revolving credit	£55m	4.2%	LIBOR + 35bps (restricted to notified items) LIBOR + 200 bps (other purposes)
Capital loan note (DRD)	£1,250m	94.3%	5.25% (pre Apr-2010) Treasury 4.25% 2027 yield + 85bps (Apr-2010 to Apr-2014) - interest rate fixed at point of drawdown
<b>Total</b>	<b>£1,325</b>	<b>100%</b>	

Source: Frontier Report, Table 1 ("NIW Debt Facilities")

Given that approximately 95% of NIW's available debt facilities are through committed facilities in the form of a capital loan note from the Department for Regional Development (DRD), Frontier focus on this in their estimate of the cost of debt. This also appears to be the approach adopted by NIW, although this is not explicitly stated.

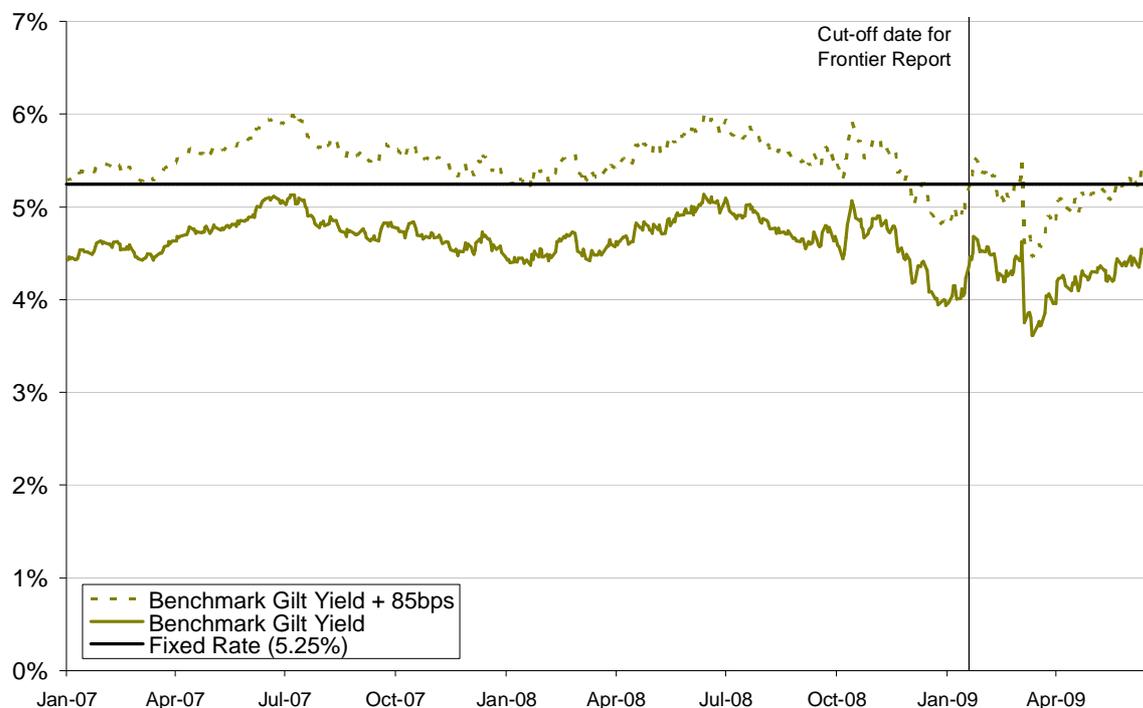
We believe that it is reasonable to focus on the capital loan note for the purposes of calculating NIW's nominal debt costs as this is by far the dominant debt instrument.

### 2.2. NIW's Nominal Debt Costs

#### 2.2.1. Frontier's approach

To estimate NIW's nominal debt costs for PC10, Frontier examine the historic benchmark yield from January 2007 to January 2009. We present in Figure 2.1 the benchmark yield for the capital loan note (Treasury 4.25% 2027) from January 2007 to date, illustrating the Frontier information cut-off point.

**Figure 2.1**  
**Cost of Capital Loan Note**



Source: NERA analysis of Debt Management Office data and Frontier Report, Figure 1 (“Reference yield on capital loan note”) and Table 3 (“Projection for the real cost of debt”)

Frontier state that the nominal cost of the capital loan note (i.e. the benchmark gilt plus the 85bps margin) is 4.95% for the month of January 2009 and the average yield from January 2007 to January 2009 is 5.53%. Over the period since the Frontier Report’s cut-off date (i.e. from 19 January to 24 June), we find that yields have averaged 5.07%.

Frontier conclude that the nominal cost of the capital loan note will lie in the range of 5.0-5.5% based on this analysis, using the then-current cost (4.95%) as the lower-bound and the long-term average cost as the upper bound, and state that they do not expect new debt finance to differ significantly from the 5.25% rate (NIW’s current debt cost).

For the existing fixed-rate debt held by NIW (assumed to be £660m), Frontier assume this is financed at 5.25%, i.e. the agreed fixed rate on current loan notes.<sup>5</sup>

## 2.2.2. NIW’s approach

In their PC10 Business Plan financial model, NIW have assumed nominal financing costs for new debt of 5.25% in 2010/11 and 5.5% in 2011/12 and 2012/13.<sup>6</sup> This corresponds to an

<sup>5</sup> In calculating the overall nominal debt costs, Frontier propose to weight the debt amounts by the proportion of new and embedded debt, although they did not have data on new debt issuance for their report and therefore did not undertake this weighting.

average nominal financing cost of 5.42% for the three-year period. NIW do not spell out their justification for these figures but these may be based on the upper-bound of Frontier's assessed range of 5.0-5.5%.<sup>7</sup>

However, for embedded debt, NIW's financial model uses a nominal cost of 5.5%, whereas we understand that NIW's capital loan note facility with the DRD has a fixed cost of 5.25% for all debt issues prior to April 2010.<sup>8</sup>

### 2.2.3. NERA's assessment

We believe that Frontier's general methodology and data inputs for estimating the nominal debt costs are reasonable. There is a question over whether regulated companies' debt costs should be based on "spot" market data (Frontier's lower-bound) or long-term averages (Frontier's upper-bound). There are also alternative approaches to deriving ranges.<sup>9</sup> However, we do not consider that these alternative approaches would materially affect the range of nominal debt costs set out by Frontier of 5% to 5.5%.

We also note that the most recent spot market data does not provide grounds for altering the proposed range.

Based on the evidence presented by Frontier and our analysis, we observe that NIW's assumption of 5.42% new debt costs over PC10 is towards the higher-end of the range set out by Frontier. NIW do not explain this assumption. We consider that a more appropriate assumption would be to take the mid-point of the identified range of 5.0-5.5%, i.e. 5.25%. This is marginally below NIW's assumption.

We also recommend that the nominal embedded debt cost is set equal to 5.25% (equal to the fixed coupon) instead of NIW's assumption of 5.5%.

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<sup>6</sup> NIW PC10 Business Plan Financial Model (15 June 2006), Sheet A2.

<sup>7</sup> We note that there is a discrepancy between these figures and those presented in NIW PC10 Business Plan Chapter B7 ("Additional table commentary and reconciliation to NIAUR financial model"), Section 2.10. The latter show nominal financing costs of 5.5% for each year in PC10, consistent with Frontier's upper-bound estimate.

<sup>8</sup> NIW Business Plan Financial Model, Sheet P5, Line 64

<sup>9</sup> There are of course alternative methods to selecting the appropriate time-period but we do not consider that they will provide materially different results. For example, an alternative way to derive a range from the data is to use the long-term average as the central estimate and employ standard deviations of daily yields over this period.

### 3. Setting the Allowed Rate of Return

NIW adopts an allowed rate of return based on the weighted average cost of capital (WACC), which is a function of real debt and equity costs, where the weights are equal to the proportion of debt and equity finance as a percentage of the RCV.

In this Section, we set out Frontier and NIW's (where this differs from Frontier) estimates of the real debt and equity costs, and their implied WACC, and we compare this to a WACC based on our estimate of NIW's debt and equity costs. For our equity costs, NIAUR asked us to adopt Ofwat's assumed cost of equity of 7.1% as set out in Ofwat's recent draft determination.

#### 3.1. Real Cost of Debt

##### 3.1.1. Frontier's Approach

Frontier derive an estimate of the cost of real debt based on their nominal debt cost assumptions (as set out above, in Section 2.2) minus expected inflation based on medium-term projections of RPI published by the HMT. The HMT forecasts are based on a sample of City and independent forecasts and released quarterly. We agree that this is a reasonable source on which to base inflation forecasts.

We present in Table 3.1 inflation projections, as presented by Frontier and HMT's February 2009 publication of RPI forecasts (cited by Frontier as the source for their figures).

**Table 3.1**  
**Frontier's Inflation Projections (% p.a.)**

	2009	2010	2011	2012	Average 2010-12
Frontier Report	-1.0	1.7	2.8	3.1	2.5
HMT (Feb 2009)	-1.3	1.9	3.0	3.0	2.6

*Source: Frontier Report, Table 2 ("RPI Inflation Projections"), HMT Forecasts for the UK Economy February 2009,*

We note that the figures presented by Frontier do not appear to reconcile precisely with the HMT publication that they cite.

Frontier conclude on a real cost of debt using a low and high inflation assumption of 2.0% and 2.5%, respectively. They state that the low end is based on inflation estimates for the start of PC10; the high end appears to be based on the average over PC10. We note that this approach would yield similar ranges if employed with HMT's actual February 2009 figures.

Frontier estimate a real cost of debt of 2.8% to 3.1%. This range is based on a nominal debt cost range of 5.1% to 5.3%, which appears to be a weighted average of Frontier's assumption of new nominal debt cost (5.0% - 5.5%) and embedded debt cost of 5.25%, but is not explicitly derived.

We reproduce Frontier's presentation of this range in Table 3.2 below.

**Table 3.2**  
**Frontier's Assessment of the Real Cost of Debt (%)**

	Lower inflation scenario	Higher inflation scenario
Nominal cost of debt	5.1	5.3
Inflation expectations	2.0	2.5
Real cost of debt	3.1	2.8

Source: Frontier Report, Table 3 ("Projection for the real cost of debt")

### 3.1.2. NIW's approach

NIW in their financial model assume a real cost of new debt of 3%. However, this is inconsistent with their assumed nominal cost of new debt of 5.42%, and their inflation forecast of 3.5% based on a dated report by EC Harris for Water UK<sup>10</sup>, (see Table 3.3). NIW's assumed nominal debt costs and inflation forecast implies a real cost of new debt of around 1.9% and not 3%.

The real cost of embedded debt is calculated (consistently) within the model, equal to NIW's nominal embedded debt cost of 5.5% minus inflation of 3.5%. This is equal to 1.9% over the period. (See NIW's financial model submission, worksheet P5, row 66).

**Table 3.3**  
**NIW's Inflation Projections (% p.a.)**

	2009	2010	2011	2012	Average 2010-12
NIW (PC10 Business Plan)	0.1	3.3	3.8	3.4	3.5

Source: NIW PC10 Business Plan, Table B7.12

### 3.1.3. NERA's assessment

The real cost of debt should be based on an estimate of the nominal debt costs minus an independent forecast of inflation over PC10. This is the approach taken by Frontier. Drawing on the latest HMT data, we estimate an average inflation rate of 2.3% over the period (see Table 3.4). However, we also note that this mid-point is subject to an unusual degree of uncertainty as we set out in Table A.1.<sup>11</sup>

We recommend that NIAUR adopt the latest HMT inflation projections as their forecast for inflation. However, NIAUR should consider revising these forecasts as new information becomes available.

<sup>10</sup> NIW's figures are based on the EC Harris (December 2008) Report for Water UK on Capex Price Inflation. See NIW PC10 Business Plan, B7.4.1.1

<sup>11</sup> We observe that there is currently unusually high uncertainty about medium-term projections of inflation for the UK, a fact noted by the Bank of England and HMT among others. See Bank of England (May 2009) Inflation Report, p. 8: "The outlook for inflation remains *extremely uncertain* ..."; HMT (April 2009) Budget Report, p. 201: "the inflation forecast is subject to *significant uncertainty*." In Appendix A we present interquartile ranges to demonstrate a range of plausible forecasts that excludes potential outliers in the top and bottom quartiles of the distribution.

**Table 3.4**  
**HMT Inflation Projections (% p.a.)**

	2009	2010	2011	2012	Average 2010-12
HMT (Feb 2009) – Mean	-1.3	1.9	3.0	3.0	2.6
HMT (May 2009) – Mean	-1.3	1.7	2.3	2.9	2.3

*Source: NERA analysis of HMT Forecasts for the UK Economy February 2009, HMT Forecasts for the UK Economy May 2009*

Using NERA's nominal debt cost for new and embedded debt of 5.25% and an inflation figure of 2.3%, suggests a real cost of debt of 2.88% which lies in the range of Frontier's estimate of 2.8% to 3.1%.

Our estimate of real debt costs of 2.88% is only slightly lower than NIW's assumption of a 3% real cost of debt. However, as explained in Section 3.1.2 the set of numbers included in the NIW model for nominal debt costs, inflation and real debt costs are inconsistent. In particular, NIW's inflation forecast is based on a December 2008 report by EC Harris which is outdated.<sup>12</sup> Instead, we recommend that NIAUR adopt the latest inflation forecasts by HMT.

### 3.2. Real Cost of Equity

Frontier sets out evidence from a NERA report for Water UK as the basis for its cost of equity estimate for NIW.<sup>13</sup> The NERA report set out a range of 7.4% to 7.9% based on a 60% gearing. NIW then adopt an estimate of 7.7% for the cost of equity in their Business Plan at 60% gearing, i.e. the approximate mid-point of the estimated range for E&W companies.

To calculate NIW's WACC, NIAUR asked us to use Ofwat's cost of equity assumption as set out in its recent Draft Determination, which is equal to 7.1% post tax, and an assumed gearing of 55%.<sup>14</sup>

#### 3.2.1. WACC

Our best estimate of the overall vanilla WACC for NIW is 4.8% based on our assessment of NIW's actual debt costs, Ofwat's cost of equity as set out in its recent Draft Determination, and NIAUR's gearing assumption of 55%. Our overall WACC estimate is set out in Table 3.5

By comparison, NIW estimated a WACC of 4.9% excluding embedded debt, and 4.6% - 4.7% including their low embedded real debt cost estimate. Frontier does not set out an explicit conclusion on the WACC.

<sup>12</sup> EC Harris (December 2008) Capex Price Inflation Report for Water UK

<sup>13</sup> Frontier (2009) op. cit., p. 10

<sup>14</sup> Ofwat (June 2009) Draft Determinations, p.106.

**Table 3.5**  
**NERA Estimates of WACC:**  
**NIW Actual Cost of Debt; Ofwat Cost of Equity at PR09 DD**

<b>Item</b>	<b>WACC</b>
Gearing	55%
NERA Estimate of NIW Cost of Debt	2.88%
Ofwat Cost of Equity (PR09 DD)	7.1%
Post tax CoE, Pre-tax CoD ("Vanilla WACC")	4.8%

*Source: NERA analysis.*

## 4. WICS Draft Determination

The Water Industry Commission for Scotland (WICS) has recently published its draft determination for Scottish Water.<sup>15</sup> In the section we briefly review the WICS determination with regard to the cost of debt and equity finance assumptions for Scottish Water.

The key points to note are as follows:

- § The WICS has set an allowed real pre-tax cost of debt of 3.5%. This is based on the WICS estimate of the debt costs of E&W water companies.<sup>16</sup> The Commission acknowledges that their allowance is higher than Scottish Water's expected actual debt costs, and proposes that any outperformance "*should be credited to the Scottish Water reserve account*".<sup>17</sup> The Commission also states that setting a commercial based cost of debt would allow Scottish Water to raise capital from private debt markets in the event that this is required.
- § According to the WICS, Scottish Water had proposed a real cost of debt of 2.5% (post-tax), which implies a rate of around 3.5%<sup>18</sup>, i.e. consistent with the WICS proposal.
- § The WICS has set a "commercial" cost of equity finance of 3%.<sup>19</sup> This is clearly below any reasonable lower-bound estimate of the market-based cost of equity. However, the WICS also notes that if it were to adjust Scottish Water's current cost depreciation charge to be in line with lower CCD charges in E&W but keep revenues constant, then the implied cost of equity finance would be 6%.
- § Overall, the WICS estimated Vanilla WACC (pre-tax debt, post-tax equity) lies between 3.3% (3% equity) and 4.7% (6% equity).

**Table 4.1**  
**WICS Proposals on the WACC**

	<b>Proposals before adjustments for high CCD</b>	<b>Proposals after adjustments for high CCD</b>
Gearing	54%	54%
Real pre-tax CoD	3.50%	3.50%
Real cost of equity	3%	6%
WACC (pre-tax CoD, post-tax CoE)	3.3%	4.7%

Source: WICS Draft Determination, Staff Paper 3, p.7.

<sup>15</sup> WICS (30<sup>th</sup> June 2009) Draft Determination

<sup>16</sup> WICS (30<sup>th</sup> June 2009) Draft Determination, Staff Paper 3, Financing Scottish Water, p.5.

<sup>17</sup> WICS (30<sup>th</sup> June 2009) Draft Determination, Staff Paper 3, Financing Scottish Water, p.5.

<sup>18</sup> Calculated as:  $\text{CoD post-tax}/(1-28\%) = \text{CoD pre-tax}$ .

<sup>19</sup> WICS (30<sup>th</sup> June 2009) Draft Determination, Staff Paper 3, Financing Scottish Water, p.3.

## Appendix A. Supporting Data

### A.1. Inflation Expectations

We present in Table A.1 both the mean and interquartile ranges of the City and independent forecasts published by HMT.<sup>20</sup> This shows that the latest interquartile range is 1.7% to 3.0% for the PC10 period, with a mid-point of 2.3%.

**Table A.1**  
**HMT Inflation Projections (% p.a.)**

	2009	2010	2011	2012	Average 2010-12
HMT (Feb 2009) – Mean	-1.3	1.9	3.0	3.0	2.6
HMT (Feb 2009) – Interquartile Range	-2.3 / 1.0	1.3 / 2.2	2.4 / 3.6	2.5 / 3.9	2.1 / 3.2
HMT (May 2009) – Mean	-1.3	1.7	2.3	2.9	2.3
HMT (May 2009) – Interquartile Range	-1.7 / -1.2	0.9 / 2.5	1.7 / 2.8	2.5 / 3.8	1.7 / 3.0

Source: NERA analysis of HMT Forecasts for the UK Economy February 2009, HMT Forecasts for the UK Economy May 2009

<sup>20</sup> We observe that there is currently unusually high uncertainty about medium-term projections of inflation for the UK, a fact noted by the Bank of England and HMT among others. See Bank of England (May 2009) Inflation Report, p. 8: “The outlook for inflation remains *extremely uncertain* ...”; HMT (April 2009) Budget Report, p. 201: “... the inflation forecast is subject to *significant uncertainty*.” We therefore present interquartile ranges to demonstrate a range of plausible forecasts that excludes potential outliers in the top and bottom quartiles of the distribution.

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