

Modelling | Model Audit | Training | Advisory



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Ofwat
Review of PR24 Final Methodology Model
Model Review Report

About CubeLynx



Powering Decision Making

An independent team supporting organisations and individuals to make critical decisions, deliver innovation, efficiency and performance in increasingly changing markets.

Through Interactive Spreadsheet Modelling

At the core of our service is the spreadsheet – we then apply analytical & financial know-how to use and train clients on spreadsheet methodologies to refine, rework & reformat management information into a form enabling clients best access and interpret this info. We then support and empower our clients to make the most of the management info.

Providing Commercial & Business Know-how

CubeLynx is highly experienced team led by a management group which understands business, but also continues to thrive in the depths of the spreadsheet. CubeLynx provides the bridge between the technical and the commercial logic, providing deep insights into data, helping clients to make critical financial and business decisions.

Sectors



Networks



Water



Aviation



Renewables



Digital/Fibre



Housing



Regeneration



Charities



Impact Investment



Making a Difference to you and Society

In addition to providing you with cost-effective, transformational support.....

CubeLynx promotes diversity and employs financial modellers who are neurodiverse, particularly those who are Autistic. The Autistic community has a large untapped talent pool of financial modellers and CubeLynx commits to provide this community with careers and pathways to success.

CubeLynx is committed to sustainable principles which benefits society and the planet. To achieve this aim, ESG (Environmental, Social, and Governance) is integrated throughout our organisation not only through our own way of doing things but also in the way we have an impact on other organisations and through the low-carbon projects we work on.



Department
for Work &
Pensions



**Ambitious
about Autism**



National
Autistic
Society



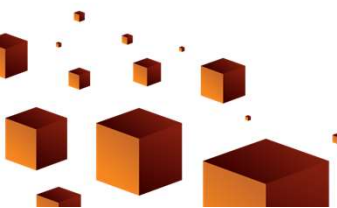
Good Finance



PENSIONS FOR PURPOSE



Professional Development



Important Notice

This report has been prepared for our client, Ofwat.

In preparing our Report, our primary sources have been models issued to us, meetings with Ofwat, and the Query & Answer log.

Our Report is based on versions of the Model that were provided to us as specified in Slides 10-11 of this Report. These are described as 'Model(s)' in the rest of this document.

Our review has focussed on the structure, formulae and modelling environment. We have accepted representations from Ofwat on the intended functionality of the Model and inputs.

This Report is for the benefit of Ofwat and should not be relied on by any other parties.

The initial basis of our work has been on the December 2022 published Final Methodology Model.

During the course of the mandate Ofwat has implemented model changes of their own, alongside changes following company feedback, these changes have been shared to us, by Ofwat, through a change log. For these amendments, we have been able to verify the changes in the updated models, for the issues that have been identified and explained by Ofwat.

CubeLynx performed assurance services ahead of Ofwat's Draft Methodology Model ('CubeLynx - Ofwat PR24 Model Review Final Report Clean.pdf'). In our report on that review, we raised some observations of a non-functional nature, for example relating to the effects on model transparency of using OpenBox.

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Introduction

We are pleased that you have engaged CubeLynx to provide model review services in relation to the PR24 financial model.

This report on the Final Methodology version of the model provides an overview of:

- The Scope of services
- Our Summary Findings
- Information reviewed
- Work undertaken by us

CubeLynx have found that the key calculations in the latest model are materially correct. In the application of the WACC, Ofwat departs from the convention adopted by other regulators. See rest of the report for further details.

We would like to thank Ofwat in taking the time to provide a run through of the model and policy, as well as the detailed responses to the questions we have raised during the course of this mandate.

Scope of Services

The review of the model was limited to the following areas of the model:

1. Advise Ofwat on the appropriateness of the overall model build
2. Review key calculations in the model and confirm that they work correctly
3. Provide assurance that the methodology used in the model fits with Ofwat's policy requirements
4. Provide advice on how to correct issues found with the model and to ensure it complies with best practice

Findings

Scope	Summary
1. Appropriateness of model build	<p>The Excel model we have reviewed is a single-company model, that would need to be implemented separately for each regulated company. It's inputs, representing an Ofwat view, company view, and another view, will be fed by feeder models and its principal outputs will be in used in setting determinations. We have not had sight of these related models, their respective links, the safeguards that Ofwat will put in place to manage those processes or the spectrum of analysis that Ofwat may wish to undertake with those outputs. We highlight that the analytical demands on a price control model can be extensive at time-critical and pressured stages in the price control review.</p> <p>The model we have reviewed has been machine-generated using a software known as OpenBox. We understand this approach can provide significant modelling resource efficiencies for Ofwat and help secure the logical integrity of the resulting Excel code. Our review has not found any coding errors attributed to errors in machine-generation. While we raised some concerns arising from this approach in our earlier report on the Draft Methodology Model, relating to ease of use and potential challenges in building confidence among a wide range of user-stakeholders, we have no additional concerns arising in this review. We note that Ofwat has been responsive to our suggestions for improvements that would help transparency and we are aware that stakeholders have not raised significant concerns themselves. We recommend that Ofwat should periodically review how it manages its potential reliance on a relatively small company for continuing support and software updates.</p>
2. Key calculations in the model	<p>The application of WACC - Ofwat departs from the convention adopted by Ofgem and some of the other regulators (sometimes inconsistently) by taking into account the time value of money in computing allowed returns. Ofgem's approach is to apply the WACC to the average of the opening balance and the discounted closing balance. This generates revenue allowances that maintain financial capital on a discounted cash flow basis. Ofwat's method results in a structurally higher allowance by not discounting the closing balance in the RCV averaging calculation (or otherwise modifying the calculation in an equivalent way).</p> <p>Following our Q&A process, we have found the key calculations in the latest model to be materially correct. Ofwat has responded positively to our queries, and we have been able to resolve the issues we encountered. In some cases, Ofwat has explained why they will not make our suggested amendments, and we can accept those reasons.</p>

Findings

Scope	Summary
3. Model alignment to policy	<p>We have reviewed the model against documents that Ofwat have helpfully identified to us and found inconsistencies between the model and policy documentation. We highlighted these to Ofwat, and following this, they have amended the model to align with policy documentation.</p> <p>We are aware that the documentation Ofwat will produce at Initial and Final Determinations will be more substantial and it will be especially important to ensure proper alignment with financial modelling.</p> <p>We have highlighted the potential for distorted outputs if detailed annual inflation forecasts depart from the separately input overall average inflation assumption. We note this should not directly affect price control outputs, but we recommend careful monitoring of this issue during this period of significant uncertainty and volatility in inflation.</p>
4. Compliance to best practice	<p>Ofwat adopts FAST standards for model development and our testing indicates that the model is FAST compliant. We have highlighted issues that relate to the use of OpenBox which has best practice implications in relation to formatting and readability of the model.</p>

Through our Q&A process we have raised 115 issues/comments, of which, Ofwat has amended 67 of these issues. There are no issues that remain 'open'.

Information Overview

Information issued by Ofwat

PR24_final_methodology_main_document

PR24_financial_model_Final_Methodology

PR24_financial_model_Final_Methodology.obz

Appendix 10 Aligning risk and return

Appendix 11 Allowed return

Appendix 13 Data and modelling

Draft model responses - errors and functionality

PR24 financial model change log - draft to final

1st Iteration - PR24_financial_model_Final_Methodology CL v1.3

1st Iteration - PR24_financial_model_Final_Methodology CL v2.1 responses

1st Iteration - PR24_financial_model_Final_Methodology CL v3.2 Responses

2nd Iteration - PR24 financial model v18p

2nd Iteration - PR24 financial model v18p.obz

2nd Iteration - PR24_financial_model_Final_Methodology CL v3.0 changes noted

Information Overview

Information issued by Ofwat

2nd Iteration - Company queries and responses

2nd Iteration - Change log for CL

3rd Iteration - PR24 financial model v18z for CL

3rd Iteration - Change log for CL 28022023

4th Iteration - PR24 financial model v19u

4th Iteration - Change log for CL

4th Iteration - PR24 financial model v19u CL v3 SENT Ofwat responses

5th Iteration - PR24 financial model v19z

5th Iteration - Change log for CL

5th Iteration - PR24 financial model v20a

Testing Undertaken

High-Level Review

Developed an overview of the structure of the Model. Our team examined the information flows and requirements of the Model. The sheets of the Excel Model were mapped using specialist financial model testing tools. This allowed the team to understand the formula flow and the consistency of formulae across and down the sheet. These spreadsheet maps can be produced and evaluated very quickly. We have also examined all worksheets in the Models by eye.

Scenario testing

Designed a set of scenarios where single elements were varied between each scenario, in order to determine whether the Model output changes in the expected manner.

Running specialist software

CubeLynx used specialist Excel tools that help to ensure the internal consistency and logical integrity of the Model. The tools are able to identify potential issues within a spreadsheet, which can then be individually checked to determine their validity.

Cell by cell review

We have undertaken a cell-by-cell review to further understand the model formulae. This cell-by-cell review has been done in a systematic way using the software tests as a guide to identify and focus in the right areas efficiently.

Focussed Reconciliation

Replicated large parts of the model in our template model to ensure the same result can be reached and where there are differences this has allowed us to investigate further and identify errors. We carried out a further reconciliation of modelled cash flows to the regulatory building blocks to help identify other potential errors.

Policy Review

CubeLynx checked the policy information provided and compared them to the model to ensure that they are consistent.

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