|  |
| --- |
| Milliman Standard Calibration Report |
| @@CALIBDATE@@ |
| Prepared by:  Craig McCulloch  FIAA  Rudi Puchy  FIA |

**Table of Contents**

[Section 1 Introduction 4](#_Toc472931922)

[1.1. Background 4](#_Toc472931923)

[1.2. Objective 4](#_Toc472931924)

[1.3. Methodology 4](#_Toc472931925)

[Section 2 Interest Rates (2 Factor Hull White) 5](#_Toc472931926)

[2.1. Introduction 5](#_Toc472931927)

[2.2. Parameters 5](#_Toc472931928)

[2.3. Input Yield Curve 5](#_Toc472931929)

[2.4. Distributions 6](#_Toc472931931)

[Section 3 Inflation 9](#_Toc472931932)

[3.1. Introduction 9](#_Toc472931933)

[Section 4 Consumer Price Inflation (Vasicek) 10](#_Toc472931934)

[4.1. Parameters 10](#_Toc472931935)

[4.2. Distributions 10](#_Toc472931936)

[Section 5 Average Weekly Earnings (Vasicek) 12](#_Toc472931937)

[5.1. Parameters 12](#_Toc472931938)

[5.2. Distributions 12](#_Toc472931939)

[Section 6 Equity Assets 14](#_Toc472931940)

[Section 7 Australian Equities 15](#_Toc472931941)

[7.1. Parameters 15](#_Toc472931942)

[7.2. Distributions 15](#_Toc472931943)

[Section 8 International Equities Hedged 17](#_Toc472931944)

[8.1. Parameters 17](#_Toc472931945)

[8.2. Distributions 17](#_Toc472931946)

[Section 9 International Equities Unhedged 19](#_Toc472931947)

[9.1. Parameters 19](#_Toc472931948)

[9.2. Distributions 19](#_Toc472931949)

[Section 10 Emerging Market Equities Unhedged 21](#_Toc472931950)

[10.1. Parameters 21](#_Toc472931951)

[10.2. Distributions 21](#_Toc472931952)

[Section 11 Bond Assets 23](#_Toc472931953)

[11.1. Overview 23](#_Toc472931954)

[Section 12 Australian Fixed Interest Government 24](#_Toc472931955)

[12.1. Parameters 24](#_Toc472931956)

[12.2. Distributions 24](#_Toc472931957)

[Section 13 Australian Fixed Interest Corporate 26](#_Toc472931958)

[13.1. Parameters 26](#_Toc472931959)

[13.2. Distributions 26](#_Toc472931960)

[Section 14 International Fixed Interest Govt Hedged 28](#_Toc472931961)

[14.1. Parameters 28](#_Toc472931962)

[14.2. Distributions 28](#_Toc472931963)

[Section 15 Alternative Assets 30](#_Toc472931964)

[15.1. Overview 30](#_Toc472931965)

[Section 16 Australian Listed Property 31](#_Toc472931966)

[16.1. Parameters 31](#_Toc472931967)

[16.2. Distributions 31](#_Toc472931968)

[Section 17 Australian Direct Property 33](#_Toc472931969)

[17.1. Parameters 33](#_Toc472931970)

[17.2. Distributions 33](#_Toc472931971)

[Section 18 International Alternatives Hedged 35](#_Toc472931972)

[18.1. Parameters 35](#_Toc472931973)

[18.2. Distributions 35](#_Toc472931974)

[Section 19 Australian Infrastructure 37](#_Toc472931975)

[19.1. Parameters 37](#_Toc472931976)

[19.2. Distributions 37](#_Toc472931977)

[Section 20 Correlations 39](#_Toc472931978)

[20.1. Overview 39](#_Toc472931979)

[20.2. Key correlations 39](#_Toc472931980)

[20.3. 39](#_Toc472931981)

1. Introduction
   1. Background
      1. This document details the @@CALIBDATE@@ Calibration of the Milliman Analytic Platform Economic Scenario Generator.
      2. The parameterisation and configuration of the economic models is a key input into Milliman Analytic Platform. Small changes to certain parameters can have large impacts on final results and as such a strict governance process around calibration is very important. This document is one part of this governance process that will allow the user of the calibration to assess whether the standard calibration is suitable for them or not.
   2. Objective
      1. This calibration is designed to represent the long-term to ultra-long-term dynamics of financial markets, specifically for interest rates, inflation, and risky asset returns. This calibration and model configuration is unlikely to be suitable for projections less than 3 years.
      2. The calibration will focus more on long-term data to calibrate models rather than current market conditions with the exception of interest rates and inflation where the yield curve and current inflation will be used.
   3. Methodology
      1. The methodology followed within this calibration is detailed in the document “Calibration - Approach, targets and validation”. The broad calibration concepts will be outlined in this document for completeness but for detailed explanation and targets review the above document.
      2. Targets for asset classes have been set through the use of historical data analysis and expert judgment. The overriding principle of the asset class returns and volatility is to maintain broadly constant risk adjusted returns so that no asset class is favoured over the other during a simulation.
   4. Reliance and Limitations
      1. To be completed by Craig Mc
2. Interest Rates (2 Factor Hull White)
   1. Introduction
      1. The initial yield curve is calibrated by making use of the Reserve Bank of Australia published yield curve as at the end of the quarter. The yield curve is extrapolated beyond the 10-year point by assuming constant forward rates from year 10 onwards.
      2. The distribution of the interest rate model has been calibrated using historical data and expert judgement. The historic was used to obtain a distribution for the relative movements of the yield curve. The parameters were then optimised to match the percentiles of the historic analysis as far as possible.
      3. The standard calibration makes use of a two factor Hull White interest rate model to model nominal interest rates. The 2 Factor Hull White model has the following key features
         * Two sources of risk, this will allow for more complex yield curve shapes than simple short rate volatility.
         * Direct input yield curves.
         * The short rate process and hence any forward rates are normally distributed.
         * Mean reverting process to a long-term average.
         * The model can produce negative rates, depending on the calibration.
   2. Parameters

|  |  |  |  |
| --- | --- | --- | --- |
| **Parameter** | **@@OLDDATE@@** | **@@CALIBDATE@@** | **Description** |
|  | @@OLDHWALPHAS@@ | @@NEWHWALPHAs@@ | The mean reversion speed of the short rate process. |
|  | @@OLDHWALPHAA@@ | @@NEWHWALPHAA@@ | The mean reversion speed of the alternative process |
|  | @@OLDHWSIGMAS@@ | @@NEWHWSIGMAS@@ | The volatility of the short rate process |
|  | @@OLDHWSIGMAA@@ | @@NEWHWSIGMAA@@ | The volatility of the alternative process |
|  | @@OLDHWGAMMA@@ | @@NEWHWGAMMA@@ | The market price of risk of the short rate process. |

* 1. Input Yield Curve

@@YIELDCURVECHART@@

* 1. Distributions
     1. Cash Total Return Percentiles (@@OLDDATE@@)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| %’ile | 1yr | 5yr | 10yr | 15yr | 20yr | 30yr |
| 5% | @@OLDCASH1\_5@@ | @@OLDCASH5\_5@@ | @@OLDCASH10\_5@@ | @@OLDCASH15\_5@@ | @@OLDCASH25\_5@@ | @@OLDCASH30\_5@@ |
| 25% | @@OLDCASH1\_25@@ | @@OLDCASH5\_25@@ | @@OLDCASH10\_25@@ | @@OLDCASH15\_25@@ | @@OLDCASH25\_25@@ | @@OLDCASH30\_25@@ |
| 50% | @@OLDCASH1\_50@@ | @@OLDCASH5\_50@@ | @@OLDCASH10\_50@@ | @@OLDCASH15\_50@@ | @@OLDCASH25\_50@@ | @@OLDCASH30\_50@@ |
| 75% | @@OLDCASH1\_75@@ | @@OLDCASH5\_75@@ | @@OLDCASH10\_75@@ | @@OLDCASH15\_75@@ | @@OLDCASH25\_75@@ | @@OLDCASH30\_75@@ |
| 95% | @@OLDCASH1\_95@@ | @@OLDCASH5\_95@@ | @@OLDCASH10\_95@@ | @@OLDCASH15\_95@@ | @@OLDCASH25\_95@@ | @@OLDCASH30\_95@@ |
| Mean | @@OLDCASH1\_MU@@ | @@OLDCASH5\_MU@@ | @@OLDCASH10\_MU@@ | @@OLDCASH15\_MU@@ | @@OLDCASH25\_MU@@ | @@OLDCASH30\_MU@@ |
| Volatility | @@OLDCASH1\_VOL@@ | @@OLDCASH5\_VOL@@ | @@OLDCASH10\_VOL@@ | @@OLDCASH15\_VOL@@ | @@OLDCASH25\_VOL@@ | @@OLDCASH30\_VOL@@ |

* + 1. Cash Total Return Percentiles (@@CALIBDATE@@)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| %’ile | 1yr | 5yr | 10yr | 15yr | 20yr | 30yr |
| 5% | @@NEWCASH1\_5@@ | @@NEWCASH5\_5@@ | @@NEWCASH10\_5@@ | @@NEWCASH15\_5@@ | @@NEWCASH25\_5@@ | @@NEWCASH30\_5@@ |
| 25% | @@NEWCASH1\_25@@ | @@NEWCASH5\_25@@ | @@NEWCASH10\_25@@ | @@NEWCASH15\_25@@ | @@NEWCASH25\_25@@ | @@NEWCASH30\_25@@ |
| 50% | @@NEWCASH1\_50@@ | @@NEWCASH5\_50@@ | @@NEWCASH10\_50@@ | @@NEWCASH15\_50@@ | @@NEWCASH25\_50@@ | @@NEWCASH30\_50@@ |
| 75% | @@NEWCASH1\_75@@ | @@NEWCASH5\_75@@ | @@NEWCASH10\_75@@ | @@NEWCASH15\_75@@ | @@NEWCASH25\_75@@ | @@NEWCASH30\_75@@ |
| 95% | @@NEWCASH1\_95@@ | @@NEWCASH5\_95@@ | @@NEWCASH10\_95@@ | @@NEWCASH15\_95@@ | @@NEWCASH25\_95@@ | @@NEWCASH30\_95@@ |
| Mean | @@NEWCASH1\_MU@@ | @@NEWCASH5\_MU@@ | @@NEWCASH10\_MU@@ | @@NEWCASH15\_MU@@ | @@NEWCASH25\_MU@@ | @@NEWCASH30\_MU@@ |
| Volatility | @@NEWCASH1\_VOL@@ | @@NEWCASH5\_VOL@@ | @@NEWCASH10\_VOL@@ | @@NEWCASH15\_VOL@@ | @@NEWCASH25\_VOL@@ | @@NEWCASH30\_VOL@@ |

* + 1. Total Return Charts (@@OLDDATE@@)

|  |  |
| --- | --- |
| Percentile Distribution | Historgram @ 10 years |
| @@OLDHWCASHPERCENTILE@@ | @@OLDHWHIST@@ |

* + 1. Total Return Charts (@@CALIBDATE@@)

|  |  |
| --- | --- |
| Percentile Distribution | Historgram @ 10 years |
| @@NEWHWPERCENTILE@@ | @@NEWHWHIST@@ |

* + 1. 10yr Spot Rate Percentiles (@@OLDDATE@@)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| %’ile | 1yr | 5yr | 10yr | 15yr | 20yr | 30yr |
| 5% | @@OLDSPOT1\_5@@ | @@OLDSPOT5\_5@@ | @@OLDSPOT10\_5@@ | @@OLDSPOT15\_5@@ | @@OLDSPOT25\_5@@ | @@OLDSPOT30\_5@@ |
| 25% | @@OLDSPOT1\_25@@ | @@OLDSPOT5\_25@@ | @@OLDSPOT10\_25@@ | @@OLDSPOT15\_25@@ | @@OLDSPOT25\_25@@ | @@OLDSPOT30\_25@@ |
| 50% | @@OLDSPOT1\_50@@ | @@OLDSPOT5\_50@@ | @@OLDSPOT10\_50@@ | @@OLDSPOT15\_50@@ | @@OLDSPOT25\_50@@ | @@OLDSPOT30\_50@@ |
| 75% | @@OLDSPOT1\_75@@ | @@OLDSPOT5\_75@@ | @@OLDSPOT10\_75@@ | @@OLDSPOT15\_75@@ | @@OLDSPOT25\_75@@ | @@OLDSPOT30\_75@@ |
| 95% | @@OLDSPOT1\_95@@ | @@OLDSPOT5\_95@@ | @@OLDSPOT10\_95@@ | @@OLDSPOT15\_95@@ | @@OLDSPOT25\_95@@ | @@OLDSPOT30\_95@@ |
| Mean | @@OLDSPOT1\_MU@@ | @@OLDSPOT5\_MU@@ | @@OLDSPOT10\_MU@@ | @@OLDSPOT15\_MU@@ | @@OLDSPOT25\_MU@@ | @@OLDSPOT30\_MU@@ |
| Volatility | @@OLDSPOT1\_VOL@@ | @@OLDSPOT5\_VOL@@ | @@OLDSPOT10\_VOL@@ | @@OLDSPOT15\_VOL@@ | @@OLDSPOT25\_VOL@@ | @@OLDSPOT30\_VOL@@ |

* + 1. 10yr Spot Rate Percentiles (@@CALIBDATE@@)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| %’ile | 1yr | 5yr | 10yr | 15yr | 20yr | 30yr |
| 5% | @@NEWSPOT1\_5@@ | @@NEWSPOT5\_5@@ | @@NEWSPOT10\_5@@ | @@NEWSPOT15\_5@@ | @@NEWSPOT25\_5@@ | @@NEWSPOT30\_5@@ |
| 25% | @@NEWSPOT1\_25@@ | @@NEWSPOT5\_25@@ | @@NEWSPOT10\_25@@ | @@NEWSPOT15\_25@@ | @@NEWSPOT25\_25@@ | @@NEWSPOT30\_25@@ |
| 50% | @@NEWSPOT1\_50@@ | @@NEWSPOT5\_50@@ | @@NEWSPOT10\_50@@ | @@NEWSPOT15\_50@@ | @@NEWSPOT25\_50@@ | @@NEWSPOT30\_50@@ |
| 75% | @@NEWSPOT1\_75@@ | @@NEWSPOT5\_75@@ | @@NEWSPOT10\_75@@ | @@NEWSPOT15\_75@@ | @@NEWSPOT25\_75@@ | @@NEWSPOT30\_75@@ |
| 95% | @@NEWSPOT1\_95@@ | @@NEWSPOT5\_95@@ | @@NEWSPOT10\_95@@ | @@NEWSPOT15\_95@@ | @@NEWSPOT25\_95@@ | @@NEWSPOT30\_95@@ |
| Mean | @@NEWSPOT1\_MU@@ | @@NEWSPOT5\_MU@@ | @@NEWSPOT10\_MU@@ | @@NEWSPOT15\_MU@@ | @@NEWSPOT25\_MU@@ | @@NEWSPOT30\_MU@@ |
| Volatility | @@NEWSPOT1\_VOL@@ | @@NEWSPOT5\_VOL@@ | @@NEWSPOT10\_VOL@@ | @@NEWSPOT15\_VOL@@ | @@NEWSPOT25\_VOL@@ | @@NEWSPOT30\_VOL@@ |

* + 1. 30yr Spot Rate Percentiles (@@OLDDATE@@)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| %’ile | 1yr | 5yr | 10yr | 15yr | 20yr | 30yr |
| 5% | @@OLDSPOT301\_5@@ | @@OLDSPOT305\_5@@ | @@OLDSPOT3010\_5@@ | @@OLDSPOT3015\_5@@ | @@OLDSPOT3025\_5@@ | @@OLDSPOT3030\_5@@ |
| 25% | @@OLDSPOT301\_25@@ | @@OLDSPOT305\_25@@ | @@OLDSPOT3010\_25@@ | @@OLDSPOT3015\_25@@ | @@OLDSPOT3025\_25@@ | @@OLDSPOT3030\_25@@ |
| 50% | @@OLDSPOT301\_50@@ | @@OLDSPOT305\_50@@ | @@OLDSPOT3010\_50@@ | @@OLDSPOT3015\_50@@ | @@OLDSPOT3025\_50@@ | @@OLDSPOT3030\_50@@ |
| 75% | @@OLDSPOT301\_75@@ | @@OLDSPOT305\_75@@ | @@OLDSPOT3010\_75@@ | @@OLDSPOT3015\_75@@ | @@OLDSPOT3025\_75@@ | @@OLDSPOT3030\_75@@ |
| 95% | @@OLDSPOT301\_95@@ | @@OLDSPOT305\_95@@ | @@OLDSPOT3010\_95@@ | @@OLDSPOT3015\_95@@ | @@OLDSPOT3025\_95@@ | @@OLDSPOT3030\_95@@ |
| Mean | @@OLDSPOT301\_MU@@ | @@OLDSPOT305\_MU@@ | @@OLDSPOT3010\_MU@@ | @@OLDSPOT3015\_MU@@ | @@OLDSPOT3025\_MU@@ | @@OLDSPOT3030\_MU@@ |
| Volatility | @@OLDSPOT301\_VOL@@ | @@OLDSPOT305\_VOL@@ | @@OLDSPOT3010\_VOL@@ | @@OLDSPOT3015\_VOL@@ | @@OLDSPOT3025\_VOL@@ | @@OLDSPOT3030\_VOL@@ |

* + 1. 30yr Spot Rate Percentiles (@@CALIBDATE@@)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| %’ile | 1yr | 5yr | 10yr | 15yr | 20yr | 30yr |
| 5% | @@NEWSPOT301\_5@@ | @@NEWSPOT305\_5@@ | @@NEWSPOT3010\_5@@ | @@NEWSPOT3015\_5@@ | @@NEWSPOT3025\_5@@ | @@NEWSPOT3030\_5@@ |
| 25% | @@NEWSPOT301\_25@@ | @@NEWSPOT305\_25@@ | @@NEWSPOT3010\_25@@ | @@NEWSPOT3015\_25@@ | @@NEWSPOT3025\_25@@ | @@NEWSPOT3030\_25@@ |
| 50% | @@NEWSPOT301\_50@@ | @@NEWSPOT305\_50@@ | @@NEWSPOT3010\_50@@ | @@NEWSPOT3015\_50@@ | @@NEWSPOT3025\_50@@ | @@NEWSPOT3030\_50@@ |
| 75% | @@NEWSPOT301\_75@@ | @@NEWSPOT305\_75@@ | @@NEWSPOT3010\_75@@ | @@NEWSPOT3015\_75@@ | @@NEWSPOT3025\_75@@ | @@NEWSPOT3030\_75@@ |
| 95% | @@NEWSPOT301\_95@@ | @@NEWSPOT305\_95@@ | @@NEWSPOT3010\_95@@ | @@NEWSPOT3015\_95@@ | @@NEWSPOT3025\_95@@ | @@NEWSPOT3030\_95@@ |
| Mean | @@NEWSPOT301\_MU@@ | @@NEWSPOT305\_MU@@ | @@NEWSPOT3010\_MU@@ | @@NEWSPOT3015\_MU@@ | @@NEWSPOT3025\_MU@@ | @@NEWSPOT3030\_MU@@ |
| Volatility | @@NEWSPOT301\_VOL@@ | @@NEWSPOT305\_VOL@@ | @@NEWSPOT3010\_VOL@@ | @@NEWSPOT3015\_VOL@@ | @@NEWSPOT3025\_VOL@@ | @@NEWSPOT3030\_VOL@@ |

1. Inflation
   1. Introduction
      1. Two different types of inflation are modelled in the standard calibration namely, Consumer Price Inflation and Average Weekly Wages Inflation. Both forms of inflation are modelled using a One factor Vasicek model(Ornstein Uhlenbeck process).
      2. The key features of the Vasicek model are
         * One risk factor
         * Normally distributed short rate model
         * Mean reverting process.
2. Consumer Price Inflation (Vasicek)
   1. Parameters

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | @@OLDDATE@@ | @@CALIBDATE@@ | Description |
|  | @@OLDCPIR0@@ | @@NEWCPIR0@@ | The starting rate of the CPI process. |
|  | @@OLDCPIALPHA@@ | @@NEWCPIALPHA@@ | The mean reversion speed of the short rate process. |
|  | @@OLDCPIMU@@ | @@NEWCPIMU@@ | The mean reversion level of the short process |
|  | @@OLDCPISIGMA@@ | @@NEWCPISIGMA@@ | The volatility of the short rate process |
|  | 0 | 0 | The market price of risk of the short rate process. |

* 1. Distributions
     1. CPI Rate Percentiles (@@OLDDATE@@)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| %’ile | 1yr | 5yr | 10yr | 15yr | 20yr | 30yr |
| 5% | @@OLDCPI1\_5@@ | @@OLDCPI5\_5@@ | @@OLDCPI10\_5@@ | @@OLDCPI15\_5@@ | @@OLDCPI25\_5@@ | @@OLDCPI30\_5@@ |
| 25% | @@OLDCPI1\_25@@ | @@OLDCPI5\_25@@ | @@OLDCPI10\_25@@ | @@OLDCPI15\_25@@ | @@OLDCPI25\_25@@ | @@OLDCPI30\_25@@ |
| 50% | @@OLDCPI1\_50@@ | @@OLDCPI5\_50@@ | @@OLDCPI10\_50@@ | @@OLDCPI15\_50@@ | @@OLDCPI25\_50@@ | @@OLDCPI30\_50@@ |
| 75% | @@OLDCPI1\_75@@ | @@OLDCPI5\_75@@ | @@OLDCPI10\_75@@ | @@OLDCPI15\_75@@ | @@OLDCPI25\_75@@ | @@OLDCPI30\_75@@ |
| 95% | @@OLDCPI1\_95@@ | @@OLDCPI5\_95@@ | @@OLDCPI10\_95@@ | @@OLDCPI15\_95@@ | @@OLDCPI25\_95@@ | @@OLDCPI30\_95@@ |
| Mean | @@OLDCPI1\_MU@@ | @@OLDCPI5\_MU@@ | @@OLDCPI10\_MU@@ | @@OLDCPI15\_MU@@ | @@OLDCPI25\_MU@@ | @@OLDCPI30\_MU@@ |
| Volatility | @@OLDCPI1\_VOL@@ | @@OLDCPI5\_VOL@@ | @@OLDCPI10\_VOL@@ | @@OLDCPI15\_VOL@@ | @@OLDCPI25\_VOL@@ | @@OLDCPI30\_VOL@@ |

* + 1. CPI Rate Percentiles (@@CALIBDATE@@)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| %’ile | 1yr | 5yr | 10yr | 15yr | 20yr | 30yr |
| 5% | @@NEWCPI1\_5@@ | @@NEWCPI5\_5@@ | @@NEWCPI10\_5@@ | @@NEWCPI15\_5@@ | @@NEWCPI25\_5@@ | @@NEWCPI30\_5@@ |
| 25% | @@NEWCPI1\_25@@ | @@NEWCPI5\_25@@ | @@NEWCPI10\_25@@ | @@NEWCPI15\_25@@ | @@NEWCPI25\_25@@ | @@NEWCPI30\_25@@ |
| 50% | @@NEWCPI1\_50@@ | @@NEWCPI5\_50@@ | @@NEWCPI10\_50@@ | @@NEWCPI15\_50@@ | @@NEWCPI25\_50@@ | @@NEWCPI30\_50@@ |
| 75% | @@NEWCPI1\_75@@ | @@NEWCPI5\_75@@ | @@NEWCPI10\_75@@ | @@NEWCPI15\_75@@ | @@NEWCPI25\_75@@ | @@NEWCPI30\_75@@ |
| 95% | @@NEWCPI1\_95@@ | @@NEWCPI5\_95@@ | @@NEWCPI10\_95@@ | @@NEWCPI15\_95@@ | @@NEWCPI25\_95@@ | @@NEWCPI30\_95@@ |
| Mean | @@NEWCPI1\_MU@@ | @@NEWCPI5\_MU@@ | @@NEWCPI10\_MU@@ | @@NEWCPI15\_MU@@ | @@NEWCPI25\_MU@@ | @@NEWCPI30\_MU@@ |
| Volatility | @@NEWCPI1\_VOL@@ | @@NEWCPI5\_VOL@@ | @@NEWCPI10\_VOL@@ | @@NEWCPI15\_VOL@@ | @@NEWCPI25\_VOL@@ | @@NEWCPI30\_VOL@@ |

* + 1. CPI Rate Charts (@@OLDDATE@@)

|  |  |
| --- | --- |
| Percentile Distribution | Historgram @ 10 years |
| @@OLDCPIPERCENTILE@@ | @@OLDCPIHIST@@ |

* + 1. CPI Rate Charts (@@CALIBDATE@@)

|  |  |
| --- | --- |
| Percentile Distribution | Historgram @ 10 years |
| @@NEWCPIPERCENTILE@@ | @@NEWCPIHIST@@ |

1. Average Weekly Earnings (Vasicek)
   1. Parameters

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | @@OLDDATE@@ | @@CALIBDATE@@ | Description |
|  | @@OLDAWER0@@ | @@NEWAWER0@@ | The starting rate of the AWE process. |
|  | @@OLDAWEALPHA@@ | @@NEWAWEALPHA@@ | The mean reversion speed of the short rate process. |
|  | @@OLDAWEMU@@ | @@NEWAWEMU@@ | The mean reversion level of the short process |
|  | @@OLDAWESIGMA@@ | @@OLDAWESIGMA@@ | The volatility of the short rate process |
|  | 0 | 0 | The market price of risk of the short rate process. |

* 1. Distributions
     1. AWE Rate Percentiles (@@OLDDATE@@)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| %’ile | 1yr | 5yr | 10yr | 15yr | 20yr | 30yr |
| 5% | @@OLDAWE1\_5@@ | @@OLDAWE5\_5@@ | @@OLDAWE10\_5@@ | @@OLDAWE15\_5@@ | @@OLDAWE25\_5@@ | @@OLDAWE30\_5@@ |
| 25% | @@OLDAWE1\_25@@ | @@OLDAWE5\_25@@ | @@OLDAWE10\_25@@ | @@OLDAWE15\_25@@ | @@OLDAWE25\_25@@ | @@OLDAWE30\_25@@ |
| 50% | @@OLDAWE1\_50@@ | @@OLDAWE5\_50@@ | @@OLDAWE10\_50@@ | @@OLDAWE15\_50@@ | @@OLDAWE25\_50@@ | @@OLDAWE30\_50@@ |
| 75% | @@OLDAWE1\_75@@ | @@OLDAWE5\_75@@ | @@OLDAWE10\_75@@ | @@OLDAWE15\_75@@ | @@OLDAWE25\_75@@ | @@OLDAWE30\_75@@ |
| 95% | @@OLDAWE1\_95@@ | @@OLDAWE5\_95@@ | @@OLDAWE10\_95@@ | @@OLDAWE15\_95@@ | @@OLDAWE25\_95@@ | @@OLDAWE30\_95@@ |
| Mean | @@OLDAWE1\_MU@@ | @@OLDAWE5\_MU@@ | @@OLDAWE10\_MU@@ | @@OLDAWE15\_MU@@ | @@OLDAWE25\_MU@@ | @@OLDAWE30\_MU@@ |
| Volatility | @@OLDAWE1\_VOL@@ | @@OLDAWE5\_VOL@@ | @@OLDAWE10\_VOL@@ | @@OLDAWE15\_VOL@@ | @@OLDAWE25\_VOL@@ | @@OLDAWE30\_VOL@@ |

* + 1. AWE Rate Percentiles (@@CALIBDATE@@)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| %’ile | 1yr | 5yr | 10yr | 15yr | 20yr | 30yr |
| 5% | @@NEWAWE1\_5@@ | @@NEWAWE5\_5@@ | @@NEWAWE10\_5@@ | @@NEWAWE15\_5@@ | @@NEWAWE25\_5@@ | @@NEWAWE30\_5@@ |
| 25% | @@NEWAWE1\_25@@ | @@NEWAWE5\_25@@ | @@NEWAWE10\_25@@ | @@NEWAWE15\_25@@ | @@NEWAWE25\_25@@ | @@NEWAWE30\_25@@ |
| 50% | @@NEWAWE1\_50@@ | @@NEWAWE5\_50@@ | @@NEWAWE10\_50@@ | @@NEWAWE15\_50@@ | @@NEWAWE25\_50@@ | @@NEWAWE30\_50@@ |
| 75% | @@NEWAWE1\_75@@ | @@NEWAWE5\_75@@ | @@NEWAWE10\_75@@ | @@NEWAWE15\_75@@ | @@NEWAWE25\_75@@ | @@NEWAWE30\_75@@ |
| 95% | @@NEWAWE1\_95@@ | @@NEWAWE5\_95@@ | @@NEWAWE10\_95@@ | @@NEWAWE15\_95@@ | @@NEWAWE25\_95@@ | @@NEWAWE30\_95@@ |
| Mean | @@NEWAWE1\_MU@@ | @@NEWAWE5\_MU@@ | @@NEWAWE10\_MU@@ | @@NEWAWE15\_MU@@ | @@NEWAWE25\_MU@@ | @@NEWAWE30\_MU@@ |
| Volatility | @@NEWAWE1\_VOL@@ | @@NEWAWE5\_VOL@@ | @@NEWAWE10\_VOL@@ | @@NEWAWE15\_VOL@@ | @@NEWAWE25\_VOL@@ | @@NEWAWE30\_VOL@@ |

* + 1. AWE Rate Charts (@@OLDDATE@@)

|  |  |
| --- | --- |
| Percentile Distribution | Historgram @ 10 years |
| @@OLDAWEPERCENTILE@@ | @@OLDAWEHIST@@ |

* + 1. AWE Rate Charts (@@CALIBDATE@@)

|  |  |
| --- | --- |
| Percentile Distribution | Historgram @ 10 years |
| @@NEWAWEPERCENTILE@@ | @@NEWAWEHIST@@ |

1. Equity Assets
   * 1. Equity assets are modelled using a Geometric Brownian Motion model, a volatility model and an income model. Majority of the assets are configured to use a Regime Switching Volatility model. The income model is not currently configured as at 31st December 2016 but will be included in future calibrations.
     2. The equity assets are modelled as excess returns over the Australian Dollar cash return, the excess return targets and hence parameters are configured periodically and as such the total returns will only change quarterly due to the updated yield curve. As such this section of the document will aim to compare the total return distributions of the equity assets between quarters in order to quantify the differences due to the change in the yield curve.
     3. The following equity assets have been calibrated
        + Australian Equities
        + International Equities – Hedged
        + International Equities – Unhedged
        + Emerging Market Equities - Unhedged
2. Australian Equities
   1. Parameters

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | @@OLDDATE@@ | @@CALIBDATE@@ | Description |
|  | 0 | 0 | The mean drift of the underlying GBM model. Note: this is set to zero as the volatility model provides the mean return in the specific regime. |
| Volatility Model (Regime Switching) | | | |
|  | @@OLDAUEQP12@@ | @@NEWAUEQP12@@ | The probability of changing from regime 1 into regime 2 over a one year period. |
|  | @@OLDAUEQP21@@ | @@NEWAUEQP21@@ | The probability of changing from regime 2 into regime 1 over a one year period. |
|  | @@OLDAUEQMU1@@ | @@NEWAUEQMU1@@ | The mean drift of the GBM when in regime 1. |
|  | @@OLDAUEQSIGMA1@@ | @@NEWAUEQSIGMA1@@ | The volatility of the GBM when in regime 1 |
|  | @@OLDAUEQMU2@@ | @@NEWAUEQMU2@@ | The mean drift of the GBM when in regime 2. |
|  | @@OLDAUEQSIGMA2@@ | @@NEWAUEQSIGMA2@@ | The volatility of the GBM when in regime 2. |
| Income Yield Model (Ornstein Uhlenbeck) | | | |
|  | @@OLDAUEQY0@@ | @@NEWAUEQY0@@ | The current retrospective dividend yield. |
|  | @@OLDAUEQYMU@@ | @@NEWAUEQYMU@@ | The long-term mean reversion level of the dividend yield |
|  | @@OLDAUEQYALPHA@@ | @@NEWAUEQYALPHA@@ | The speed of mean reversion of the dividend yield |
|  | @@OLDAUEQYSIGMA@@ | @@NEWAUEQYSIGMA@@ | The volatility of the dividend yield |

* 1. Distributions
     1. Total Return Percentiles (@@OLDDATE@@)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| %’ile | 1yr | 5yr | 10yr | 15yr | 20yr | 30yr |
| 5% | @@OLDAUEQ1\_5@@ | @@OLDAUEQ5\_5@@ | @@OLDAUEQ10\_5@@ | @@OLDAUEQ15\_5@@ | @@OLDAUEQ25\_5@@ | @@OLDAUEQ30\_5@@ |
| 25% | @@OLDAUEQ1\_25@@ | @@OLDAUEQ5\_25@@ | @@OLDAUEQ10\_25@@ | @@OLDAUEQ15\_25@@ | @@OLDAUEQ25\_25@@ | @@OLDAUEQ30\_25@@ |
| 50% | @@OLDAUEQ1\_50@@ | @@OLDAUEQ5\_50@@ | @@OLDAUEQ10\_50@@ | @@OLDAUEQ15\_50@@ | @@OLDAUEQ25\_50@@ | @@OLDAUEQ30\_50@@ |
| 75% | @@OLDAUEQ1\_75@@ | @@OLDAUEQ5\_75@@ | @@OLDAUEQ10\_75@@ | @@OLDAUEQ15\_75@@ | @@OLDAUEQ25\_75@@ | @@OLDAUEQ30\_75@@ |
| 95% | @@OLDAUEQ1\_95@@ | @@OLDAUEQ5\_95@@ | @@OLDAUEQ10\_95@@ | @@OLDAUEQ15\_95@@ | @@OLDAUEQ25\_95@@ | @@OLDAUEQ30\_95@@ |
| Mean | @@OLDAUEQ1\_MU@@ | @@OLDAUEQ5\_MU@@ | @@OLDAUEQ10\_MU@@ | @@OLDAUEQ15\_MU@@ | @@OLDAUEQ25\_MU@@ | @@OLDAUEQ30\_MU@@ |
| Volatility | @@OLDAUEQ1\_VOL@@ | @@OLDAUEQ5\_VOL@@ | @@OLDAUEQ10\_VOL@@ | @@OLDAUEQ15\_VOL@@ | @@OLDAUEQ25\_VOL@@ | @@OLDAUEQ30\_VOL@@ |

* + 1. Total Return Percentiles (@@CALIBDATE@@)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| %’ile | 1yr | 5yr | 10yr | 15yr | 20yr | 30yr |
| 5% | @@NEWAUEQ1\_5@@ | @@NEWAUEQ5\_5@@ | @@NEWAUEQ10\_5@@ | @@NEWAUEQ15\_5@@ | @@NEWAUEQ25\_5@@ | @@NEWAUEQ30\_5@@ |
| 25% | @@NEWAUEQ1\_25@@ | @@NEWAUEQ5\_25@@ | @@NEWAUEQ10\_25@@ | @@NEWAUEQ15\_25@@ | @@NEWAUEQ25\_25@@ | @@NEWAUEQ30\_25@@ |
| 50% | @@NEWAUEQ1\_50@@ | @@NEWAUEQ5\_50@@ | @@NEWAUEQ10\_50@@ | @@NEWAUEQ15\_50@@ | @@NEWAUEQ25\_50@@ | @@NEWAUEQ30\_50@@ |
| 75% | @@NEWAUEQ1\_75@@ | @@NEWAUEQ5\_75@@ | @@NEWAUEQ10\_75@@ | @@NEWAUEQ15\_75@@ | @@NEWAUEQ25\_75@@ | @@NEWAUEQ30\_75@@ |
| 95% | @@NEWAUEQ1\_95@@ | @@NEWAUEQ5\_95@@ | @@NEWAUEQ10\_95@@ | @@NEWAUEQ15\_95@@ | @@NEWAUEQ25\_95@@ | @@NEWAUEQ30\_95@@ |
| Mean | @@NEWAUEQ1\_MU@@ | @@NEWAUEQ5\_MU@@ | @@NEWAUEQ10\_MU@@ | @@NEWAUEQ15\_MU@@ | @@NEWAUEQ25\_MU@@ | @@NEWAUEQ30\_MU@@ |
| Volatility | @@NEWAUEQ1\_VOL@@ | @@NEWAUEQ5\_VOL@@ | @@NEWAUEQ10\_VOL@@ | @@NEWAUEQ15\_VOL@@ | @@NEWAUEQ25\_VOL@@ | @@NEWAUEQ30\_VOL@@ |

* + 1. Total Return Charts (@@OLDDATE@@)

|  |  |
| --- | --- |
| Percentile Distribution | Historgram @ 10 years |
| @@OLDAUEQPERCENTILE@@ | @@OLDAUEQHIST@@ |

* + 1. Total Return Charts (@@CALIBDATE@@)

|  |  |
| --- | --- |
| Percentile Distribution | Historgram @ 10 years |
| @@NEWAUEQPERCENTILE@@ | @@NEWAUEQHIST@@ |

1. International Equities Hedged
   1. Parameters

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | @@OLDDATE@@ | @@CALIBDATE@@ | Description |
|  | 0 | 0 | The mean drift of the underlying GBM model. Note: this is set to zero as the volatility model provides the mean return in the specific regime. |
| Volatility Model (Regime Switching) | | | |
|  | @@OLDINTEQP12@@ | @@NEWINTEQP12@@ | The probability of changing from regime 1 into regime 2 over a one year period. |
|  | @@OLDINTEQP21@@ | @@NEWINTEQP21@@ | The probability of changing from regime 2 into regime 1 over a one year period. |
|  | @@OLDINTEQMU1@@ | @@NEWINTEQMU1@@ | The mean drift of the GBM when in regime 1. |
|  | @@OLDINTEQSIGMA1@@ | @@NEWINTEQSIGMA1@@ | The volatility of the GBM when in regime 1 |
|  | @@OLDINTEQMU2@@ | @@NEWINTEQMU2@@ | The mean drift of the GBM when in regime 2. |
|  | @@OLDINTEQSIGMA2@@ | @@NEWINTEQSIGMA2@@ | The volatility of the GBM when in regime 2. |
| Income Yield Model (Ornstein Uhlenbeck) | | | |
|  | @@OLDINTEQY0@@ | @@NEWINTEQY0@@ | The current retrospective dividend yield. |
|  | @@OLDINTEQYMU@@ | @@NEWINTEQYMU@@ | The long-term mean reversion level of the dividend yield |
|  | @@OLDINTEQYALPHA@@ | @@NEWINTEQYALPHA@@ | The speed of mean reversion of the dividend yield |
|  | @@OLDINTEQYSIGMA@@ | @@NEWINTEQYSIGMA@@ | The volatility of the dividend yield |

* 1. Distributions
     1. Total Return Percentiles (@@OLDDATE@@)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| %’ile | 1yr | 5yr | 10yr | 15yr | 20yr | 30yr |
| 5% | @@OLDINTEQ1\_5@@ | @@OLDINTEQ5\_5@@ | @@OLDINTEQ10\_5@@ | @@OLDINTEQ15\_5@@ | @@OLDINTEQ25\_5@@ | @@OLDINTEQ30\_5@@ |
| 25% | @@OLDINTEQ1\_25@@ | @@OLDINTEQ5\_25@@ | @@OLDINTEQ10\_25@@ | @@OLDINTEQ15\_25@@ | @@OLDINTEQ25\_25@@ | @@OLDINTEQ30\_25@@ |
| 50% | @@OLDINTEQ1\_50@@ | @@OLDINTEQ5\_50@@ | @@OLDINTEQ10\_50@@ | @@OLDINTEQ15\_50@@ | @@OLDINTEQ25\_50@@ | @@OLDINTEQ30\_50@@ |
| 75% | @@OLDINTEQ1\_75@@ | @@OLDINTEQ5\_75@@ | @@OLDINTEQ10\_75@@ | @@OLDINTEQ15\_75@@ | @@OLDINTEQ25\_75@@ | @@OLDINTEQ30\_75@@ |
| 95% | @@OLDINTEQ1\_95@@ | @@OLDINTEQ5\_95@@ | @@OLDINTEQ10\_95@@ | @@OLDINTEQ15\_95@@ | @@OLDINTEQ25\_95@@ | @@OLDINTEQ30\_95@@ |
| Mean | @@OLDINTEQ1\_MU@@ | @@OLDINTEQ5\_MU@@ | @@OLDINTEQ10\_MU@@ | @@OLDINTEQ15\_MU@@ | @@OLDINTEQ25\_MU@@ | @@OLDINTEQ30\_MU@@ |
| Volatility | @@OLDINTEQ1\_VOL@@ | @@OLDINTEQ5\_VOL@@ | @@OLDINTEQ10\_VOL@@ | @@OLDINTEQ15\_VOL@@ | @@OLDINTEQ25\_VOL@@ | @@OLDINTEQ30\_VOL@@ |

* + 1. Total Return Percentiles (@@CALIBDATE@@)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| %’ile | 1yr | 5yr | 10yr | 15yr | 20yr | 30yr |
| 5% | @@NEWINTEQ1\_5@@ | @@NEWINTEQ5\_5@@ | @@NEWINTEQ10\_5@@ | @@NEWINTEQ15\_5@@ | @@NEWINTEQ25\_5@@ | @@NEWINTEQ30\_5@@ |
| 25% | @@NEWINTEQ1\_25@@ | @@NEWINTEQ5\_25@@ | @@NEWINTEQ10\_25@@ | @@NEWINTEQ15\_25@@ | @@NEWINTEQ25\_25@@ | @@NEWINTEQ30\_25@@ |
| 50% | @@NEWINTEQ1\_50@@ | @@NEWINTEQ5\_50@@ | @@NEWINTEQ10\_50@@ | @@NEWINTEQ15\_50@@ | @@NEWINTEQ25\_50@@ | @@NEWINTEQ30\_50@@ |
| 75% | @@NEWINTEQ1\_75@@ | @@NEWINTEQ5\_75@@ | @@NEWINTEQ10\_75@@ | @@NEWINTEQ15\_75@@ | @@NEWINTEQ25\_75@@ | @@NEWINTEQ30\_75@@ |
| 95% | @@NEWINTEQ1\_95@@ | @@NEWINTEQ5\_95@@ | @@NEWINTEQ10\_95@@ | @@NEWINTEQ15\_95@@ | @@NEWINTEQ25\_95@@ | @@NEWINTEQ30\_95@@ |
| Mean | @@NEWINTEQ1\_MU@@ | @@NEWINTEQ5\_MU@@ | @@NEWINTEQ10\_MU@@ | @@NEWINTEQ15\_MU@@ | @@NEWINTEQ25\_MU@@ | @@NEWINTEQ30\_MU@@ |
| Volatility | @@NEWINTEQ1\_VOL@@ | @@NEWINTEQ5\_VOL@@ | @@NEWINTEQ10\_VOL@@ | @@NEWINTEQ15\_VOL@@ | @@NEWINTEQ25\_VOL@@ | @@NEWINTEQ30\_VOL@@ |

* + 1. Total Return Charts (@@OLDDATE@@)

|  |  |
| --- | --- |
| Percentile Distribution | Historgram @ 10 years |
| @@OLDINTEQPERCENTILE@@ | @@OLDINTEQHIST@@ |

* + 1. Total Return Charts (@@CALIBDATE@@)

|  |  |
| --- | --- |
| Percentile Distribution | Historgram @ 10 years |
| @@NEWINTEQPERCENTILE@@ | @@NEWINTEQHIST@@ |

1. International Equities Unhedged
   1. Parameters

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | @@OLDDATE@@ | @@CALIBDATE@@ | Description |
|  | 0 | 0 | The mean drift of the underlying GBM model. Note: this is set to zero as the volatility model provides the mean return in the specific regime. |
| Volatility Model (Regime Switching) | | | |
|  | @@OLDINTEQUNHP12@@ | @@NEWINTEQUNHP12@@ | The probability of changing from regime 1 into regime 2 over a one year period. |
|  | @@OLDINTEQUNHP21@@ | @@NEWINTEQUNHP21@@ | The probability of changing from regime 2 into regime 1 over a one year period. |
|  | @@OLDINTEQUNHMU1@@ | @@NEWINTEQUNHMU1@@ | The mean drift of the GBM when in regime 1. |
|  | @@OLDINTEQUNHSIGMA1@@ | @@NEWINTEQUNHSIGMA1@@ | The volatility of the GBM when in regime 1 |
|  | @@OLDINTEQUNHMU2@@ | @@NEWINTEQUNHMU2@@ | The mean drift of the GBM when in regime 2. |
|  | @@OLDINTEQUNHSIGMA2@@ | @@NEWINTEQUNHSIGMA2@@ | The volatility of the GBM when in regime 2. |
| Income Yield Model (Ornstein Uhlenbeck) | | | |
|  | @@OLDINTEQUNHY0@@ | @@NEWINTEQUNHY0@@ | The current retrospective dividend yield. |
|  | @@OLDINTEQUNHYMU@@ | @@NEWINTEQUNHYMU@@ | The long-term mean reversion level of the dividend yield |
|  | @@OLDINTEQUNHYALPHA@@ | @@NEWINTEQUNHYALPHA@@ | The speed of mean reversion of the dividend yield |
|  | @@OLDINTEQUNHYSIGMA@@ | @@NEWINTEQUNHYSIGMA@@ | The volatility of the dividend yield |

* 1. Distributions
     1. Total Return Percentiles (@@OLDDATE@@)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| %’ile | 1yr | 5yr | 10yr | 15yr | 20yr | 30yr |
| 5% | @@OLDINTEQUNH1\_5@@ | @@OLDINTEQUNH5\_5@@ | @@OLDINTEQUNH10\_5@@ | @@OLDINTEQUNH15\_5@@ | @@OLDINTEQUNH25\_5@@ | @@OLDINTEQUNH30\_5@@ |
| 25% | @@OLDINTEQUNH1\_25@@ | @@OLDINTEQUNH5\_25@@ | @@OLDINTEQUNH10\_25@@ | @@OLDINTEQUNH15\_25@@ | @@OLDINTEQUNH25\_25@@ | @@OLDINTEQUNH30\_25@@ |
| 50% | @@OLDINTEQUNH1\_50@@ | @@OLDINTEQUNH5\_50@@ | @@OLDINTEQUNH10\_50@@ | @@OLDINTEQUNH15\_50@@ | @@OLDINTEQUNH25\_50@@ | @@OLDINTEQUNH30\_50@@ |
| 75% | @@OLDINTEQUNH1\_75@@ | @@OLDINTEQUNH5\_75@@ | @@OLDINTEQUNH10\_75@@ | @@OLDINTEQUNH15\_75@@ | @@OLDINTEQUNH25\_75@@ | @@OLDINTEQUNH30\_75@@ |
| 95% | @@OLDINTEQUNH1\_95@@ | @@OLDINTEQUNH5\_95@@ | @@OLDINTEQUNH10\_95@@ | @@OLDINTEQUNH15\_95@@ | @@OLDINTEQUNH25\_95@@ | @@OLDINTEQUNH30\_95@@ |
| Mean | @@OLDINTEQUNH1\_MU@@ | @@OLDINTEQUNH5\_MU@@ | @@OLDINTEQUNH10\_MU@@ | @@OLDINTEQUNH15\_MU@@ | @@OLDINTEQUNH25\_MU@@ | @@OLDINTEQUNH30\_MU@@ |
| Volatility | @@OLDINTEQUNH1\_VOL@@ | @@OLDINTEQUNH5\_VOL@@ | @@OLDINTEQUNH10\_VOL@@ | @@OLDINTEQUNH15\_VOL@@ | @@OLDINTEQUNH25\_VOL@@ | @@OLDINTEQUNH30\_VOL@@ |

* + 1. Total Return Percentiles (@@CALIBDATE@@)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| %’ile | 1yr | 5yr | 10yr | 15yr | 20yr | 30yr |
| 5% | @@NEWINTEQUNH1\_5@@ | @@NEWINTEQUNH5\_5@@ | @@NEWINTEQUNH10\_5@@ | @@NEWINTEQUNH15\_5@@ | @@NEWINTEQUNH25\_5@@ | @@NEWINTEQUNH30\_5@@ |
| 25% | @@NEWINTEQUNH1\_25@@ | @@NEWINTEQUNH5\_25@@ | @@NEWINTEQUNH10\_25@@ | @@NEWINTEQUNH15\_25@@ | @@NEWINTEQUNH25\_25@@ | @@NEWINTEQUNH30\_25@@ |
| 50% | @@NEWINTEQUNH1\_50@@ | @@NEWINTEQUNH5\_50@@ | @@NEWINTEQUNH10\_50@@ | @@NEWINTEQUNH15\_50@@ | @@NEWINTEQUNH25\_50@@ | @@NEWINTEQUNH30\_50@@ |
| 75% | @@NEWINTEQUNH1\_75@@ | @@NEWINTEQUNH5\_75@@ | @@NEWINTEQUNH10\_75@@ | @@NEWINTEQUNH15\_75@@ | @@NEWINTEQUNH25\_75@@ | @@NEWINTEQUNH30\_75@@ |
| 95% | @@NEWINTEQUNH1\_95@@ | @@NEWINTEQUNH5\_95@@ | @@NEWINTEQUNH10\_95@@ | @@NEWINTEQUNH15\_95@@ | @@NEWINTEQUNH25\_95@@ | @@NEWINTEQUNH30\_95@@ |
| Mean | @@NEWINTEQUNH1\_MU@@ | @@NEWINTEQUNH5\_MU@@ | @@NEWINTEQUNH10\_MU@@ | @@NEWINTEQUNH15\_MU@@ | @@NEWINTEQUNH25\_MU@@ | @@NEWINTEQUNH30\_MU@@ |
| Volatility | @@NEWINTEQUNH1\_VOL@@ | @@NEWINTEQUNH5\_VOL@@ | @@NEWINTEQUNH10\_VOL@@ | @@NEWINTEQUNH15\_VOL@@ | @@NEWINTEQUNH25\_VOL@@ | @@NEWINTEQUNH30\_VOL@@ |

* + 1. Total Return Charts (@@OLDDATE@@)

|  |  |
| --- | --- |
| Percentile Distribution | Historgram @ 10 years |
| @@OLDINTEQUNHPERCENTILE@@ | @@OLDINTEQUNHHIST@@ |

* + 1. Total Return Charts (@@CALIBDATE@@)

|  |  |
| --- | --- |
| Percentile Distribution | Historgram @ 10 years |
| @@NEWINTEQUNHPERCENTILE@@ | @@NEWINTEQUNHHIST@@ |

1. Emerging Market Equities Unhedged
   1. Parameters

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | @@OLDDATE@@ | @@CALIBDATE@@ | Description |
|  | 0 | 0 | The mean drift of the underlying GBM model. Note: this is set to zero as the volatility model provides the mean return in the specific regime. |
| Volatility Model (Regime Switching) | | | |
|  | @@OLDEMEQP12@@ | @@NEWEMEQP12@@ | The probability of changing from regime 1 into regime 2 over a one year period. |
|  | @@OLDEMEQP21@@ | @@NEWEMEQP21@@ | The probability of changing from regime 2 into regime 1 over a one year period. |
|  | @@OLDEMEQMU1@@ | @@NEWEMEQMU1@@ | The mean drift of the GBM when in regime 1. |
|  | @@OLDEMEQSIGMA1@@ | @@NEWEMEQSIGMA1@@ | The volatility of the GBM when in regime 1 |
|  | @@OLDEMEQMU2@@ | @@NEWEMEQMU2@@ | The mean drift of the GBM when in regime 2. |
|  | @@OLDEMEQSIGMA2@@ | @@NEWEMEQSIGMA2@@ | The volatility of the GBM when in regime 2. |
| Income Yield Model (Ornstein Uhlenbeck) | | | |
|  | @@OLDEMEQY0@@ | @@NEWEMEQY0@@ | The current retrospective dividend yield. |
|  | @@OLDEMEQYMU@@ | @@NEWEMEQYMU@@ | The long-term mean reversion level of the dividend yield |
|  | @@OLDEMEQYALPHA@@ | @@NEWEMEQYALPHA@@ | The speed of mean reversion of the dividend yield |
|  | @@OLDEMEQYSIGMA@@ | @@NEWEMEQYSIGMA@@ | The volatility of the dividend yield |

* 1. Distributions
     1. Total Return Percentiles (@@OLDDATE@@)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| %’ile | 1yr | 5yr | 10yr | 15yr | 20yr | 30yr |
| 5% | @@OLDEMEQ1\_5@@ | @@OLDEMEQ5\_5@@ | @@OLDEMEQ10\_5@@ | @@OLDEMEQ15\_5@@ | @@OLDEMEQ25\_5@@ | @@OLDEMEQ30\_5@@ |
| 25% | @@OLDEMEQ1\_25@@ | @@OLDEMEQ5\_25@@ | @@OLDEMEQ10\_25@@ | @@OLDEMEQ15\_25@@ | @@OLDEMEQ25\_25@@ | @@OLDEMEQ30\_25@@ |
| 50% | @@OLDEMEQ1\_50@@ | @@OLDEMEQ5\_50@@ | @@OLDEMEQ10\_50@@ | @@OLDEMEQ15\_50@@ | @@OLDEMEQ25\_50@@ | @@OLDEMEQ30\_50@@ |
| 75% | @@OLDEMEQ1\_75@@ | @@OLDEMEQ5\_75@@ | @@OLDEMEQ10\_75@@ | @@OLDEMEQ15\_75@@ | @@OLDEMEQ25\_75@@ | @@OLDEMEQ30\_75@@ |
| 95% | @@OLDEMEQ1\_95@@ | @@OLDEMEQ5\_95@@ | @@OLDEMEQ10\_95@@ | @@OLDEMEQ15\_95@@ | @@OLDEMEQ25\_95@@ | @@OLDEMEQ30\_95@@ |
| Mean | @@OLDEMEQ1\_MU@@ | @@OLDEMEQ5\_MU@@ | @@OLDEMEQ10\_MU@@ | @@OLDEMEQ15\_MU@@ | @@OLDEMEQ25\_MU@@ | @@OLDEMEQ30\_MU@@ |
| Volatility | @@OLDEMEQ1\_VOL@@ | @@OLDEMEQ5\_VOL@@ | @@OLDEMEQ10\_VOL@@ | @@OLDEMEQ15\_VOL@@ | @@OLDEMEQ25\_VOL@@ | @@OLDEMEQ30\_VOL@@ |

* + 1. Total Return Percentiles (@@CALIBDATE@@)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| %’ile | 1yr | 5yr | 10yr | 15yr | 20yr | 30yr |
| 5% | @@NEWEMEQ1\_5@@ | @@NEWEMEQ5\_5@@ | @@NEWEMEQ10\_5@@ | @@NEWEMEQ15\_5@@ | @@NEWEMEQ25\_5@@ | @@NEWEMEQ30\_5@@ |
| 25% | @@NEWEMEQ1\_25@@ | @@NEWEMEQ5\_25@@ | @@NEWEMEQ10\_25@@ | @@NEWEMEQ15\_25@@ | @@NEWEMEQ25\_25@@ | @@NEWEMEQ30\_25@@ |
| 50% | @@NEWEMEQ1\_50@@ | @@NEWEMEQ5\_50@@ | @@NEWEMEQ10\_50@@ | @@NEWEMEQ15\_50@@ | @@NEWEMEQ25\_50@@ | @@NEWEMEQ30\_50@@ |
| 75% | @@NEWEMEQ1\_75@@ | @@NEWEMEQ5\_75@@ | @@NEWEMEQ10\_75@@ | @@NEWEMEQ15\_75@@ | @@NEWEMEQ25\_75@@ | @@NEWEMEQ30\_75@@ |
| 95% | @@NEWEMEQ1\_95@@ | @@NEWEMEQ5\_95@@ | @@NEWEMEQ10\_95@@ | @@NEWEMEQ15\_95@@ | @@NEWEMEQ25\_95@@ | @@NEWEMEQ30\_95@@ |
| Mean | @@NEWEMEQ1\_MU@@ | @@NEWEMEQ5\_MU@@ | @@NEWEMEQ10\_MU@@ | @@NEWEMEQ15\_MU@@ | @@NEWEMEQ25\_MU@@ | @@NEWEMEQ30\_MU@@ |
| Volatility | @@NEWEMEQ1\_VOL@@ | @@NEWEMEQ5\_VOL@@ | @@NEWEMEQ10\_VOL@@ | @@NEWEMEQ15\_VOL@@ | @@NEWEMEQ25\_VOL@@ | @@NEWEMEQ30\_VOL@@ |

* + 1. Total Return Charts (@@OLDDATE@@)

|  |  |
| --- | --- |
| Percentile Distribution | Historgram @ 10 years |
| @@OLDEMEQPERCENTILE@@ | @@OLDEMEQHIST@@ |

* + 1. Total Return Charts (@@CALIBDATE@@)

|  |  |
| --- | --- |
| Percentile Distribution | Historgram @ 10 years |
| @@NEWEMEQPERCENTILE@@ | @@NEWEMEQHIST@@ |

1. Fixed Income Assets
   1. Overview
      1. Fixed income assets are modelled similarly to Equity assets using a Geometric Brownian Motion model, a volatility model and an income model. All the fixed income assets are configured to use a Regime Switching Volatility model. The income model is not currently configured as at 31st December 2016 but will be included in future calibrations.
      2. The fixed income assets are modelled as excess returns above the Australian Dollar cash return, the excess return targets and hence parameters are configured periodically and as such the total returns will only change quarterly due to the updated yield curve. As such this section of the document will aim to compare the total return distributions of the fixed income assets between quarters in order to quantify the differences due to the change in the yield curve.
      3. The following fixed income assets have been calibrated
         * Australian Fixed Interest Government
         * Australian Fixed Interest Corporate
         * International Fixed Interest Government
2. Australian Fixed Interest Government
   1. Parameters

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | @@OLDDATE@@ | @@CALIBDATE@@ | Description |
|  | 0 | 0 | The mean drift of the underlying GBM model. Note: this is set to zero as the volatility model provides the mean return in the specific regime. |
| Volatility Model (Regime Switching) | | | |
|  | @@OLDAUFIP12@@ | @@NEWAUFIP12@@ | The probability of changing from regime 1 into regime 2 over a one year period. |
|  | @@OLDAUFIP21@@ | @@NEWAUFIP21@@ | The probability of changing from regime 2 into regime 1 over a one year period. |
|  | @@OLDAUFIMU1@@ | @@NEWAUFIMU1@@ | The mean drift of the GBM when in regime 1. |
|  | @@OLDAUFISIGMA1@@ | @@NEWAUFISIGMA1@@ | The volatility of the GBM when in regime 1 |
|  | @@OLDAUFIMU2@@ | @@NEWAUFIMU2@@ | The mean drift of the GBM when in regime 2. |
|  | @@OLDAUFISIGMA2@@ | @@NEWAUFISIGMA2@@ | The volatility of the GBM when in regime 2. |
| Income Yield Model (Ornstein Uhlenbeck) | | | |
|  | @@OLDAUFIY0@@ | @@NEWAUFIY0@@ | The current retrospective dividend yield. |
|  | @@OLDAUFIYMU@@ | @@NEWAUFIYMU@@ | The long-term mean reversion level of the dividend yield |
|  | @@OLDAUFIYALPHA@@ | @@NEWAUFIYALPHA@@ | The speed of mean reversion of the dividend yield |
|  | @@OLDAUFIYSIGMA@@ | @@NEWAUFIYSIGMA@@ | The volatility of the dividend yield |

* 1. Distributions
     1. Total Return Percentiles (@@OLDDATE@@)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| %’ile | 1yr | 5yr | 10yr | 15yr | 20yr | 30yr |
| 5% | @@OLDAUFI1\_5@@ | @@OLDAUFI5\_5@@ | @@OLDAUFI10\_5@@ | @@OLDAUFI15\_5@@ | @@OLDAUFI25\_5@@ | @@OLDAUFI30\_5@@ |
| 25% | @@OLDAUFI1\_25@@ | @@OLDAUFI5\_25@@ | @@OLDAUFI10\_25@@ | @@OLDAUFI15\_25@@ | @@OLDAUFI25\_25@@ | @@OLDAUFI30\_25@@ |
| 50% | @@OLDAUFI1\_50@@ | @@OLDAUFI5\_50@@ | @@OLDAUFI10\_50@@ | @@OLDAUFI15\_50@@ | @@OLDAUFI25\_50@@ | @@OLDAUFI30\_50@@ |
| 75% | @@OLDAUFI1\_75@@ | @@OLDAUFI5\_75@@ | @@OLDAUFI10\_75@@ | @@OLDAUFI15\_75@@ | @@OLDAUFI25\_75@@ | @@OLDAUFI30\_75@@ |
| 95% | @@OLDAUFI1\_95@@ | @@OLDAUFI5\_95@@ | @@OLDAUFI10\_95@@ | @@OLDAUFI15\_95@@ | @@OLDAUFI25\_95@@ | @@OLDAUFI30\_95@@ |
| Mean | @@OLDAUFI1\_MU@@ | @@OLDAUFI5\_MU@@ | @@OLDAUFI10\_MU@@ | @@OLDAUFI15\_MU@@ | @@OLDAUFI25\_MU@@ | @@OLDAUFI30\_MU@@ |
| Volatility | @@OLDAUFI1\_VOL@@ | @@OLDAUFI5\_VOL@@ | @@OLDAUFI10\_VOL@@ | @@OLDAUFI15\_VOL@@ | @@OLDAUFI25\_VOL@@ | @@OLDAUFI30\_VOL@@ |

* + 1. Total Return Percentiles (@@CALIBDATE@@)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| %’ile | 1yr | 5yr | 10yr | 15yr | 20yr | 30yr |
| 5% | @@NEWAUFI1\_5@@ | @@NEWAUFI5\_5@@ | @@NEWAUFI10\_5@@ | @@NEWAUFI15\_5@@ | @@NEWAUFI25\_5@@ | @@NEWAUFI30\_5@@ |
| 25% | @@NEWAUFI1\_25@@ | @@NEWAUFI5\_25@@ | @@NEWAUFI10\_25@@ | @@NEWAUFI15\_25@@ | @@NEWAUFI25\_25@@ | @@NEWAUFI30\_25@@ |
| 50% | @@NEWAUFI1\_50@@ | @@NEWAUFI5\_50@@ | @@NEWAUFI10\_50@@ | @@NEWAUFI15\_50@@ | @@NEWAUFI25\_50@@ | @@NEWAUFI30\_50@@ |
| 75% | @@NEWAUFI1\_75@@ | @@NEWAUFI5\_75@@ | @@NEWAUFI10\_75@@ | @@NEWAUFI15\_75@@ | @@NEWAUFI25\_75@@ | @@NEWAUFI30\_75@@ |
| 95% | @@NEWAUFI1\_95@@ | @@NEWAUFI5\_95@@ | @@NEWAUFI10\_95@@ | @@NEWAUFI15\_95@@ | @@NEWAUFI25\_95@@ | @@NEWAUFI30\_95@@ |
| Mean | @@NEWAUFI1\_MU@@ | @@NEWAUFI5\_MU@@ | @@NEWAUFI10\_MU@@ | @@NEWAUFI15\_MU@@ | @@NEWAUFI25\_MU@@ | @@NEWAUFI30\_MU@@ |
| Volatility | @@NEWAUFI1\_VOL@@ | @@NEWAUFI5\_VOL@@ | @@NEWAUFI10\_VOL@@ | @@NEWAUFI15\_VOL@@ | @@NEWAUFI25\_VOL@@ | @@NEWAUFI30\_VOL@@ |

* + 1. Total Return Charts (@@OLDDATE@@)

|  |  |
| --- | --- |
| Percentile Distribution | Historgram @ 10 years |
| @@OLDAUFIPERCENTILE@@ | @@OLDAUFIHIST@@ |

* + 1. Total Return Charts (@@CALIBDATE@@)

|  |  |
| --- | --- |
| Percentile Distribution | Historgram @ 10 years |
| @@NEWAUFIPERCENTILE@@ | @@NEWAUFIHIST@@ |

1. Australian Fixed Interest Corporate
   1. Parameters

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | @@OLDDATE@@ | @@CALIBDATE@@ | Description |
|  | 0 | 0 | The mean drift of the underlying GBM model. Note: this is set to zero as the volatility model provides the mean return in the specific regime. |
| Volatility Model (Regime Switching) | | | |
|  | @@OLDAUFICP12@@ | @@NEWAUFICP12@@ | The probability of changing from regime 1 into regime 2 over a one year period. |
|  | @@OLDAUFICP21@@ | @@NEWAUFICP21@@ | The probability of changing from regime 2 into regime 1 over a one year period. |
|  | @@OLDAUFICMU1@@ | @@NEWAUFICMU1@@ | The mean drift of the GBM when in regime 1. |
|  | @@OLDAUFICSIGMA1@@ | @@NEWAUFICSIGMA1@@ | The volatility of the GBM when in regime 1 |
|  | @@OLDAUFICMU2@@ | @@NEWAUFICMU2@@ | The mean drift of the GBM when in regime 2. |
|  | @@OLDAUFICSIGMA2@@ | @@NEWAUFICSIGMA2@@ | The volatility of the GBM when in regime 2. |
| Income Yield Model (Ornstein Uhlenbeck) | | | |
|  | @@OLDAUFICY0@@ | @@NEWAUFICY0@@ | The current retrospective dividend yield. |
|  | @@OLDAUFICYMU@@ | @@NEWAUFICYMU@@ | The long-term mean reversion level of the dividend yield |
|  | @@OLDAUFICYALPHA@@ | @@NEWAUFICYALPHA@@ | The speed of mean reversion of the dividend yield |
|  | @@OLDAUFICYSIGMA@@ | @@NEWAUFICYSIGMA@@ | The volatility of the dividend yield |

* 1. Distributions
     1. Total Return Percentiles (@@OLDDATE@@)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| %’ile | 1yr | 5yr | 10yr | 15yr | 20yr | 30yr |
| 5% | @@OLDAUFIC1\_5@@ | @@OLDAUFIC5\_5@@ | @@OLDAUFIC10\_5@@ | @@OLDAUFIC15\_5@@ | @@OLDAUFIC25\_5@@ | @@OLDAUFIC30\_5@@ |
| 25% | @@OLDAUFIC1\_25@@ | @@OLDAUFIC5\_25@@ | @@OLDAUFIC10\_25@@ | @@OLDAUFIC15\_25@@ | @@OLDAUFIC25\_25@@ | @@OLDAUFIC30\_25@@ |
| 50% | @@OLDAUFIC1\_50@@ | @@OLDAUFIC5\_50@@ | @@OLDAUFIC10\_50@@ | @@OLDAUFIC15\_50@@ | @@OLDAUFIC25\_50@@ | @@OLDAUFIC30\_50@@ |
| 75% | @@OLDAUFIC1\_75@@ | @@OLDAUFIC5\_75@@ | @@OLDAUFIC10\_75@@ | @@OLDAUFIC15\_75@@ | @@OLDAUFIC25\_75@@ | @@OLDAUFIC30\_75@@ |
| 95% | @@OLDAUFIC1\_95@@ | @@OLDAUFIC5\_95@@ | @@OLDAUFIC10\_95@@ | @@OLDAUFIC15\_95@@ | @@OLDAUFIC25\_95@@ | @@OLDAUFIC30\_95@@ |
| Mean | @@OLDAUFIC1\_MU@@ | @@OLDAUFIC5\_MU@@ | @@OLDAUFIC10\_MU@@ | @@OLDAUFIC15\_MU@@ | @@OLDAUFIC25\_MU@@ | @@OLDAUFIC30\_MU@@ |
| Volatility | @@OLDAUFIC1\_VOL@@ | @@OLDAUFIC5\_VOL@@ | @@OLDAUFIC10\_VOL@@ | @@OLDAUFIC15\_VOL@@ | @@OLDAUFIC25\_VOL@@ | @@OLDAUFIC30\_VOL@@ |

* + 1. Total Return Percentiles (@@CALIBDATE@@)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| %’ile | 1yr | 5yr | 10yr | 15yr | 20yr | 30yr |
| 5% | @@NEWAUFIC1\_5@@ | @@NEWAUFIC5\_5@@ | @@NEWAUFIC10\_5@@ | @@NEWAUFIC15\_5@@ | @@NEWAUFIC25\_5@@ | @@NEWAUFIC30\_5@@ |
| 25% | @@NEWAUFIC1\_25@@ | @@NEWAUFIC5\_25@@ | @@NEWAUFIC10\_25@@ | @@NEWAUFIC15\_25@@ | @@NEWAUFIC25\_25@@ | @@NEWAUFIC30\_25@@ |
| 50% | @@NEWAUFIC1\_50@@ | @@NEWAUFIC5\_50@@ | @@NEWAUFIC10\_50@@ | @@NEWAUFIC15\_50@@ | @@NEWAUFIC25\_50@@ | @@NEWAUFIC30\_50@@ |
| 75% | @@NEWAUFIC1\_75@@ | @@NEWAUFIC5\_75@@ | @@NEWAUFIC10\_75@@ | @@NEWAUFIC15\_75@@ | @@NEWAUFIC25\_75@@ | @@NEWAUFIC30\_75@@ |
| 95% | @@NEWAUFIC1\_95@@ | @@NEWAUFIC5\_95@@ | @@NEWAUFIC10\_95@@ | @@NEWAUFIC15\_95@@ | @@NEWAUFIC25\_95@@ | @@NEWAUFIC30\_95@@ |
| Mean | @@NEWAUFIC1\_MU@@ | @@NEWAUFIC5\_MU@@ | @@NEWAUFIC10\_MU@@ | @@NEWAUFIC15\_MU@@ | @@NEWAUFIC25\_MU@@ | @@NEWAUFIC30\_MU@@ |
| Volatility | @@NEWAUFIC1\_VOL@@ | @@NEWAUFIC5\_VOL@@ | @@NEWAUFIC10\_VOL@@ | @@NEWAUFIC15\_VOL@@ | @@NEWAUFIC25\_VOL@@ | @@NEWAUFIC30\_VOL@@ |

* + 1. Total Return Charts (@@OLDDATE@@)

|  |  |
| --- | --- |
| Percentile Distribution | Historgram @ 10 years |
| @@OLDAUFICPERCENTILE@@ | @@OLDAUFICHIST@@ |

* + 1. Total Return Charts (@@CALIBDATE@@)

|  |  |
| --- | --- |
| Percentile Distribution | Historgram @ 10 years |
| @@NEWAUFICPERCENTILE@@ | @@NEWAUFICHIST@@ |

1. International Fixed Interest Govt Hedged
   1. Parameters

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | @@OLDDATE@@ | @@CALIBDATE@@ | Description |
|  | 0 | 0 | The mean drift of the underlying GBM model. Note: this is set to zero as the volatility model provides the mean return in the specific regime. |
| Volatility Model (Regime Switching) | | | |
|  | @@OLDINTFIP12@@ | @@NEWINTFIP12@@ | The probability of changing from regime 1 into regime 2 over a one year period. |
|  | @@OLDINTFIP21@@ | @@NEWINTFIP21@@ | The probability of changing from regime 2 into regime 1 over a one year period. |
|  | @@OLDINTFIMU1@@ | @@NEWINTFIMU1@@ | The mean drift of the GBM when in regime 1. |
|  | @@OLDINTFISIGMA1@@ | @@NEWINTFISIGMA1@@ | The volatility of the GBM when in regime 1 |
|  | @@OLDINTFIMU2@@ | @@NEWINTFIMU2@@ | The mean drift of the GBM when in regime 2. |
|  | @@OLDINTFISIGMA2@@ | @@NEWINTFISIGMA2@@ | The volatility of the GBM when in regime 2. |
| Income Yield Model (Ornstein Uhlenbeck) | | | |
|  | @@OLDINTFIY0@@ | @@NEWINTFIY0@@ | The current retrospective dividend yield. |
|  | @@OLDINTFIYMU@@ | @@NEWINTFIYMU@@ | The long-term mean reversion level of the dividend yield |
|  | @@OLDINTFIYALPHA@@ | @@NEWINTFIYALPHA@@ | The speed of mean reversion of the dividend yield |
|  | @@OLDINTFIYSIGMA@@ | @@NEWINTFIYSIGMA@@ | The volatility of the dividend yield |

* 1. Distributions
     1. Total Return Percentiles (@@OLDDATE@@)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| %’ile | 1yr | 5yr | 10yr | 15yr | 20yr | 30yr |
| 5% | @@OLDINTFI1\_5@@ | @@OLDINTFI5\_5@@ | @@OLDINTFI10\_5@@ | @@OLDINTFI15\_5@@ | @@OLDINTFI25\_5@@ | @@OLDINTFI30\_5@@ |
| 25% | @@OLDINTFI1\_25@@ | @@OLDINTFI5\_25@@ | @@OLDINTFI10\_25@@ | @@OLDINTFI15\_25@@ | @@OLDINTFI25\_25@@ | @@OLDINTFI30\_25@@ |
| 50% | @@OLDINTFI1\_50@@ | @@OLDINTFI5\_50@@ | @@OLDINTFI10\_50@@ | @@OLDINTFI15\_50@@ | @@OLDINTFI25\_50@@ | @@OLDINTFI30\_50@@ |
| 75% | @@OLDINTFI1\_75@@ | @@OLDINTFI5\_75@@ | @@OLDINTFI10\_75@@ | @@OLDINTFI15\_75@@ | @@OLDINTFI25\_75@@ | @@OLDINTFI30\_75@@ |
| 95% | @@OLDINTFI1\_95@@ | @@OLDINTFI5\_95@@ | @@OLDINTFI10\_95@@ | @@OLDINTFI15\_95@@ | @@OLDINTFI25\_95@@ | @@OLDINTFI30\_95@@ |
| Mean | @@OLDINTFI1\_MU@@ | @@OLDINTFI5\_MU@@ | @@OLDINTFI10\_MU@@ | @@OLDINTFI15\_MU@@ | @@OLDINTFI25\_MU@@ | @@OLDINTFI30\_MU@@ |
| Volatility | @@OLDINTFI1\_VOL@@ | @@OLDINTFI5\_VOL@@ | @@OLDINTFI10\_VOL@@ | @@OLDINTFI15\_VOL@@ | @@OLDINTFI25\_VOL@@ | @@OLDINTFI30\_VOL@@ |

* + 1. Total Return Percentiles (@@CALIBDATE@@)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| %’ile | 1yr | 5yr | 10yr | 15yr | 20yr | 30yr |
| 5% | @@NEWINTFI1\_5@@ | @@NEWINTFI5\_5@@ | @@NEWINTFI10\_5@@ | @@NEWINTFI15\_5@@ | @@NEWINTFI25\_5@@ | @@NEWINTFI30\_5@@ |
| 25% | @@NEWINTFI1\_25@@ | @@NEWINTFI5\_25@@ | @@NEWINTFI10\_25@@ | @@NEWINTFI15\_25@@ | @@NEWINTFI25\_25@@ | @@NEWINTFI30\_25@@ |
| 50% | @@NEWINTFI1\_50@@ | @@NEWINTFI5\_50@@ | @@NEWINTFI10\_50@@ | @@NEWINTFI15\_50@@ | @@NEWINTFI25\_50@@ | @@NEWINTFI30\_50@@ |
| 75% | @@NEWINTFI1\_75@@ | @@NEWINTFI5\_75@@ | @@NEWINTFI10\_75@@ | @@NEWINTFI15\_75@@ | @@NEWINTFI25\_75@@ | @@NEWINTFI30\_75@@ |
| 95% | @@NEWINTFI1\_95@@ | @@NEWINTFI5\_95@@ | @@NEWINTFI10\_95@@ | @@NEWINTFI15\_95@@ | @@NEWINTFI25\_95@@ | @@NEWINTFI30\_95@@ |
| Mean | @@NEWINTFI1\_MU@@ | @@NEWINTFI5\_MU@@ | @@NEWINTFI10\_MU@@ | @@NEWINTFI15\_MU@@ | @@NEWINTFI25\_MU@@ | @@NEWINTFI30\_MU@@ |
| Volatility | @@NEWINTFI1\_VOL@@ | @@NEWINTFI5\_VOL@@ | @@NEWINTFI10\_VOL@@ | @@NEWINTFI15\_VOL@@ | @@NEWINTFI25\_VOL@@ | @@NEWINTFI30\_VOL@@ |

* + 1. Total Return Charts (@@OLDDATE@@)

|  |  |
| --- | --- |
| Percentile Distribution | Historgram @ 10 years |
| @@OLDINTFIPERCENTILE@@ | @@OLDINTFIHIST@@ |

* + 1. Total Return Charts (@@CALIBDATE@@)

|  |  |
| --- | --- |
| Percentile Distribution | Historgram @ 10 years |
| @@NEWINTFIPERCENTILE@@ | @@NEWINTFIHIST@@ |

1. Alternative Assets
   1. Overview
      1. Alternative assets are modelled similarly to Equity assets using a Geometric Brownian Motion model, a volatility model and an income model. All the alternative assets are configured to use a Regime Switching Volatility model. The income model is not currently configured as at 31st December 2016 but will be included in future calibrations.
      2. The alternative assets are modelled as excess returns above the Australian Dollar cash return, the excess return targets and hence parameters are configured periodically and as such the total returns will only change quarterly due to the updated yield curve. As such this section of the document will aim to compare the total return distributions of the alternative assets between quarters in order to quantify the differences due to the change in the yield curve.
      3. The following alternative assets have been calibrated
         * Australian Listed Property
         * Australian Direct Property
         * International Alternatives Hedged
         * Australian Infrastructure
2. Australian Listed Property
   1. Parameters

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | @@OLDDATE@@ | @@CALIBDATE@@ | Description |
|  | 0 | 0 | The mean drift of the underlying GBM model. Note: this is set to zero as the volatility model provides the mean return in the specific regime. |
| Volatility Model (Regime Switching) | | | |
|  | @@OLDAUPP12@@ | @@NEWAUPP12@@ | The probability of changing from regime 1 into regime 2 over a one year period. |
|  | @@OLDAUPP21@@ | @@NEWAUPP21@@ | The probability of changing from regime 2 into regime 1 over a one year period. |
|  | @@OLDAUPMU1@@ | @@NEWAUPMU1@@ | The mean drift of the GBM when in regime 1. |
|  | @@OLDAUPSIGMA1@@ | @@NEWAUPSIGMA1@@ | The volatility of the GBM when in regime 1 |
|  | @@OLDAUPMU2@@ | @@NEWAUPMU2@@ | The mean drift of the GBM when in regime 2. |
|  | @@OLDAUPSIGMA2@@ | @@NEWAUPSIGMA2@@ | The volatility of the GBM when in regime 2. |
| Income Yield Model (Ornstein Uhlenbeck) | | | |
|  | @@OLDAUPY0@@ | @@NEWAUPY0@@ | The current retrospective dividend yield. |
|  | @@OLDAUPYMU@@ | @@NEWAUPYMU@@ | The long-term mean reversion level of the dividend yield |
|  | @@OLDAUPYALPHA@@ | @@NEWAUPYALPHA@@ | The speed of mean reversion of the dividend yield |
|  | @@OLDAUPYSIGMA@@ | @@NEWAUPYSIGMA@@ | The volatility of the dividend yield |

* 1. Distributions
     1. Total Return Percentiles (@@OLDDATE@@)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| %’ile | 1yr | 5yr | 10yr | 15yr | 20yr | 30yr |
| 5% | @@OLDAUP1\_5@@ | @@OLDAUP5\_5@@ | @@OLDAUP10\_5@@ | @@OLDAUP15\_5@@ | @@OLDAUP25\_5@@ | @@OLDAUP30\_5@@ |
| 25% | @@OLDAUP1\_25@@ | @@OLDAUP5\_25@@ | @@OLDAUP10\_25@@ | @@OLDAUP15\_25@@ | @@OLDAUP25\_25@@ | @@OLDAUP30\_25@@ |
| 50% | @@OLDAUP1\_50@@ | @@OLDAUP5\_50@@ | @@OLDAUP10\_50@@ | @@OLDAUP15\_50@@ | @@OLDAUP25\_50@@ | @@OLDAUP30\_50@@ |
| 75% | @@OLDAUP1\_75@@ | @@OLDAUP5\_75@@ | @@OLDAUP10\_75@@ | @@OLDAUP15\_75@@ | @@OLDAUP25\_75@@ | @@OLDAUP30\_75@@ |
| 95% | @@OLDAUP1\_95@@ | @@OLDAUP5\_95@@ | @@OLDAUP10\_95@@ | @@OLDAUP15\_95@@ | @@OLDAUP25\_95@@ | @@OLDAUP30\_95@@ |
| Mean | @@OLDAUP1\_MU@@ | @@OLDAUP5\_MU@@ | @@OLDAUP10\_MU@@ | @@OLDAUP15\_MU@@ | @@OLDAUP25\_MU@@ | @@OLDAUP30\_MU@@ |
| Volatility | @@OLDAUP1\_VOL@@ | @@OLDAUP5\_VOL@@ | @@OLDAUP10\_VOL@@ | @@OLDAUP15\_VOL@@ | @@OLDAUP25\_VOL@@ | @@OLDAUP30\_VOL@@ |

* + 1. Total Return Percentiles (@@CALIBDATE@@)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| %’ile | 1yr | 5yr | 10yr | 15yr | 20yr | 30yr |
| 5% | @@NEWAUP1\_5@@ | @@NEWAUP5\_5@@ | @@NEWAUP10\_5@@ | @@NEWAUP15\_5@@ | @@NEWAUP25\_5@@ | @@NEWAUP30\_5@@ |
| 25% | @@NEWAUP1\_25@@ | @@NEWAUP5\_25@@ | @@NEWAUP10\_25@@ | @@NEWAUP15\_25@@ | @@NEWAUP25\_25@@ | @@NEWAUP30\_25@@ |
| 50% | @@NEWAUP1\_50@@ | @@NEWAUP5\_50@@ | @@NEWAUP10\_50@@ | @@NEWAUP15\_50@@ | @@NEWAUP25\_50@@ | @@NEWAUP30\_50@@ |
| 75% | @@NEWAUP1\_75@@ | @@NEWAUP5\_75@@ | @@NEWAUP10\_75@@ | @@NEWAUP15\_75@@ | @@NEWAUP25\_75@@ | @@NEWAUP30\_75@@ |
| 95% | @@NEWAUP1\_95@@ | @@NEWAUP5\_95@@ | @@NEWAUP10\_95@@ | @@NEWAUP15\_95@@ | @@NEWAUP25\_95@@ | @@NEWAUP30\_95@@ |
| Mean | @@NEWAUP1\_MU@@ | @@NEWAUP5\_MU@@ | @@NEWAUP10\_MU@@ | @@NEWAUP15\_MU@@ | @@NEWAUP25\_MU@@ | @@NEWAUP30\_MU@@ |
| Volatility | @@NEWAUP1\_VOL@@ | @@NEWAUP5\_VOL@@ | @@NEWAUP10\_VOL@@ | @@NEWAUP15\_VOL@@ | @@NEWAUP25\_VOL@@ | @@NEWAUP30\_VOL@@ |

* + 1. Total Return Charts @@OLDDATE@@)

|  |  |
| --- | --- |
| Percentile Distribution | Historgram @ 10 years |
| @@OLDAUPPERCENTILE@@ | @@OLDAUPHIST@@ |

* + 1. Total Return Charts (@@CALIBDATE@@)

|  |  |
| --- | --- |
| Percentile Distribution | Historgram @ 10 years |
| @@NEWAUPPERCENTILE@@ | @@NEWAUPHIST@@ |

1. Australian Direct Property
   1. Parameters

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | @@OLDDATE@@ | @@CALIBDATE@@ | Description |
|  | 0 | 0 | The mean drift of the underlying GBM model. Note: this is set to zero as the volatility model provides the mean return in the specific regime. |
| Volatility Model (Regime Switching) | | | |
|  | @@OLDAUDPP12@@ | @@NEWAUDPP12@@ | The probability of changing from regime 1 into regime 2 over a one year period. |
|  | @@OLDAUDPP21@@ | @@NEWAUDPP21@@ | The probability of changing from regime 2 into regime 1 over a one year period. |
|  | @@OLDAUDPMU1@@ | @@NEWAUDPMU1@@ | The mean drift of the GBM when in regime 1. |
|  | @@OLDAUDPSIGMA1@@ | @@NEWAUDPSIGMA1@@ | The volatility of the GBM when in regime 1 |
|  | @@OLDAUDPMU2@@ | @@NEWAUDPMU2@@ | The mean drift of the GBM when in regime 2. |
|  | @@OLDAUDPSIGMA2@@ | @@NEWAUDPSIGMA2@@ | The volatility of the GBM when in regime 2. |
| Income Yield Model (Ornstein Uhlenbeck) | | | |
|  | @@OLDAUDPY0@@ | @@NEWAUDPY0@@ | The current retrospective dividend yield. |
|  | @@OLDAUDPYMU@@ | @@NEWAUDPYMU@@ | The long-term mean reversion level of the dividend yield |
|  | @@OLDAUDPYALPHA@@ | @@NEWAUDPYALPHA@@ | The speed of mean reversion of the dividend yield |
|  | @@OLDAUDPYSIGMA@@ | @@NEWAUDPYSIGMA@@ | The volatility of the dividend yield |

* 1. Distributions
     1. Total Return Percentiles (@@OLDDATE@@)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| %’ile | 1yr | 5yr | 10yr | 15yr | 20yr | 30yr |
| 5% | @@OLDAUDP1\_5@@ | @@OLDAUDP5\_5@@ | @@OLDAUDP10\_5@@ | @@OLDAUDP15\_5@@ | @@OLDAUDP25\_5@@ | @@OLDAUDP30\_5@@ |
| 25% | @@OLDAUDP1\_25@@ | @@OLDAUDP5\_25@@ | @@OLDAUDP10\_25@@ | @@OLDAUDP15\_25@@ | @@OLDAUDP25\_25@@ | @@OLDAUDP30\_25@@ |
| 50% | @@OLDAUDP1\_50@@ | @@OLDAUDP5\_50@@ | @@OLDAUDP10\_50@@ | @@OLDAUDP15\_50@@ | @@OLDAUDP25\_50@@ | @@OLDAUDP30\_50@@ |
| 75% | @@OLDAUDP1\_75@@ | @@OLDAUDP5\_75@@ | @@OLDAUDP10\_75@@ | @@OLDAUDP15\_75@@ | @@OLDAUDP25\_75@@ | @@OLDAUDP30\_75@@ |
| 95% | @@OLDAUDP1\_95@@ | @@OLDAUDP5\_95@@ | @@OLDAUDP10\_95@@ | @@OLDAUDP15\_95@@ | @@OLDAUDP25\_95@@ | @@OLDAUDP30\_95@@ |
| Mean | @@OLDAUDP1\_MU@@ | @@OLDAUDP5\_MU@@ | @@OLDAUDP10\_MU@@ | @@OLDAUDP15\_MU@@ | @@OLDAUDP25\_MU@@ | @@OLDAUDP30\_MU@@ |
| Volatilityy | @@OLDAUDP1\_VOL@@ | @@OLDAUDP5\_VOL@@ | @@OLDAUDP10\_VOL@@ | @@OLDAUDP15\_VOL@@ | @@OLDAUDP25\_VOL@@ | @@OLDAUDP30\_VOL@@ |

* + 1. Total Return Percentiles (@@CALIBDATE@@)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| %’ile | 1yr | 5yr | 10yr | 15yr | 20yr | 30yr |
| 5% | @@NEWAUDP1\_5@@ | @@NEWAUDP5\_5@@ | @@NEWAUDP10\_5@@ | @@NEWAUDP15\_5@@ | @@NEWAUDP25\_5@@ | @@NEWAUDP30\_5@@ |
| 25% | @@NEWAUDP1\_25@@ | @@NEWAUDP5\_25@@ | @@NEWAUDP10\_25@@ | @@NEWAUDP15\_25@@ | @@NEWAUDP25\_25@@ | @@NEWAUDP30\_25@@ |
| 50% | @@NEWAUDP1\_50@@ | @@NEWAUDP5\_50@@ | @@NEWAUDP10\_50@@ | @@NEWAUDP15\_50@@ | @@NEWAUDP25\_50@@ | @@NEWAUDP30\_50@@ |
| 75% | @@NEWAUDP1\_75@@ | @@NEWAUDP5\_75@@ | @@NEWAUDP10\_75@@ | @@NEWAUDP15\_75@@ | @@NEWAUDP25\_75@@ | @@NEWAUDP30\_75@@ |
| 95% | @@NEWAUDP1\_95@@ | @@NEWAUDP5\_95@@ | @@NEWAUDP10\_95@@ | @@NEWAUDP15\_95@@ | @@NEWAUDP25\_95@@ | @@NEWAUDP30\_95@@ |
| Mean | @@NEWAUDP1\_MU@@ | @@NEWAUDP5\_MU@@ | @@NEWAUDP10\_MU@@ | @@NEWAUDP15\_MU@@ | @@NEWAUDP25\_MU@@ | @@NEWAUDP30\_MU@@ |
| Volatilityy | @@NEWAUDP1\_VOL@@ | @@NEWAUDP5\_VOL@@ | @@NEWAUDP10\_VOL@@ | @@NEWAUDP15\_VOL@@ | @@NEWAUDP25\_VOL@@ | @@NEWAUDP30\_VOL@@ |

* + 1. Total Return Charts (@@OLDDATE@@)

|  |  |
| --- | --- |
| Percentile Distribution | Historgram @ 10 years |
| @@OLDAUDPPERCENTILE@@ | @@OLDAUDPHIST@@ |

* + 1. Total Return Charts (@@CALIBDATE@@)

|  |  |
| --- | --- |
| Percentile Distribution | Historgram @ 10 years |
| @@NEWAUDPPERCENTILE@@ | @@NEWAUDPHIST@@ |

1. International Alternatives Hedged
   1. Parameters

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | @@OLDDATE@@ | @@CALIBDATE@@ | Description |
|  | 0 | 0 | The mean drift of the underlying GBM model. Note: this is set to zero as the volatility model provides the mean return in the specific regime. |
| Volatility Model (Regime Switching) | | | |
|  | @@OLDINTAHP12@@ | @@NEWINTAHP12@@ | The probability of changing from regime 1 into regime 2 over a one year period. |
|  | @@OLDINTAHP21@@ | @@NEWINTAHP21@@ | The probability of changing from regime 2 into regime 1 over a one year period. |
|  | @@OLDINTAHMU1@@ | @@NEWINTAHMU1@@ | The mean drift of the GBM when in regime 1. |
|  | @@OLDINTAHSIGMA1@@ | @@NEWINTAHSIGMA1@@ | The volatility of the GBM when in regime 1 |
|  | @@OLDINTAHMU2@@ | @@NEWINTAHMU2@@ | The mean drift of the GBM when in regime 2. |
|  | @@OLDINTAHSIGMA2@@ | @@NEWINTAHSIGMA2@@ | The volatility of the GBM when in regime 2. |
| Income Yield Model (Ornstein Uhlenbeck) | | | |
|  | @@OLDINTAHY0@@ | @@NEWINTAHY0@@ | The current retrospective dividend yield. |
|  | @@OLDINTAHYMU@@ | @@NEWINTAHYMU@@ | The long-term mean reversion level of the dividend yield |
|  | @@OLDINTAHYALPHA@@ | @@NEWINTAHYALPHA@@ | The speed of mean reversion of the dividend yield |
|  | @@OLDINTAHYSIGMA@@ | @@NEWINTAHYSIGMA@@ | The volatility of the dividend yield |

* 1. Distributions
     1. Total Return Percentiles (@@OLDDATE@@)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| %’ile | 1yr | 5yr | 10yr | 15yr | 20yr | 30yr |
| 5% | @@OLDINTAH1\_5@@ | @@OLDINTAH5\_5@@ | @@OLDINTAH10\_5@@ | @@OLDINTAH15\_5@@ | @@OLDINTAH25\_5@@ | @@OLDINTAH30\_5@@ |
| 25% | @@OLDINTAH1\_25@@ | @@OLDINTAH5\_25@@ | @@OLDINTAH10\_25@@ | @@OLDINTAH15\_25@@ | @@OLDINTAH25\_25@@ | @@OLDINTAH30\_25@@ |
| 50% | @@OLDINTAH1\_50@@ | @@OLDINTAH5\_50@@ | @@OLDINTAH10\_50@@ | @@OLDINTAH15\_50@@ | @@OLDINTAH25\_50@@ | @@OLDINTAH30\_50@@ |
| 75% | @@OLDINTAH1\_75@@ | @@OLDINTAH5\_75@@ | @@OLDINTAH10\_75@@ | @@OLDINTAH15\_75@@ | @@OLDINTAH25\_75@@ | @@OLDINTAH30\_75@@ |
| 95% | @@OLDINTAH1\_95@@ | @@OLDINTAH5\_95@@ | @@OLDINTAH10\_95@@ | @@OLDINTAH15\_95@@ | @@OLDINTAH25\_95@@ | @@OLDINTAH30\_95@@ |
| Mean | @@OLDINTAH1\_MU@@ | @@OLDINTAH5\_MU@@ | @@OLDINTAH10\_MU@@ | @@OLDINTAH15\_MU@@ | @@OLDINTAH25\_MU@@ | @@OLDINTAH30\_MU@@ |
| Volatilityy | @@OLDINTAH1\_VOL@@ | @@OLDINTAH5\_VOL@@ | @@OLDINTAH10\_VOL@@ | @@OLDINTAH15\_VOL@@ | @@OLDINTAH25\_VOL@@ | @@OLDINTAH30\_VOL@@ |

* + 1. Total Return Percentiles (@@CALIBDATE@@)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| %’ile | 1yr | 5yr | 10yr | 15yr | 20yr | 30yr |
| 5% | @@NEWINTAH1\_5@@ | @@NEWINTAH5\_5@@ | @@NEWINTAH10\_5@@ | @@NEWINTAH15\_5@@ | @@NEWINTAH25\_5@@ | @@NEWINTAH30\_5@@ |
| 25% | @@NEWINTAH1\_25@@ | @@NEWINTAH5\_25@@ | @@NEWINTAH10\_25@@ | @@NEWINTAH15\_25@@ | @@NEWINTAH25\_25@@ | @@NEWINTAH30\_25@@ |
| 50% | @@NEWINTAH1\_50@@ | @@NEWINTAH5\_50@@ | @@NEWINTAH10\_50@@ | @@NEWINTAH15\_50@@ | @@NEWINTAH25\_50@@ | @@NEWINTAH30\_50@@ |
| 75% | @@NEWINTAH1\_75@@ | @@NEWINTAH5\_75@@ | @@NEWINTAH10\_75@@ | @@NEWINTAH15\_75@@ | @@NEWINTAH25\_75@@ | @@NEWINTAH30\_75@@ |
| 95% | @@NEWINTAH1\_95@@ | @@NEWINTAH5\_95@@ | @@NEWINTAH10\_95@@ | @@NEWINTAH15\_95@@ | @@NEWINTAH25\_95@@ | @@NEWINTAH30\_95@@ |
| Mean | @@NEWINTAH1\_MU@@ | @@NEWINTAH5\_MU@@ | @@NEWINTAH10\_MU@@ | @@NEWINTAH15\_MU@@ | @@NEWINTAH25\_MU@@ | @@NEWINTAH30\_MU@@ |
| Volatilityy | @@NEWINTAH1\_VOL@@ | @@NEWINTAH5\_VOL@@ | @@NEWINTAH10\_VOL@@ | @@NEWINTAH15\_VOL@@ | @@NEWINTAH25\_VOL@@ | @@NEWINTAH30\_VOL@@ |

* + 1. Total Return Charts (@@OLDDATE@@)

|  |  |
| --- | --- |
| Percentile Distribution | Historgram @ 10 years |
| @@OLDINTAHPERCENTILE@@ | @@OLDINTAHHIST@@ |

* + 1. Total Return Charts (@@CALIBDATE@@)

|  |  |
| --- | --- |
| Percentile Distribution | Historgram @ 10 years |
| @@NEWINTAHPERCENTILE@@ | @@NEWINTAHHIST@@ |

1. Australian Infrastructure
   1. Parameters

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | @@OLDDATE@@ | @@CALIBDATE@@ | Description |
|  | 0 | 0 | The mean drift of the underlying GBM model. Note: this is set to zero as the volatility model provides the mean return in the specific regime. |
| Volatility Model (Regime Switching) | | | |
|  | @@OLDAUIP12@@ | @@NEWAUIP12@@ | The probability of changing from regime 1 into regime 2 over a one year period. |
|  | @@OLDAUIP21@@ | @@NEWAUIP21@@ | The probability of changing from regime 2 into regime 1 over a one year period. |
|  | @@OLDAUIMU1@@ | @@NEWAUIMU1@@ | The mean drift of the GBM when in regime 1. |
|  | @@OLDAUISIGMA1@@ | @@NEWAUISIGMA1@@ | The volatility of the GBM when in regime 1 |
|  | @@OLDAUIMU2@@ | @@NEWAUIMU2@@ | The mean drift of the GBM when in regime 2. |
|  | @@OLDAUISIGMA2@@ | @@NEWAUISIGMA2@@ | The volatility of the GBM when in regime 2. |
| Income Yield Model (Ornstein Uhlenbeck) | | | |
|  | @@OLDAUIY0@@ | @@NEWAUIY0@@ | The current retrospective dividend yield. |
|  | @@OLDAUIYMU@@ | @@NEWAUIYMU@@ | The long-term mean reversion level of the dividend yield |
|  | @@OLDAUIYALPHA@@ | @@NEWAUIYALPHA@@ | The speed of mean reversion of the dividend yield |
|  | @@OLDAUIYSIGMA@@ | @@NEWAUIYSIGMA@@ | The volatility of the dividend yield |

* 1. Distributions
     1. Total Return Percentiles (@@OLDDATE@@)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| %’ile | 1yr | 5yr | 10yr | 15yr | 20yr | 30yr |
| 5% | @@OLDAUI1\_5@@ | @@OLDAUI5\_5@@ | @@OLDAUI10\_5@@ | @@OLDAUI15\_5@@ | @@OLDAUI25\_5@@ | @@OLDAUI30\_5@@ |
| 25% | @@OLDAUI1\_25@@ | @@OLDAUI5\_25@@ | @@OLDAUI10\_25@@ | @@OLDAUI15\_25@@ | @@OLDAUI25\_25@@ | @@OLDAUI30\_25@@ |
| 50% | @@OLDAUI1\_50@@ | @@OLDAUI5\_50@@ | @@OLDAUI10\_50@@ | @@OLDAUI15\_50@@ | @@OLDAUI25\_50@@ | @@OLDAUI30\_50@@ |
| 75% | @@OLDAUI1\_75@@ | @@OLDAUI5\_75@@ | @@OLDAUI10\_75@@ | @@OLDAUI15\_75@@ | @@OLDAUI25\_75@@ | @@OLDAUI30\_75@@ |
| 95% | @@OLDAUI1\_95@@ | @@OLDAUI5\_95@@ | @@OLDAUI10\_95@@ | @@OLDAUI15\_95@@ | @@OLDAUI25\_95@@ | @@OLDAUI30\_95@@ |
| Mean | @@OLDAUI1\_MU@@ | @@OLDAUI5\_MU@@ | @@OLDAUI10\_MU@@ | @@OLDAUI15\_MU@@ | @@OLDAUI25\_MU@@ | @@OLDAUI30\_MU@@ |
| Volatility | @@OLDAUI1\_VOL@@ | @@OLDAUI5\_VOL@@ | @@OLDAUI10\_VOL@@ | @@OLDAUI15\_VOL@@ | @@OLDAUI25\_VOL@@ | @@OLDAUI30\_VOL@@ |

* + 1. Total Return Percentiles (@@CALIBDATE@@)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| %’ile | 1yr | 5yr | 10yr | 15yr | 20yr | 30yr |
| 5% | @@NEWAUI1\_5@@ | @@NEWAUI5\_5@@ | @@NEWAUI10\_5@@ | @@NEWAUI15\_5@@ | @@NEWAUI25\_5@@ | @@NEWAUI30\_5@@ |
| 25% | @@NEWAUI1\_25@@ | @@NEWAUI5\_25@@ | @@NEWAUI10\_25@@ | @@NEWAUI15\_25@@ | @@NEWAUI25\_25@@ | @@NEWAUI30\_25@@ |
| 50% | @@NEWAUI1\_50@@ | @@NEWAUI5\_50@@ | @@NEWAUI10\_50@@ | @@NEWAUI15\_50@@ | @@NEWAUI25\_50@@ | @@NEWAUI30\_50@@ |
| 75% | @@NEWAUI1\_75@@ | @@NEWAUI5\_75@@ | @@NEWAUI10\_75@@ | @@NEWAUI15\_75@@ | @@NEWAUI25\_75@@ | @@NEWAUI30\_75@@ |
| 95% | @@NEWAUI1\_95@@ | @@NEWAUI5\_95@@ | @@NEWAUI10\_95@@ | @@NEWAUI15\_95@@ | @@NEWAUI25\_95@@ | @@NEWAUI30\_95@@ |
| Mean | @@NEWAUI1\_MU@@ | @@NEWAUI5\_MU@@ | @@NEWAUI10\_MU@@ | @@NEWAUI15\_MU@@ | @@NEWAUI25\_MU@@ | @@NEWAUI30\_MU@@ |
| Volatility | @@NEWAUI1\_VOL@@ | @@NEWAUI5\_VOL@@ | @@NEWAUI10\_VOL@@ | @@NEWAUI15\_VOL@@ | @@NEWAUI25\_VOL@@ | @@NEWAUI30\_VOL@@ |

* + 1. Total Return Charts (@@OLDDATE@@)

|  |  |
| --- | --- |
| Percentile Distribution | Historgram @ 10 years |
| @@OLDAUIPERCENTILE@@ | @@OLDAUIHIST@@ |

* + 1. Total Return Charts (@@CALIBDATE@@)

|  |  |
| --- | --- |
| Percentile Distribution | Historgram @ 10 years |
| @@NEWAUIPERCENTILE@@ | @@NEWAUIHIST@@ |

1. Correlations
   1. Overview
      1. Correlations are controlled through shocks to the state variables of each of the models and also through some of the structure imposed by the assumption that risky assets are built using the cash plus excess return approach.
   2. Asset class correlations

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Cash | CPI | AWE | Australian Equities | International Equities Hedged | International Equities UnHedged | Emerging Market Equities | Australian Fixed Interest Govt | Australian Fixed Interest Corporate | International Fixed Interest Govt Hedged | Australian Listed Property | Australian Direct Property | International Alternatives Hedged | Australian Infrastructure |
| Cash | 1 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| CPI |  | 1 |  |  |  |  |  |  |  |  |  |  |  |  |
| AWE |  |  | 1 |  |  |  |  |  |  |  |  |  |  |  |
| Australian Equities |  |  |  | 1 |  |  |  |  |  |  |  |  |  |  |
| International Equities Hedged |  |  |  |  | 1 |  |  |  |  |  |  |  |  |  |
| International Equities UnHedged |  |  |  |  |  | 1 |  |  |  |  |  |  |  |  |
| Emerging Market Equities |  |  |  |  |  |  | 1 |  |  |  |  |  |  |  |
| Australian Fixed Interest Govt |  |  |  |  |  |  |  | 1 |  |  |  |  |  |  |
| Australian Fixed Interest Corporate |  |  |  |  |  |  |  |  | 1 |  |  |  |  |  |
| International Fixed Interest Govt Hedged |  |  |  |  |  |  |  |  |  | 1 |  |  |  |  |
| Australian Listed Property |  |  |  |  |  |  |  |  |  |  | 1 |  |  |  |
| Australian Direct Property |  |  |  |  |  |  |  |  |  |  |  | 1 |  |  |
| International Alternatives Hedged |  |  |  |  |  |  |  |  |  |  |  |  | 1 |  |
| Australian Infrastructure |  |  |  |  |  |  |  |  |  |  |  |  |  | 1 |