AKUR8
RESERVING

Arius
IFRS 17 Support

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1. IFRS 17 Background

Much of the reporting required by IFRS 17 is available from the data that Arius retains. While Arius is not intended as an IFRS 17 reporting solution, the system does provide a number of reports to help meet the regulation's requirements.

This document describes the tables and collections within the Arius Deterministic module applicable for those actuaries responsible for deriving the insurance service expense and the insurance finance expense for income statements subject to IFRS 17 requirements.

The Arius objects discussed here were developed according to the Canadian Institute of Actuaries educational note *IFRS 17 Discount Rates and Cash Flow Considerations for Property and Casualty Insurance Contracts (June 2022).* They will also provide material support to users throughout Europe and elsewhere who must comply with the IFRS standards.

The IFRS 17 tables in Arius calculate and summarize the total insurance finance charge and the total insurance service expense. The total insurance finance expense includes the unwinding of the discount (the release of the effect of discounting due to the passage of time) and any change in discounting assumptions (including changes in the yield curve relative to a priori assumptions). Changes in the payment patterns, actual payments made, and changes in the risk adjustment comprise the total insurance service expense.

The IFRS 17 standard is complex and has a number of options, not all of which are included within the Arius framework. Specifically, the tables referenced in this document apply to companies who are using the Premium Allocation Approach (PAA), the Standard Formula, and are not choosing the Other Comprehensive Income (OCI) option. In other words, the Arius tables for the insurance service expense and the insurance finance expense assume that there is a single yield curve associated with the liabilities being analyzed that does not vary by exposure period.

The tables shown in this document are from the Arius_Sample.apj file, which you can access from …\Documents\Milliman\Arius\DemoFiles folder. The Arius Sample File plays the role of the *current* evaluation date project file, described throughout this document.

SUMMARY OF THE APPROACH

The approach to deriving these values in Arius leverages two separate project files, representing the same reserving segment(s) at sequential valuation dates. Information is transferred from the *prior* evaluation date project (at *time T*) into the *current* evaluation date project (at *time T+1*), in which the IFRS 17 reports are populated.

At a high level, you will do the following:

1. Populate effective interest rate vectors in the prior (*time T*) Arius project file. This allows Arius to calculate a number of present value totals.
2. Copy these present value results from the prior file into specific input vectors in the current file (*T+1*).

Then with the prior present value figures loaded in the current Arius file, additional reports become available that support IFRS 17 reporting and analysis (Change in Time Value of Money, Change in Risk Adjustment, etc.)

In Step #1 above, you'll first populate three interest rate vectors in the *prior* evaluation date project (at *time T*) in the **Effective Interest Rates** collection under the DETERMINISTIC | SPECIAL REGULATORY| IFRS17 folder:

- **Effective Interest Rate** – this is the set of interest rates applicable at *time T.*
- **Shifted Effective Interest Rate** - this should match the **Effective Interest Rate** object, with evaluations shifted to the right by the length of the time between evaluations. For example, with 1 year between the *prior* and *current* evaluations, you would shift the rate to the right by 1 cell if using year age increments, 2 cells if using half-year age increments, 4 cells if using quarter age increments, and 12 cells if using month age increments. This will impact loss payments within this window coming through as undiscounted.
- **Subsequent Effective Interest Rate** - These are the rates as of the *current* evaluation at *time T+1*. These should match the **Effective Interest Rate** vector from the *current* file, with the inputs shifted right by the same number of cells described above.

Note

It's highly recommended that automated imports (e.g., Arius API, Arius Enterprise Direct Imports) are used to pull and push data to ensure consistency between the *prior* and the *current* file.

DERIVING IFRS 17 REPORTS WITHIN ARIUS

Note: This section assumes that you have already derived nominal future cash flows for Loss, ALAE, Salvage & Subrogation, and ULAE for an analysis as of *time T* and assumes an understanding of how cash flow tables and discounting work within Arius. For guidance on producing Cash Flow Reports within Arius, refer to the document *Cash Flow Reports* found under HELP | USER DOCUMENTATION.

While the generation of the IFRS 17 reports within Arius is automatic once the proper data is provided, you will need to transfer some data elements between the *prior* file and the *current* file (and vice versa) to ensure consistency between the two files.

1. Working within the project file as of *time T* (the *prior* file), navigate to the **Effective Interest Rates** and **Other Inputs** collections under the DETERMINISTIC | SPECIAL REGULATORY | IFRS17 folder.
   - Populate input #802 Effective Interest Rate.
   - Populate input #450 Shifted Effective Interest Rate.
   - Populate input #452 IFRS17 Risk Adjustment Percentage.
2. Then, roll forward this project to *time T+1*, and save it as the *current* file:
   - Perform the nominal analysis through the derivation of nominal cash flows.
   - Populate input **#802 Effective Interest Rate.**
   - Populate input **#450 Shifted Effective Interest Rate.**
   - Populate input **#452 IFRS17 Risk Adjustment Percentage.**
3. If you are populating the ULAE-related reports, navigate to the Financial Reporting Tables (ULAE) collection under the DETERMINISTIC | SPECIAL REGULATORY | IFRS17 folder:
   - Populate input #452 Incremental Paid ULAE.
4. Then, back in the *prior* file:
   - Populate input #451 Subsequent Effective Interest Rate.

5. Using copy/paste, the Arius API, or Arius Enterprise Extract Tables & Direct Imports, transfer data from the **METHODS** in the *prior* file to the **INPUTS** in the *current* file, according to the table below. Take care to ensure alignment of exposure periods and that interest rates are shifted to the appropriate number of periods.

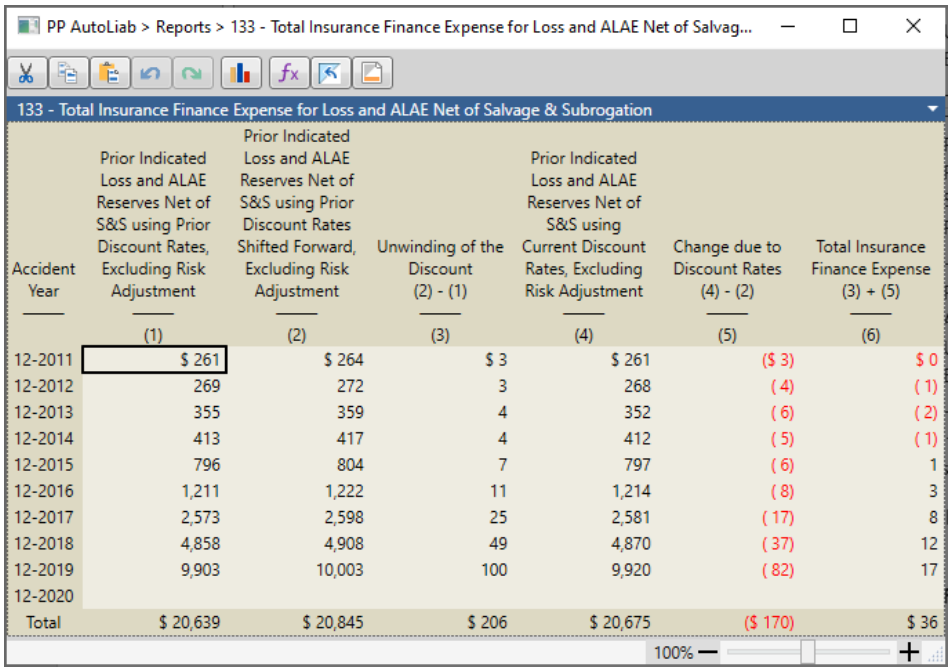
Prior File **Methods | Assumptions | IFRS 17**		***Current File*** **Data | Results**	
TABLE ID	**TABLE NAME**	**TABLE ID**	**TABLE NAME**
401	Present Value of Future Payments of Loss and ALAE Net of S&S using Effective Interest Rate	401	Prior Present Value of Future Payments of Loss and ALAE Net of S&S using Prior Effective Interest Rate
402	Present Value of Future Payments of Loss and ALAE Net of S&S using Shifted Effective Interest Rate	402	Prior Present Value of Future Payments of Loss and ALAE Net of S&S using Prior Shifted Effective Interest Rate
403	Present Value of Future Payments of Loss and ALAE Net of S&S using Subsequent Effective Interest Rate	403	Prior Present Value of Future Payments of Loss and ALAE Net of S&S using Prior Subsequent Effective Interest Rate
404	Present Value of Risk Adjusted Future Payments of Loss and ALAE Net of S&S using Effective Interest Rate	404	Prior Present Value of Risk Adjusted Future Payments of Loss and ALAE Net of S&S using Prior Effective Interest Rate
405	Present Value of Risk Adjusted Future Payments of Loss and ALAE Net of S&S using Shifted Effective Interest Rate	405	Prior Present Value of Risk Adjusted Future Payments of Loss and ALAE Net of S&S using Prior Shifted Effective Interest Rate
406	Present Value of Risk Adjusted Future Payments of Loss and ALAE Net of S&S using Subsequent Effective Interest Rate	406	Prior Present Value of Risk Adjusted Future Payments of Loss and ALAE Net of S&S using Prior Subsequent Effective Interest Rate
407	Present Value of Future Payments of ULAE using Effective Interest Rate	407	Prior Present Value of Future Payments of ULAE using Prior Effective Interest Rate
408	Present Value of Future Payments of ULAE using Shifted Effective Interest Rate	408	Prior Present Value of Future Payments of ULAE using Prior Shifted Effective Interest Rate
409	Present Value of Future Payments of ULAE using Subsequent Effective Interest Rate	409	Prior Present Value of Future Payments of ULAE using Prior Subsequent Effective Interest Rate
410	Present Value of Risk Adjusted Future Payments of ULAE using Effective Interest Rate	410	Prior Present Value of Risk Adjusted Future Payments of ULAE using Prior Effective Interest Rate
411	Present Value of Risk Adjusted Future Payments of ULAE using Shifted Effective Interest Rate	411	Prior Present Value of Risk Adjusted Future Payments of ULAE using Prior Shifted Effective Interest Rate
412	Present Value of Risk Adjusted Future Payments of ULAE using Subsequent Effective Interest Rate	412	Prior Present Value of Risk Adjusted Future Payments of ULAE using Prior Subsequent Effective Interest Rate

RESULTING REPORTS

After completing the actions above, the following reports in the *current* file will be updated and ready for review within the **Financial Reporting Tables (Loss and ALAE)** and **Financial Reporting Tables (ULAE)** collections under the DETERMINISTIC | SPECIAL REGULATORY | IFRS17 folder:

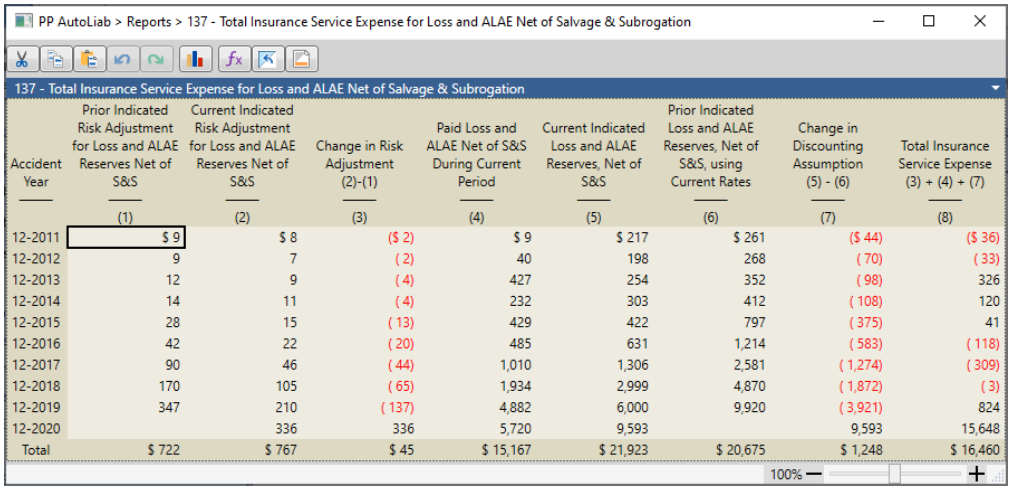
- Report 133 – Total Insurance Finance Expense for Loss and ALAE Net of Salvage & Subrogation
- Report 135 – Total Insurance Finance Expense for Risk Adjustment on Loss and ALAE Net of Salvage & Subrogation
- Report 137 – Total Insurance Service Expense for Loss and ALAE Net of Salvage & Subrogation
- Report 134 – Total Insurance Finance Expense for ULAE
- Report 136 – Total Insurance Finance Expense for Risk Adjustment on ULAE
- Report 138 – Total Insurance Service Expense for ULAE

Reports 133 through 136 are similar, other than the liability being summarized, within each of these tables (133 is shown below). These tables decompose the Total Insurance Finance Expense column 6 into the core components of the Discount Unwind (column 3) and the change in the discount rates themselves (column 5).



Accident Year	Prior Indicated Loss and ALAE Reserves Net of S&S using Prior Discount Rates, Excluding Risk Adjustment	Prior Indicated Loss and ALAE Reserves Net of S&S using Prior Discount Rates Shifted Forward, Excluding Risk Adjustment	Unwinding of the Discount (2) - (1)	Prior Indicated Loss and ALAE Reserves Net of S&S using Current Discount Rates, Excluding Risk Adjustment	Change due to Discount Rates (4) - (2)	Total Insurance Finance Expense (3) + (5)
	(1)	(2)	(3)	(4)	(5)	(6)
12-2011	$ 261	$ 264	$ 3	$ 261	($ 3)	$ 0
12-2012	269	272	3	268	(4)	(1)
12-2013	355	359	4	352	(6)	(2)
12-2014	413	417	4	412	(5)	(1)
12-2015	796	804	7	797	(6)	1
12-2016	1,211	1,222	11	1,214	(8)	3
12-2017	2,573	2,598	25	2,581	(17)	8
12-2018	4,858	4,908	49	4,870	(37)	12
12-2019	9,903	10,003	100	9,920	(82)	17
12-2020						
Total	$ 20,639	$ 20,845	$ 206	$ 20,675	($ 170)	$ 36

Reports 137 and 138 summarize the **Total Insurance Service Expense**, for Loss and ALAE Net of Salvage & Subrogation and ULAE, respectively.



Accident Year	Prior Indicated Risk Adjustment for Loss and ALAE Reserves Net of S&S (1)	Current Indicated Risk Adjustment for Loss and ALAE Reserves Net of S&S (2)	Change in Risk Adjustment (2)-(1) (3)	Paid Loss and ALAE Net of S&S During Current Period (4)	Current Indicated Loss and ALAE Reserves, Net of S&S (5)	Prior Indicated Loss and ALAE Reserves, Net of S&S, using Current Rates (6)	Change in Discounting Assumption (5) - (6) (7)	Total Insurance Service Expense (3) + (4) + (7) (8)
12-2011	$ 9	$ 8	($ 2)	$ 9	$ 217	$ 261	($ 44)	($ 36)
12-2012	9	7	(2)	40	198	268	(70)	(33)
12-2013	12	9	(4)	427	254	352	(98)	326
12-2014	14	11	(4)	232	303	412	(108)	120
12-2015	28	15	(13)	429	422	797	(375)	41
12-2016	42	22	(20)	485	631	1,214	(583)	(118)
12-2017	90	46	(44)	1,010	1,306	2,581	(1,274)	(309)
12-2018	170	105	(65)	1,934	2,999	4,870	(1,872)	(3)
12-2019	347	210	(137)	4,882	6,000	9,920	(3,921)	824
12-2020		336	336	5,720	9,593		9,593	15,648
Total	$ 722	$ 767	$ 45	$ 15,167	$ 21,923	$ 20,675	$ 1,248	$ 16,460

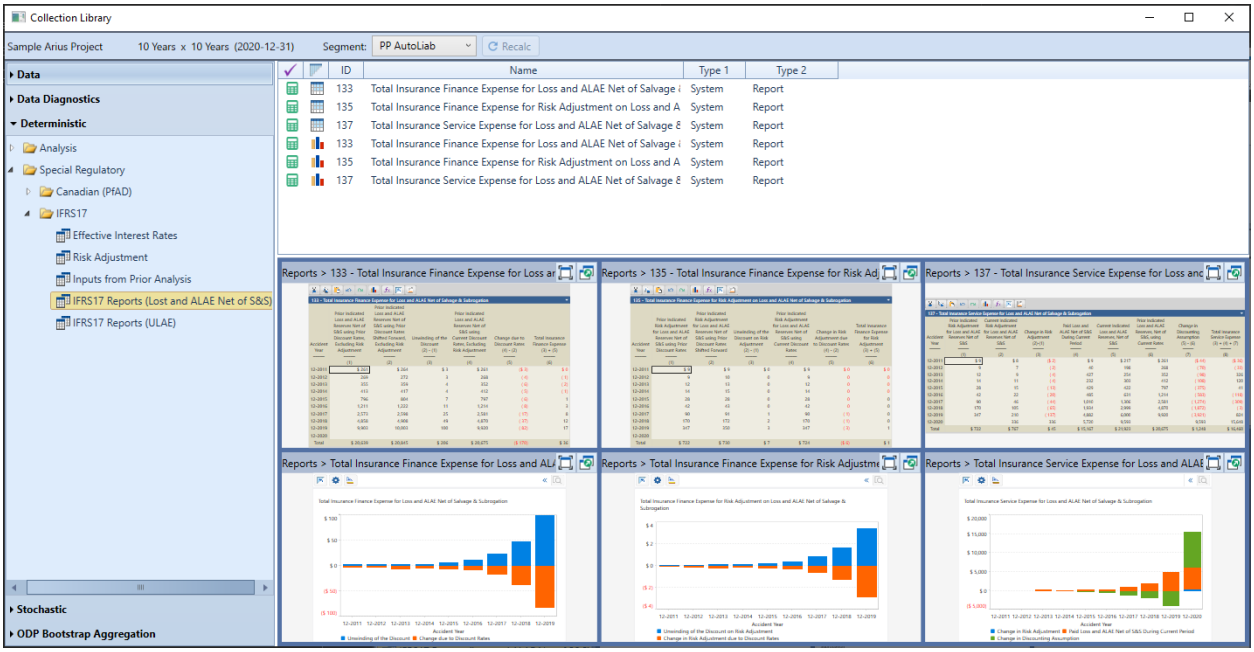
2. Where to find IFRS 17 Collections & Objects

COLLECTIONS

From the **Home** ribbon, go to COLLECTION LIBRARY | OPEN COLLECTION LIBRARY. Navigate to the collections shown below, then drag and drop these collections into your navigation pane, if they are not already present.

IFRS 17 Reporting Collections found in the Collection Library

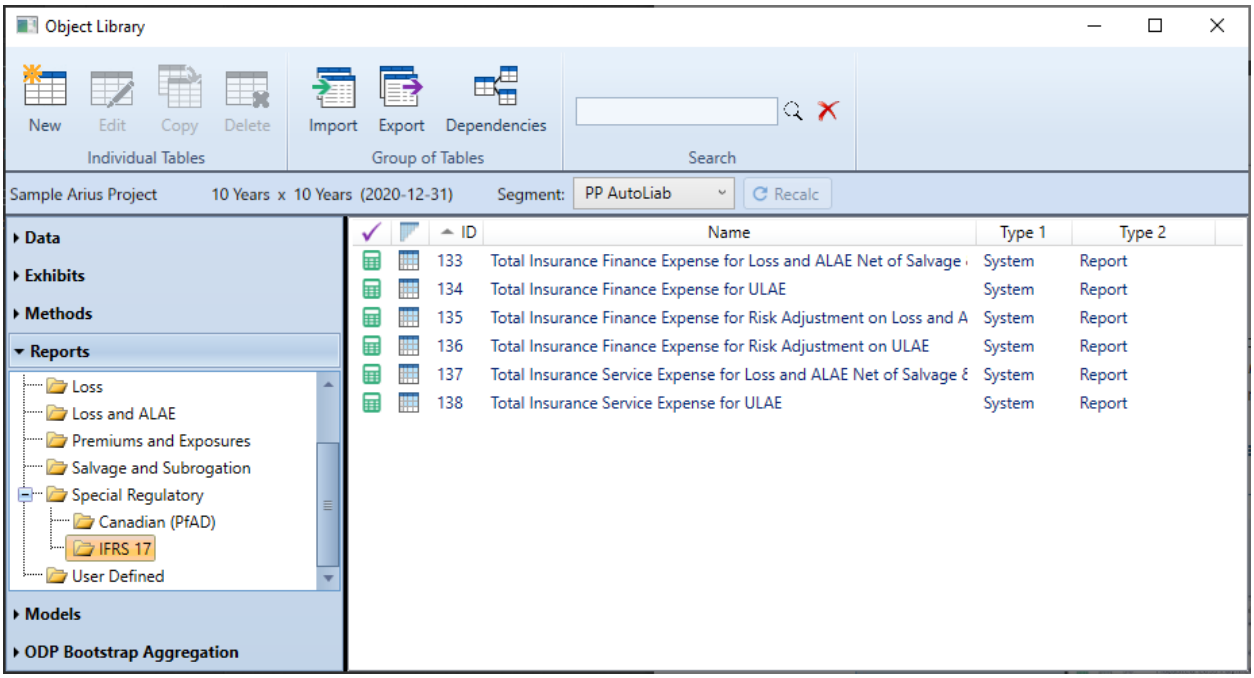
The IFRS 17 folder (under Special Regulatory) itself can be dragged into your navigation pane to bring over all collections to the folder.



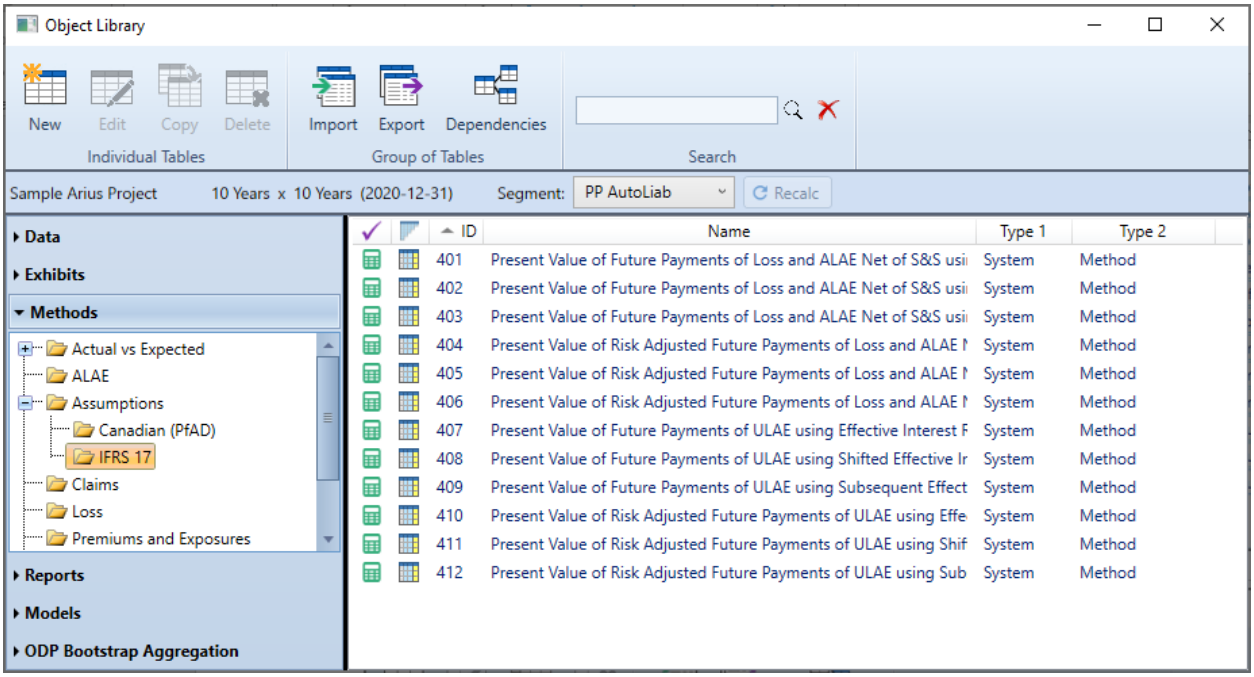
OBJECTS

Individual objects are found in the **Object Library**. Most are included in the Collections shown above. Refer to the document *Collections of tables* found under HELP | USER DOCUMENTATION for instructions on adding these objects to collections in your navigation pane.

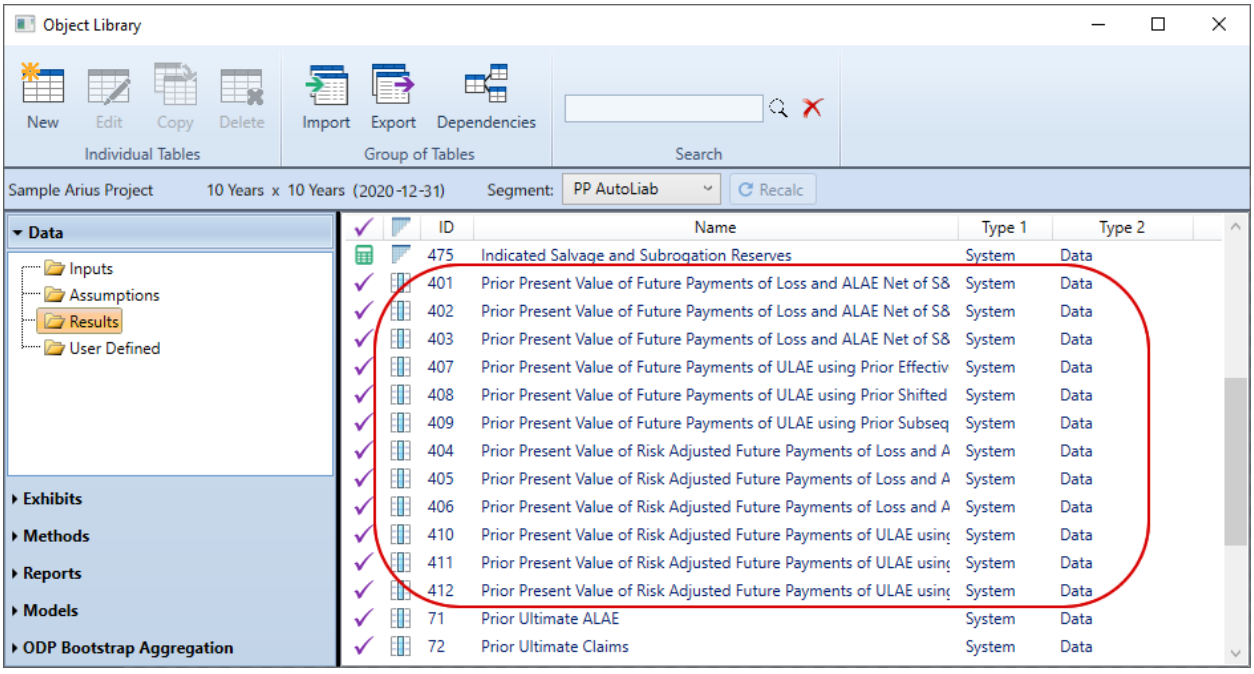
IFRS 17 objects in the Reports node of the Object Library

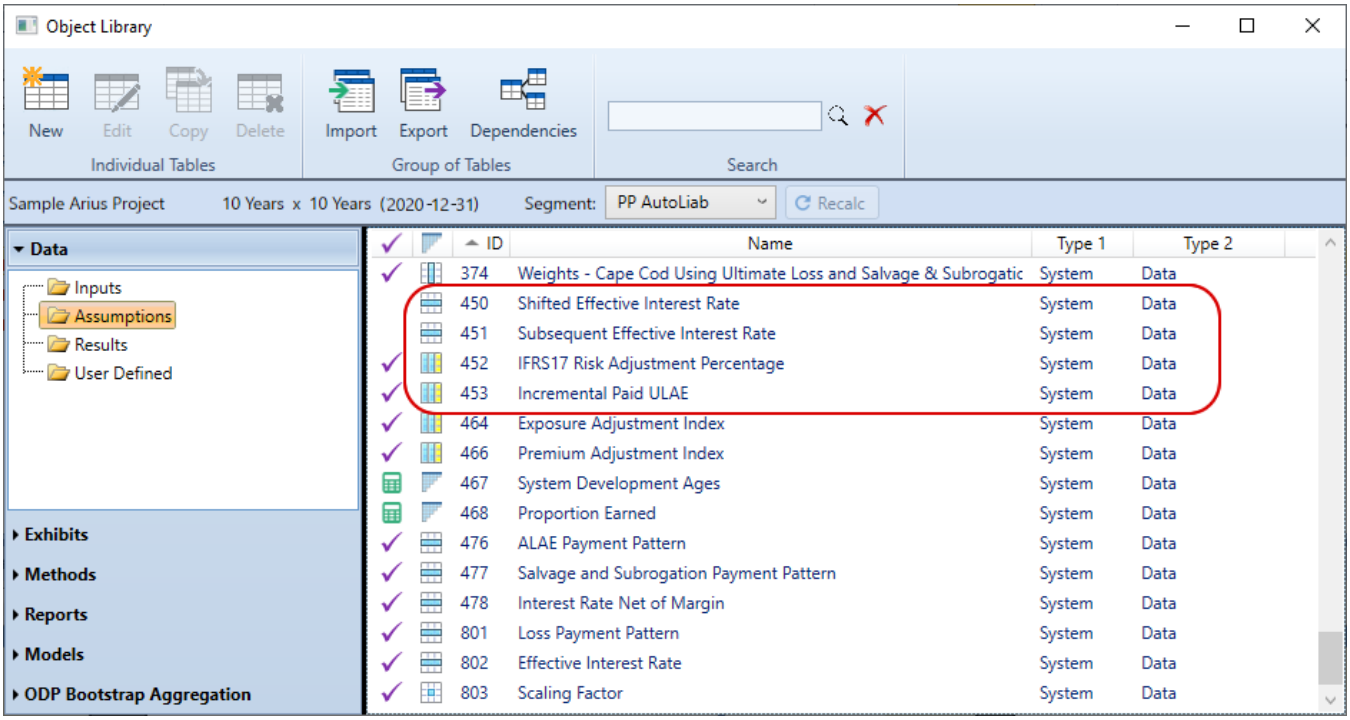


IFRS 17 objects in the Methods node of the Object Library



IFRS 17 objects in the Data node of the Object Library




Object Library
New
Edit
Copy
Delete
Individual Tables
Import
Export
Dependencies
Group of Tables
Search
Sample Arius Project
10 Years x 10 Years (2020-12-31)
Segment:
PP AutoLiab
Recalc
Data
Inputs
Assumptions
Results
User Defined
Exhibits
Methods
Reports
Models
ODP Bootstrap Aggregation
ID
Name
Type 1
Type 2
374 Weights - Cape Cod Using Ultimate Loss and Salvage & Subrogatic System Data
450 Shifted Effective Interest Rate System Data
451 Subsequent Effective Interest Rate System Data
452 IFRS17 Risk Adjustment Percentage System Data
453 Incremental Paid ULAE System Data
464 Exposure Adjustment Index System Data
466 Premium Adjustment Index System Data
467 System Development Ages System Data
468 Proportion Earned System Data
476 ALAE Payment Pattern System Data
477 Salvage and Subrogation Payment Pattern System Data
478 Interest Rate Net of Margin System Data
801 Loss Payment Pattern System Data
802 Effective Interest Rate System Data
803 Scaling Factor System Data