User Guide for General Insurance Reserving & Reporting Suite ("GIRRS")

A step by step guide to using GIRRS

January 2022

pwc

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Overview of *GIRRS*

Scope of Software (1/3)

The purpose of the software is to perform IFRS 17 specific calculations and produce IFRS 17 financial figures, as required for accounting and reporting purposes. The software includes a reserving module, which has the capability to produce best estimate liabilities and fulfilment cashflows to feed into the IFRS 17 calculations.

In terms of IFRS 17 financial figures, given the correct input data and assumptions, the software is able to produce:

- Balance Sheet (“B/S”) items for IFRS 17 related items:
  - Asset / Liability for Incurred Claims
  - Asset / Liability for Remaining Coverage
  - Loss Component, Loss Recovery Component
- Profit or Loss (“P&L”) items for IFRS 17 related items:
  - Insurance Service Result (comprising Insurance Revenue and Insurance Service Expenses)
  - Insurance Finance Income or Expenses
- IFRS 17 related disclosures:
  - Reconciliation of Asset / Liability for Remaining Coverage
  - Reconciliation of Asset / Liability for Incurred Claims
  - Other required quantitative IFRS 17 disclosures
- IFRS 17 specific accounting journal entries

Scope of Software (2/3)

The software is designed for the purposes of measurement of specific insurance and reinsurance contracts that fall within the scope of IFRS 17. Concepts referred to within IFRS 17 that require measurement under a different IFRS (e.g. distinct investment components, embedded derivatives) cannot be accounted for within the software. Contracts that are not within the scope of IFRS 17 (e.g. warranties, financial guarantees) also cannot be accounted for within the software.

The following types of insurance contracts that are within the scope of IFRS 17 and can be accounted for within the software include:

- Insurance contracts without direct participation features
- Reinsurance contracts held

The following types of insurance contracts that are within the scope of IFRS 17 but cannot be accounted for within the software include:

- Insurance contracts with direct participation features
- Investment contract with direct participation features
- Fixed fee service contracts
- Loans that transfer significant risk

Scope of Software (3/3)

There are three (3) measurement approaches (GMM, PAA, VFA) that can be applied under IFRS 17. In this software version (v Beta), the software can perform the measurement for the PAA only, and does not include the GMM and VFA measurement. The entity is required to perform its own analysis of its insurance contracts and determine the measurement model which is appropriate for those contracts. This analysis is performed outside of the software.

There are a number of limitations to the software, including:

- Externally produced input data (e.g. portfolio data, cohort year definition, UPR, DAC) must be provided in accordance with IFRS 17 requirements. Further detail is provided in the Software Data Dictionary.

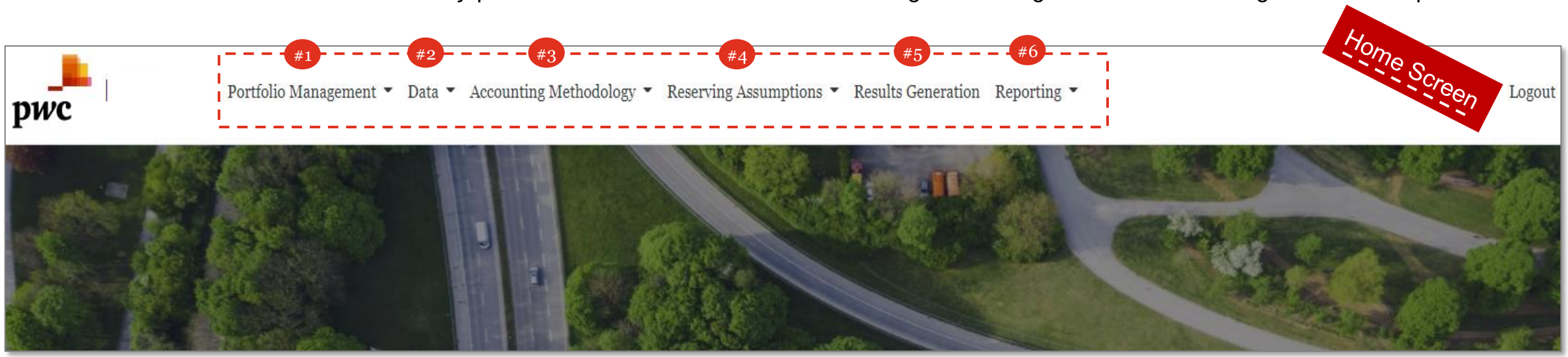
- Certain calculations or assumptions (e.g. directly attributable expenses, illiquidity premium) are required to be performed externally, prior to entry in the system. These will be specified throughout the document.

2

User Guide for *GIRRS*

GIRRS User Guide - Overview

Below are the illustration of the functionality process flow to use GIRRS. The following sides will go into detailed user guide for each process.



Six key functionality steps to operating the PwC's simplified solution:

#1

Step 1: Portfolio management
To configure and map to the IFRS 17 Portfolio, Cohort and Group definitions.

#2

Step 2: Data
Upload required data (flexible integration options) with automated data validation functionality

#3

Step 3: Accounting Methodology
Select accounting policy choices under IFRS 17 and configure the IFRS 17 Chart of Accounts

#4

Step 4: Reserving Assumptions
Select reserving assumptions using actuarial methodology to determine the Fulfilment Cashflows

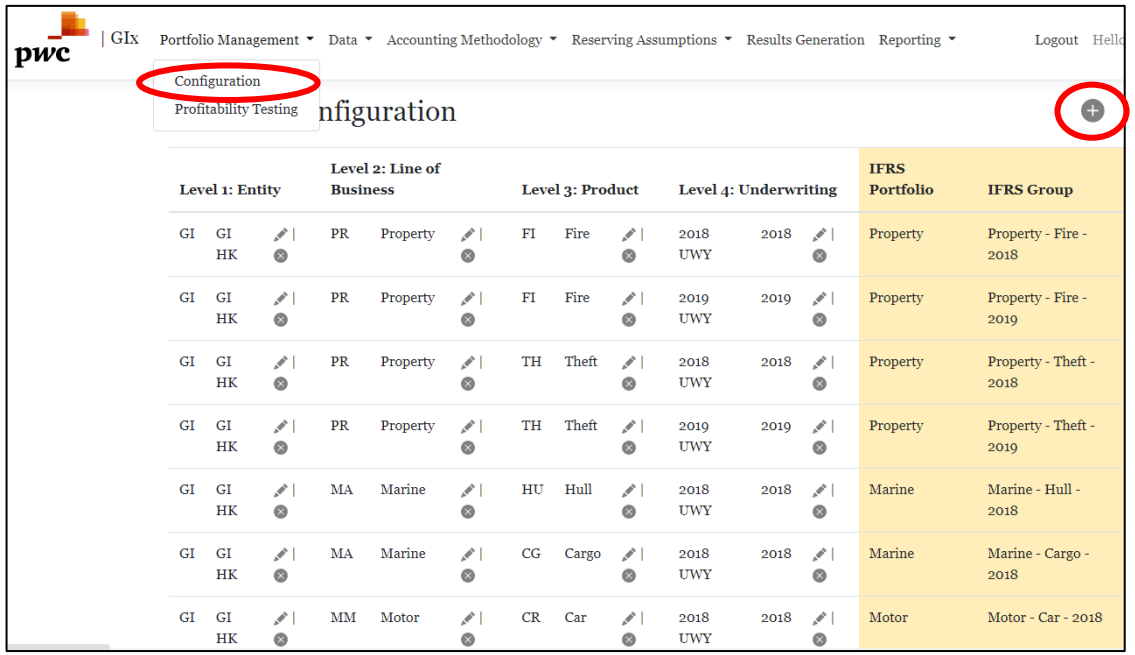
#5

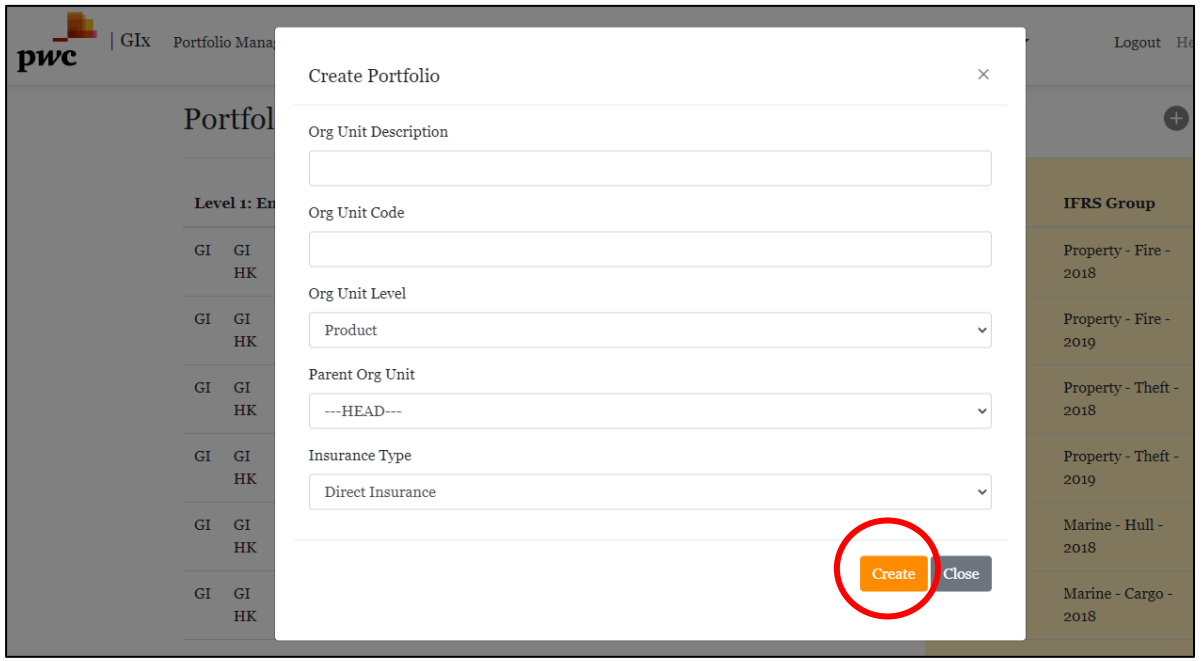
Step 5: Results Generation
Run the results for each valuation date, including the risk adjustment bootstrapping simulation

#6

Step 6: Reporting
Filter through reports for IFRS 17 results (financial statements, reconciliation disclosures)

GIRRS User Guide – Portfolio Management (1/2)





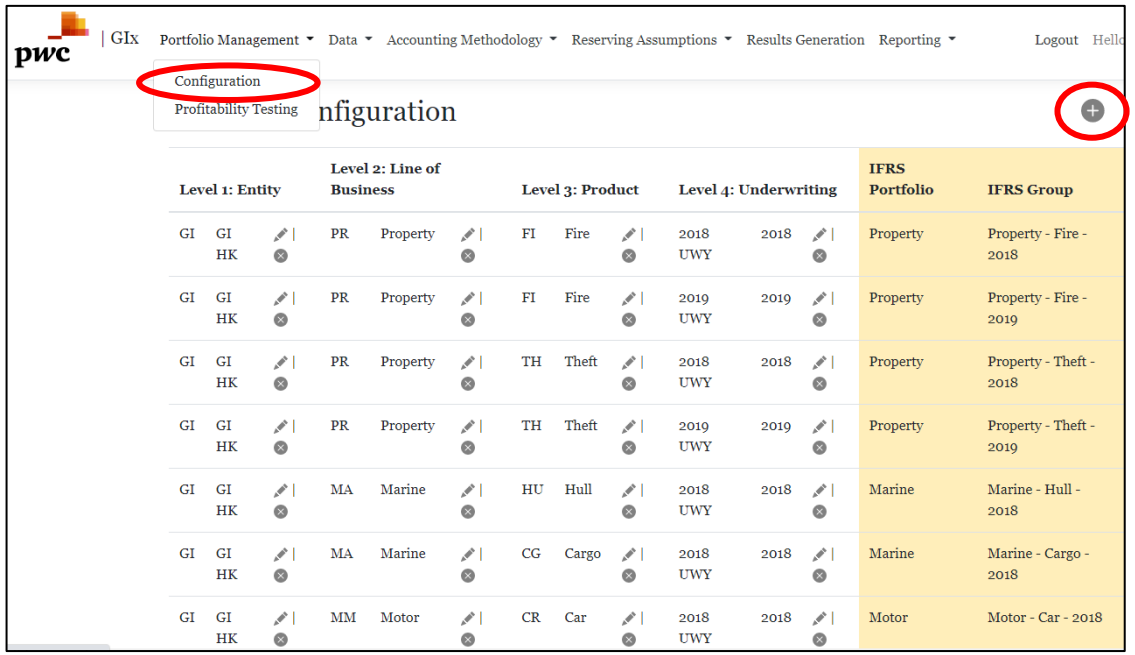
Under the Portfolio Management tab, the user can click on the **"Configuration"** button.

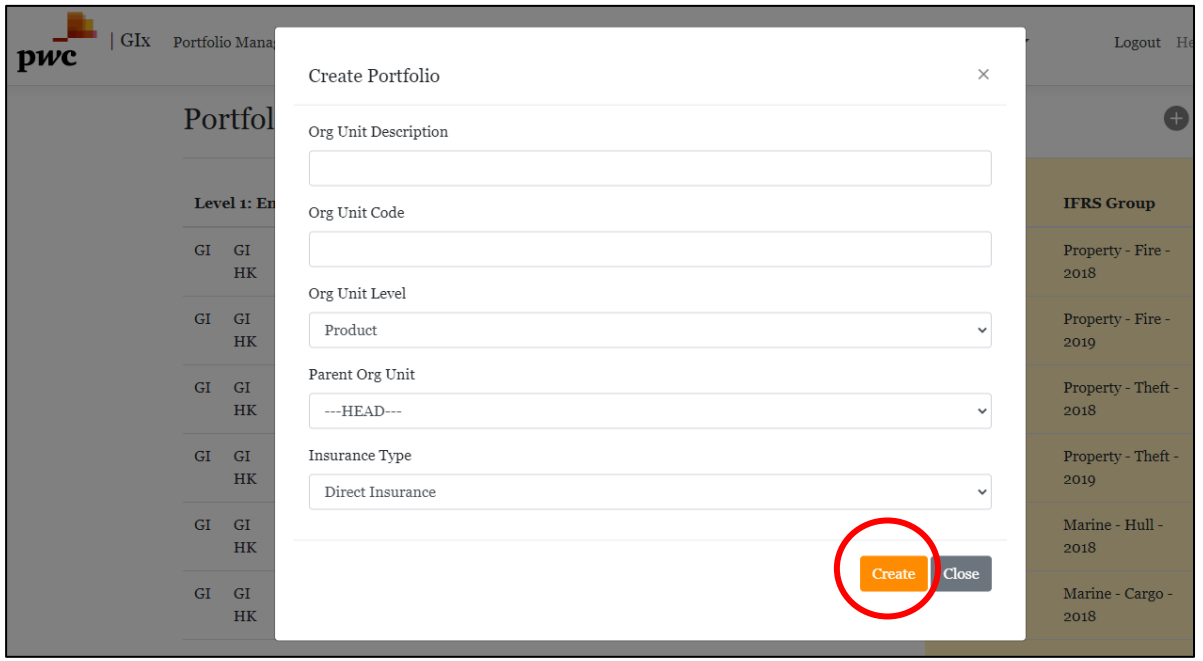
This will take the user to a screen which outlines all of the IFRS 17 Portfolios have been set up in GIRRS.

To add a new Portfolio, the user can click on the "+" button on the upper right, which will bring up a pop up screen.

In the pop up screen, the user can enter or select the characteristics of the Portfolio from the drop-down, including the "Org Unit Description", "Org Unit Code", "Org Unit Level", "Parent Org Unit" and "Insurance Type". Once that is done, click the "Create" button to add the new portfolio.

GIRRS User Guide – Portfolio Management (1/2)





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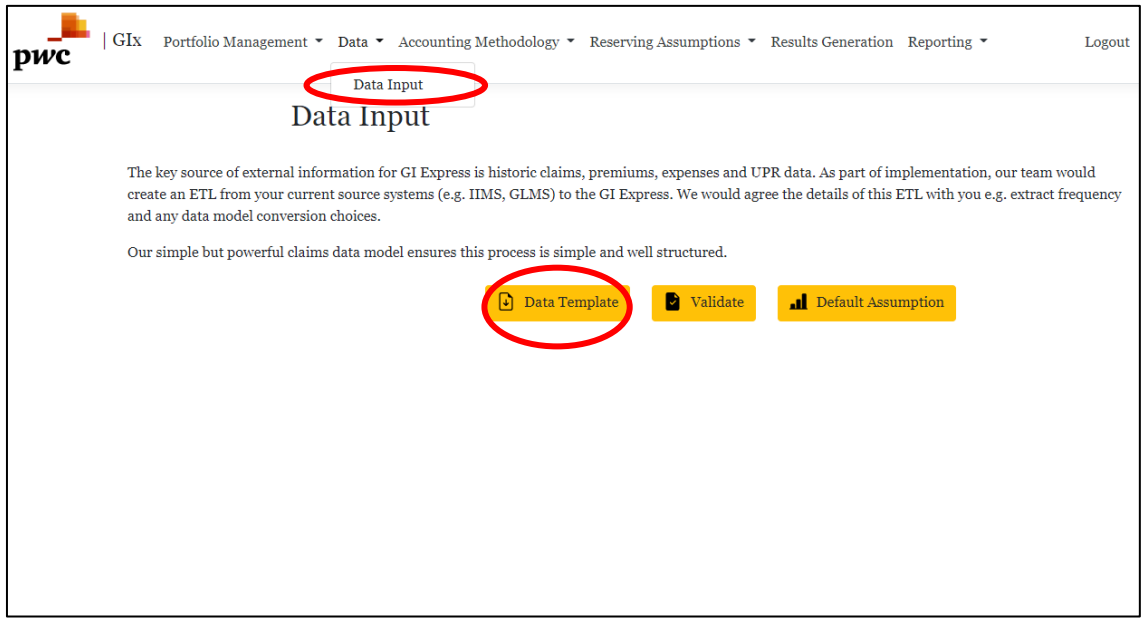
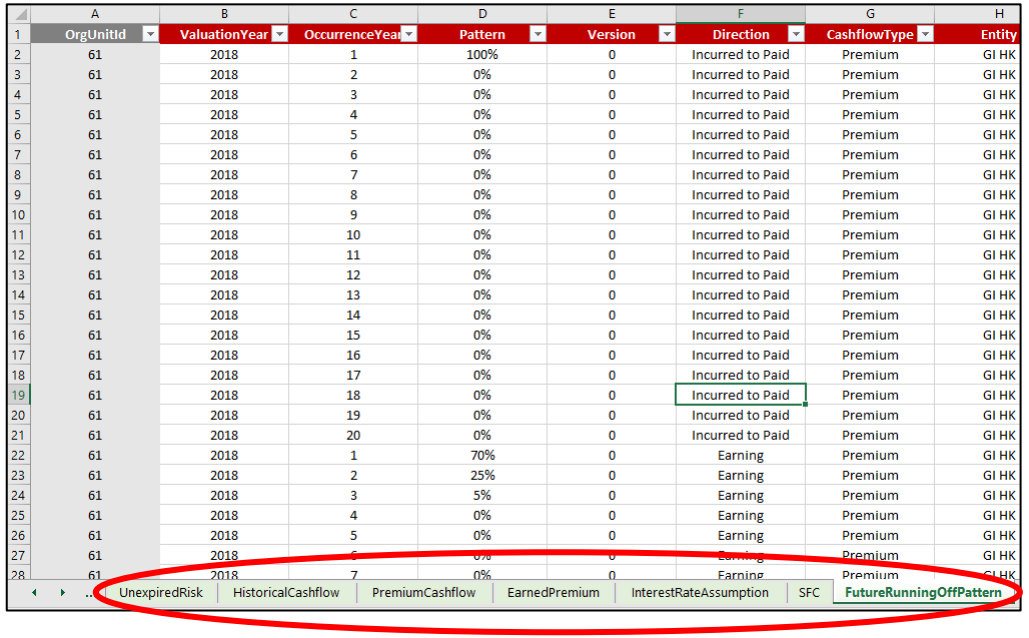
GIRRS User Guide – Data (1/2)





	A	B	C	D	E	F	G	H
1	OrgUnitId	ValuationYear	OccurrenceYear	Pattern	Version	Direction	CashflowType	Entity
2	61	2018	1	100%	0	Incurred to Paid	Premium	GI HK
3	61	2018	2	0%	0	Incurred to Paid	Premium	GI HK
4	61	2018	3	0%	0	Incurred to Paid	Premium	GI HK
5	61	2018	4	0%	0	Incurred to Paid	Premium	GI HK
6	61	2018	5	0%	0	Incurred to Paid	Premium	GI HK
7	61	2018	6	0%	0	Incurred to Paid	Premium	GI HK
8	61	2018	7	0%	0	Incurred to Paid	Premium	GI HK
9	61	2018	8	0%	0	Incurred to Paid	Premium	GI HK
10	61	2018	9	0%	0	Incurred to Paid	Premium	GI HK
11	61	2018	10	0%	0	Incurred to Paid	Premium	GI HK
12	61	2018	11	0%	0	Incurred to Paid	Premium	GI HK
13	61	2018	12	0%	0	Incurred to Paid	Premium	GI HK
14	61	2018	13	0%	0	Incurred to Paid	Premium	GI HK
15	61	2018	14	0%	0	Incurred to Paid	Premium	GI HK
16	61	2018	15	0%	0	Incurred to Paid	Premium	GI HK
17	61	2018	16	0%	0	Incurred to Paid	Premium	GI HK
18	61	2018	17	0%	0	Incurred to Paid	Premium	GI HK
19	61	2018	18	0%	0	Incurred to Paid	Premium	GI HK
20	61	2018	19	0%	0	Incurred to Paid	Premium	GI HK
21	61	2018	20	0%	0	Incurred to Paid	Premium	GI HK
22	61	2018	1	70%	0	Earning	Premium	GI HK
23	61	2018	2	25%	0	Earning	Premium	GI HK
24	61	2018	3	5%	0	Earning	Premium	GI HK
25	61	2018	4	0%	0	Earning	Premium	GI HK
26	61	2018	5	0%	0	Earning	Premium	GI HK
27	61	2018	6	0%	0	Earning	Premium	GI HK
28	61	2018	7	0%	0	Earning	Premium	GI HK

UnexpiredRisk | HistoricalCashflow | PremiumCashflow | EarnedPremium | InterestRateAssumption | SFC | FutureRunningOffPattern

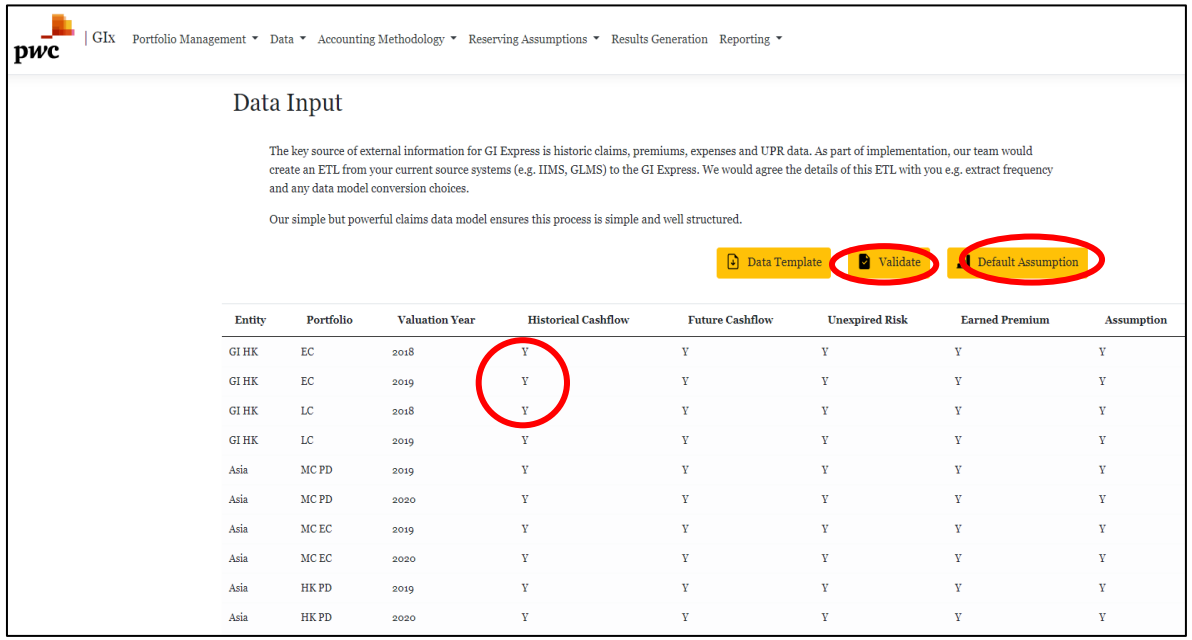
Under the Data tab, the user can click on the **“Data Input”** button.

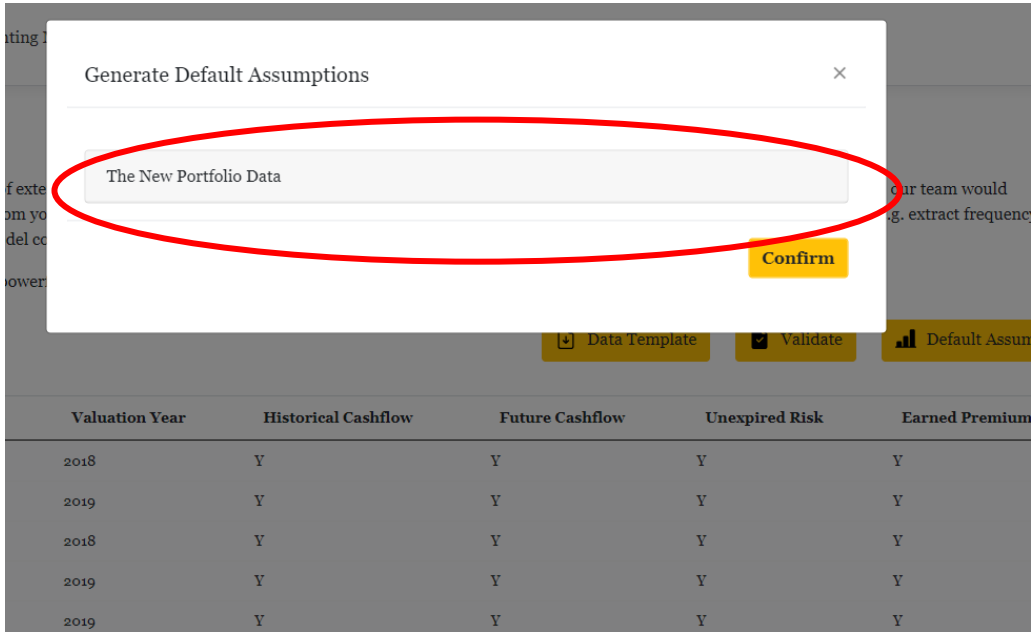
This will take the user to a screen where the user can click “Data Template” and download the template (excel format) for data upload.

The user should populate the data template with the appropriate data (e.g. premiums, UPR, claims, expenses). GIRRS will come with a data dictionary to help users source the right data and format.

Once the data template is populated, the user can then upload it to GIRRS.

GIRRS User Guide – Data (2/2)





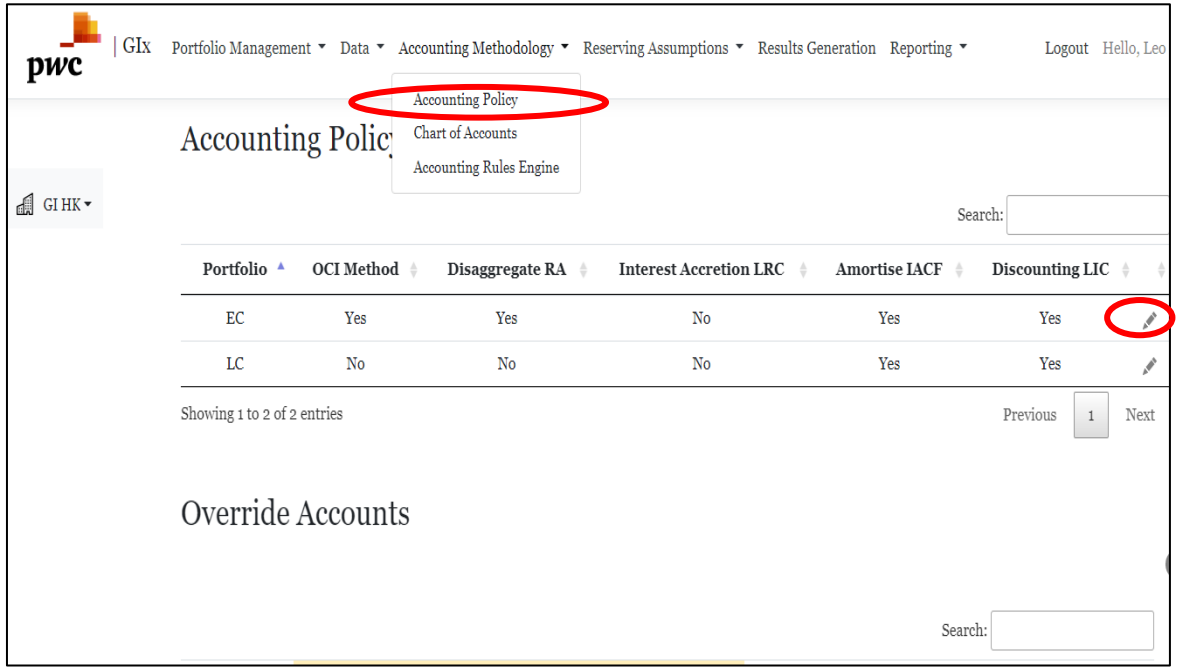
After the data is uploaded to GIRRS, the user can click on the **"Validate"** button.

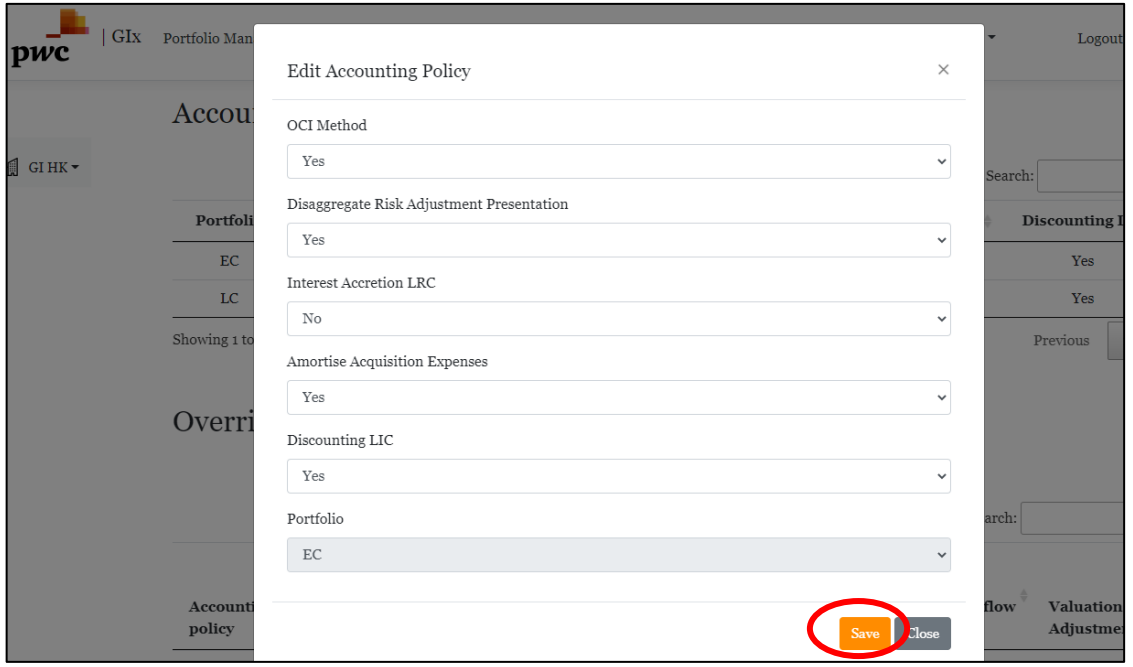
This will take the user to a screen showing whether each data tabs have been uploaded to GIRRS.The user should be able to identity the data for each group is uploaded with a 'Y'.

To generate default assumption for each group, the user can click on the "Default Assumptions" button on the right side, which will bring up a pop up screen.

In the pop up screen, the user can select the existing reference group from the drop-down list. Once that is done, click the "Confirm" button to load the default assumptions for new portfolio data.

GIRRS User Guide – Accounting Methodology (1/3)





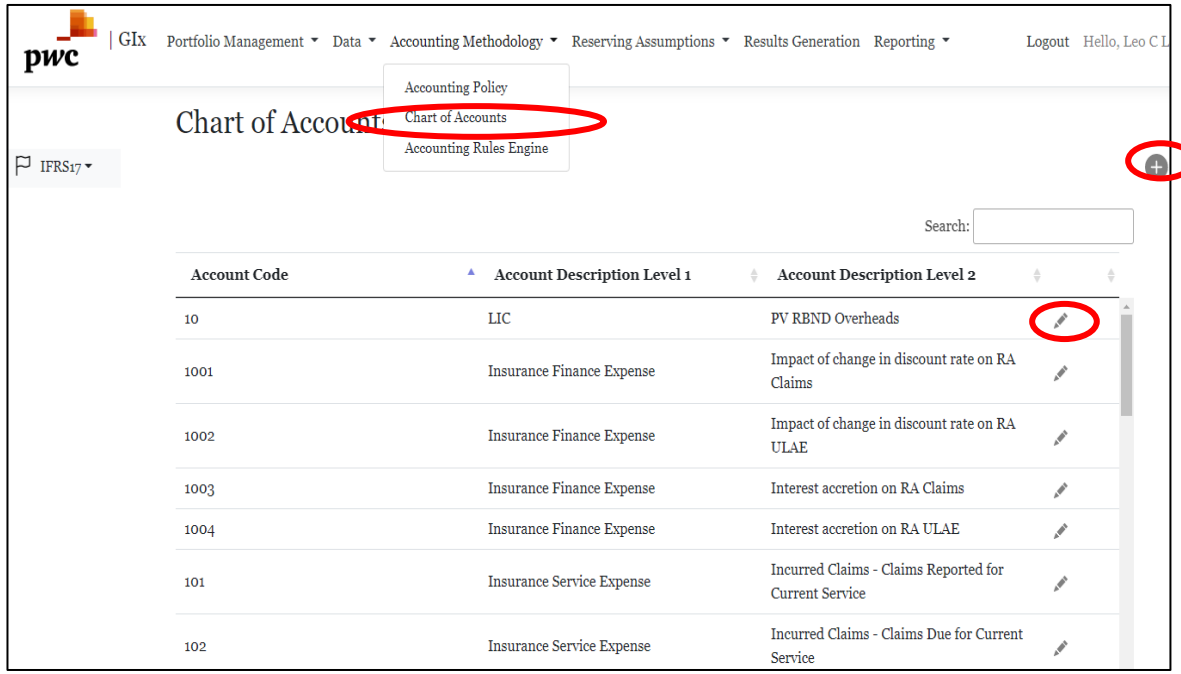
Under the Accounting Methodology tab, the user can click on the **"Accounting Policy"** button.

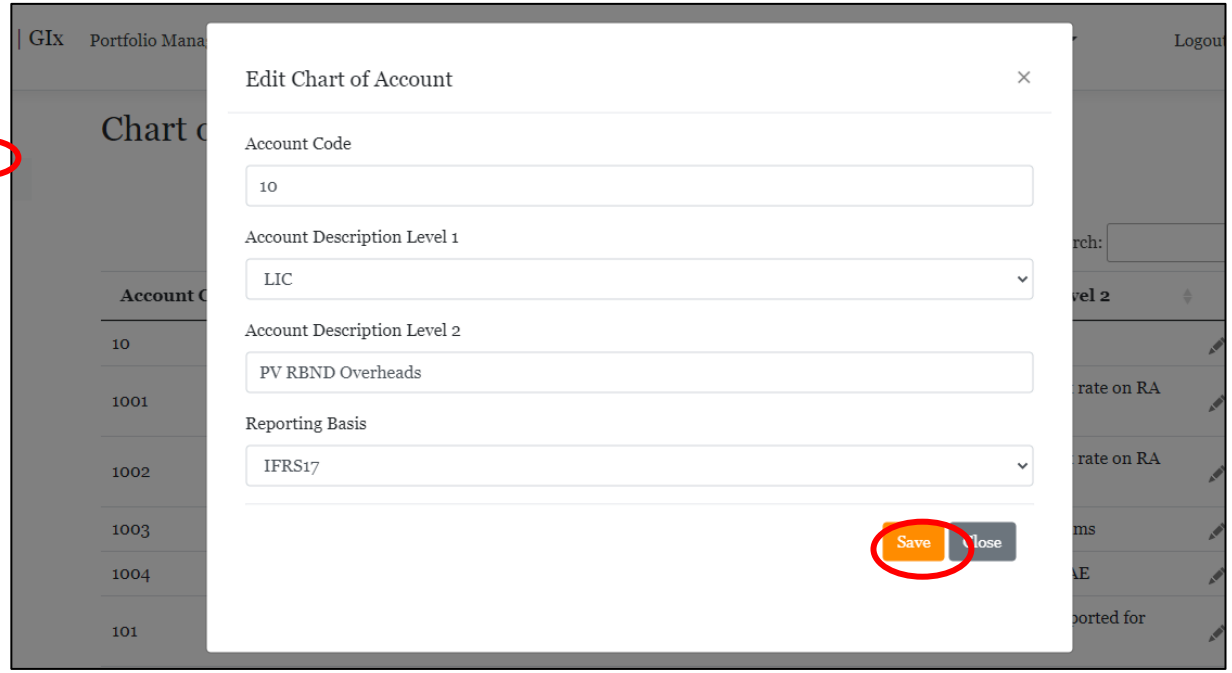
This will take the user to a screen which outlines all of the Accounting Policy options (PAA only) for each Portfolio in GIRRS.

To edit a new accounting policy option, the user can click on the "edit" button on the right side, which will bring up a pop up screen.

In the pop up screen, the user can enter or select the accounting policy choices from the drop-down, including the "OCI Method", "Disaggregate Risk Adjustment Presentation", "Interest Accretion LRC", "Amortise Acquisition Expense" etc. Once that is done, click the "Save" button to edit/add the new accounting policy choices.

GIRRS User Guide – Accounting Methodology (2/3)





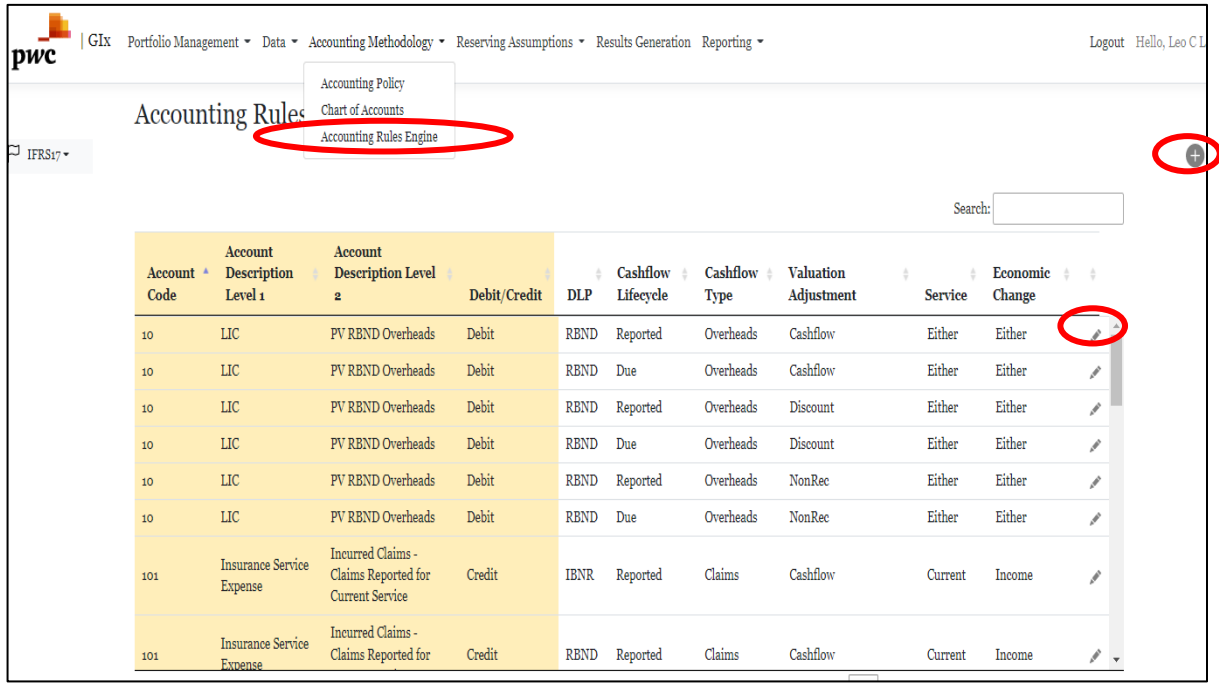
Under the Accounting Methodology tab, the user can click on the **"Chart of Accounts"** button.

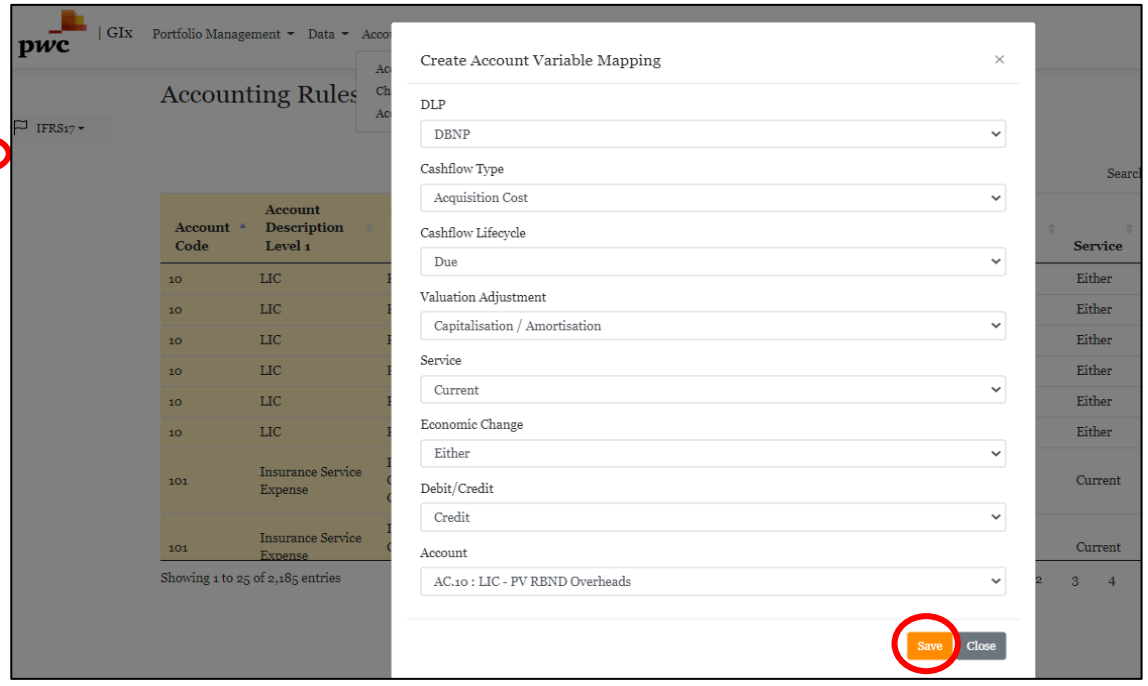
This will take the user to a screen which outlines all of the defined Chart of Accounts in GIRRS.

To edit/add a chart of account, the user can click on the "edit/+" button on the right side, which will bring up a pop up screen.

In the pop up screen, the user can enter or select the characteristics of the chart of accounts from the drop-down, including the "Account Code", "Description" etc. Once that is done, click the "Save" button to edit/add the chart of account.

GIRRS User Guide – Accounting Methodology (3/3)





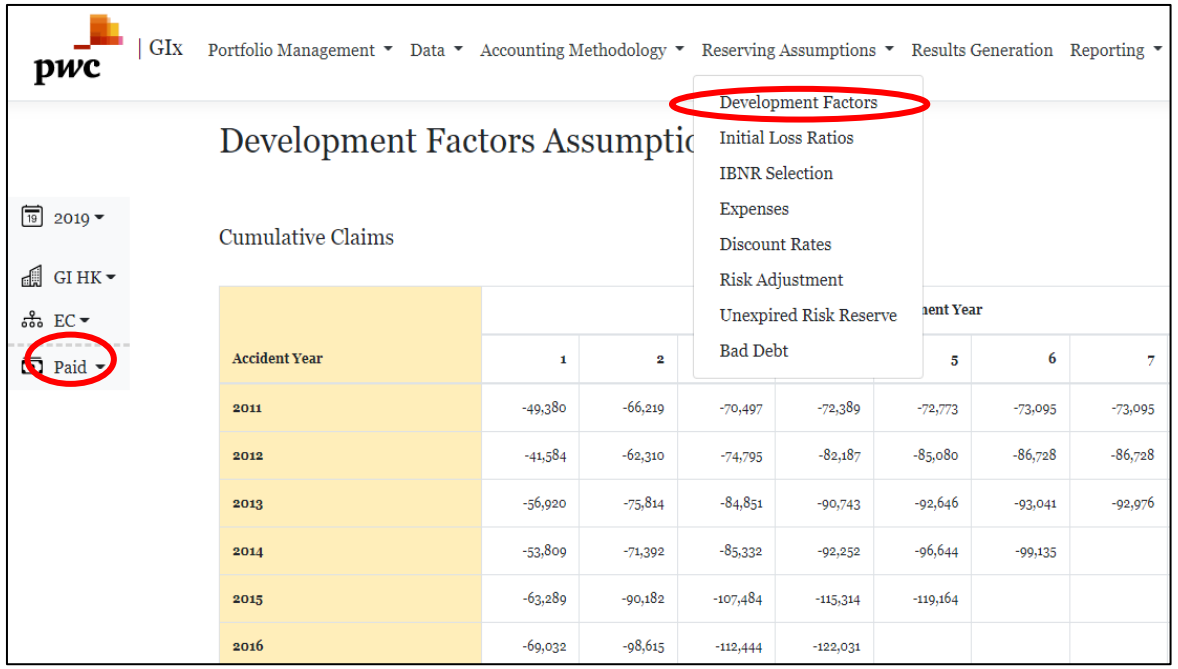
Under the Accounting Methodology tab, the user can click on the **"Accounting Rule Engine"** button.

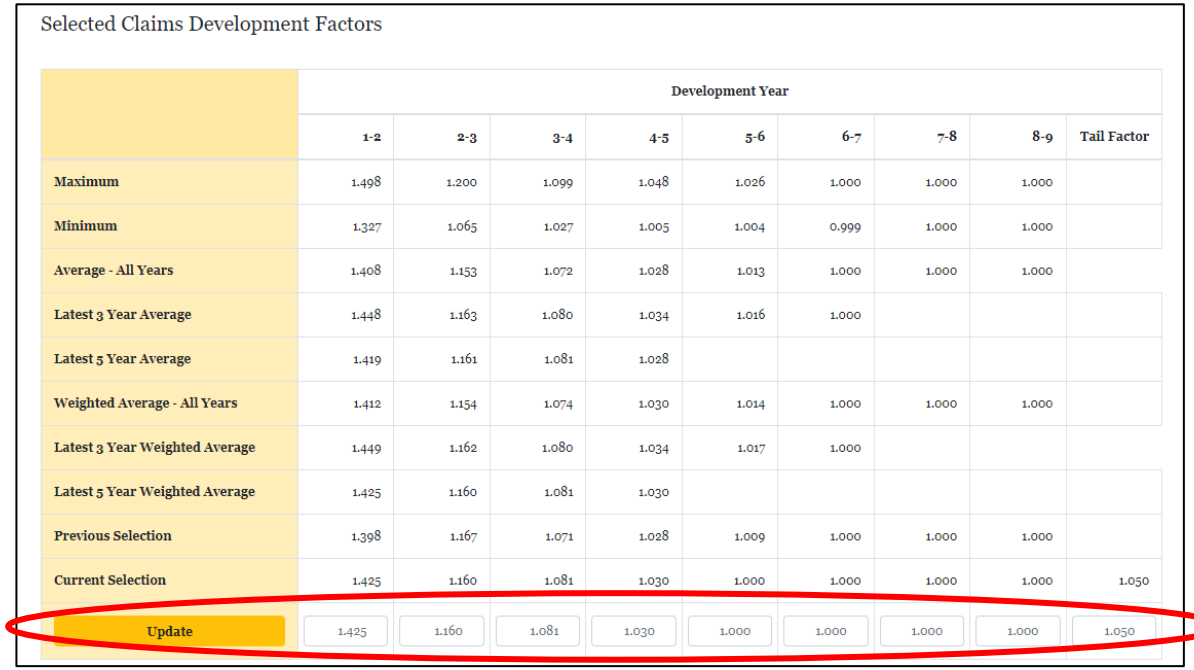
This will take the user to a screen which outlines all of the defined Accounting Rules Engine in GI Suite.

To edit/add a new accounting rule, the user can click on the "edit/+" button on the right side, which will bring up a pop up screen.

In the pop up screen, the user can enter or select the characteristics of the accounting rule from the drop-down, including the "Cashflow Type", "Cashflow Lifecycle", "Debit/Credit", "Account" etc. Once that is done, click the "Save" button to edit/add the new accounting rule.

GIRRS User Guide – Reserving Assumptions (1/6)



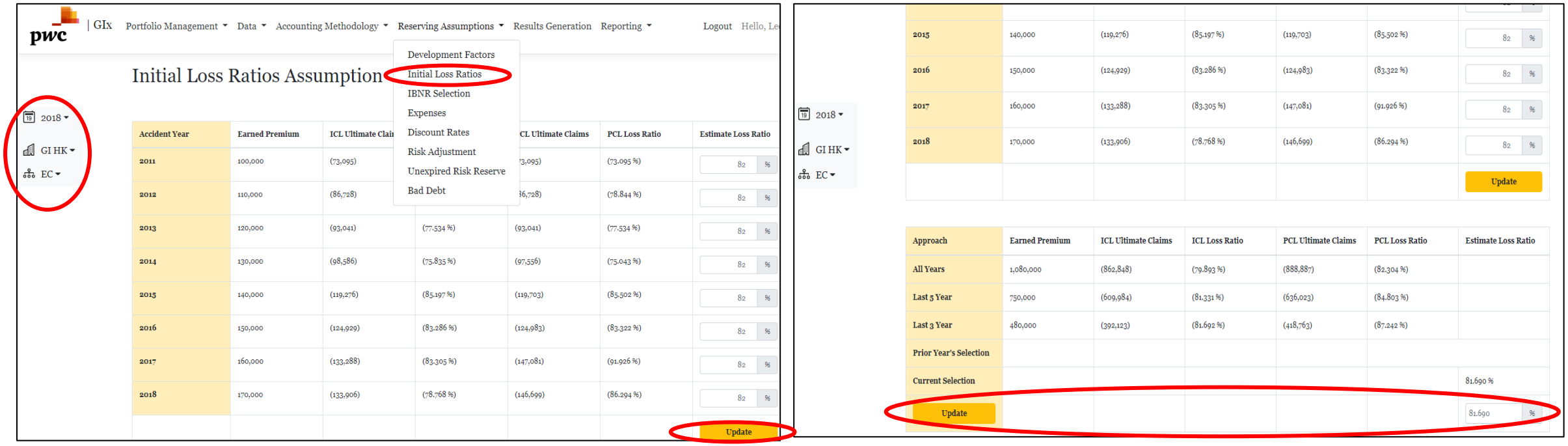


Under the Reserving Assumptions tab, the user can click on the **"Development Factors"** button.

This will take the user to a screen which the user can select Paid or Incurred Chain Ladder Development Factors ("LDFs") based on historical data. These assumptions are used by GIRRS to determine reserves (i.e. IBNR) and payment patterns which produces future cashflows.

To toggle between Paid or Incurred data, the user can click on the "Paid/Incurred" button on the left side. As the user scrolls down the page, the last table is where the user can select the LDF assumption for each development year and tail development. The user can either select one of the pre-calculated averages, or enter a manual number. Once input, the user can press the "Update" button to save the assumptions.

GIRRS User Guide – Reserving Assumptions (2/6)



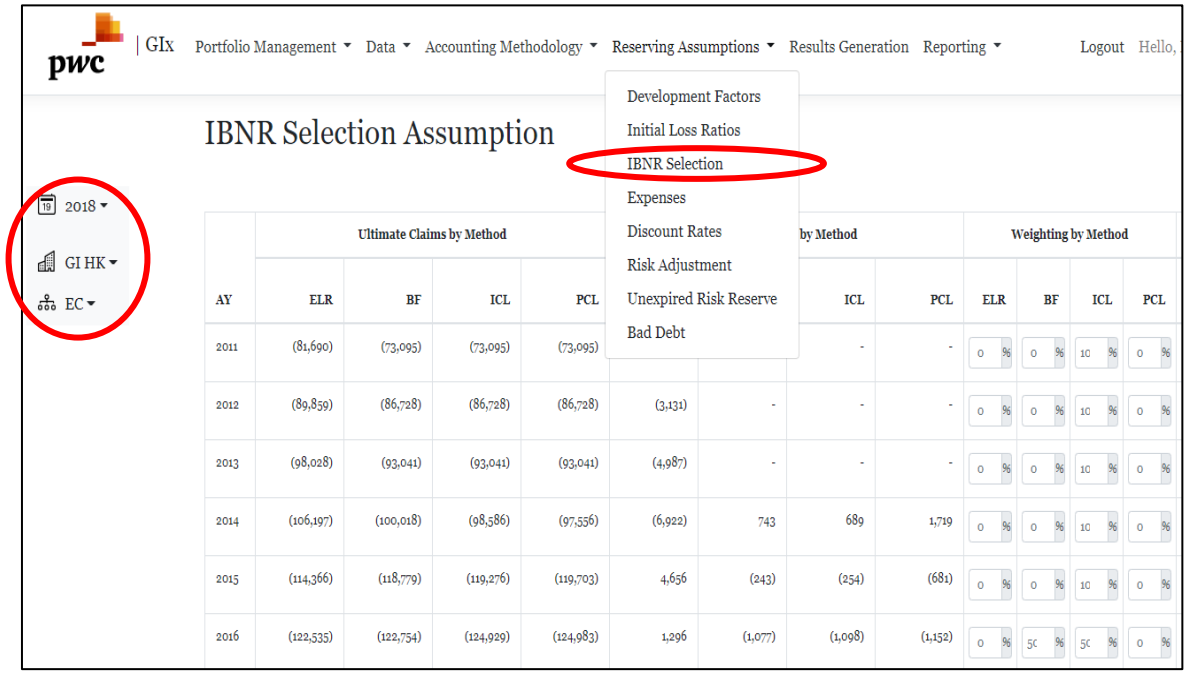
Under the Reserving Assumptions tab, the user can click on the **"Initial Loss Ratios"** button.

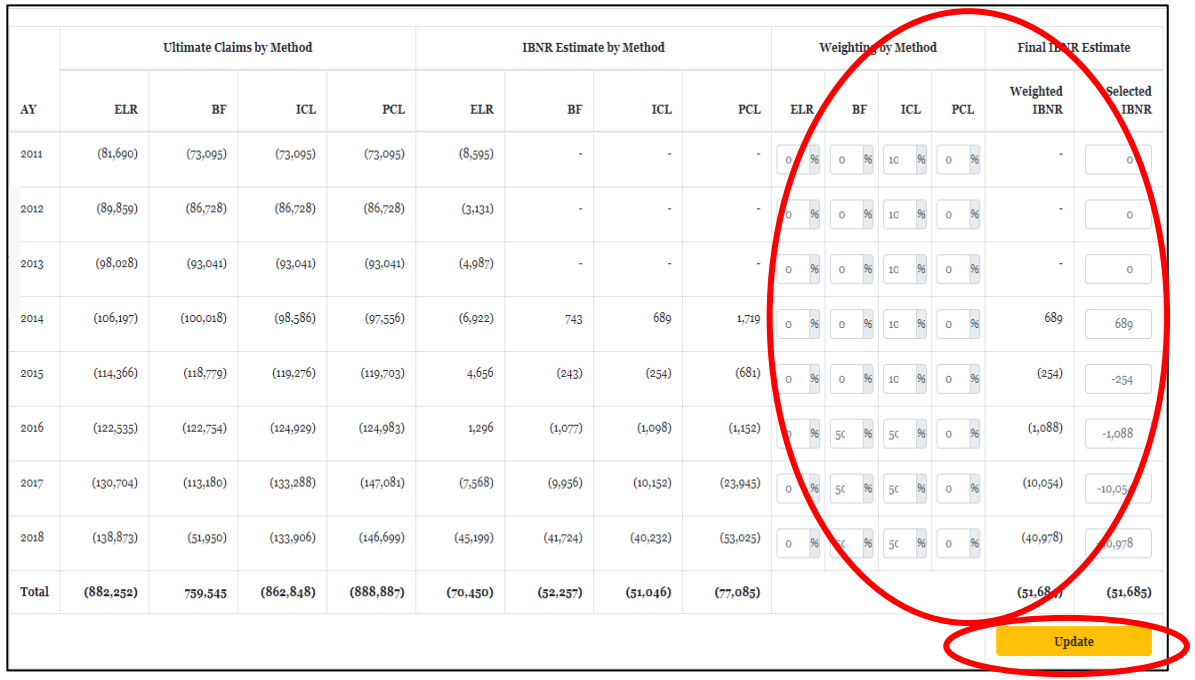
This will take the user to a screen which the user can select the Initial Loss Ratios ("ELRs") based on historical data. These assumptions are used by GIRRS to determine reserves (i.e. IBNR for BF method and ELR method), the unexpired risk loss component and profitability testing.

At the top left side, the user can select the "Valuation Year" and "Portfolio" for the data. The first table is where the user can select the ELR assumption for reserving for each accident year. The user can enter a manual number and press the "Update" button to save the assumption.

As the user scrolls down the page, the last table is where the user can select the ELR assumption for profitability testing and unexpired risk loss component. The user can either select one of the pre-calculated averages, or enter a manual number. Once input, the user can press the "Update" button to save the assumption.

GIRRS User Guide – Reserving Assumptions (3/6)





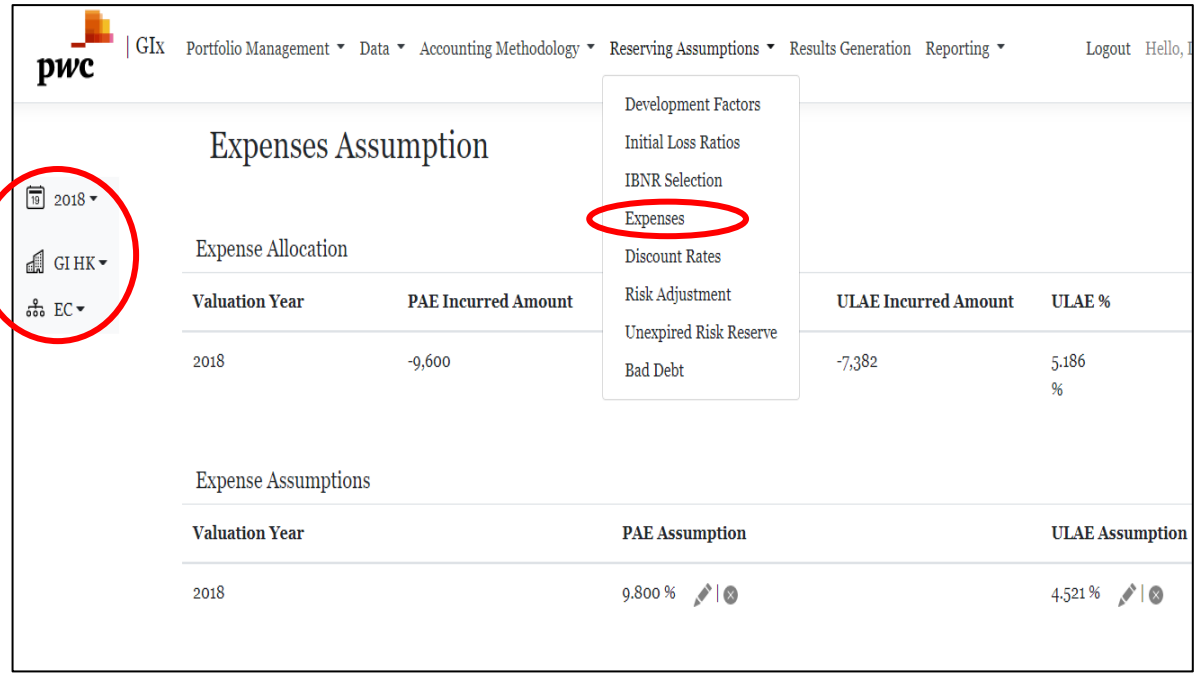
Under the Reserving Assumptions tab, the user can click on the **"IBNR Selection"** button.

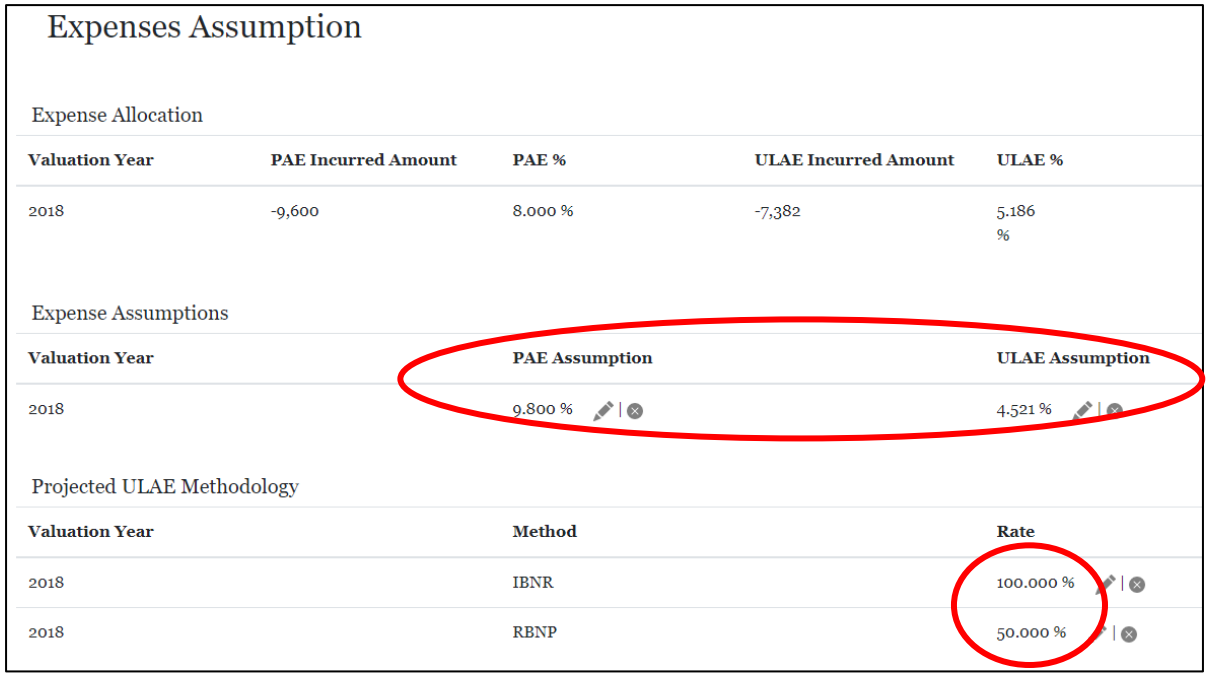
This will take the user to a screen which the user can select the IBNR for each accident year based on historical data. These assumptions are used by GIRRS to determine the final reserves. At the top left side, the user can select the "Valuation Year" and "Portfolio" for the data. As the user scrolls down the page, the right hand columns are where the user can either:

- Manually enter the IBNR (e.g. if the user wants to import the analysis done outside of GIRRS)
- Calculate the IBNR within GIRRS by using a weighted average of different methods (ELR, BF, ICL and PCL). The user can enter the weightings to apply for each method. Note the % for each accident year has to add up to 100%.

Once input, the user can press the "Update" button to save the assumption.

GIRRS User Guide – Reserving Assumptions (4/6)



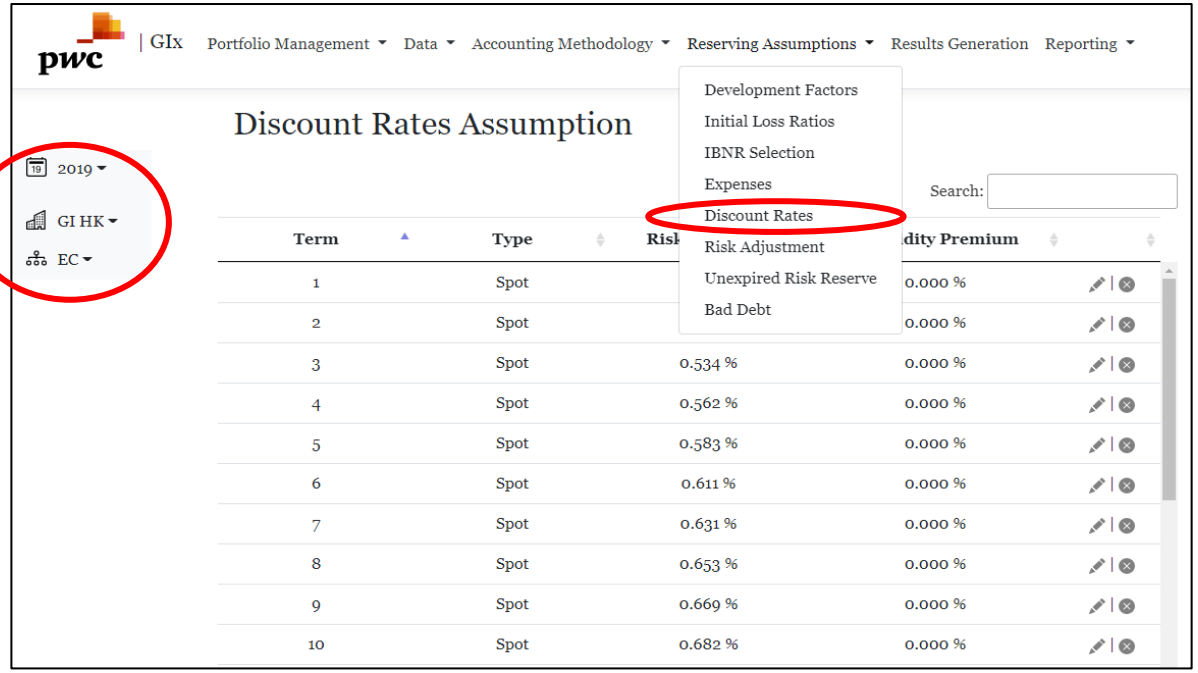


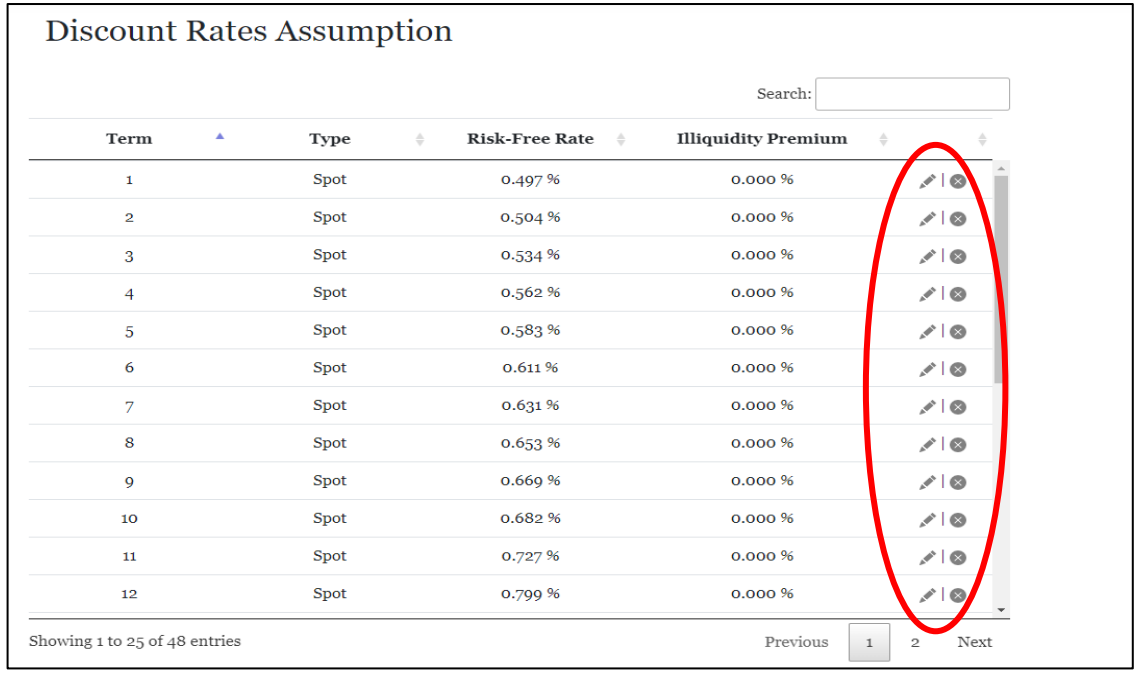
Under the Reserving Assumptions tab, the user can click on the **"Expenses"** button.

This will take the user to a screen which the user can select the Expense assumptions. These assumptions are used by GIRRS to determine reserves (i.e. expense allowance) and the unexpired risk loss component.

At the top left side, the user can select the "Valuation Year" and "Portfolio" for the data. As the user scrolls down the page, the first table displays the actual incurred PAE and ULAE amounts (from data inputs) are in the first table. The second table is where the user can select the PAE and ULAE assumption for each Portfolio. The third table is where the user can input what proportion of the ULAE assumption to apply for RBNP and IBNR.

GIRRS User Guide – Reserving Assumptions (5/6)



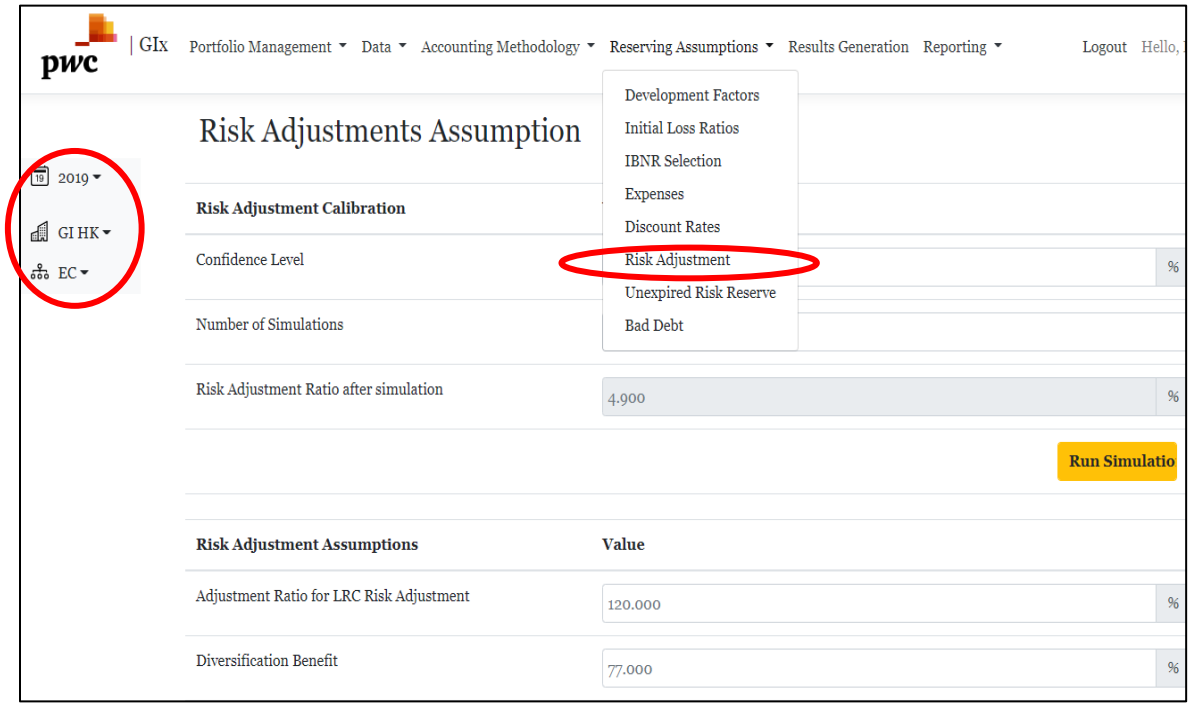


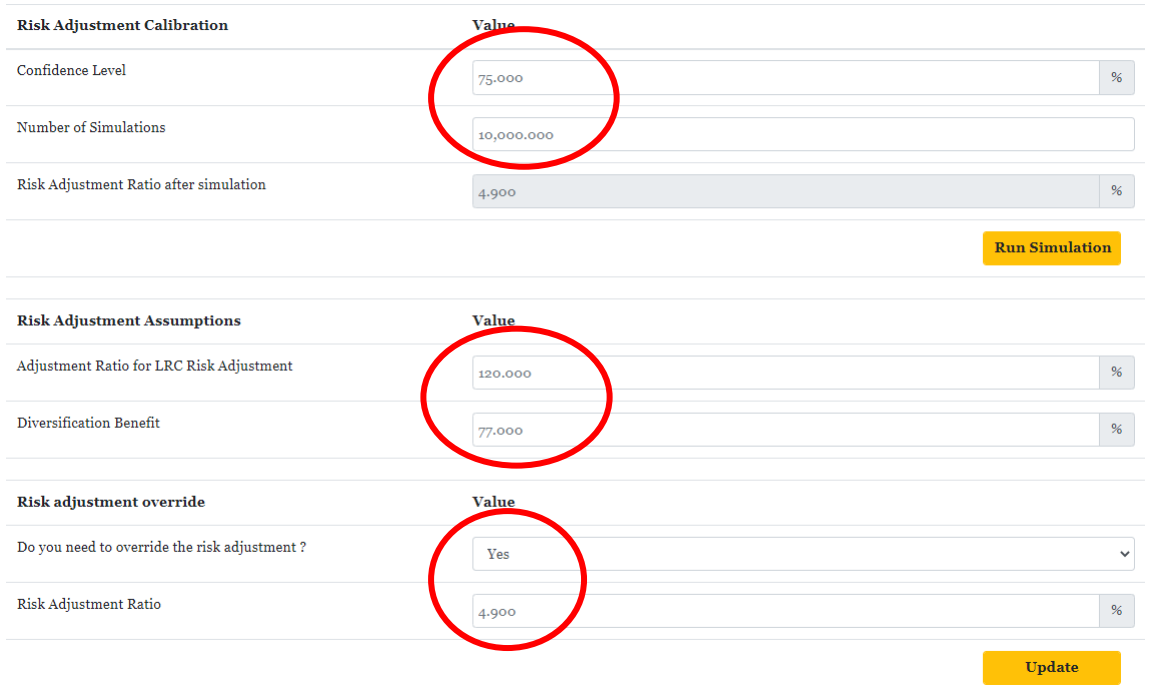
Under the Reserving Assumptions tab, the user can click on the **"Discount Rates"** button.

This will take the user to a screen which the user can select the Discount Rates assumptions. These assumptions are used by GIRRS to discount future cashflows.

At the top left side, the user can select the "Valuation Year" and "Portfolio" for the data. As the user scrolls down the page, the right column is where the user can edit the discount rates (risk free rate and/or illiquidity premium) for each term. GIRRS will come with pre-populated risk-free free rates for HKD from data input and the default term is yearly.

GIRRS User Guide – Reserving Assumptions (6/6)



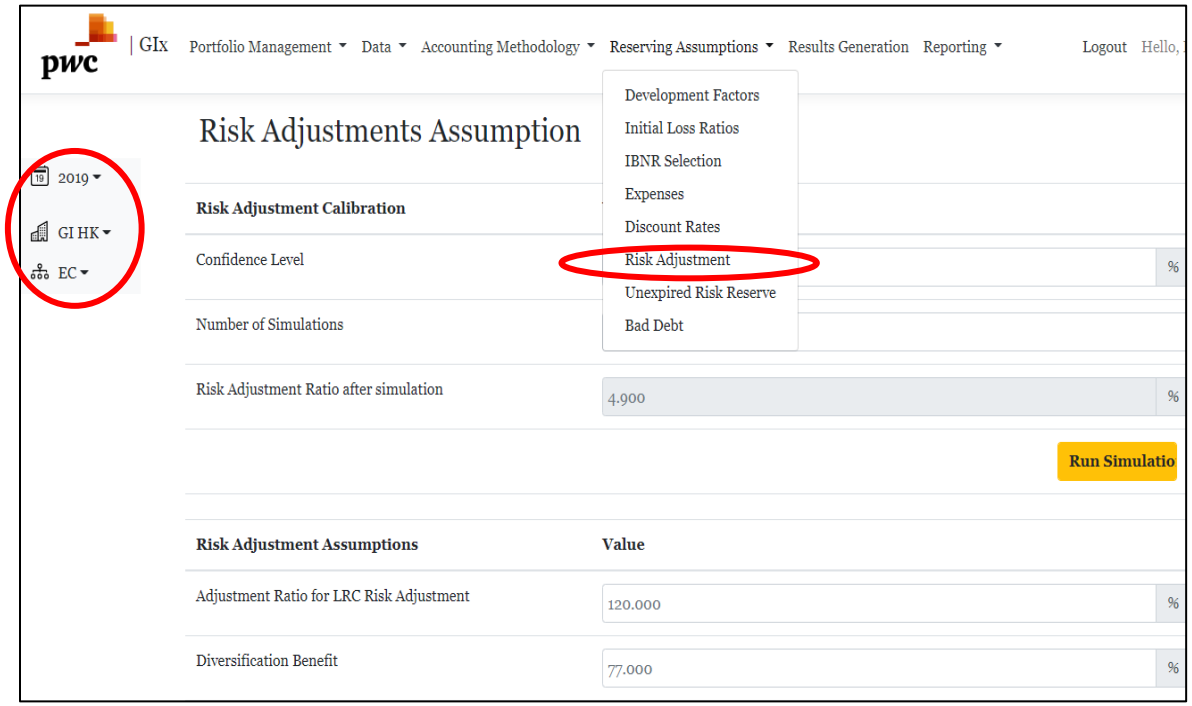


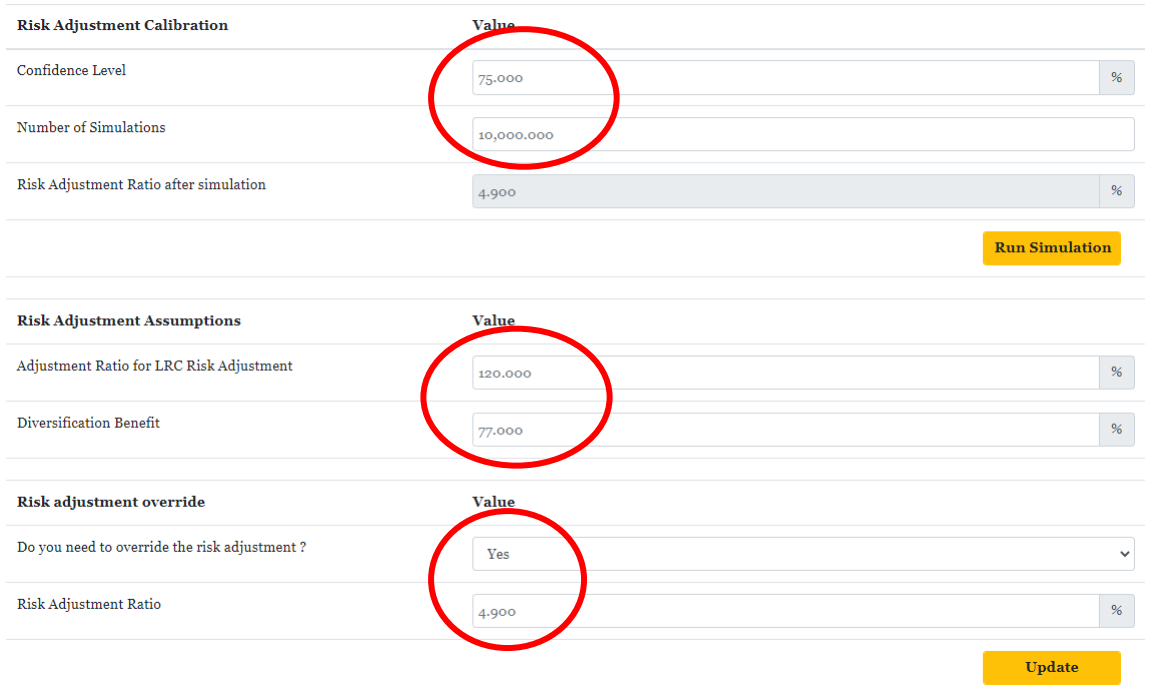
Under the Reserving Assumptions tab, the user can click on the **"Risk Adjustment"** button.

This will take the user to a screen which the user can run the Risk Adjustment assumptions. These assumptions are used by GIRRS to calculate the risk adjustment for non-financial risks.

At the top left side, the user can select the "Valuation Year" and "Portfolio" for the data. As the user scrolls down the page, the first table allows the user to select the confidence interval and number of simulation to calibrate the risk adjustment to. Then the user can press the "Run simulation" button to simulate the risk adjustment assumption. The second table allows the user to enter the adjustment ratio for LRC and diversification benefits. The third table allow the user to select whether to override the risk adjustment from the drop down list and manually enter the risk adjustment ratio. Then the user can press the "Update" button to save the risk adjustment assumptions.

GIRRS User Guide – Reserving Assumptions (6/6)





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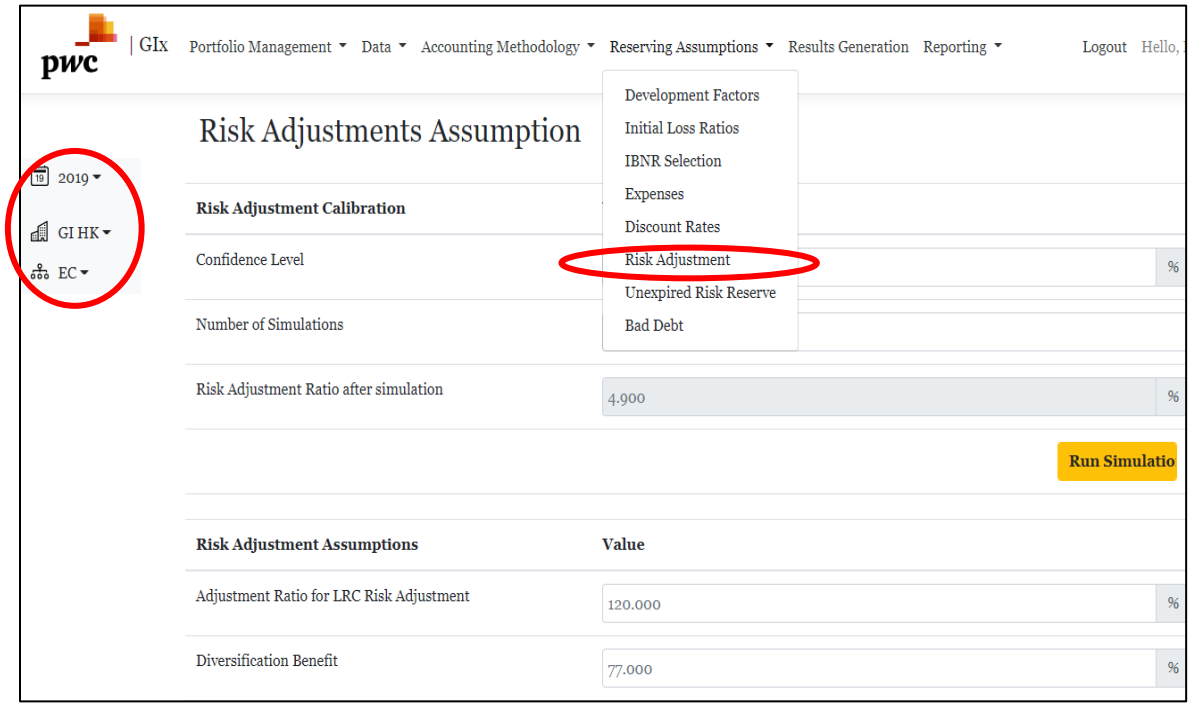
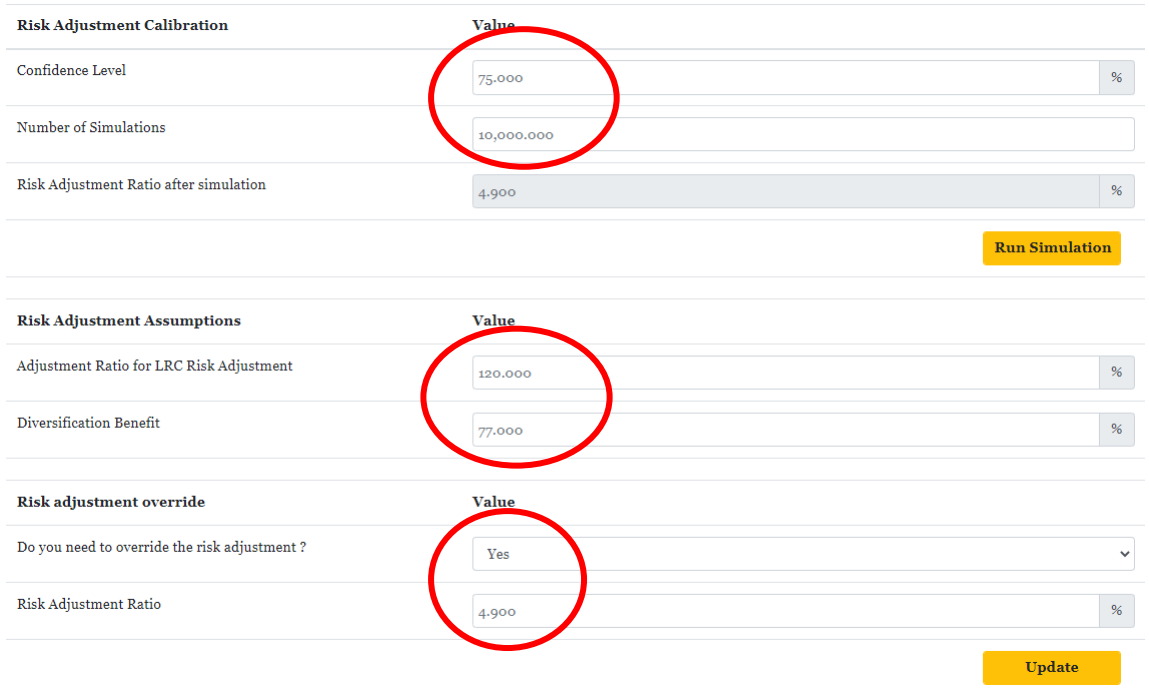
At the top left side, the user can select the "Valuation Year" and "Portfolio" for the data. As the user scrolls down the page, the first table allows the user to select the confidence interval and number of simulation to calibrate the risk adjustment to. Then the user can press the "Run simulation" button to simulate the risk adjustment assumption. The second table allows the user to enter the adjustment ratio for LRC and diversification benefits. The third table allow the user to select whether to override the risk adjustment from the drop down list and manually enter the risk adjustment ratio. Then the user can press the "Update" button to save the risk adjustment assumptions.

GIRRS User Guide – Reserving Assumptions (6/6)



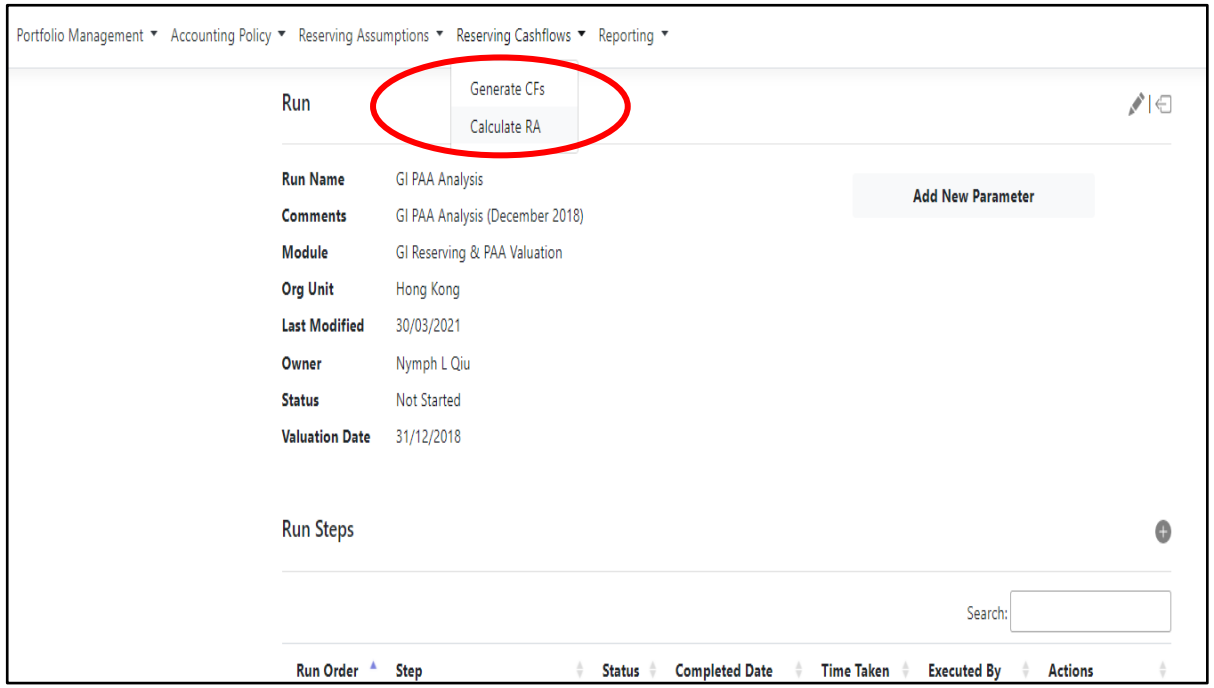


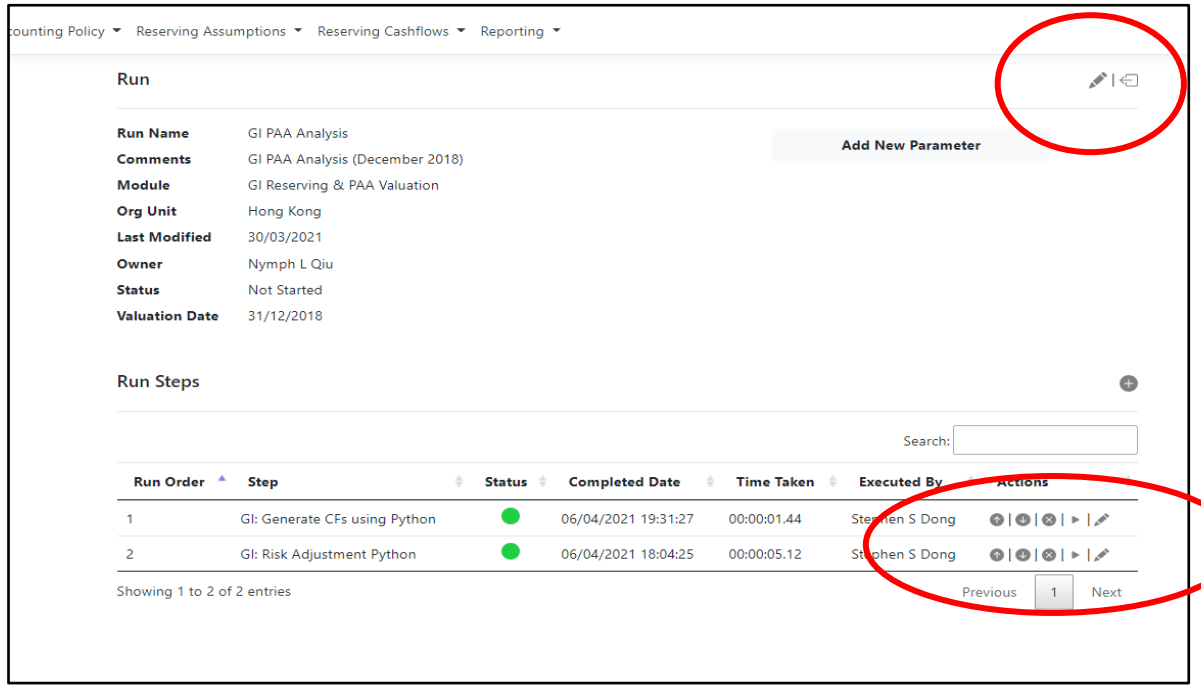
Under the Reserving Assumptions tab, the user can click on the **"Risk Adjustment"** button.

This will take the user to a screen which the user can run the Risk Adjustment assumptions. These assumptions are used by GIRRS to calculate the risk adjustment for non-financial risks.

At the top left side, the user can select the "Valuation Year" and "Portfolio" for the data. As the user scrolls down the page, the first table allows the user to select the confidence interval and number of simulation to calibrate the risk adjustment to. Then the user can press the "Run simulation" button to simulate the risk adjustment assumption. The second table allows the user to enter the adjustment ratio for LRC and diversification benefits. The third table allow the user to select whether to override the risk adjustment from the drop down list and manually enter the risk adjustment ratio. Then the user can press the "Update" button to save the risk adjustment assumptions.

GIRRS User Guide – Reserving Cashflows



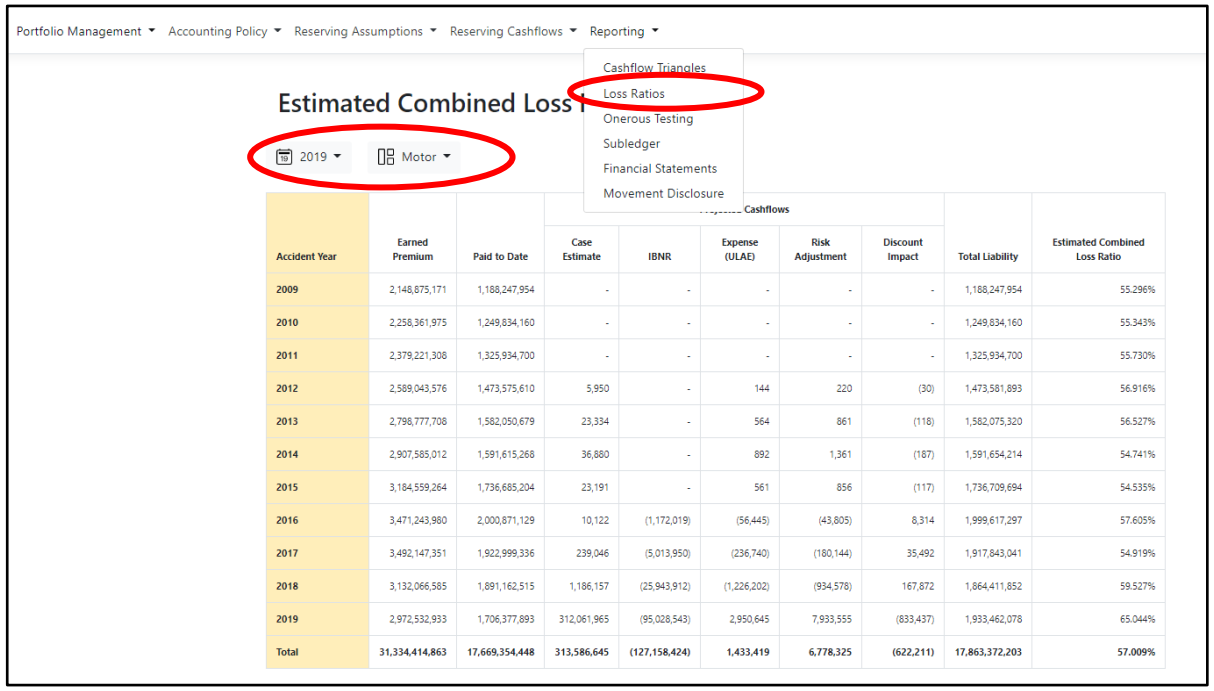


Under the Reserving Cashflows tab, the user can click on the **"Generate CFs"** and **"Calculate RA"** button.

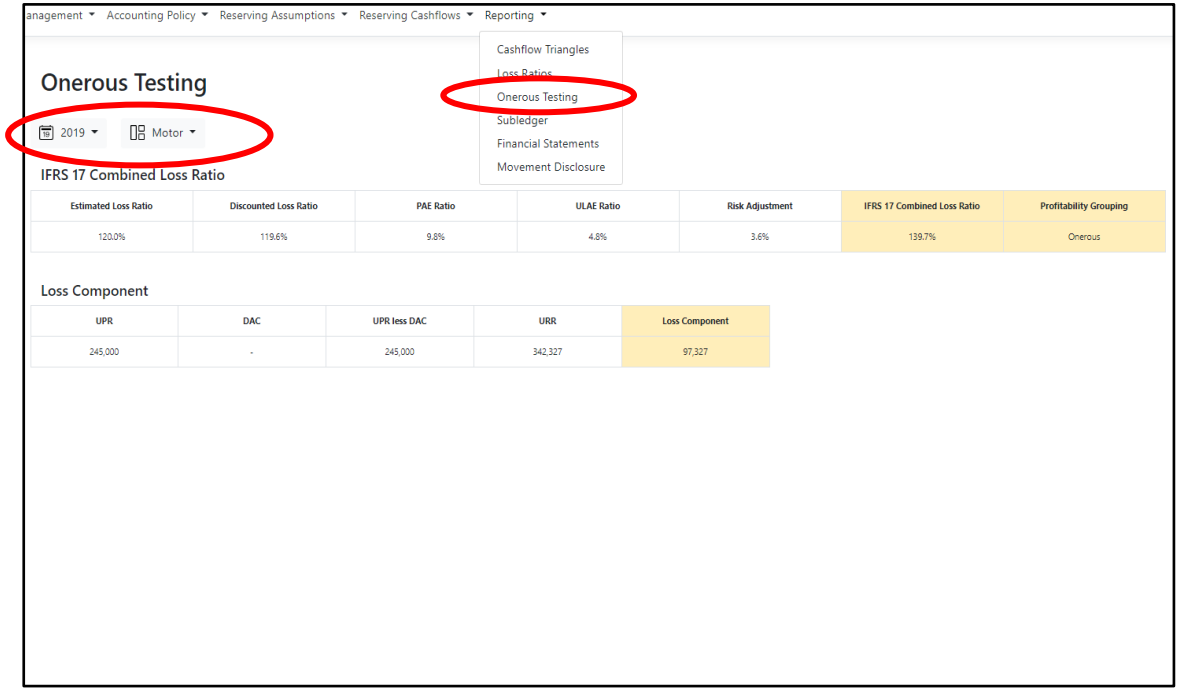
This will take the user to a screen which the user can run the projected cashflows and the risk adjustment (which has an inbuilt stochastic simulation engine).

The user just needs to press the triangle button to re-run the any updated assumptions and output the revised cashflows and risk adjustment. These calculations will then flow through to the Reporting Module.

GIRRS User Guide – Reporting (1/3)



Accident Year	Earned Premium	Paid to Date	Projected Cashflows: Case Estimate	Projected Cashflows: IBNR	Projected Cashflows: Expense (ULAE)	Projected Cashflows: Risk Adjustment	Projected Cashflows: Discount Impact	Total Liability	Estimated Combined Loss Ratio
2009	2,148,875,171	1,188,247,954	-	-	-	-	-	1,188,247,954	55.296%
2010	2,258,361,975	1,249,834,160	-	-	-	-	-	1,249,834,160	55.343%
2011	2,379,221,308	1,325,934,700	-	-	-	-	-	1,325,934,700	55.730%
2012	2,589,043,576	1,473,575,610	5,950	-	144	220	(30)	1,473,581,893	56.916%
2013	2,798,777,708	1,582,050,679	23,334	-	564	861	(118)	1,582,075,320	56.527%
2014	2,907,585,012	1,591,615,268	36,880	-	892	1,361	(187)	1,591,654,214	54.741%
2015	3,184,559,264	1,736,685,204	23,191	-	561	856	(117)	1,736,709,694	54.535%
2016	3,471,243,980	2,000,871,129	10,122	(1,172,019)	(56,445)	(43,805)	8,314	1,999,617,297	57.605%
2017	3,492,147,351	1,922,999,336	239,046	(5,013,950)	(236,740)	(180,144)	35,492	1,917,843,041	54.919%
2018	3,132,066,585	1,891,162,515	1,186,157	(25,943,912)	(1,226,202)	(934,578)	167,872	1,864,411,852	59.527%
2019	2,972,532,933	1,706,377,893	312,061,965	(95,028,543)	2,950,645	7,933,555	(833,437)	1,933,462,078	65.044%
Total	**31,334,414,863**	**17,669,354,448**	**313,586,645**	**(127,158,424)**	**1,433,419**	**6,778,325**	**(622,211)**	**17,863,372,203**	**57.009%**



Estimated Loss Ratio	Discounted Loss Ratio	PAE Ratio	ULAE Ratio	Risk Adjustment	IFRS 17 Combined Loss Ratio	Profitability Grouping
120.0%	119.6%	9.8%	4.8%	3.6%	139.7%	Onerous

Loss Component

UPR	DAC	UPR less DAC	URR	Loss Component
245,000	-	245,000	342,327	97,327

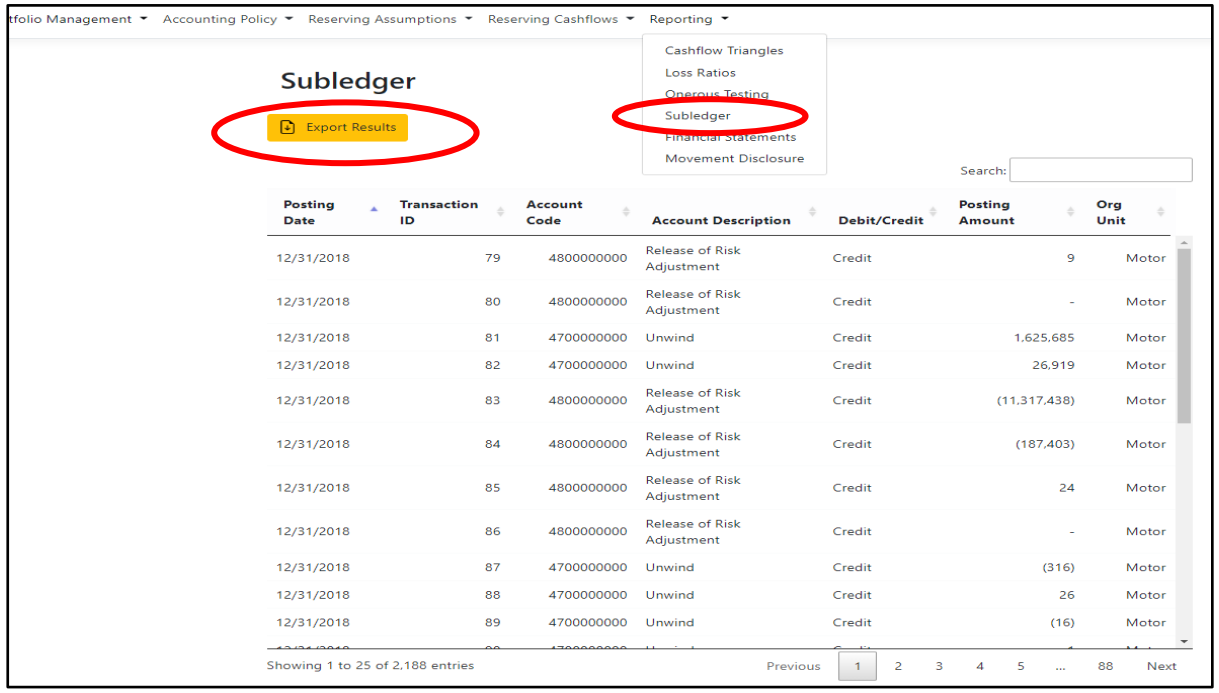
Under the Reporting tab, the user can click on the **"Loss Ratios"** and **"Onerous Testing"** button.

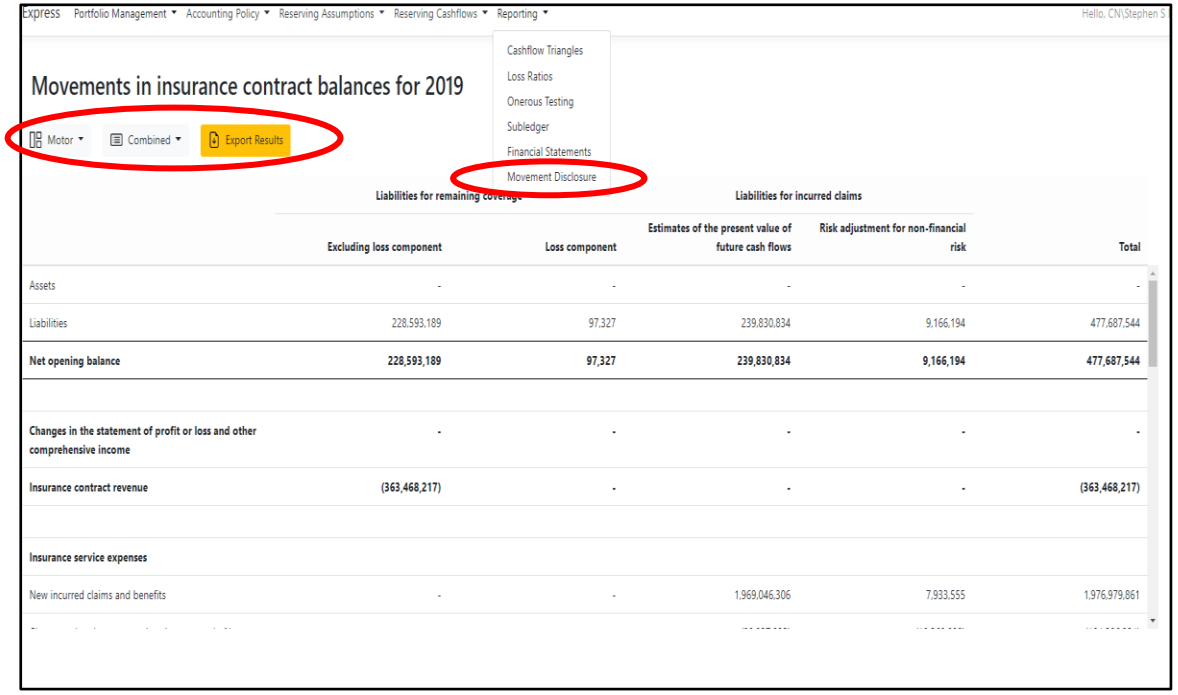
For both screens, the user can select the "Valuation Year" and "Portfolio" to look at the respective outputs.

The Loss Ratios screen summarizes the outstanding claim liability (i.e LIC) by accident year, showing a breakdown of items such as paid to date, case reserves, IBNR and risk adjustment.

The Onerous Testing screen summarizes whether each portfolio is onerous under IFRS 17 and if so, the calculation of the Loss Component. Note the Loss Component is a simplified calculation under PAA (details in functional specs).

GIRRS User Guide – Reporting (2/3)





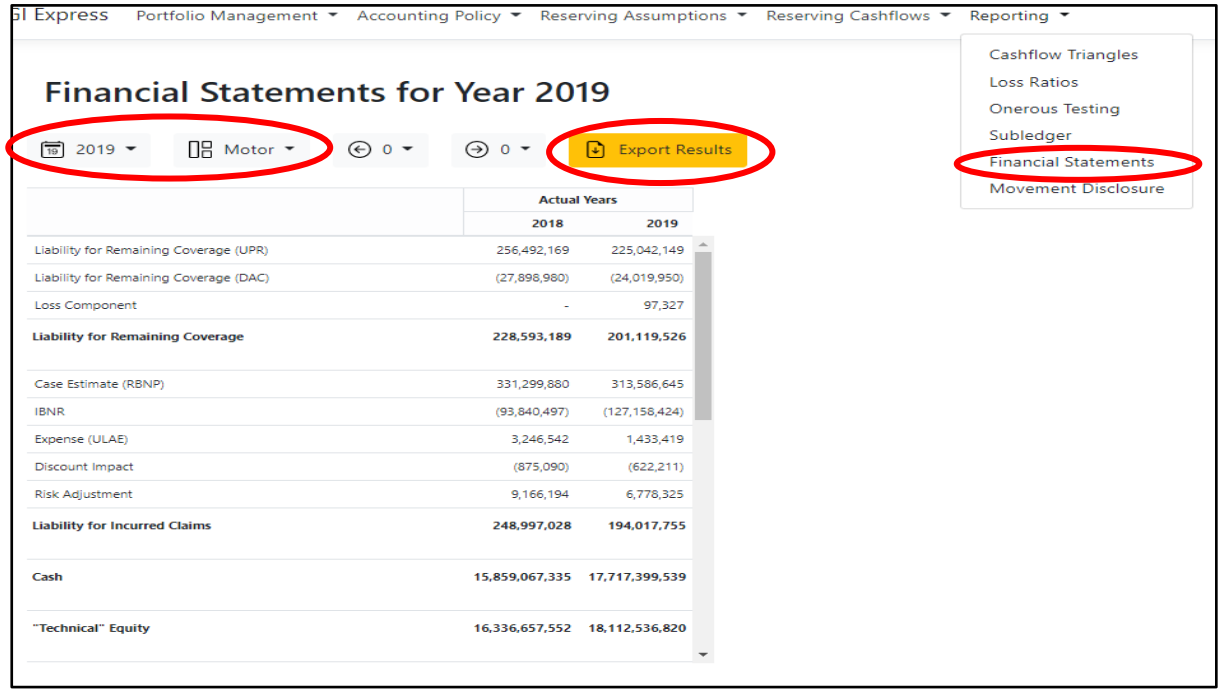
Under the Reporting tab, the user can click on the **"Subledger"** and **"Movement Disclosure"** button.

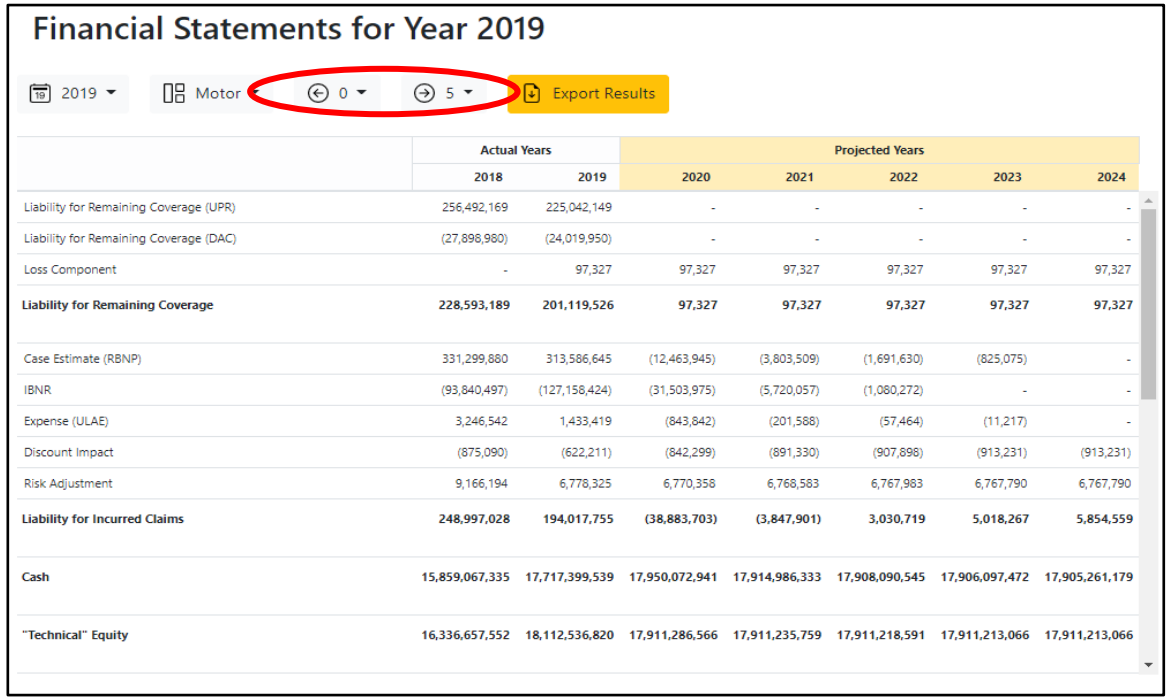
For both screens, the user can select the "Valuation Year" and "Portfolio" to look at the respective outputs. The user can also press the "Export Results" button to download the outputs in either CSV or Excel format.

The Subledger screen lists out all of the IFRS 17 accounting debit/credit journal entries that can be extracted and integrated to the client's general ledger system. The journal entries have been produced using the accounting rules engine (i.e. CoA) set up in GI Suite.

The Movement Disclosures screen produces the insurance liability movement disclosures that are required under IFRS 17. The user can select either the LRC, LIC or Combined movement disclosures to extract.

GIRRS User Guide – Reporting (3/3)





	Actual Years		Projected Years				
	2018	2019	2020	2021	2022	2023	2024
Liability for Remaining Coverage (UPR)	256,492,169	225,042,149	-	-	-	-	-
Liability for Remaining Coverage (DAC)	(27,898,980)	(24,019,950)	-	-	-	-	-
Loss Component	-	97,327	97,327	97,327	97,327	97,327	97,327
Liability for Remaining Coverage	**228,593,189**	**201,119,526**	**97,327**	**97,327**	**97,327**	**97,327**	**97,327**
Case Estimate (RBNP)	331,299,880	313,586,645	(12,463,945)	(3,803,509)	(1,691,630)	(825,075)	-
IBNR	(93,840,497)	(127,158,424)	(31,503,975)	(5,720,057)	(1,080,272)	-	-
Expense (ULAE)	3,246,542	1,433,419	(843,842)	(201,588)	(57,464)	(11,217)	-
Discount Impact	(875,090)	(622,211)	(842,299)	(891,330)	(907,898)	(913,231)	(913,231)
Risk Adjustment	9,166,194	6,778,325	6,770,358	6,768,583	6,767,983	6,767,790	6,767,790
Liability for Incurred Claims	**248,997,028**	**194,017,755**	**(38,883,703)**	**(3,847,901)**	**3,030,719**	**5,018,267**	**5,854,559**
Cash	**15,859,067,335**	**17,717,399,539**	**17,950,072,941**	**17,914,986,333**	**17,908,090,545**	**17,906,097,472**	**17,905,261,179**
"Technical" Equity	**16,336,657,552**	**18,112,536,820**	**17,911,286,566**	**17,911,235,759**	**17,911,218,591**	**17,911,213,066**	**17,911,213,066**

Under the Reporting tab, the user can click on the **"Financial Statements"** button.

The user can select the "Valuation Year" and "Portfolio" to look at the respective outputs. The user can also press the "Export Results" button to download the outputs in either CSV or Excel format.

The Financial Statement screen summarizes the liability breakdown for LRC and LIC balances , and the resulting Profit and Loss results from the change in insurance balances. The user can also select the backward or forward years button to show projects of the LRC and LIC balances, based on business planning assumptions. Note these projected liability balances will be needed for Hong Kong RBC, and is a future development of GI Suite.