

Import from Client

- ◆ **Import with replacement.** When importing a library entry that has the same name as an existing entry, ProVal now gives you the option to replace the existing entry, rather than always saving as new. This is extremely helpful when users are working in multiple copies of a client and work needs to be recombined into a single client.

Modify Treatment of Incoming Objects

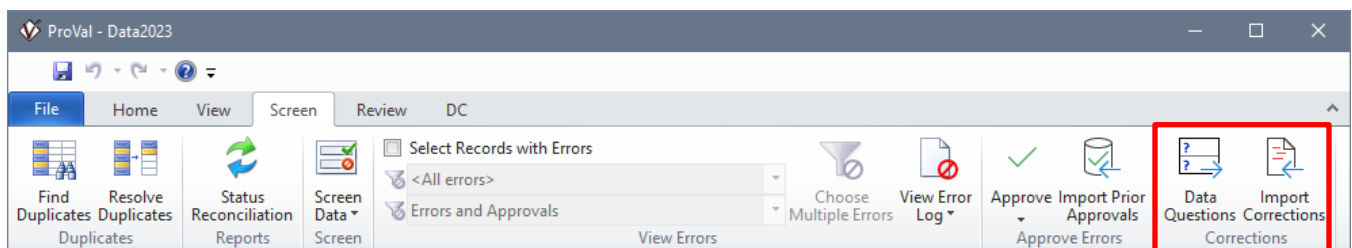
Library/Object Name	Current Client Last Modified	Import Client Last Modified	Treatment	Name after Import
Valuation Assumptions - U.S. Qualified Pension				
2022 Acct Val Assumptions 6.00% Updated Mortality	5/15/2023 11:25 AM	5/15/2023 2:43 PM	Replace	2022 Acct Val Assumptions 6.00% Updated Mortality
Valuations - U.S. Qualified Pension				
2022 Valuation		5/15/2023 2:44 PM	New	2022 Valuation

Custom suffix for library entries:

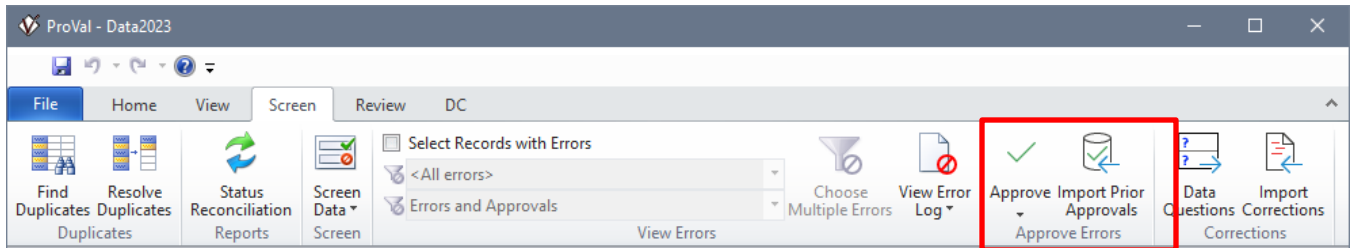
Custom suffix for component/field names:

Census Data

- ◆ **Data questions & corrections.** A new Data Questions tool lets you easily create a client-friendly list of data questions in Excel from logged data errors (e.g., flagged by Screen Data). Data questions are fully customizable, including the text of questions, column (field) headings, and which errors/warnings to include. These customizations are reusable from year to year and client to client. When receiving the spreadsheet back from your client, you can easily see what changes (corrections) were made in Excel, make any needed adjustments (e.g., turn a client's comment into a correction), and merge the changes back into the ProVal database using the companion Import Corrections tool.



- ◆ **Approving data errors.** Data errors (e.g., flagged by Screen Data) can now be approved for individual records so they will be ignored by downstream activities, such as preparing data questions. For example, you might approve a record flagged with a large pay decrease because it's explained by a transfer. Approvals can be carried forward from year to year so you can use the same treatment that was applied in the past. To approve an error, simply click Approve when viewing errors in Spreadsheet Edit or in the database's Error Log.



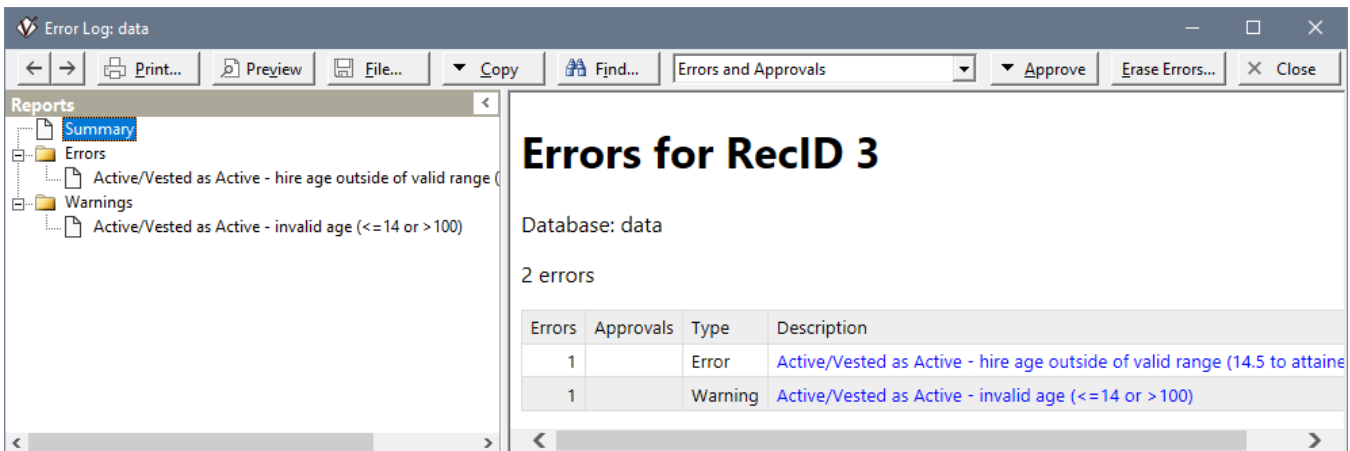
- ◆ **Viewing errors.** ProVal now offers more flexibility for viewing data errors (e.g., flagged by Screen Data).
 - In Spreadsheet Edit, data values relevant to errors and warnings are highlighted with a red triangle and yellow background. Hovering your mouse over a highlighted cell shows the errors and warnings related to that cell. Hovering your mouse over the RecID row heading with a red triangle shows all errors for the record.

RecID	Age	HireAge	Sex
3	115.03	12.75	Female

2 errors/warnings for RecID 3

1. Error: Active/Vested as Active - hire age outside of valid range (14.5 to attained age)
Field: HireAge
2. Warning: Active/Vested as Active - invalid age (<= 14 or > 100)
Field: Age




- The Error Log now includes a summary with links to the individual error reports so you can more easily see the overview of all errors. You can also view the error log for selected records by first selecting the records (e.g., with the mouse) then clicking Screen > View Error Log > Errors for Selected Records. For example:



- ◆ **Resolve duplicates.** A selection expression can now be applied to the input database before applying the resolve duplicate logic. This effectively deletes records that don't meet the selection expression from the output database. For example, you could use this to exclude non-duplicate records from the result.
- ◆ **Database search.** A new search condition, NOTIN, is now available. This can be useful, for example, to find participant IDs outside of a specific set.
- ◆ Sped up importing of csv files, especially those with lots of fields. In one test case, the time to import a csv file with about ten thousand records and 350 fields went from 58 to 4.5 seconds.

Sample Lives

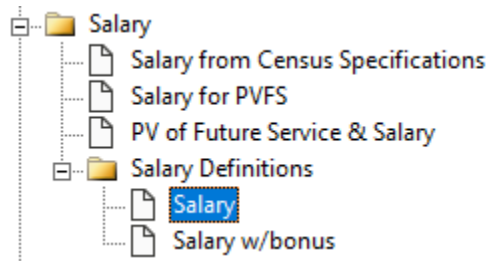
- ◆ **Editing entries.** You can now directly edit library entries, such as Census Specifications, Assumptions, and Plan Definitions from within Sample Lives. If you see something that needs to be revised, you can do so right on the spot without having to back out of sample lives. What's more, you'll instantly see the revised sample life results as soon as you've saved the change.

Plan Definition:	Plan (4/27/2022 11:06 AM)	
Valuation Assumptions:	Funding Assumptions (4/27/2022 11:28 AM)	
Database File:	Data 2022 (2/3/2023 1:26 PM)	
Census Specifications:	Census Specifications (4/19/2022 12:33 PM)	

- ◆ **COLA rates.** The annual COLA rates and amounts are now shown in payment form value and inactive liability sample life reports. The inactive liability report also contains new footnotes with details about COLA timing.

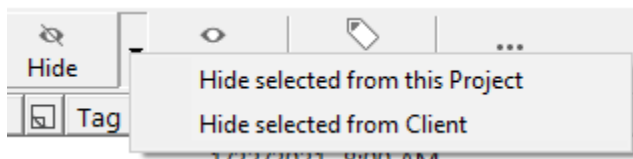
Year	Member Age	Interest Discount	Member Survival	COLA Rate	COLA Amount	Member Annuity Amount	Member Payment Frequency Adjustment	Member Present Value
2023	82	1.000000	1.000000	0.0200	83.72	4,185.93	0.931755	3,900.26
2024	83	0.934579	0.910680	0.0200	85.39	4,269.65	0.928241	3,373.14
2025	84	0.873439	0.821866	0.0200	87.10	4,355.04	0.924590	2,890.51
2026	85	0.816298	0.734710	0.0200	88.84	4,442.14	0.920826	2,453.21

- ◆ Sample lives now include a report for each salary definition, not just the one specified in Census Specifications. Additionally, where salary is displayed in reports, links will jump to the relevant detailed salary report.



Mortality Tables

- ◆ You can now hide mortality tables from a client – rather than just hiding from individual projects. For example, you might hide obsolete tables or tables that are not applicable to your plan.



- ◆ **Club Vita mappings.** ProVal now has integrated support for mapping individual participants to Club Vita's personalized longevity curves, known as VitaCurves. To use, open a database and click Home > Define > VitaCurve Mappings. A VitaCurve license is required, which can be licensed directly from Club Vita (clubvita.net).

Output & Reporting

- ◆ **Aggregating runs by group.** In Valuation and Core Projection output, you can now aggregate runs by group, rather than only in total across all runs. For example, suppose you are analyzing an assumption change and have two pre-assumption change runs and two post-assumption change runs. Now you can summarize the pre- and post-assumption change results when looking at aggregate output.

Aggregation & Subtotals

Display Aggregate Total Results

Display Valuations by Group

Display Subtotal Results

Aggregate Subtotal Results by Group

Valuations

	Valuation Group	Valuation
<input checked="" type="checkbox"/>	Pre-change	FA Valuation - Group 2 - Pre-change
<input checked="" type="checkbox"/>	Post-change	FA Valuation - Group 2 - Post-change
<input checked="" type="checkbox"/>	Pre-change	FA Valuation - Group 1, Pre-change
<input checked="" type="checkbox"/>	Post-change	FA Valuation - Group 1, Post-change



Valuations	Funding Not-at-Risk Liab
Pre-change	71,088,292
Post-change	56,006,514

- ◆ **Funded ratios.** In Valuation Set and Deterministic Forecast output, you can display funded ratios on both a market value of assets and actuarial (or market-related) value of assets. Previously, you could only display the ratios on a single basis.
- ◆ **Spot rate interest method.** A new exhibit, "Spot Rate Method Interest on PBO & Service Cost", has been added to Valuation Sets and Deterministic forecasts. This exhibit details the calculation of interest on the PBO and Service Cost based on the underlying cash flows.

Duration (a)	Interest Rate (b)	PBO PV Factor (c)	PBO Benefit Payments (d)	PBO BPs times Interest (e) = (b) x (d)	Interest Cost on PBO (f) = (c) x (e)	Service Cost PV Factor (g)	Service Cost Benefit Payments (h)	Service Cost BPs times Interest (i) = (b) x (h)	Interest Cost on Service Cost (j) = (g) x (i)
0	0.02000	0.99123	715,647	14,313	14,187	0.99122	0	0	0
1	0.02000	0.97179	905,506	18,110	17,599	0.97179	7,425	149	144
2	0.03000	0.93028	1,036,923	31,108	28,939	0.93028	15,983	479	446
3	0.03000	0.90319	1,203,177	36,095	32,601	0.90318	26,890	807	729

Additionally, the measurement date benefit payment exhibit has been updated to include additional columns showing the discounted value of each cash flow.

- ◆ PV Salary and PV EEC are now output for accounting valuations and core projections. Experience employee contributions are now an output item for core projections.

All Plans

- ◆ **Tag `em and add `em.** You can now assign tags while using Add/Omit. For example, if you're editing a Valuation Set and selecting Valuations to add, you can modify tags for Valuations right on the spot.
- ◆ **Individual results**
 - Individual results have been added for PBO and Service Cost cash flows as well as projected pay.
 - A new option lets you include non-participating and excluded records in individual results with a blank value. This ensures that every record that is run (i.e., meets the selection expression) will have a result. If unchecked, non-participating and excluded records (e.g., due to missing data or not eligible for any benefits) are not included in the individual results database.

Include non-participating and excluded records that meet selection expression

Individual results:

Type	Field Name	Description
Accounting	zPBO_ExpBP_act_actg_Year_0	Year 0 PBO Expected Benefit Payments for A...
Accounting	zPBO_ExpBP_act_actg_Year_1	Year 1 PBO Expected Benefit Payments for A...
Accounting	zPBO_ExpBP_act_actg_Year_2	Year 2 PBO Expected Benefit Payments for A...
Accounting	zPBO_ExpBP_act_actg_Year_3	Year 3 PBO Expected Benefit Payments for A...
Accounting	zPBO_ExpBP_act_actg_Year_4	Year 4 PBO Expected Benefit Payments for A...
Accounting	zTPAY_actg_Year_0	Year 0 Salary for Active Members (actg)
Accounting	zTPAY_actg_Year_1	Year 1 Salary for Active Members (actg)
Accounting	zTPAY_actg_Year_2	Year 2 Salary for Active Members (actg)
Accounting	zTPAY_actg_Year_3	Year 3 Salary for Active Members (actg)

- ◆ **Salary bonuses.** Now when specifying bonus parameters in a Salary Definition, you can specify whether the bonus paid in the current year should be based on current year salary or prior year salary.

Bonus Parameters

Bonus percentage:

Table Database field

Calculate bonus using

Bonus override for valuation year

Bonus limit

- ◆ A new parameter lets you specify that only a fraction of the expected benefit payments will be paid from plan assets when the accounting standard is either ASC 715 or IAS 19. This is useful for funded non-qualified and OPEB plans where some benefit payments are made from plan assets and the remainder are from general corporate assets.
- ◆ In Valuation Sets and Forecasts with a long roll forward under ASC 715 or IAS 19, the roll forward period can now be up to 18 months (previously, it was capped at 15 months).

Pension Plans

- ◆ **Lump sum & optional form factors.** You can now assume interest rates that vary by calendar year of decrement. This is useful if you have separate short-term and long-term assumptions for interest rates. Additionally, in accounting assumptions, lump sum factors can now reference the underlying valuation interest rate.

Isfactor - ?

Interest Rates

Use valuation interest rate
 Constant interest rate
 Pre-commencement:
 Post-commencement:
 Variable by duration from:

From	Up to	Rate
0		

Input is forward rates
 spot rates

Spot rate method

Variable by calendar year of decrement

From	To	Rate
-	2023	0.065
2024	2024	0.075
2025		0.055

Effective period runs to end of "To" year.

- ◆ **COLAs.** A new option in Valuation Assumptions > Conversion Factors lets you include the value of any COLAs when calculating the conversion factor. Previously, ProVal only included the COLA in the conversion factor if converting from an annuity to a lump sum.

US Qualified Pension Plans

- ◆ **Government forms.** The Schedule SB and MB forms have been updated for 2022 including exporting the following XML tags:
 - Updated codes for PPA amortization relief on the Schedule SB
 - Expense load when available for the Schedule SB
 - Benefit payment schedule for the Schedules SB & MB

Note that this enhancement was included in an update to ProVal 3.18 but included here in case you missed it.

- ◆ **Credit balance waivers.** When determining the amount of prefunding balance to waive, ProVal can now check up to two funded ratios. For example, suppose you want to waive enough prefunding balance to achieve both a 100% funded ratio on a funding target basis (to avoid quarterlies) and an 80% funded ratio on a Max Tax basis (to avoid a PBGC 4010 filing).

Waivers

Waive balances to:

Meet AFTAP, if possible

Waive balances an additional 10%, if possible

Avoid At-Risk status, if possible

Be eligible to apply balances against MRC in the following year (80% funded)

Meet % Funding NAR FTAP

Do not waive balances if target cannot be met

Meet % Max Tax UC NAR FTAP

Do not waive balances if target cannot be met

US Public Pension Plans

- ◆ **Deterministic forecasts by group.** Deterministic Forecasts that are run by group (e.g., such as a state pension system with member municipalities) can now reflect experience and assumption changes, rather than always using baseline assumptions. To facilitate this, check the new option in Core Projection > Subtotals to save sensitivity results for subtotals in a core projection.

Canadian Pension Plans

- ◆ **Cash flows for multi-year gain/loss.** In the gain/loss analysis tool, when the period is greater than 1 year, you can now input actual contributions, expenses, and benefit payments for each year. You can now also ask ProVal to adjust these amounts to end of period with interest rather than having to do it yourself.

Cash Flows

For periods greater than 1 year, use annual cash flow data

Year	Benefit Payments	Employer + Employee Contributions	Actual Expenses
2018			
2019			

Cash flows are as of

German Pension Plans

- ◆ **Stochastic decrements.** Core Projections may now be run with Monte Carlo simulated populations. In other words, experience decrements are simulated as 1s and 0s with an expected value equal to the input probabilities instead of using the input probabilities directly. This option is also available in Universal mode.

Demographic Experience ? X

Project population using:

All outcomes (probability-weighted)

Fixed outcomes (stochastically generated)

Number of trials:

Random number seed:

- ◆ **Dynamic Premium.** The Teilwert liability may now be calculated based on a level percent of salary. Previously, only the level amount method was supported.

Forecasting

- ◆ **Expected return on assets by mix.** In Stochastic Assumptions, you may now specify the accounting expected return on assets for each asset mix. This value is used if (and only if) you vary the expected return on assets or an interest rate by asset mix.

Asset Mixes

Asset mixes:

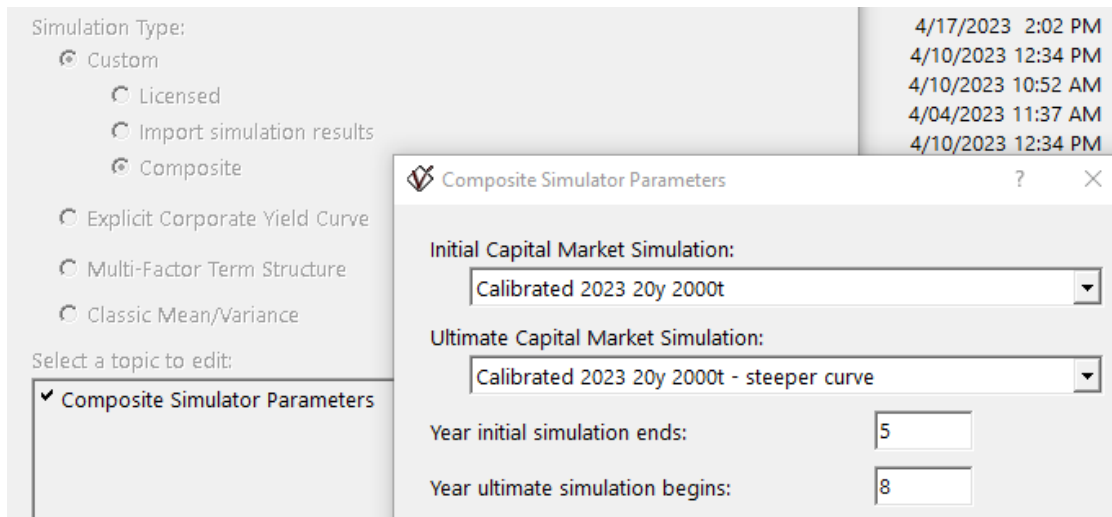
Mix #	Description	Expected Return	NRgov1	NRgov2
1	CURRENT	0.060	0.025	0.025
2	ALTERNATE	0.075	0.050	0.050

Override calculated expected return for each asset mix

- ◆ **Entry Age Normal to Unit Credit.** In the Asset & Funding Policy > Forecasting topic, a new option lets you switch from the Entry Age Normal to Unit Credit cost method during the forecast. This is useful when modeling a plan freeze since unlike Entry Age Normal, Unit Credit will have no normal cost once benefits are frozen.

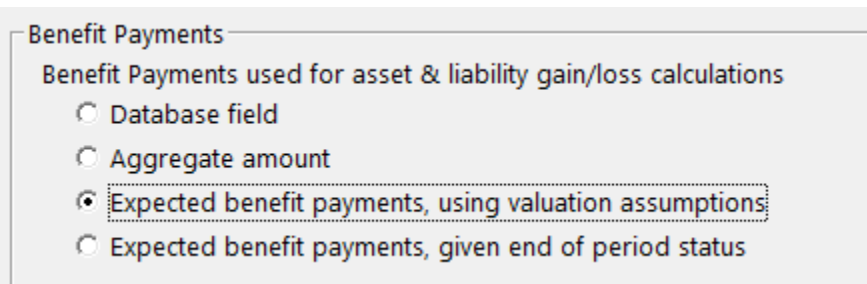
Capital Market Simulations

- ◆ A new type of custom simulator, "composite", lets you blend two simulations. For example, you might start the forecast with a flat yield curve through year 5 but grade up to a steeper yield curve over years 5 to 8.



Gain/Loss Analysis

- ◆ **Cash flows for multi-year gain/loss.** You can now enter cash flows by year for multi-year gain/loss. See [Canadian Pension Plans](#) for more.
- ◆ **Sample life summary report.** A new Summary of Liability Gain/(Loss) sample life report details the gain/loss components, including the liability rollforward, similar to what's shown for the total run.
- ◆ **Expected benefit payments.** A new option lets you use expected benefit payments based on beginning-of-year status (i.e., that match valuation results) for rolling forward liabilities and other gain/loss calculations.



Nondiscrimination Testing

- ◆ The output for US Nondiscrimination Coverage and General Tests has been updated to a user-friendly HTML format, simplifying navigation.

ProVal API

- ◆ The **GetValResults** and **GetCoreResults** functions have new optional arguments that let you retrieve Valuation and Core Projection results using an output style.
- ◆ The **FileOpen** function returns an additional result that lets you know which version of ProVal is needed to open a client that is either too old or too new relative to the version of ProVal being used. This is useful in conjunction with a new **eng.ChangeWorkspace** function that lets you use a different version of ProVal for the next FileOpen call and subsequent calculations.

System

- ◆ The 4 GB limit on library and database files has been removed. Previously, this limit could have resulted in a FILE FULL error for clients with lots of runs, lots of subtotals, or both.

Changes Log

- ◆ Be sure to read the changes log (see the "changes log.doc" file in the ProVal directory) about updates to certain calculations that may change results.