What's New! ProVal®

ProVal version 2.30 October 2009

ProVal version 2.30 adds the ability to **make contributions after the end of the plan year** and assume separate **salary scales for alternative salary definitions**. System enhancements include **"back door" buttons to edit inputs within runs** (e.g., edit Valuation Assumptions from within a Valuation), **read-only access to clients that are in use** by another user, and explicit support for **Office 2007** and **Windows Vista**. In addition, there are many enhancements specific to pension plans in the **U.S., Canada, The Netherlands,** and **Belgium.** You'll find details about these and other enhancements below.

Report Writer

- Template documents can now include charts that draw on data from the Report Writer.
- Template documents can now include exhibits (i.e., a table marked by a single bookmark). This works just like saving exhibits directly from ProVal to Word, but now within the Report Writer.
- Decrement rates are now saved to Access and can be included in your reports.
- A new Populate button within Report Definitions lets you add missing items that are needed by the template document. This makes the process of updating your Report Definition to work with a new or updated template document much easier.
- User-defined queries are now supported to compute derived fields from existing values.

System

- "Back door" buttons  let you directly edit Plan Definitions, Valuation Assumptions, and Census Specifications from within a Valuation. Look for these "back door" buttons within all runs on the Execute menu – Valuations, Valuation Sets, Core Projections, Deterministic Forecasts, and Stochastic Forecasts.
- A client folder can now be opened as read-only when it is in use by another user, another machine (such as the Batch Server), or even yourself (e.g., viewing results for completed runs while waiting for other runs to execute).
- ProVal now explicitly recognizes Office 2007 files with .xlsx (Excel), .docx (Word), and .accdb (Access) file extensions. For example, if you have Excel 2007 installed, you can import data from and save results to .xlsx files; if you have Word 2007 installed, you can save exhibits to .docx files; and if you have Access 2007 installed, you can save exhibits to .accdb files. If no extension is specified when saving (e.g., "myfile" instead of "myfile.xls" or "myfile.xlsx"), ProVal will default to using the classic extensions .xls, .doc, and .mdb to avoid potential issues sharing files with users that don't have Office 2007.
- ProVal's help has been upgraded to a format which is explicitly supported by Windows Vista, avoiding the need to separately download and install the Windows Help program (WinHlp32.exe).
- When unhiding library entries, the list of entries now includes the date last modified. This makes it easy, for example, to sort the list chronologically to find the most recent entries.

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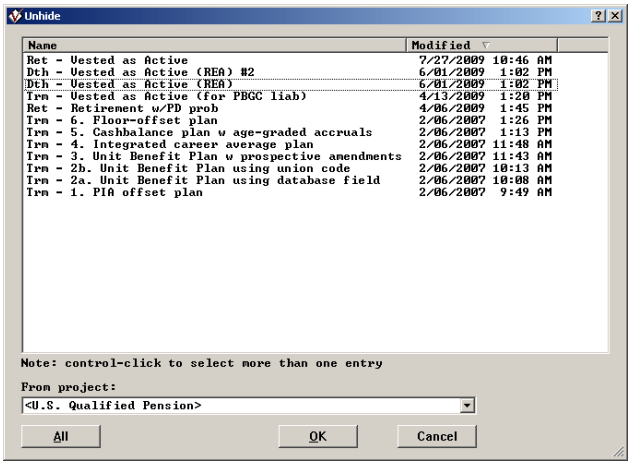
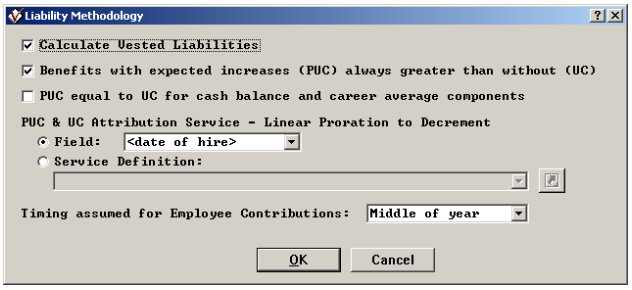


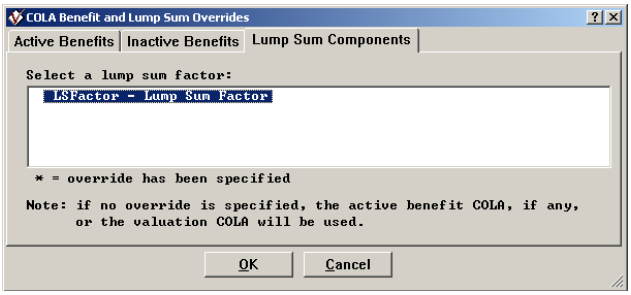
- The header #TITLE2 has been set equal to the entry name for relevant commands on the Execute menu. On the output menu, it has been set equal to the output style and the entry name for exhibits.
- The version number and date are now displayed with the Run Date. This is particularly useful to be able to tell if a change in results is explained by a changes log entry.
- Listings of RecIDs produced by ProVal processing are now formatted with commas and spaces to facilitate copying and pasting. Thus, for example, if some records have been excluded from a Valuation because of invalid data, it will be easy to copy their IDs from the valuation processing message and paste them into a selection expression so you can track down the data problem. (Note that the new formatting is not used when messages processed in versions prior to 2.30 are re-displayed.)
- Regional and Language Options (decimal symbol, digit grouping symbol, and list separator) are now respected when importing capital market simulations and reference tables. This allows a user with non-US Regional Settings to import a CMS that was exported from ProVal.
- Runs will now abort if you run subtotals on a database with invalid codes. This can happen, for example, if you copy a database from another client with the same fields but different codes.
- ProVal now automatically cleans up FFLUSH.LOG files older than 3 months and avoids creating these logs unless explicitly turned on by the user (by a setting [Config] FlushLog=Y in provalw.ini). These files record issues with the file system (e.g., network) and can grow large if the file system is unresponsive for long periods of time.

Pension Plans

- Runs with lump sum factors and smaller groups of participants (e.g., sample lives) will now run faster.
- Employee contributions can now assume beginning of year timing when calculating the normal cost offset. This eliminates an interest adjustment.



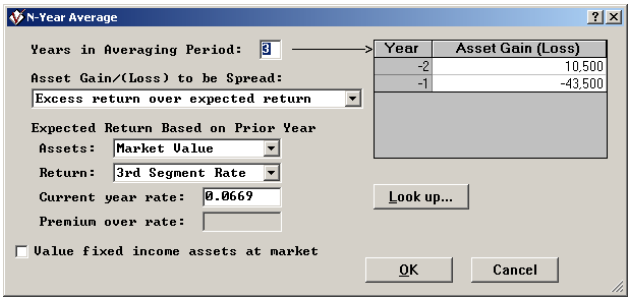
- COLA overrides for lump sum factors can now be specified.



US Pension Plans

- Dynamic mortality tables can now be selected for 415 limit adjustments.
- Projected benefits for the max-tax liability, max-tax normal cost and not-at-risk target normal cost are now available from the valuation output menu.
- ProVal will now save the at-risk liability for participants valued with a "vested valued through active" status code. Additionally, scaling factors can now be specified for the inactive at-risk liability.
- A new option is available to waive credit balances an additional 10% to avoid a presumption of underfunding after the 4th month. (This was actually released as a special update to version 2.29 but is mentioned here in case you missed it.)

- The N-Yr Average Actuarial Value of Assets method has a new option to smooth assets based on a return equal to the third PPA segment rate.



- In a PPA contribution schedule, for each quarterly contribution and the remaining contribution, users can specify whether to pay with cash, credit balance (if available), or both.

See Contribution Timing, page 7

US Multiemployer Pension Plans

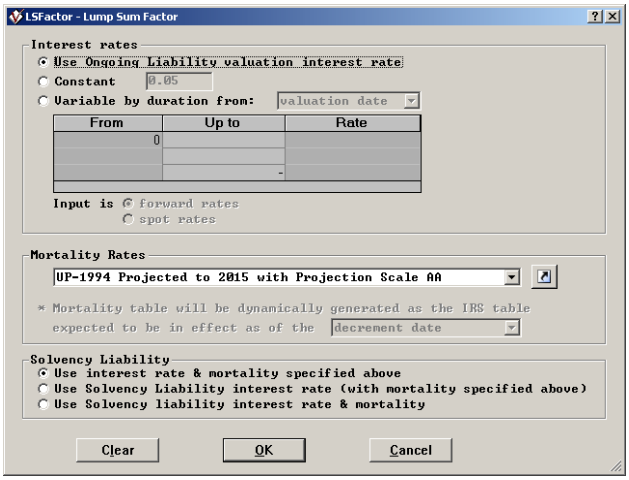
- Valuations and Core Projections now calculate a vested funding liability.
- An estimated reorganization index is now calculated in Valuation Sets, Deterministic & Stochastic Forecasts.

Estimated Reorganization Index

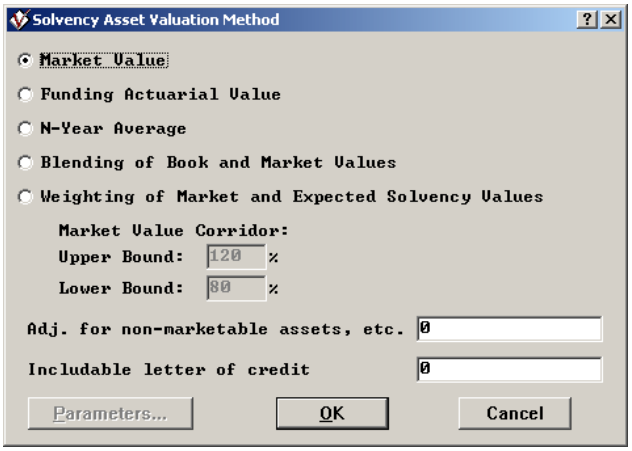
1. Actuarial present value of vested plan benefits	
(a) Retirees and benef. receiving payments	$2,871,448
(b) Participants not receiving payments	8,929,494
(c) Total: (a)+(b)	$11,800,942
2. Actuarial Value of Assets	$30,302,403
3. Present value factors to amortize unfunded vested benefits	
(a) Over 10 years	7.2469
(b) Over 25 years	11.5288
4. Vested Benefit Charge	
(a) Participants receiving payments ((1)(a) - (2))/(3)(a), min zero	0
(b) Participants not receiving payments ((1)(b) - ((2)-(1)(a), min zero))/(3)(b), min zero	0
(c) Total: (a)+(b)	$0
5. Net Charges to Funding Standard Account	
(a) Normal Cost	1,161,067
(b) Net amortization charges/(credits)	39,103
(c) Total: (a)+(b), min zero	$1,200,170
6. Estimated Reorganization Index: (4)(c)-5(c), min zero	$0

Canadian Registered Pension Plans

- New options in the Solvency Liability topic of Valuation Assumptions handle the following assumptions:
  - For participants eligible to retire on the Valuation Date, assume immediate commencement instead of commencement at optimal age.
  - Compare the value of the retirement benefit to the transfer value of the termination benefit.
  - For participants not eligible to retire on the Valuation Date, consider all possible payment ages from current age through 100% retirement when determining optimal value.
- Lump sum factors in Canadian mode can now "use the valuation interest rate".



- Quebec Bill 30 funding rules have been implemented with, in the absence of final regulations, general parameters for specifying the provision for adverse deviation.
- A new Solvency asset topic is available in the Asset & Funding Policy to allow for a distinct solvency asset valuation method.



- A new option allows technical deficiencies to be offset prior to other amortization bases when applying gains. As a result, the source of base must now be specified for all ongoing liability amortization bases. The available choices are: technical (e.g., actuarial loss), initial unfunded liability and improvement (e.g., plan change).
- Letters of credit are now supported as a solvency asset. This includes a forecasting option that

allows the user to vary the extent to which Letters of Credit are used.

- There is a new option under the Advanced button of Lump Sum factors to use the age on the valuation date to compute the lump sum factor for Solvency liabilities. This is useful for handling minimum indexation during deferral for Solvency by using a ratio of lump sum factors with and without COLAs.

OPEB Plans

- EPBO/PVFB and APBO/PUC NC projected benefits are now available when viewing OPEB core projection results.

Netherlands Pension Plans

- There is a new option in Joint Life Annuity (and REA) payment forms to assume the survivor age and percent married are determined at commencement (or member death).
- The percent married assumption can now be entered as a table that varies by member age and/or sex.

Belgium Pension Plans

- Two new "Insurance reserve" benefit formula operators are available to value employee and employer insurance contracts if such contracts are defined in the Plan Definition.

See Belgium Insurance Reserves, page 14

All Plans

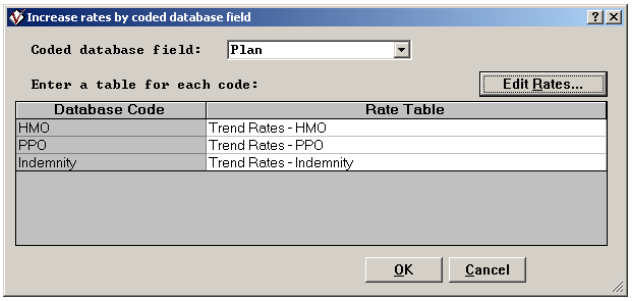
- Users can now override their salary increase and merit assumptions for alternate Salary Definitions.

See Salary Enhancements, page 11

- Custom salary and final average pay operators can now sum multiple Salary Definitions. This allows a pay limit to be applied to the sum of multiple pay components.

See Salary Enhancements, page 11

- Events in a Valuation Set that reference Valuations can now be removed by unchecking all the Valuations and clicking OK rather than having to use the Erase button. Also, the "Erase" button has been renamed "Remove".
- The options for timing and adjustment of valuation salary and number are now available for funding runs without having to run EAN liability methods.
- A new option, "Middle of year, except survivorship at end of year," was added to adjust Present Value of Future Salary.
- An "Edit Rates…" button is now available under the Params button for increase rates, COLAs, and post-decrement probabilities that vary by coded field or calendar year.

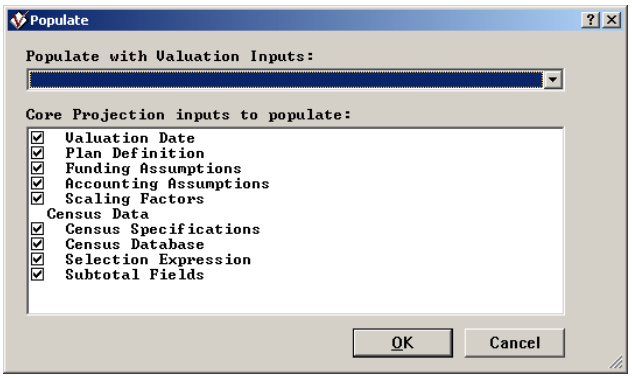


Sample Lives

- Payment form value sample life reports are now available in a Core Projection.
- ProVal now remembers which accrual basis components and operators were deselected by the user when viewing sample lives.

Forecasting

- A Core Projection's inputs can now be populated from a valuation.



- Contributions can now be made after the end of the plan year using a contribution timing parameter of up to 1.8. In addition, a new timing parameter is available for PPA Asset & Funding Policies to pay quarterly contributions and any remaining contribution when due.

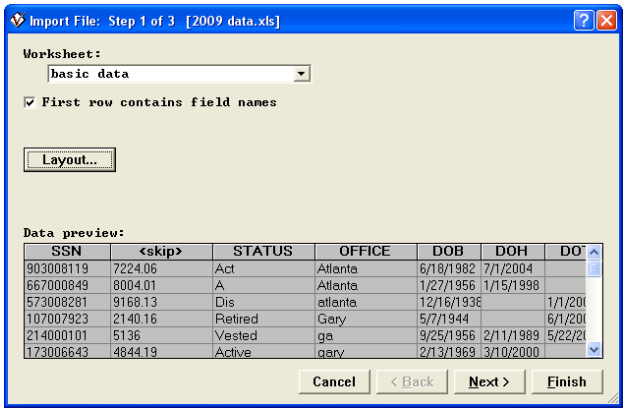
See Contribution Timing, page 7

- A new parameter is available that specifies the timing for payment of administrative expenses and PBGC premiums. Previously, these were always assumed to be the same date that contributions were made.

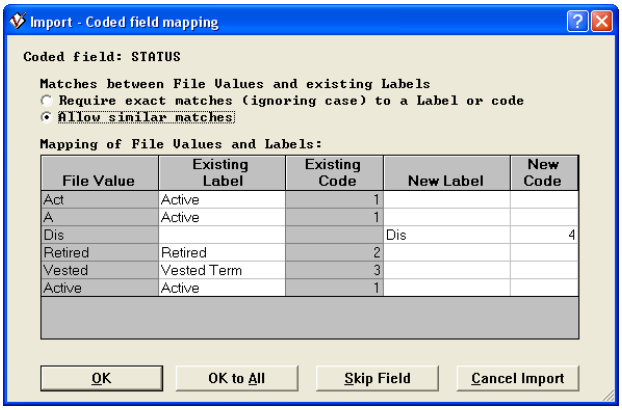
- Statistics for portfolios with negative allocations are now displayed in the efficient frontier. This is useful for checking the effective return of an allocation that includes Swaps.

Census Data

- When the Change History for a database is saved to a CSV or Excel file, the data is now parsed into the separate columns shown in the View (Date Modified, Field, User, Tool, RecIDs, and Description).
- Column headers in a data import file can now include **<skip>** as a way of signaling to ProVal that a column is to be ignored.

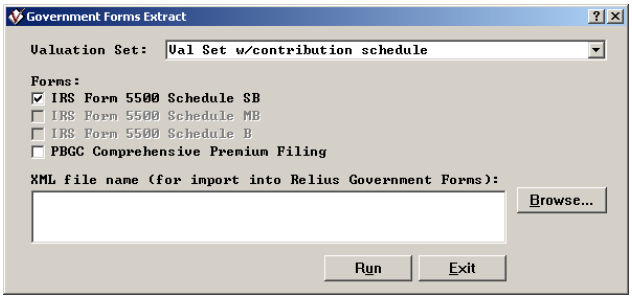


- In the data import process, ProVal now makes it easier for the user to control the handling of coded fields.



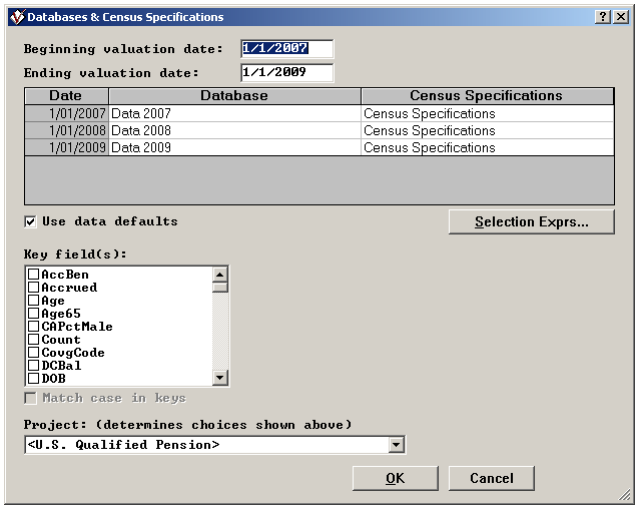
Government Forms

- The Government Forms tool now supports the Schedules SB and MB. (This was actually released as a special update to version 2.29 but is mentioned here in case you missed it.)



Experience Studies

- Experience studies now support pre/post-commencement mortality assumptions.
- Experience studies can now reference Census Specifications to obtain basic data in lieu of populating the screens. In addition, data defaults can now be used.



Nondiscrimination Testing

- In coverage and general tests, a new option allows you to define a rate group as "An HCE is placed in a group if the NAR is at least equal to the lower NAR bound of the group and the MVAR is at least equal to the lower MVAR bound of the group." (This was actually released as a special update to version 2.29 but is mentioned here in case you missed it.)

Changes Log

- Be sure to read the changes log (see What's New in Help or the CHANGES.LOG file in the ProVal directory) about updates to certain calculations that may change results.

New Member of the WinTech Team

Emma Russell recently joined the WinTech team. She is an experienced consulting actuary and, among other responsibilities, will be working on ProVal enhancements. Be sure to say hello to her if you reach her at ProVal support.

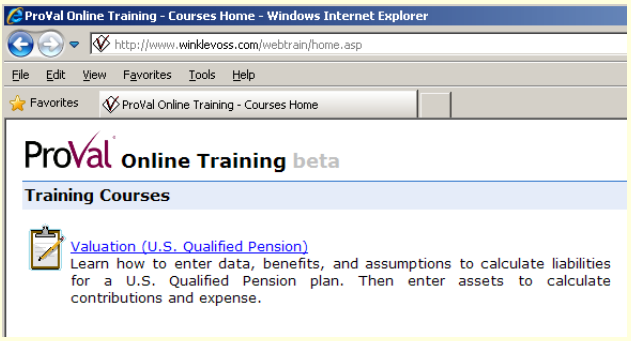
WinTech's Virtual Back Office

Need help with a forecasting project? Why not call upon WinTech's experienced actuaries to fill in? Contact **Hank Freeman** at (203) 861-5526 for details or to request a quote.

ProVal Online Training beta

We're developing online training courses and the first course – for U.S. Qualified valuations – is now available to try out. Online training is **free** and a great resource for new and existing users alike. You can complete the courses **at your own pace**, in your own office, without the need to travel. Each training course is **interactive**, with video instructions, hands-on exercises to complete in ProVal, and quizzes to test for comprehension. If you log out before finishing a course, you can pick up where you left off when you log back in. When you do finish, a **certificate of completion** will be emailed to you so you can show your boss or hang it on your wall.

Try it out at www.winklevoss.com/webtrain/.



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Contribution Timing

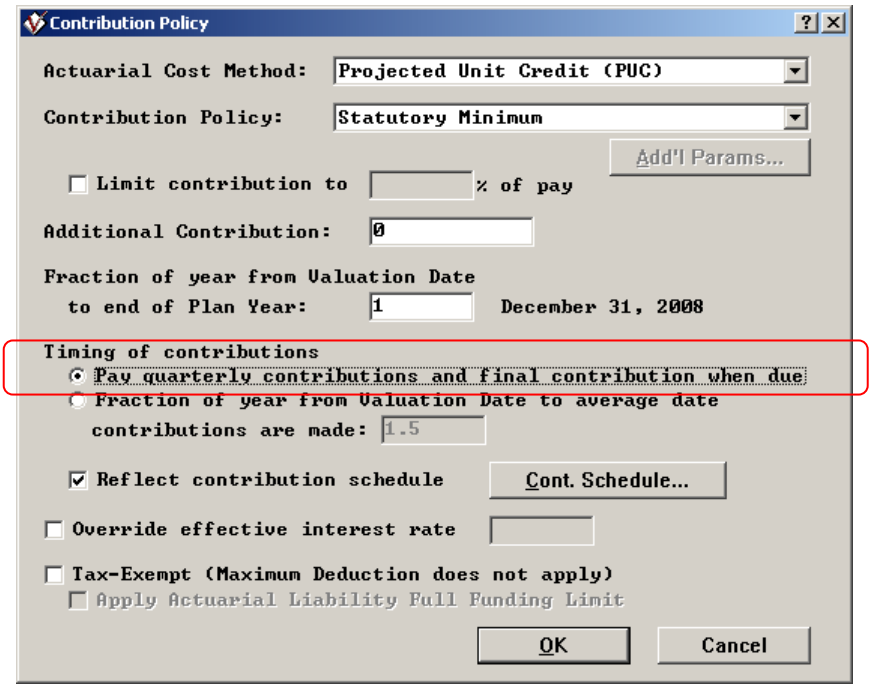
ProVal Version 2.30 contains four (4) new enhancements related to employer contributions:

1) ProVal now allows receivables in a forecast, improving the estimate of future funding (under PPA) and accounting asset values.
2) For Asset & Funding policies with a PPA law type, there is a new option to pay quarterly contributions and the final contribution when due per regulatory requirements.
3) Under a PPA law type, there is now complete control over how contributions will be paid in the first year (i.e., cash, credit balance or a combination of the two).
4) Timing calculations have been improved with respect to end of year additional contributions under the Asset & Funding Policy > Forecast Analysis topic when the measurement date is different from the valuation date.

Timing of contributions

"Quarterlies and Final when Due"

Under the PPA law type, there is a new option to pay quarterly contributions and the final contribution when due. If this option is selected, ProVal will pay quarterly contributions, if required, 3.5, 6.5, 9.5, and 12.5 months after the beginning of the plan year and all remaining payments 8.5 months after the end of the plan year.



The final contribution under this option includes contributions above the minimum required contribution and any additional contributions. It does not, however, include any end of year additional contribution defined under the Forecast Analysis section of the Asset & Funding Policy (see additional discussion of this contribution below). If the "quarterlies and final when due" option is selected, a contribution schedule must be reflected.

Average Date Contributions are Made

In all modes, the fraction of year from Valuation Date to average date contributions are made can now be a value up to 1.8, permitting receivables to be properly reflected in accounting valuations, and appropriately discounted in PPA funding valuations. Thus, these timing enhancements will improve the accuracy of future asset values in a forecast.

Previously, in a forecast, ProVal always assumed that contributions were made before the end of the plan year. For example, if a contribution schedule in year 1 had contributions made after the end of the plan year, for forecasting purposes, ProVal assumed these contributions were already in the assets at the beginning of the 2nd year. Now, ProVal will always respect the timing specified in a Contribution Schedule. This will result in a more accurate return on contributions and expected return for year 2.

Exhibit Output Enhancements

If the "pay quarterly contributions and final contribution when due" option is selected, the Development of Employer Contribution exhibit (if a forecast is run) will contain a new line item, "*Schedule of plan year cash contributions*" (see illustration below), that splits the plan year contribution into payments. In years after the first year, this also represents the timing of payments.

In the first year, the actual timing used in return and present value calculations will be based upon the contribution schedule. In this case, the contributions in the new line item will be displayed based on the quarterly or final payment to which they were applied. The details of these first year contributions are in the Schedule of Employer Contribution exhibit which is available by running a Valuation Set.

Development of Employer Contribution (Statutory Minimum)

	2009	2010
5. Employer contribution: (3)+(4)(c)	2,131,136	2,376,335
6. Schedule of plan year cash contributions		
(a) First Quarterly	379,821	502,058
(b) Second Quarterly	379,821	502,058
(c) Third Quarterly	379,821	502,058
(d) Fourth Quarterly	379,821	502,058
(e) Remaining Payment	$611,852	$368,103

For all funding runs, the Development of Market Assets exhibit has been modified to make it easier to track contributions receivable. The initial market assets section now displays the assets excluding receivables, the receivables (discounted under PPA) and the final market assets.

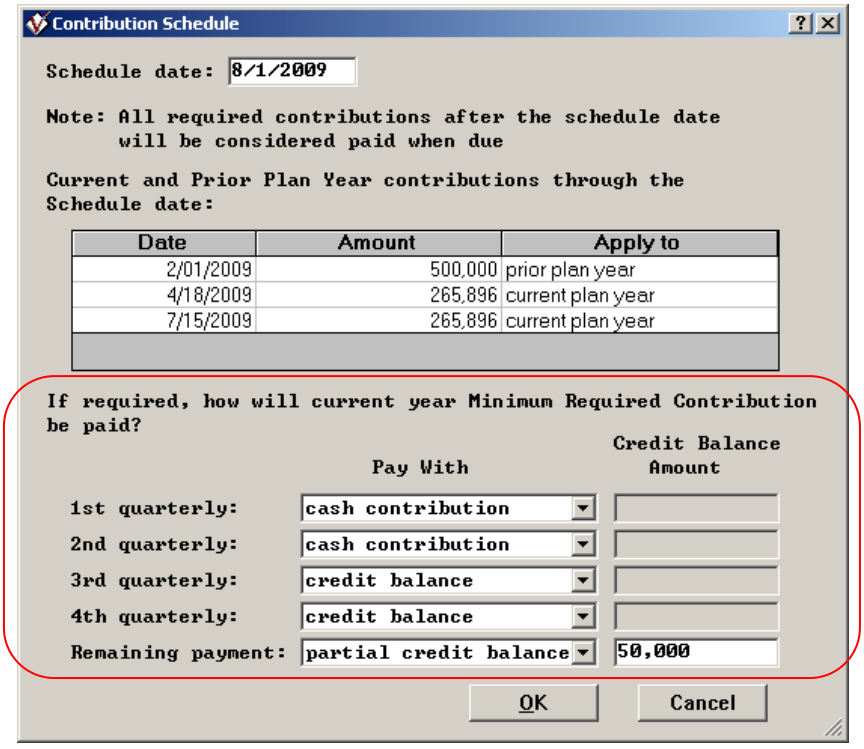
In the example below, the 2010 contribution receivable of $991,673 is the 4th 2009 quarterly plus the remaining 2009 payment (379,821+611,852). The discounted contributions receivable of $964,460 are these payments discounted to the beginning of the 2010 plan year using the 2009 effective interest rate. The 2010 contribution of $1,506,174 is the first 3 quarterlies of the 2010 plan year (502,058 x 3).

Development of Market Assets (Funding basis)

	2009	2010
1. Market assets:		
(a) Market assets excl. receivables	18,877,704	20,731,411
(b) Discounted contributions receivable	0	964,460
(c) Market assets, January 1: (a)+(b)	18,877,704	21,695,871
2. Cash flow items:		
(a) Employer contributions	1,139,463	1,506,174
(b) Contributions receivable	0	991,673
(c) Benefit payments	(593,055)	(693,498)
(d) Employee contributions	0	0
(e) PBGC premiums	(29,036)	(30,695)
(f) Administrative expenses	0	0
(g) 420 transfers	0	0
3. Total cash flow: sum of (2)	517,372	1,773,654

PPA Contribution Schedule

There is a new section in the PPA Contribution schedule that specifies how each required payment should be paid. The options are to pay the required contribution with credit balance, cash, or partial credit balance. In the example below, the first two quarterly payments are paid with cash, the second two with credit balance, and the remaining payment with $50,000 of credit balance and the rest in cash.



The Schedule of Employer Contribution, available in a Valuation Set if a contribution schedule is run, details how the required payments are satisfied. In the example below, at the beginning of the plan year, $62,549 of credit balance was available. On 2/1 another $500,000 of credit balance became available.

This credit balance was used to satisfy the 10/15 and 1/15 quarterly contributions entirely. Additionally, $50,000, as specified in the Asset & Funding Policy, was used to satisfy the final payment due to meet the minimum requirement. Actual contributions for the current plan year were made on 4/18 and 7/15 to satisfy the 4/15 and 7/15 quarterly payments, respectively. Finally, ProVal calculated the cash contribution due on 9/15 ($1,605,165) to meet the minimum requirements.

Schedule of Employer Contributions

Contributions				Application to Minimum Requirements							Late
		CB applied and contribs discounted to BOPY			PPA interest credit			Contribution applied			Interest
Date funds avail.	Amount	at Eff i	w/ LI	Applied against	From	On	Amount	Required	Available	Applied	(LI)
Credit balance (CB):											
Thu 1/01/2009	$62,549	$62,549	$62,549	10/15/2009 Qtrly	1/1/2009	$62,549	$3,151	$265,896	$65,700	$65,700	
Sun 2/01/2009	500,000	190,595	190,595	10/15/2009 Qtrly	1/1/2009	497,520	25,063	200,196	522,583	200,196	
		249,187	249,187	1/15/2010 Qtrly	10/15/2009	322,387	5,119	265,896	327,506	265,896	
Wed 9/15/2010	0	44,948	44,948	Final cont.	1/1/2009	57,738	6,489	560,824	64,227	50,000	
Actual contributions:											
Sat 4/18/2009	265,896	261,068	260,970	4/15/2009 Qtrly				265,896	265,896	265,896	98
Wed 7/15/2009	265,896	257,163	257,163	7/15/2009 Qtrly				265,896	265,896	265,896	
Final contribution:											
Wed 9/15/2010	510,824	459,211	459,211	Final cont.							
Total:	$1,605,165	$1,524,721	$1,524,623								$98
Total excluding CB:	$1,042,616	$977,442	$977,344								

End of Year additional contribution

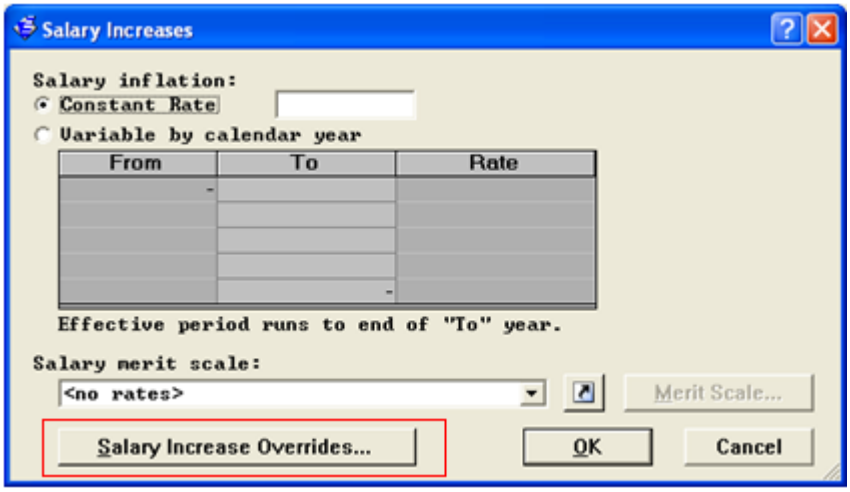
A change was also made, for ProVal version 2.30, to the treatment of the end of year additional contribution if the valuation date does not equal the measurement date. Previously, an end of year additional contribution was always assumed to be paid on the last day of the plan year for funding purposes and the last day of the fiscal year for accounting purposes. In other words, interest was never applied to this contribution. Now, if the funding target is a funding variable, the contribution is assumed to be paid on the last day of the plan year and if the funding target is an accounting variable, the contribution is assumed to be paid on the last day of the fiscal year (but not later than 8.5 months after the end of the plan year in US Qualified Mode). Interest is then applied accurately for funding and accounting purposes.

Salary Enhancements

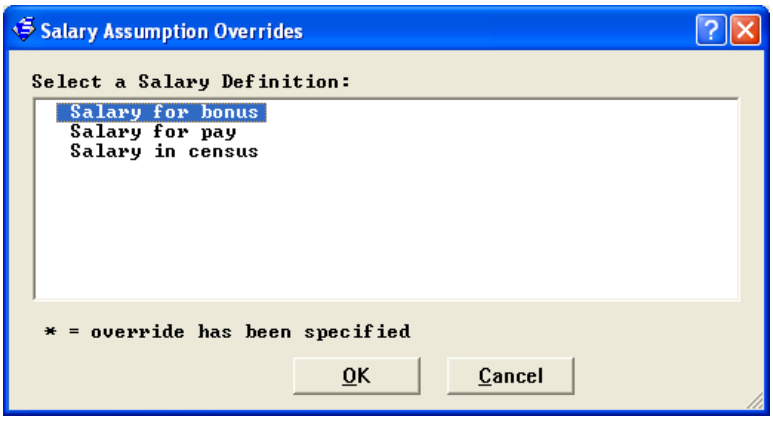
ProVal now allows more flexibility for salaries, including salaries that are the sum of base + bonus, where base and bonus may have separate salary and merit scales. This may be done through the new ability to override the salary inflation and merit assumptions for any Salary Definition. This ability is available for Funding and Accounting Valuations and Core Projections in all modes. ProVal now also provides the flexibility to choose multiple Salary Definitions for Salary and Final Average Salary custom operators.

Salary Increase Overrides

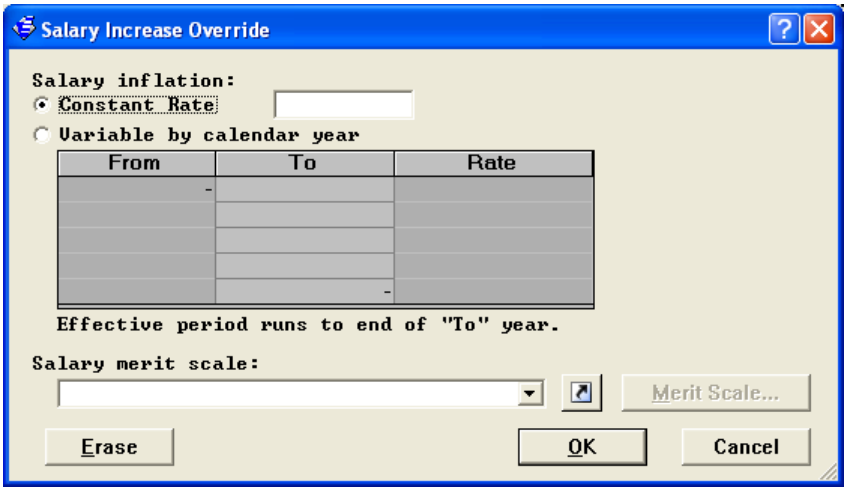
For Valuation Assumptions, the Salary Increase Overrides button of the Salary Increases topic now allows you to associate specific salary increase assumptions (different from those in the main Salary Increases dialog box) with selected Salary Definitions. Note that interest rates and salary increase assumptions are now coded under separate topics in all modes and under all (U.S. qualified) law types.



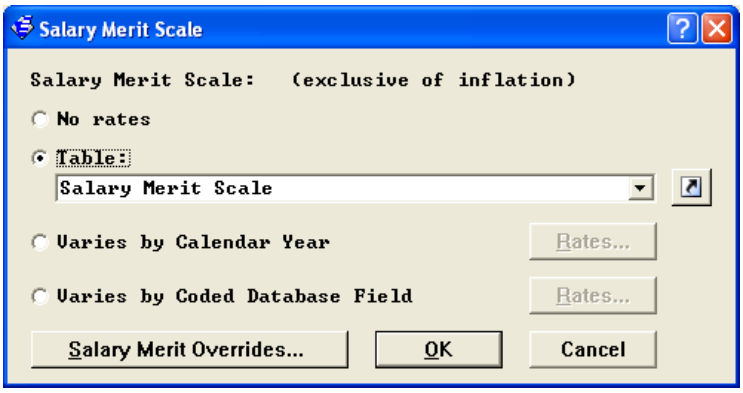
When you click the Salary Increase Overrides button, a list of all Salary Definitions unhidden in the current Project appears in the next (Salary Assumption Overrides) dialog box. Click the name of a Salary Definition whose salary inflation and/or salary merit scale assumptions you wish to override.



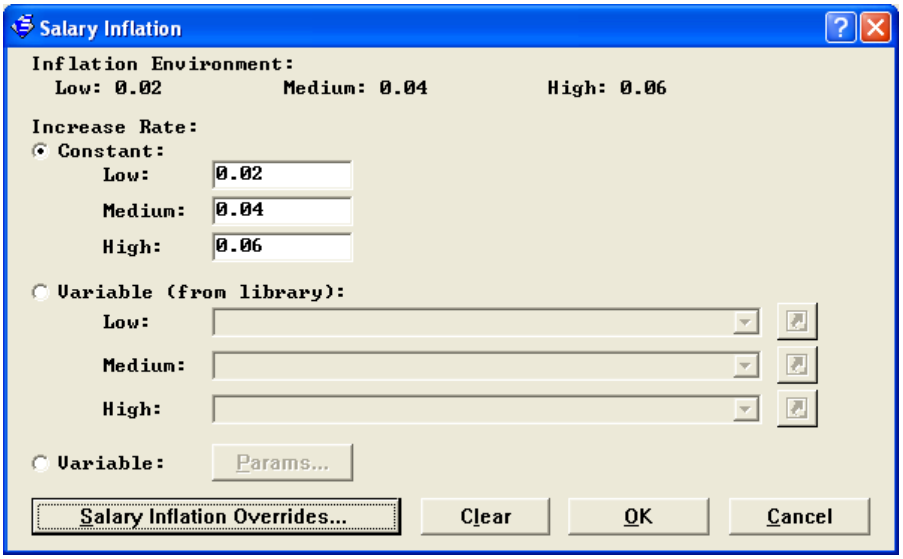
You can select, for the override, any of the options available in the main Salary Increases dialog box. Thus, for example, you can override the salary inflation assumption with a constant rate or with rates that vary by calendar year.



In a Core Projection, the Salary Merit Overrides button of the Salary Merit Scale topic of Projection Assumptions allows you to associate different salary merit scale experience assumptions (different from those in the main Salary Merit Scale dialog box) with selected Salary Definitions. After clicking this button, click the name of the Salary Definition whose salary merit scale assumptions you wish to override.



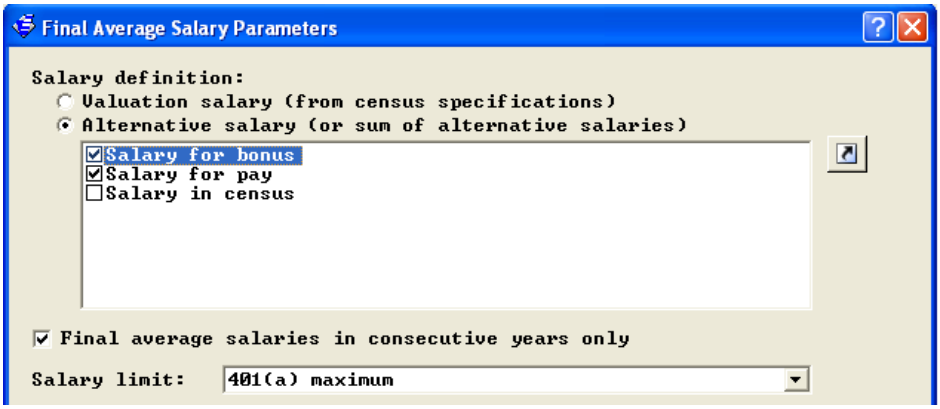
Similarly, the Salary Inflation Overrides button (found under the Increase and Crediting Rates topic by clicking Salary, then Regulatory Items and Salary Inflation) allows you to associate different salary inflation experience assumptions (different from those in the main Salary Inflation dialog box) with selected Salary Definitions. After clicking this button, click the name of the Salary Definition whose salary inflation assumptions you wish to override.



Note: Under the Experience Studies tool, only the salary increase assumptions on the main screen in the Valuation Assumptions will apply to the present value of future salary and salary growth. Expected salaries will not reflect overrides; different salary scale assumptions thus require separate Experience Studies.

Custom Operators

If more than one Salary Definition is selected for a custom #SALARY or #FAS operator, ProVal will sum the values of the selected Salary Definitions to determine each year's pay; any desired limit will be applied to this sum. Under the #FAS operator, ProVal will consider the sum of the pay values of the Salary Definitions when determining, for example, which years have the 5 highest consecutive (or non-consecutive) salaries over the last 10 years. Thus you may use each year's total compensation in final average pay, after the base and bonus have been projected with their own salary scales.



Belgium Insurance Reserves

Background

Belgian defined benefit retirement plans are often funded in part or in whole through insurance contracts. The provisions of these contracts affect or even define the amounts of benefits to be paid and valued. Some plans have both employer and employee contracts, some have only employee contracts, and some have neither (this last case needing no calculation of reserves). A pension fund may be maintained to finance obligations not funded through insurance contracts.

When both the employer and the employees have insurance contracts, an employee's vested benefit at decrement is generally a lump sum equal to the sum of employee and employer contract reserves (after application of the legal minimum). In some cases, funding valuations will consider only the employer-paid portion, that is, the total benefit net of the employee contribution portion. The plan's benefit formula underlies the benefits targeted under the contract, but does not directly determine the amount to be paid.

When only the employees have insurance contracts, an employee's vested benefit at decrement is generally a lump sum equal to the greater of the benefit under the plan's formula and the reserve on the employee's contract. Again, in some cases, funding valuations will consider only the employer-paid portion.

The insurance contracts are often participating contracts, in which returns in excess of the contractual guaranteed rate are credited to an additional reserve (sometimes referred to as "profit sharing"). Within ProVal, these additional balances are used to help fund benefit obligations under the plan.

New Reserve Operators

With this enhancement, benefit amounts to be valued in Belgium are generally constructed with two new benefit formula operators: `#ReserveER` and `#ReserveEE`. These operators return the projected mathematical reserve amounts for the employer and employee contracts at each decrement age, including any additional reserve in a participating contract. These operators have no arguments; rather, they are fully parameterized by user inputs (for more on these parameters, see the "Inputs…" section below).

The `#ReserveER` and `#ReserveEE` operators are available for use in benefit formulas. How the user incorporates these operators in a benefit formula depends on (a) whether insurance contracts exist for both the employer and employee, or just the employee and (b) whether the valuation method is based on the total liability or just the employer-paid portion. There are generally four cases to consider:

Insurance Contracts	Valuation method	Form of benefit formula
Employer & Employee	Total liability	#ReserveER + #ReserveEE
	Employer liability	#ReserveER
Employee only	Total liability	PlanBen #max #ReserveEE
	Employer liability	PlanBen #zminus #ReserveEE

where "PlanBen" is a component (or expression) representing the plan's normal retirement benefit.

Attribution

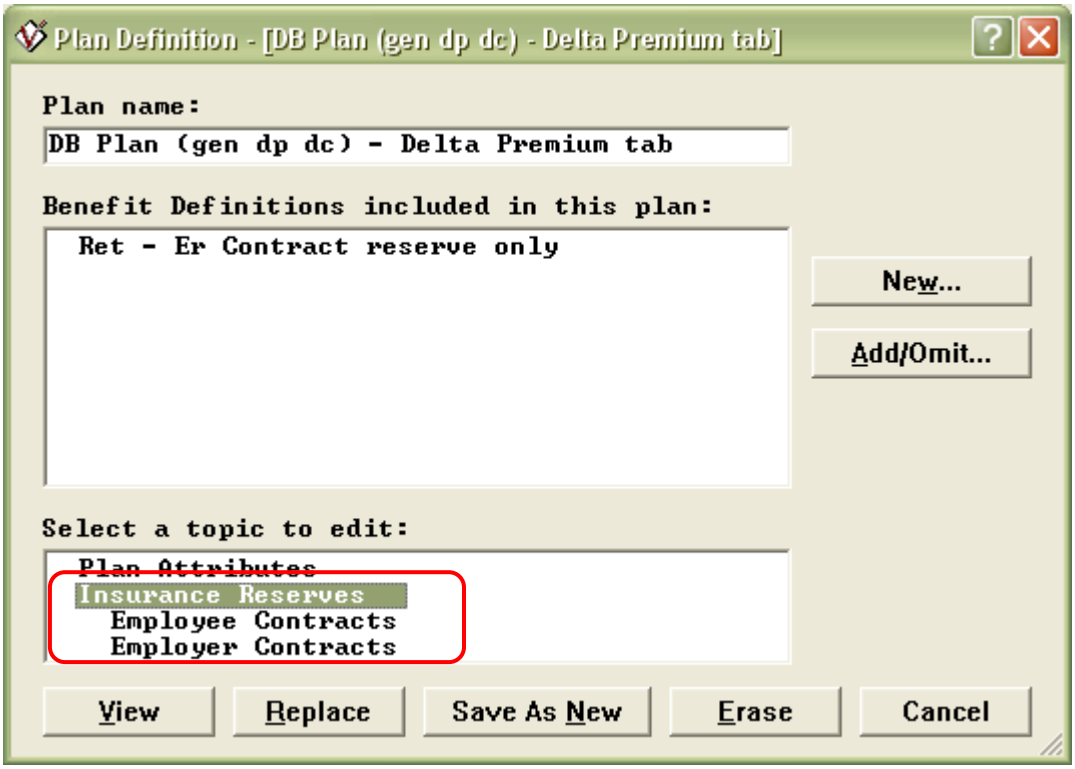
For PUC and UC attribution under "accrual rate proration", the `#ReserveER` and `#ReserveEE` operators are attributed like all other benefit formula components. The starting basis for each reserve (as discussed further below) is a benefit formula that defines the target lump sum insurance value (in the case of employer reserves) or the target premium (in the case of employee reserves). The reserves are first evaluated (and sample lives produced) on a fully projected basis for PVB calculations. For PUC and UC attribution, they are then re-evaluated at the beginning and end of the year for each liability using benefit formula component values with appropriately frozen service and salary amounts.

The "linear attribution" methods would work the way they do now – attributing the entire projected benefit, rather than by component.

Definition of Insurance Contracts

Plan Definition

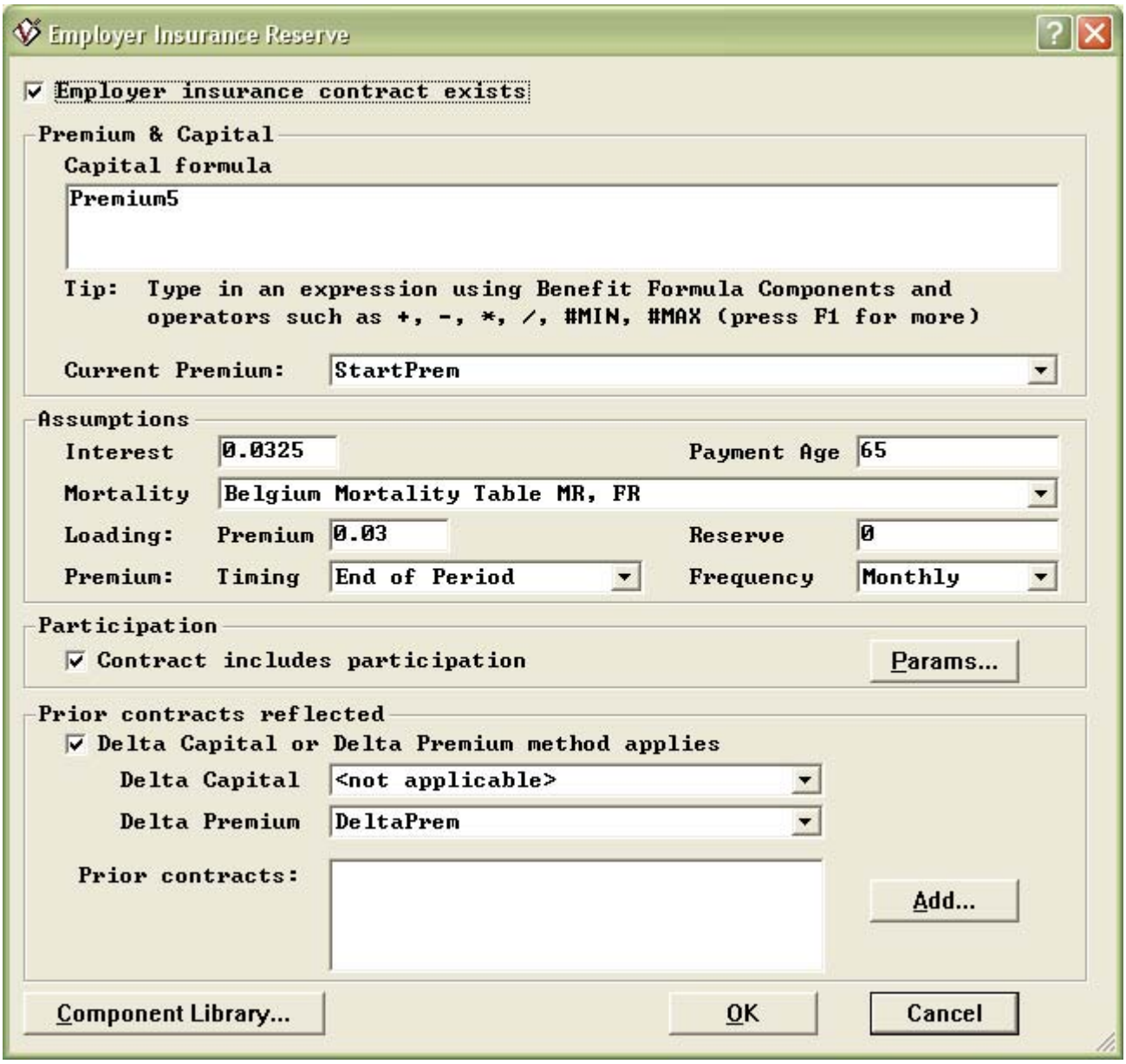
The `#ReserveER` and `#ReserveEE` operators are available only in the SERP (Non-qualified) Pension mode, and only if the Insurance Contracts topics indicate that insurance exists. Clicking the topic name brings up the dialog requesting inputs for the terms of the insurance contracts.



Insurance Reserve Dialogs

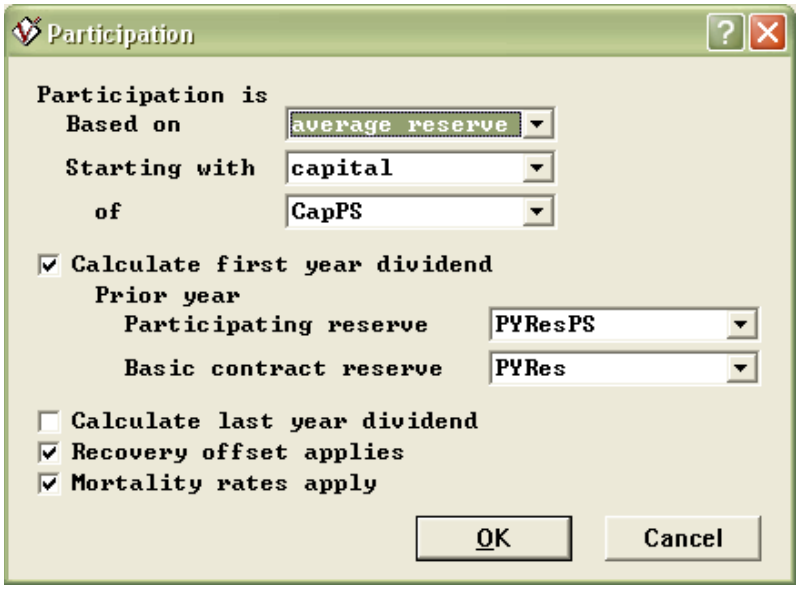
The dialog below collects inputs for calculating reserves under an employer-funded insurance contract. There are four sections: one for the insurance premium and capital, one for the assumptions, one for participation (a.k.a., profit sharing) and one for any prior contracts. Each of the parameters is discussed in detail in ProVal's on-line command reference help.

The companion dialog for employee-funded insurance reserves is almost identical to the employer dialog, except that the formula that is entered is for the employee premium rather than the (employer) capital.



Participation parameters dialog

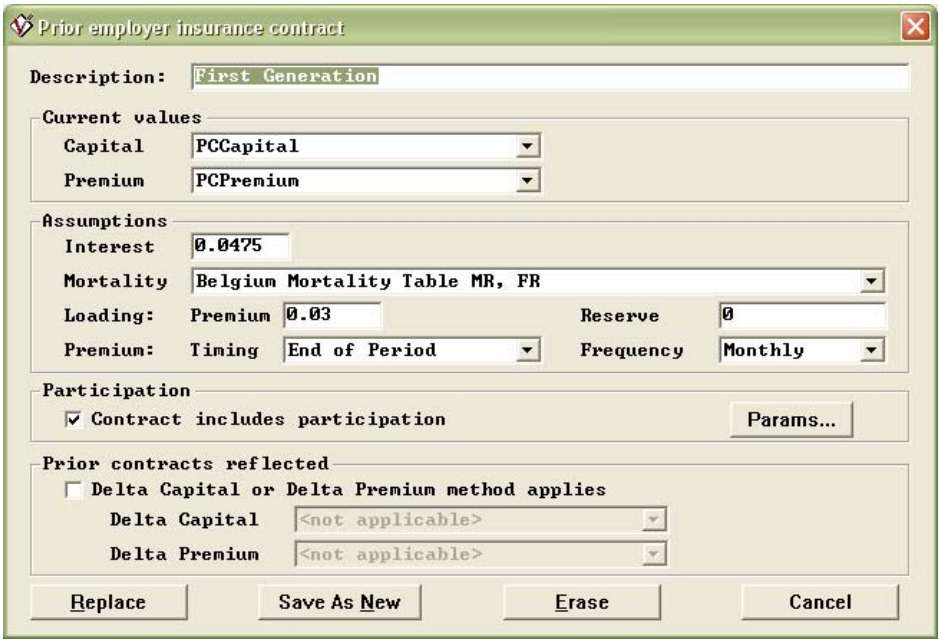
The participation parameters dialog illustrated below comes up after clicking the "Params…" in the Participation frame of the Insurance Reserve dialogs. This allows you to detail how the "profit sharing reserve" is calculated. Each of the parameters is discussed in detail in ProVal's on-line command reference help.



Prior insurance contracts

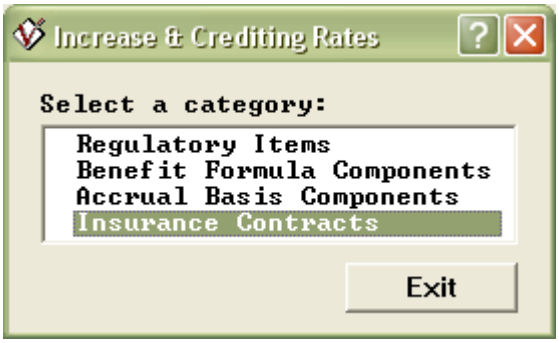
Any number of prior insurance contracts can be specified and will be valued. Prior contracts may be valued as one of three types: (1) delta capital, (2) delta premium, or (3) an explicit prior contract. For the delta capital and delta premium types, only a total amount is valued for the main contract, but prior contracts can include their own delta premium or capital amounts.

The inputs for an explicit prior contract are illustrated below. They are virtually identical to those for the main contract except that the premium and capital amounts are database fields, not formulas. Each of the parameters is discussed in detail in ProVal's on-line command reference help.



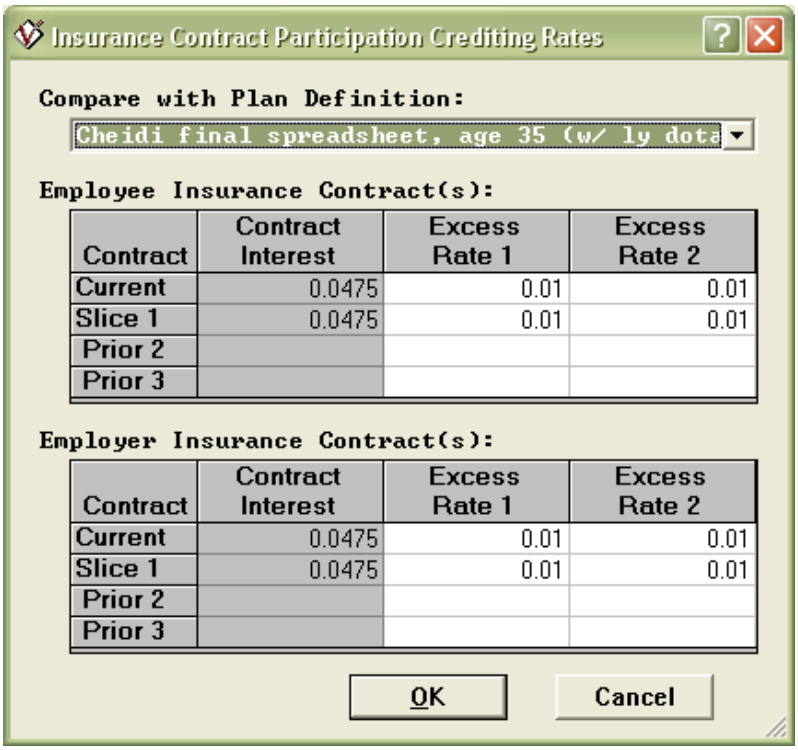
Valuation Assumptions: Excess return assumptions in participating contracts

When a contract includes participation, the dividends that comprise the participation reserve are attributable to credited interest rate in excess of the contractually guaranteed rate. For Belgium contracts, two excess rates must be specified. These are parameterized in ProVal under the Valuation Assumptions > Increase & Crediting Rates topic.



After clicking the Insurance contracts topic above, the Insurance Contract Participation Crediting Rates dialog illustrated below will appear. The excess rates for the current and any prior employee and employer contracts are specified in the unghosted areas of the spreadsheet.

You may select a Plan Definition against which to compare the rates, as is shown below. In this case, the grayed Contract Interest column will be filled in with the contract interest rates specified in the Plan Definition. Also, the generic prior contract labels ("prior 1", "prior 2", etc.) will be replaced with the prior contract descriptions in the Plan Definition. Please note that any Valuation Assumptions may be combined with any Plan Definition for a Valuation or Core Projection. This "Compare with Plan Definition" option is designed solely to facilitate verification of the valuation assumptions.



Calculations for #ReserveER and #ReserveEE

The complete formulas for the reserve calculations are included in the Technical Reference of ProVal's on-line help. However, some key issues about the calculations are discussed below:

- If there is an employee contract, it is evaluated first. The lump sum associated with an employee contract is used as an offset to the lump sum of the employer contract.
- Any prior contracts are evaluated before the main contract, because their lump sum used as an offset to the lump sum of the employer contract.
- Participation dividends may stay with the contract that generated them or be "passed up" to the main contract, depending on the user's parameterization. The lump sums associated with participation dividends are also used as an offset to the lump sum of the employer contract.
- For the main employee contract, the premium is determined based on a specified career average benefit formula component that references a salary and a contribution rate. The amount of the premium for any given year is the change in the component's "accrued benefit." Thus, changes in contribution rates based on service or differences based on location or other factors are automatically reflected. (Employee contributions are always parameterized in ProVal using a career average benefit formula component.)
- The driving force of the employee contract is the change in premium, which determines the change in capital. Conversely, the driving force in the employer contract is the change in capital, which determines the change in premium. The capital and premium are used to calculate the primary reserve (before participation). The basic form of the formula for reserves is:

$$ {}_tV_x = KL \cdot {}_{n-t}E_{x+t} - p \cdot {}_{n-t}a_{x+t} $$

  In which V is the reserve, KL is the capital, p is the premium, and the E and a are from standard actuarial notation.

  If no prior contracts exist, or if the contract change was under the Generations method, this formula will be correct (although we can use the more general form below). If the contract was changed in previous years using the Delta Capital or Delta Premium method, then one of the inputs with those names will not be zero, and the following general form must be used:

$$ {}_tV_x^i = \left(KL_{t-1}^i - (n-t)\cdot\Delta KL^i\right)\cdot {}_{n-t}E_{x+t}^{Tech.\ Int_i} - \left\lfloor P_{t-1}^i\cdot(1-load_i)+\Delta p^i\right\rfloor\cdot {}_{n-t}a_{x+t}^{Tech.\ \mathrm{int}_i} $$

  Regardless of the method of contract change, the general formula can always be used. Inputs of zero for Delta Capital and Delta Premium will result in a formula identical to the basic form.

- For a participating contract, the dividend is calculated using the following formula:

  $$ r1 * V_0 + r2 * [(V_1 - V_0) / (2 \text{ if average, } 1 \text{ if total})] $$

  In which:

  - V_1 is the total reserve (basic contract + participation), before dividend. *Exception:* On the initial valuation date, V_1 will include the dividend as of that date if the capital (or reserve) on the data includes the dividend (indicated by the field "Calculate first year dividend" being unchecked).

V_0 is the same as V_1 as of one year prior. Each V_1 will become the next year's V_0. *Exception:* On the initial valuation date, ProVal will calculate V_0 as the sum of the inputs "Prior year participation reserve" and "Prior year basic contract reserve" if "Calculate first year dividend" is checked, and V_0 will not be

calculated if “Calculate first year dividend” is unchecked.