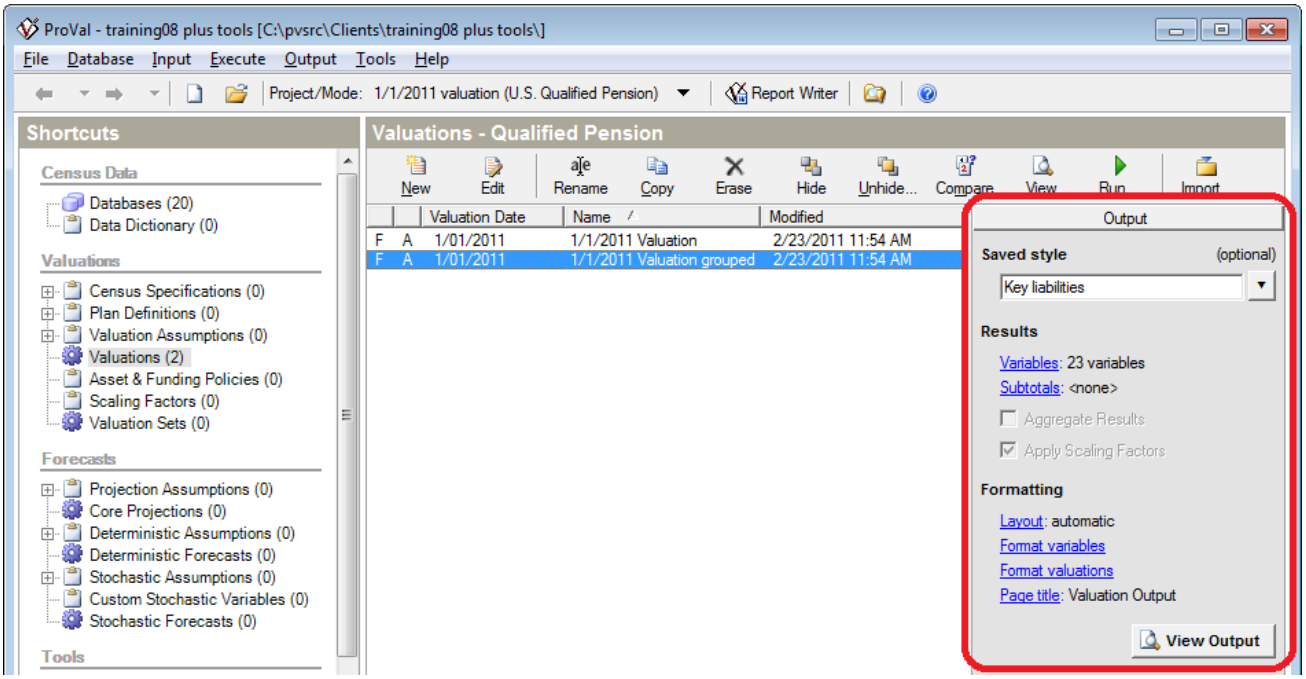
What's New in version 3.02 May 2011

ProVal version 3.02 introduces **output interface enhancements**, **stochastic liabilities with yield curves** that change shape, a **German pension mode** capable of running German tax valuations, and many other features listed below.

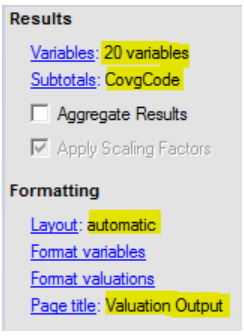
Interface

- Output options for Valuations, Valuation Sets, Core Projections, Deterministic Forecasts, Stochastic Forecasts, and Capital Market Simulations now appear alongside the list of runs. Output functionality is exactly the same as before; the options have just been placed within hands reach for easy access.

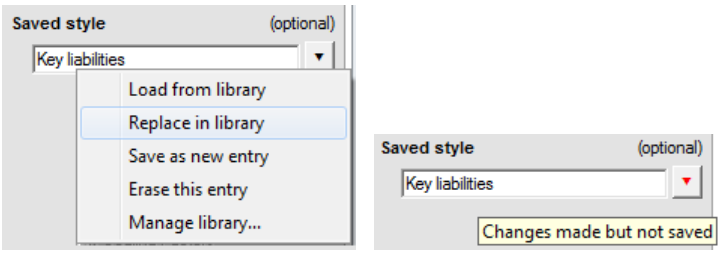


Some of the benefits include:

- No longer do you execute a run in one place, only to have to find the same run in another place to view output or exhibits. Rather, all options are available in a single place. What's more, sorting the list of runs (e.g., by name, by date last modified, etc.) can now be carried through to the output.
- Output settings (e.g., variables, subtotals, layout, etc.) are maintained until you close the current Client. For example, if you load an output style for Valuations, then go to Valuation Assumptions, when you return to Valuations the output style will still be loaded. In addition, key output settings are summarized so you don't have to click into each topic to see how they are set.

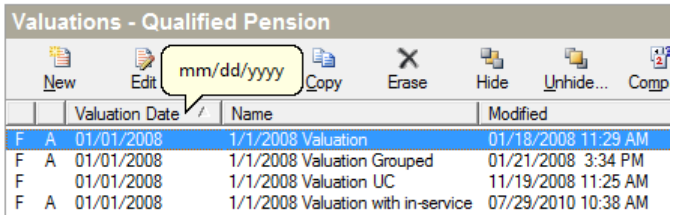


- The output style button (formerly labeled "Library") now appears directly next to the style name. What's more, if changes have been made to the output style but have not been saved, this button's image turns from  to  (black to red).



- Subtotals and sensitivities for Valuations and Core Projections are now specified after selecting runs you're interested in. This makes the list much more manageable, eliminating irrelevant subtotals or sensitivities.

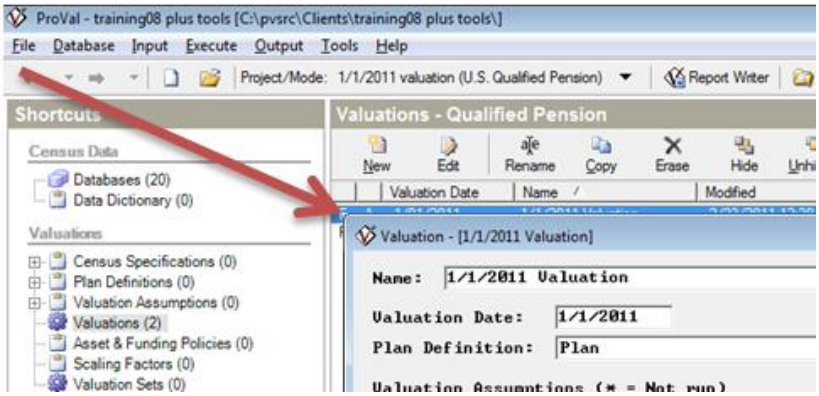
♦ The Valuation and Core Projection libraries now have a 'Valuation Date' column to identify or sort runs by.



♦ A new toolbar button (and "Explore Client Data Folder" option on the File menu) opens Windows Explorer directly to the client data folder. If you adhere to ProVal's default of saving supporting client documents here (.xls, .doc, etc.), this makes it easy to get to them quickly.

♦ The Shortcuts pane (on the left hand side) now hides items that don't pertain to the mode you are in. For example, U.S. PIA Calculations, U.S. Nondiscrimination Accrual Rates, U.S. Coverage and General Tests, and U.S. Government Forms Extract now only appear in U.S. Qualified Pension mode (except for U.S. PIA Calculations, which also appears in Public Pension mode).

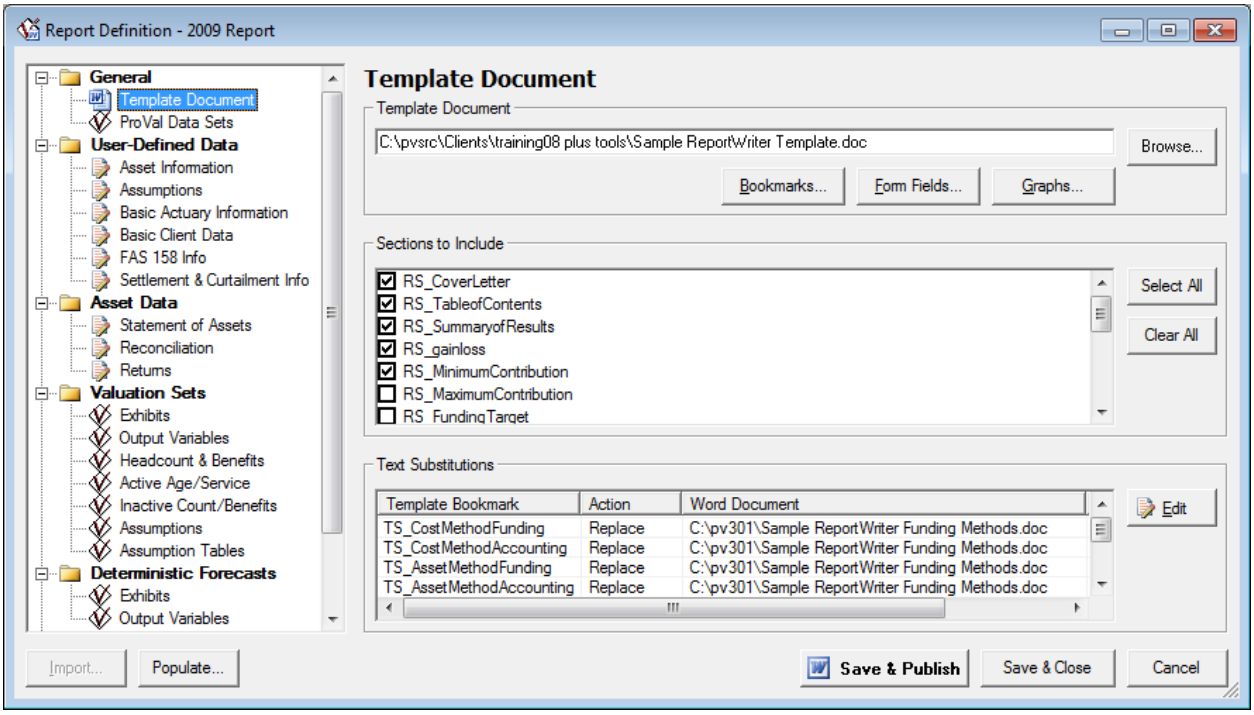
♦ Library entry dialog boxes are now positioned to avoid obscuring the Shortcuts pane.



♦ When opening a client, the width of the Name and Date columns is now adjustable so you can see long client names.

Report Writer

- The Report Definition screen has been reworked to make it easier to use. A recorded report writer demonstration is available on our ProVal Training page here: www.winklevoss.com/wintech/training/.

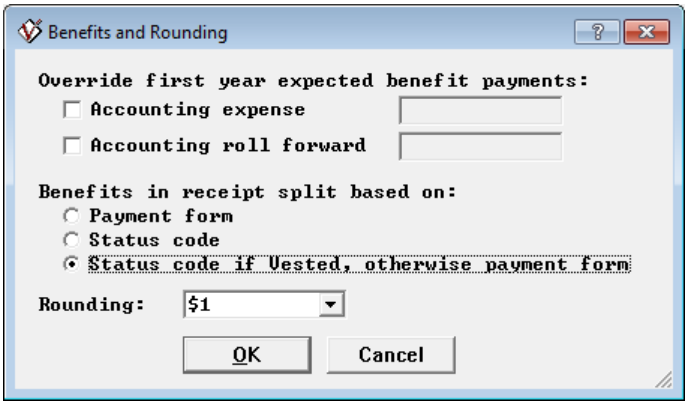


- For cells with overrides, a tooltip lets you see the original value.

Pension Plans

- In active Payment Forms, you can now specify when the benefit commences and/or temporary period stops utilizing a numeric age field from the data (e.g., containing Social Security normal retirement age of 65, 66, or 67).
- A new "modified cash refund annuity" payment form, useful for contributory pension plans, is available for actives and inactives. A modified cash refund annuity provides a life annuity plus a lump sum death benefit equal to the excess (if any) of employee contributions with interest to commencement, over the sum of annuity payments actually made before death without interest.
- In Valuation Assumptions, alternative service can now be specified for merit salary scale and post-decrement probability table lookups.
- In Valuation Assumptions, spouse age differences can now be entered as a table that varies by member age and/or sex.
- The "IRS 2008+ Small Plan Combined Static Mortality, 0 Pre-Comm (dynamic)" is now available in the mortality table library. In addition, some other small plan mortality tables have been renamed for clarity.
- For career average and cash balance benefit formula components that are projected to an age, the projection can now be based on the accrual basis in the year of decrement, rather than the year before decrement. In addition, cash balance benefit formula components can now be projected with pay credits only.

- For in-receipt/not-in-receipt liability splits, a new option, "Status code if Vested, otherwise payment form", is available in the Asset & Funding Policy in pension modes (except Public).



If selected, inactives with a status of "retired", "survivor", or "disabled" will be considered in-receipt if a benefit is payable on the valuation date, all others inactive participants will be considered not-in-receipt. This avoids mis-categorizing vested participants beyond retirement age and/or deferred disableds.

```
(a) Funding liability
    (i)   Retirees and benef. receiving payments        3,447,625
    (ii)  Terminated vested participants                  847,342
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- Valuation Individual Results are now available by optional payment form when "benefit detail" is shown.

U.S. Qualified Pension Plans

- The effective interest rate calculation has been improved when a Benefit Definition has a normal payment form of an annuity, an optional payment form of a lump sum, and underlying liability interest rates are used for the conversion. In other words, the so-called "annuity substitution" rule is applied to lump sum optional forms, computing projected cash flows on an annuity basis (using lump sum mortality and valuation interest) for purposes of computing the effective interest rate. For more, see U.S. Pension Protection Act (PPA) Updates on page 10.
- Under PPA, there is a new attribution option for benefits with projected service to fully attribute the current accrued benefit and prorate the excess of the projected benefit over the current accrued benefit over service from hire to decrement. For more, see U.S. Pension Protection Act (PPA) Updates on page 10.
- PPA Asset & Funding Policies have been enhanced to comply with Notice 2011-3. The "For 2+7, discount interest only payments" option has been removed from the screen and the calculation of accelerations has been fixed and enhanced pursuant to the Notice. (This was actually released as a special update to version 3.01 but is mentioned here in case you missed it.) For more, see U.S. Pension Protection Act (PPA) Updates on page 10.
- PPA Asset & Funding Policies have a new option to calculate an additional end of year contribution to avoid at-risk status in the next year.
- Multiemployer Asset & Funding Policies have been enhanced to handle the 431(b)(8)(A) amortization relief and 431(b)(8)(B) asset relief. (The 431(b)(8)(B) enhancement was actually released as a special update to version 3.01 but is mentioned here in case you missed it.) For more, see U.S. Pension Protection Act (PPA) Updates on page 10.
- Lump sum and optional payment forms that "use underlying liability interest rate" can now calculate an unadjusted lump sum factor at decrement. This is useful for valuing annuity forms of payment under a cash balance plan, without having to reenter the valuation interest rates. For more, see U.S. Pension Protection Act (PPA) Updates on page 10.

Canadian Registered Pension Plans

- The Asset & Funding Policy has been updated to allow contributions to be calculated in accordance with the laws and regulations currently in force in Quebec. You can choose to apply either the Supplemental Pension Plans Act (reflecting Bills 30 and 68) or the Regulation respecting funding of the municipal and university sectors. (Note that, given the temporary nature of the current solvency relief provisions, they were not directly programmed).
- Solvency incremental cost is now directly calculated in a Core Projection based on the Calculation of Incremental Cost on a Hypothetical Wind-Up or Solvency Basis educational note, published in December 2010.

German Pension Plans

- ProVal includes a new "German Pension" mode which supports calculation of German tax valuations for pension benefits (e.g., not jubilee benefits). Specifically, this includes:
  - Introduction of a Benefit Promises layer between Plan Definitions and Benefit Definitions. In German Pension mode, a Plan Definition is comprised of Benefit Promises, which are in turn comprised of Benefit Definitions.
  - Tax/Funding Valuation Assumptions for Teilwert, including the option to define a 100% retirement age by field or constant, in lieu of a table (available in all modes). Note that while Accounting assumptions are also available, they are of limited use because termination rates (and the associated post-termination legal vesting calculations) are not currently allowed.
  - RT2005G biometric formulae that pertain to Teilwert (e.g., retiree and widow annuities, adjustments for mid-year decrements, disability tables that vary by year of birth, spouse setback determined at member death).
  - Active decrements that occur at exact ages for retirement, and at mid-year for deaths and disablements. For retirement (old age) benefits, this means service for accrual definitions and benefit eligibility are evaluated at exact retirement ages. For death and disability benefits, benefits are evaluated at valuation date anniversaries, then averaged to get mid-year benefits, with eligibility applied to benefits before or after averaging. Note that timing differences can lead to different values for a single accrual definition when used in a retirement benefit vs. a death/disability benefit.

Netherlands Pension Plans

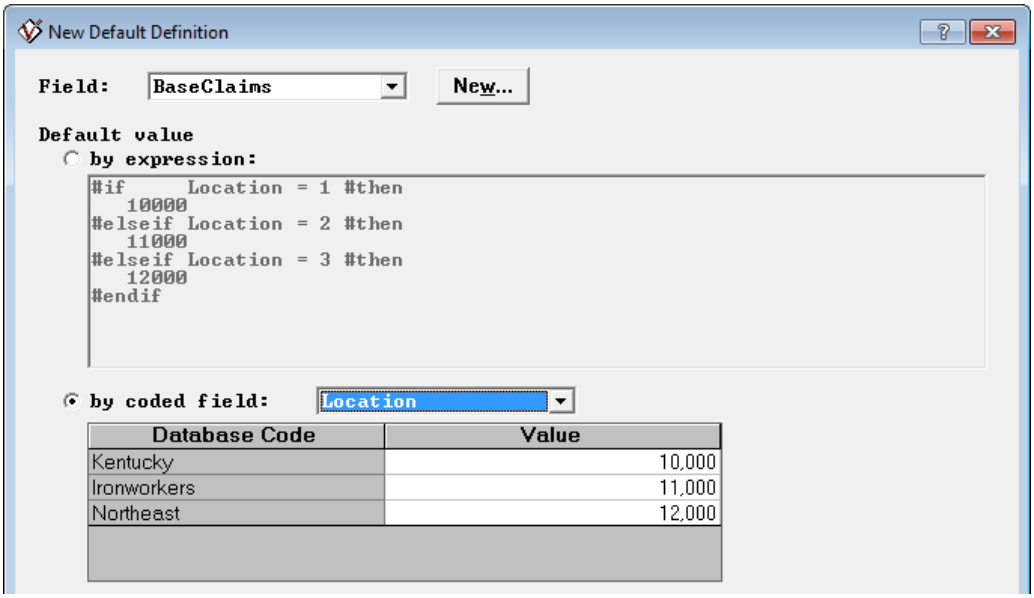
- The Career Average with Indexation benefit formula component has the following changes:
  - There is an option to treat the Accrued Benefit as being as of the day before the valuation year, so that the indexation assumption is applied on the valuation date.
  - When projected to an age, you can now project with service accruals only.
  - There is a new option in Valuation Assumptions to disregard future indexation for unit credit/ABO career average components.

OPEB Plans

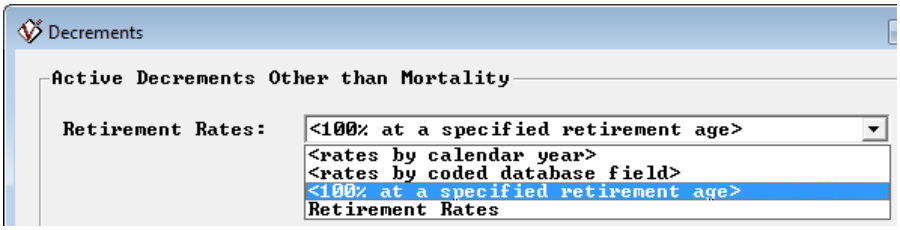
- Sample lives can now be run on +1% or -1% trend sensitivities.

All Plans

- In Census Specifications, data defaults can now be specified by coded field. What previously required a lengthy if-then-else expression and the potential for missing codes can be now accomplished by simple table entry.



- In Valuations Assumptions, a new option lets you define 100% retirement age by field or constant (e.g., 100% at age 65) in lieu of a table.



- Disability PIA calculations are now available in PIA custom operators and the U.S. PIA Calculations tool.
- A warning will be displayed if actives have a PVB/EBO/EPBO less than or equal to 0 and have met participation requirements.
- Under linear to decrement attribution, a special rule for service definitions with zero future service accruals has been eliminated. Previously, linear attribution reverted to assuming future service accruals of 1 per year; now these benefits will be considered fully attributed.

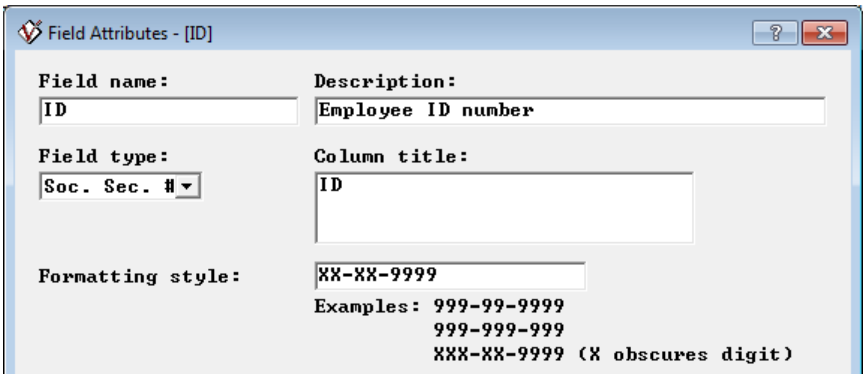
Forecasting

- A new Capital Market Simulator, called the Explicit Corporate Yield Curve, generates a full corporate bond yield curve that's internally consistent with the current treasury bond yield curve. Asset class returns based on this simulator may be parameterized as a function of corporate, as well as treasury, returns. A sample Explicit Corporate Yield Curve is now included with new ProVal clients. For more, see Forecasting Enhancements on page 15.
- Stochastic forecasts now handle full spot rate curve changes, not just parallel shifts. (Populating deterministic assumptions and stochastic trial trace are also available for these forecasts.) For PPA segment rates, ProVal approximates 24-month smoothing of the underlying corporate bond yield curve and optional look back period through averaging and phase-ins. For more, see Forecasting Enhancements on page 15.
- Stochastic forecasts with multiple mixes have been optimized to avoid repeating the liability interpolation for each mix. This improves the speed of stochastic forecasts with multiple asset mixes and makes populating ProVal PS much faster.
- In Forecast Yield Curves for Deterministic Forecasts, you may now enter yields for each duration, not only at bendpoints.

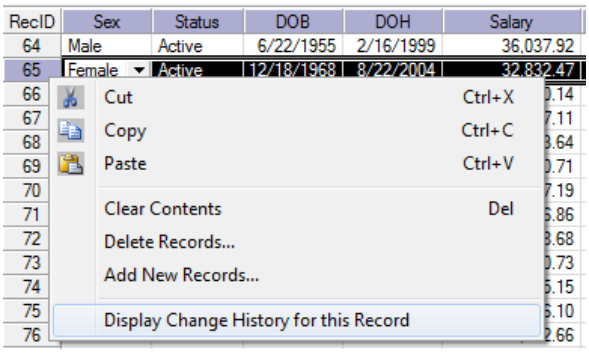
- For Efficient Frontiers with manually entered asset mixes, negative expected returns can now be entered. This would be appropriate, for example, for an excess asset return over a liability return.

Census Data

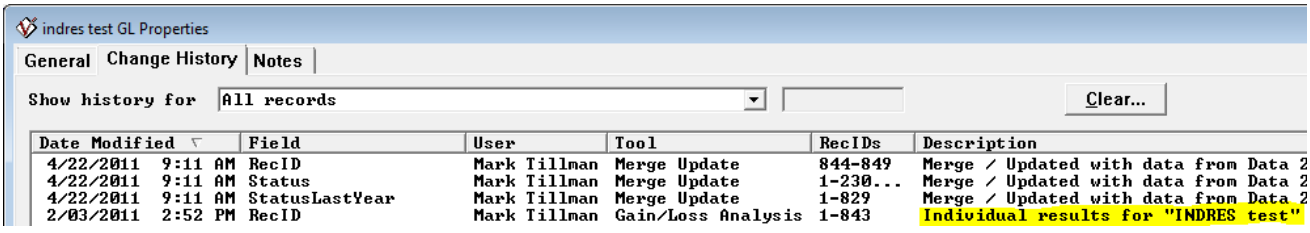
- For social security number fields, you can now obscure digits with an X in the output, e.g., displaying XXX-XX-6789 instead of 123-45-6789. This is intended to prevent full SSNs from appearing in printouts that might otherwise have to be secured per local statute. It is not intended to make the data secure; you can still access the true SSN. To use, change the field's formatting style in the Data Dictionary.



- The Database Properties > Change History now allows the change history to be viewed for an individual RecID. This is easily accessed by right-clicking on a record in Spreadsheet Edit and choosing "Display Change History for this Record".



- The Database Properties > Change History now includes the run name for individual results fields from a Valuation, Gain/Loss Analysis, U.S. Nondiscrimination Accrual Rates tool, U.S. Nondiscrimination Coverage and General Tests tool, or U.S. PIA Calculations tool.



- Expression Sets with multiple expressions have been optimized to improve speed and cut down on unused space generated (avoiding potential FILE FULL errors when reaching the 4GB limit). Run times are generally 2 to 9 times faster for expression sets with 2 to 100 expressions.
- In Group Data and Screen Data, there is now a backdoor button to Census Specifications so you do not have to leave Spreadsheet Edit to edit/create them.

- When applying data defaults in Group Data, the Census Specifications choice to "Default numeric fields to zero" is now honored, resulting in better fidelity with seriatim results based on those Census Specifications.

Gain/Loss Analysis

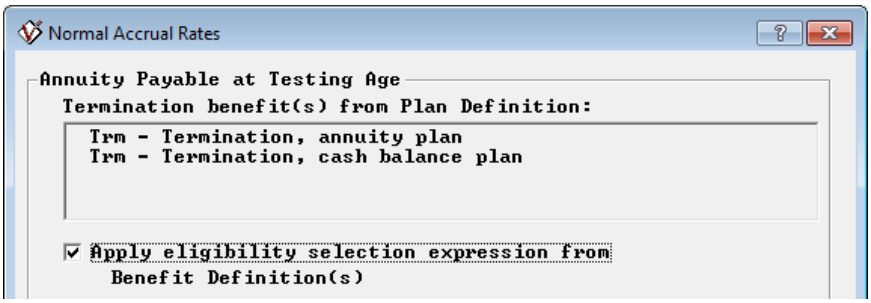
- Gain/loss rollforward under spread/gain methods with employee contributions has been improved. The previous methodology created a discrepancy between the output and individual results. In order to see revised results, Valuations referenced in the gain/loss must be rerun in version 3.02.

Administration Factors

- For Joint Life Annuity payment forms, a new option lets you determine the beneficiary at commencement, i.e., only use member mortality during the deferral period.
- Annuity factors with a payment frequency of "continuous" are now more precise, with differences generally in the 6th or 7th decimal place. This affects all ProVal calculations of continuous annuities, including those in Valuations and Core Projections.

U.S. Nondiscrimination Testing

- In the Nondiscrimination Accrual Rates tool, you can now utilize Plan Definitions with multiple termination Benefit Definitions for calculating normal accrual rates. This avoids having to run separate passes for different groups of participants with different benefits. Now, you can combine all the benefits in a single Plan Definition and check the "Apply eligibility selection from Benefit Definition(s)" box, so that only the relevant benefits are considered for each participant.

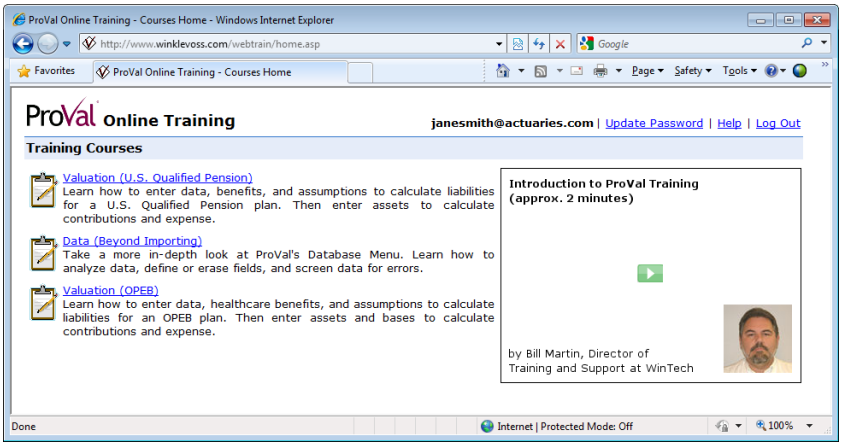


System

- Results can now be erased by right-clicking runs and selecting "Erase Results". This provides an easy way to make a set of runs available to be rerun, or save space for old runs whose results are no longer needed.
- Sample lives run with custom code will now display the name of the module and parameter file in the footnotes.
- The client update log now consistently indicates the client path in addition to the client name.
- Valuation, core projection, and gain/loss code has been streamlined to require less internal memory for large runs. This increases the speed of these runs as well as making ProVal less likely to encounter WSFULL errors. This will be most noticeable for runs with large numbers of active benefits and/or projection years.
- ProVal has been tested for use with Microsoft Office 2010.

Online Training

- Online training courses have been added for "Data (Beyond Importing)" and "Valuation (OPEB)" at www.winklevoss.com/webtrain. Online training courses are free, interactive, and can be completed at your own pace.



- As mentioned in the Report Writer section above, a recorded report writer demonstration is available on our ProVal Training page here: www.winklevoss.com/wintech/training/.

ProVal API

- A new function called 'GetRecordLayout' returns a record layout's definition. This could be used, for example, to get a mapping of codes for constructing an import schema file. For details, see "ProVal API Users Guide.pdf" in the ProVal installation folder.

ProVal PS API

- A new 'ProValVersion' function returns the ProVal version number and date that corresponds to the PS engine
- A new 'FileOpen' argument returns whether or not the client needs to be updated.
- A new 'FileOpen' argument returns the custom code module name, if applicable.

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.

New Member of the WinTech Team

Stefan Mihaylov recently joined the WinTech Team. Stefan is an experienced consulting actuary and, among other responsibilities, will be working on ProVal enhancements. Be sure to say hello to him if you reach him 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.

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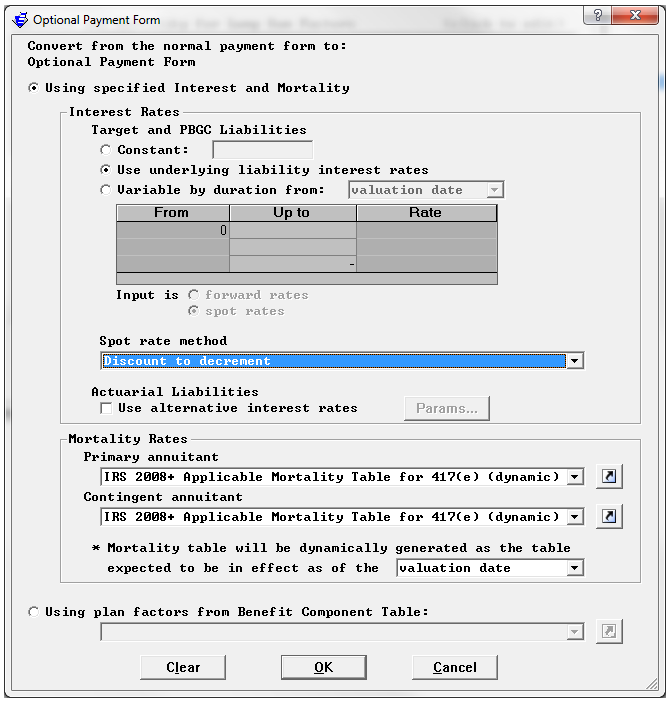
U.S. Pension Protection Act (PPA) Updates

ProVal 3.02 includes several updates to handle PPA relief for single employer and multiemployer plans, and to simplify other calculations required under PPA. These include:

- Lump Sum calculations:
  - The effective interest rate calculation has been improved to handle the "annuity substitution" rule when the normal payment form is an annuity and the optional payment form is a lump sum.
  - Lump sum and optional payment forms that "use underlying liability interest rates" can now calculate an unadjusted lump sum factor at decrement. This simplifies the assumptions for valuing annuity forms of payment under a cash balance plan.
- A new attribution option has been added which attributes the accrued benefit with accrual rate proration, and the excess of the total benefit over the accrued benefit with linear proration.
- PPA Asset & Funding Policies have been enhanced to comply with Notice 2011-3.
- Multiemployer Asset & Funding Policies have been enhanced to handle the IRC Section 431(b)(8)(A) amortization relief and 431(b)(8)(B) asset relief.

Lump Sum Calculations

Effective Interest Rates



For plans that convert annuities to lump sums based upon 417(e) assumptions, 1.430(d)-1(f)(4)(iii)(B) describes a "substitution of annuity form" method for determining the present value of these benefits. Essentially, the lump sum present value is based on the annuity payments underlying the lump sum.

ProVal 3.02 includes an enhancement to the effective interest rate calculation to value both the correct benefit payment stream and the correct effective interest rate in a single run when a Benefit Definition has an annuity as the normal payment form, a lump sum as an optional payment form, and the valuation assumptions use underlying liability interest rates for the conversion. ProVal will now produce a new projected benefit payment stream called "PPA EIR" which is only used to calculate the effective interest rate. The benefit payment stream is produced by converting the lump sums to the normal payment form (annuity substitution) and using the mortality basis defined for conversion to the lump sum optional payment form.

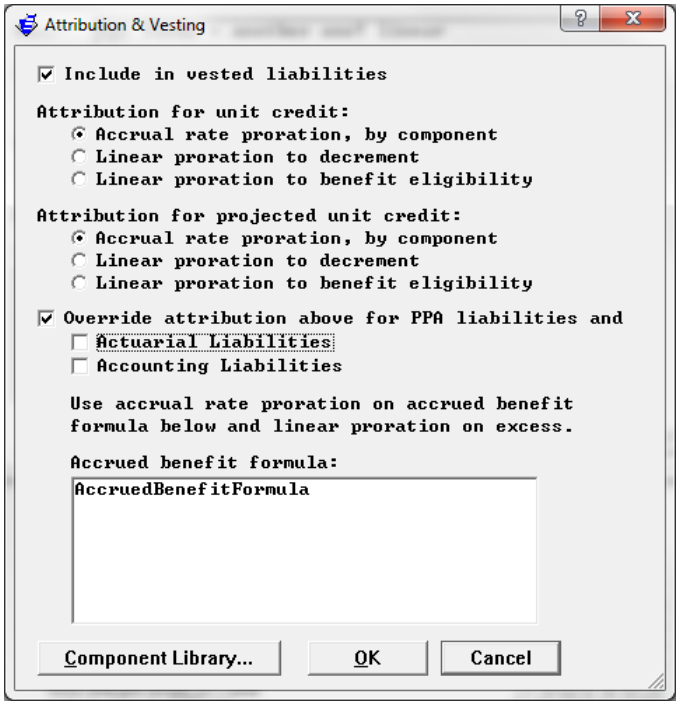
Lump Sum Payment Forms

For plans that convert lump sums to annuities (such as cash balance plans), the **Lump Sum & Optional Payment Forms** topic in PPA funding Valuation Assumptions now allows you to select "use underlying liability interest rates" in conjunction with the **Spot rate method** "discount to decrement" as required for certain lump sum to annuity conversions. Previously, rates had to be entered manually to use the "discount to decrement" method.

Attribution for Benefits not Fully Based on Accrued Benefit

U.S. IRC Regulation 1.430(d)-1 provides guidance on which benefits should be taken into account for target liabilities. Benefits which are not completely a function of the accrued benefit (for example, a disability benefit which projects service to age 65), are to be allocated in two pieces: the accrued benefit is considered fully accrued, and the excess of the total benefit over the accrued benefit is to be attributed using linear proration to decrement. To accommodate this new attribution requirement, an additional attribution option was added in U.S. Qualified and Universal Pension modes.

In the **Benefit Definition**, if you select **Attribution & Vesting** (or Attribution & Vesting & Beneficiary, if the contingency initiating benefits is death), a new option exists to **Override attribution.** If selected, this option will use accrual rate proration on the accrued benefit formula and linear proration on the excess of total benefit over accrued benefit. The not-at-risk and at-risk target liabilities will be calculated based on the sum of: (1) the accrued benefit (as entered on this dialog box) and (2) a linear proration of the portion of the total benefit (as entered on the **Benefit Formula** dialog box) in excess of the accrued benefit.



Actuarial liabilities and accounting liabilities may also be valued using this special attribution. If this is desired for either or both, check the corresponding box.

The details of this calculation are displayed in the sample life reports.

Notice 2011-3 Enhancements

Note that these enhancements were released as a special update to version 3.01.

Notice 2011-3 provided clarification on two issues directly relevant to ProVal:

- How to calculate the installments if the 2 plus 7-year amortization schedule is elected, and
- How to reflect installment acceleration amounts when relief is elected.

Amortization Installments

Prior to Notice 2011-3, there were two different schools of thought as to how the 2 plus 7-year amortization installments should be determined; ProVal provided a checkbox, "For 2+7, discount

interest only payments" to select either calculation. The Notice requires that the installment for each of the first two years be determined by multiplying the amount of the shortfall amortization base by the effective interest rate, and that the installment for the subsequent 7 years be the level amount calculated so that the present value of the 9 installments equals the amount of the shortfall amortization base. Therefore, the checkbox has been removed from the screen and there is now only one approach available for the amortization installment calculation.

An example of the calculation is as follows:

- A plan has a funding shortfall of $1,000,000 for the plan year.
- Segment Rates are 4%, 5%, and 6% and the plan's effective rate is 5.5%.
- The two-year interest only installments are $55,000 ($1,000,000 times 5.5%).
- The installments for the remaining seven years will be $159,716.
- The present value of two payments of $55,000 discounted at 4%, followed by 3 payments of $159,716 discounted at 4%, and 4 payments of $159,716 discounted at 5%, is $1,000,000.

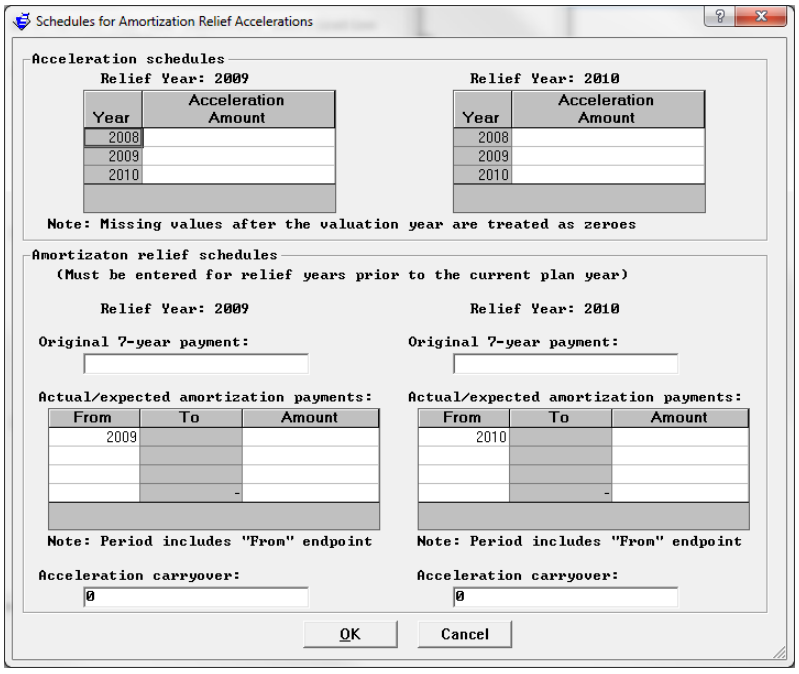
Note that existing runs which used the "For 2+7, discount interest only payments" option will still run under version 3.02. If these liabilities are rerun, the calculation will not change but a warning will display outlining how to turn off the option.

Installment Acceleration Amounts

Notice 2011-3 provided clarification on how to reflect Installment Acceleration amounts (IAAs) when relief is elected. As a result, the calculation of IAAs has been enhanced.

To reflect IAA's, in the Asset & Funding Policy, **Shortfall Amortization** topic, **Elect amortization relief** for one or two years and then check the **Reflect Accelerations** box. This will unghost the **Schedules...** button. Click on this button in order to enter details related to IAAs for the current year (and future years, for a forecast).

The **Acceleration schedules** portion of the dialog box allows you to enter acceleration amounts for the current and future valuation years. Note that, in general, if two relief years are elected, the acceleration amounts will be the same for each relief year. Certain situations, such as the election of an alternative amortization schedule for more than one election year and for one or more plans in a controlled group, may result in acceleration amount schedules which differ. ProVal will reflect the acceleration amounts when calculating the shortfall amortization.



The **Amortization relief schedules** portion of the dialog box must be entered for amortization relief years prior to the valuation date. The

Original 7-year payment represents the installment that would have been calculated had no relief been elected. The **Actual/expected amortization payments** represent the installment schedule prior to the valuation date reflecting relief and prior year installments. If the Asset & Funding Policy has been updated from the prior year using the Update button, ProVal will populate this schedule with the results from the prior year Valuation Set. These values are used to determine the maximum IAA that can be reflected in a plan year. The Shortfall Amortization Exhibit details these calculations.

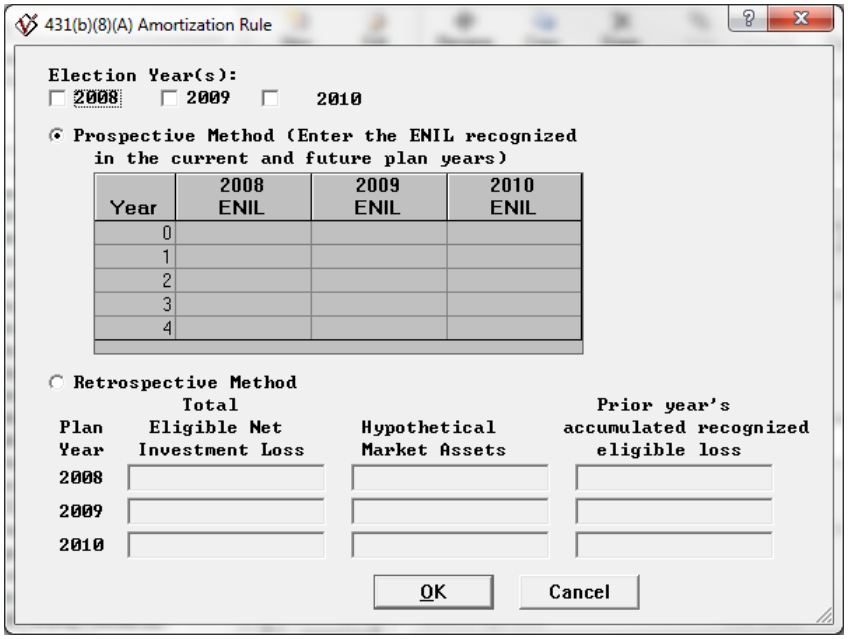
Multiemployer Plans

U.S. IRC Sections 431(b)(8)(A) and 431(b)(8)(B) allow for special relief rules for multiemployer plans that meet a solvency test (discussed in 431(b)(8)(C)) for certain plan years. Subparagraph (A) provides an extended amortization period for net investment losses and subparagraph (B) provides for additional asset valuation method smoothing. Notice 2010-83 provides additional guidance on the calculations of these two types of multiemployer plan relief.

Note that the enhancement for 431(b)(8)(B) was released as a special update to version 3.01.

Amortization Relief

The **Minimum Funding Amortization Bases** topic in the Asset & Funding policy contains a new option to **Elect 431(b)(8)(A) Amortization Rule**. If this option is selected, the **Params…** button will unghost to allow input of elections with respect to this relief.

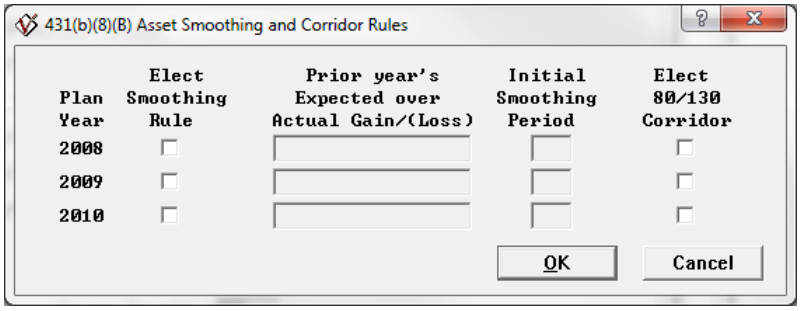


On the 431(b)(8)(A) Amortization Rule dialog box, specify the **Election Year(s)** to which amortization relief should apply and elect either the **Prospective Method** or **Retrospective Method** (both described in Notice 2010-83). Under the prospective method, specify the eligible net investment lost (**ENIL**) for each election year. The ENIL is defined as the hypothetical value of plan assets less the projected actuarial value of assets for each future year. These amounts are calculated when relief is elected.

Under the retrospective method, specify the **Total Eligible Net Investment Loss** for each election year and the **Hypothetical Market Assets** as of the valuation date, along with the **Prior year's Accumulated Recognized Eligible Loss** determined in the prior year's valuation. ProVal will then calculate the ENIL to be reflected as an amortization base in each year. The details of the calculation of the Hypothetical Actuarial Assets are displayed in the Development of Actuarial Assets Exhibits and the calculation of the ENIL is displayed in the Funding Amortization Bases (Development of Minimum Bases Amortization in a forecast) Exhibit.

Asset Relief

The **ERISA Asset Valuation Method** topic in the Asset & Funding policy contains a new option to **Elect 431(b)(8)(B) Asset Rules**. If this option is selected, the **Asset Rules Params…** button will unghost to allow input of elections with respect to this relief.



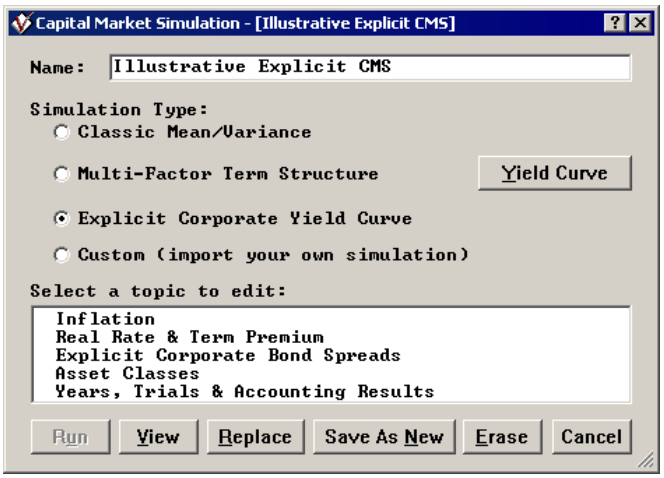
On the 431(b)(8)(B) Asset Smoothing and Corridor Rules dialog box, specify the Plan Years for which **Elect Smoothing Rule** applies, and provide the **Prior year's Expected over Actual Gain/(Loss)** to be smoothed along with the **Initial Smoothing Period** (up to 10 years).

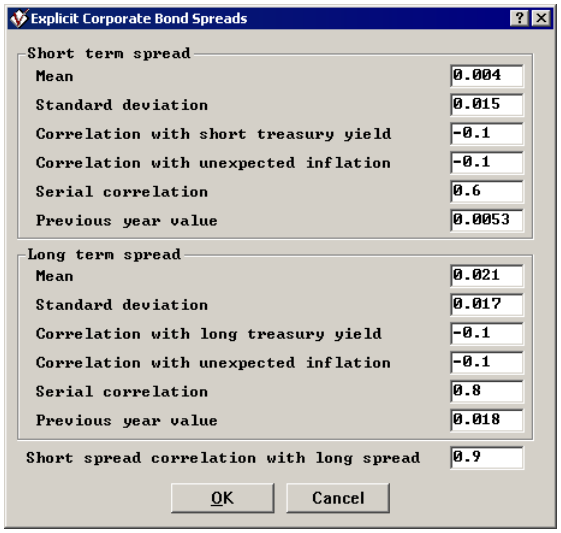
For each Plan Year, independently specify whether **Elect 80/130 corridor** applies. This corridor will be applied only for the elected year(s), in lieu of the corridor otherwise indicated on the ERISA Asset Valuation Method dialog box. In addition, ProVal will establish an amortization base reflecting this relief for a period of 10 or 30 years, depending on whether 431(b)(8)(A) relief is also elected. The calculation of the assets prior to relief is detailed in the Development of Actuarial Assets Exhibit and the calculation of the amortization base established is detailed in the Funding Amortization Bases (Development of Minimum Bases Amortization in a forecast) Exhibit.

Forecasting Enhancements

ProVal version 3.02 includes several forecasting enhancements for plans that measure their obligations using a yield curve. There is a new capital market simulator which generates a full corporate bond curve (which may be used as the basis to price both liabilities as well as assets during a forecast); stochastic forecasting can now reflect non-parallel shifts to the yield curve; and the Forecast Yield Curves library can now support the entry of a full yield curve rather than just segment rates or bendpoints.

Explicit Corporate Yield Curve Simulator





ProVal has a new Capital Market Simulator called the Explicit Corporate Yield Curve. It is an extension of the Multi-Factor Term Structure simulator, and should typically be used when corporate bond yields are used to measure plan liabilities. The new simulator will generate a set of nominal yields on corporate bonds ranging from 1-year to 30-year maturities (aka a corporate yield curve) that's internally consistent with the current Treasury bond yield curve.

The corporate curve is created by adjusting the underlying Treasury curve by a series of spreads. The spreads mainly represent the additional borrowing cost that the bond market imposes on borrowers with lower credit quality than the government securities of identical maturity. There are 13 new parameters required to calibrate the new simulator, all dealing with these credit spreads. There is a series of parameters controlling the 1-year or short term spread and another series controlling the 30-year or long term spread.

Note that, in all cases, the spreads cannot fall below zero; that is, corporate yields are deemed to always be greater than the yield of the corresponding government bond.

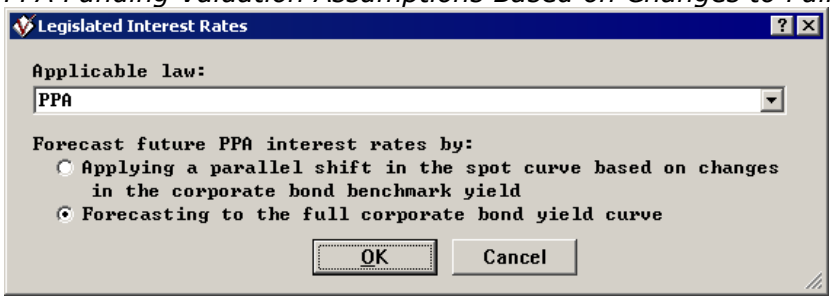
The new simulator will also calculate and store nominal returns based on changes in the 1-year and 30-year corporate bond yields. These reference returns may subsequently be used to define asset class returns in the same way that government bonds are currently available. This allows you to establish asset classes whose returns are consistent with the changes in corporate bond yields.

A sample Explicit Corporate Yield Curve ("Illustrative Explicit CMS") is now included when you create a new ProVal client. It is provided to reveal the nature of the new inputs and give you a better understanding of how to parameterize the new simulator. The simulation and the underlying parameters are not intended for production work and should not be considered reasonable or appropriate for any purpose other than educating users about the software. To access the sample simulation, create a new ProVal client and Unhide the entry from the Capital Market Simulation Library.

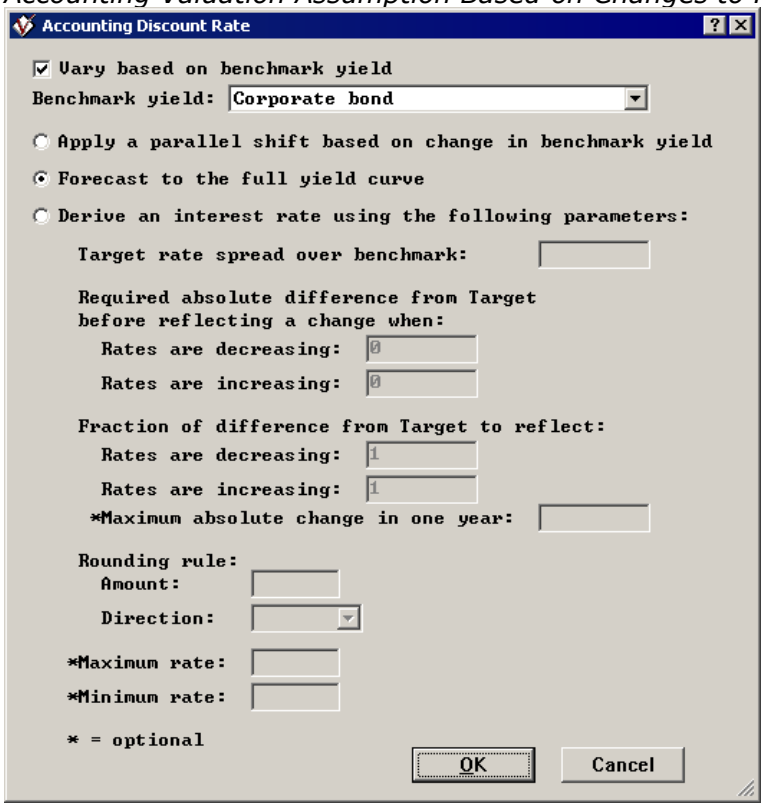
Yield Curve Forecasting

In ProVal version 3.01, the methods for forecasting future valuation interest rates in a Deterministic Forecast were expanded to include forecasting to a yield curve that is not a parallel shift from the original valuation interest rate assumption. Version 3.02 extends this functionality to stochastic forecasts, where future valuation assumptions may now be based on a yield curve generated by a capital market simulation.

PPA Funding Valuation Assumptions Based on Changes to Full Yield Curve



Accounting Valuation Assumption Based on Changes to Full Yield Curve



The Forecast Yield Curve Library was created in version 3.01 to allow you to create forecast yield curve assumptions that may subsequently be referenced in Deterministic Assumptions. The yield curves that were available to be defined were either segment rates, or in the case of a full yield curve, a curve that was fit to (up to) three defined bendpoints. In version 3.02 this functionality has been extended to allow the input of rates at every duration. So for example, a specific yield curve that was generated in the capital market simulation can now be saved into the Forecast Yield Curve library for use in a Deterministic Forecast. (To do this, use the Populate with Stochastic Trial feature when creating Deterministic Assumptions.)

Determination of PPA segment rates

ProVal determines PPA segment rates directly from forecast yield curves. Various averages and phase-ins are used to reasonably model what happens in real life.

To approximate the 24-month historical average of yield curves, ProVal uses the trapezoidal rule (one quarter of year t-2 rate, plus one half of year t-1 rate, plus one quarter of year t rate). (If a full yield curve is used instead of segment rates, the full corporate bond yield curve from the CMS will be used directly, as 24-month averaging and look back periods do not apply.)

To derive segment rates from the (24-month average) yield curve, ProVal averages rates at integer durations only, excluding ½-year durations that the IRS uses (for the simple reason that ProVal's CMS only simulates yields at integer durations). Thus, the first segment will be the average of durations 1 through 5; the second segment will be the average of durations 6 through 20; and the last segment will be the average of durations 21 through 60.

To accommodate look back periods, ProVal uses a phase-in from the initial valuation assumptions to the forecast assumptions, as described below.

Thus, ProVal will determine the segment rates in each year as follows:

At time 0, ProVal will use the segment rates that the user input in valuation assumptions. These presumably reflect a 24-month average of historical corporate bond yield curves and possibly a look back.

At time 1, the CMS produces a yield curve. ProVal will average rates from the yield curve to produce preliminary segment rates at time 1. The final PPA segment rates at time 1 will use ¼ of the preliminary segment rates at time 1 plus ¾ of the segment rates at time 0.

At time 2, the CMS produces a yield curve. ProVal will average rates from the yield curve to produce preliminary segment rates at time 2. The final PPA segment rates at time 2 will use ¼ of the preliminary segment rates at time 2 plus ½ of the preliminary segment rates at time 1 plus ¼ of the segment rates at time 0.

At time 3, the CMS produces a yield curve. We will average rates from the yield curve to produce preliminary segment rates at time 3. The final PPA segment rates at time 3 will use ¼ of the preliminary segment rates at time 3 plus ½ of the preliminary segment rates at time 2 plus ¼ of the preliminary segment rates at time 1. At this point (and for all future forecast years) the phase out of the valuation assumption is complete and only CMS-produced yield curves enter into PPA segment rates.