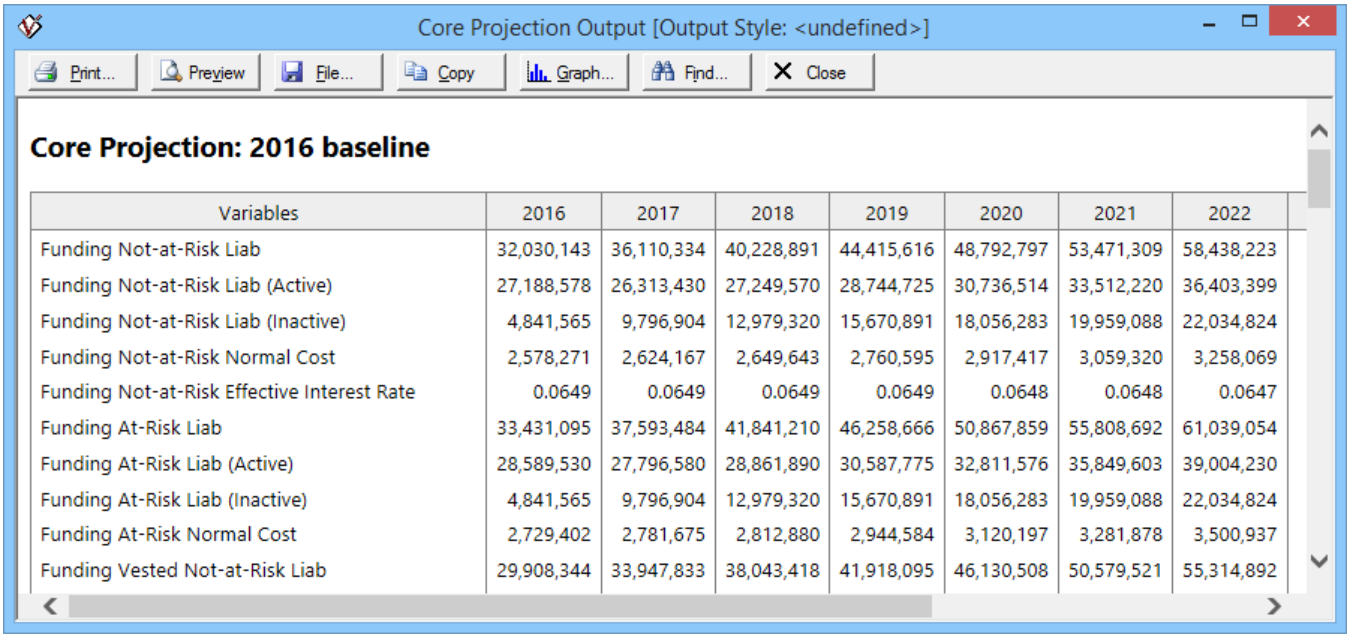
What's New in version 3.10 March 2017

ProVal version 3.10 introduces formatted output, hyperlinks in sample lives, turnkey capital market simulations, revised GASB 68/75 accounting, and many other features listed below.

Interface

- **Formatted output.** Sample lives, custom output (Output pane), exhibits, and summary output (View button within a run) are now formatted to make them more visually appealing and easier to read.



Core Projection: 2016 baseline

Variables	2016	2017	2018	2019	2020	2021	2022
Funding Not-at-Risk Liab	32,030,143	36,110,334	40,228,891	44,415,616	48,792,797	53,471,309	58,438,223
Funding Not-at-Risk Liab (Active)	27,188,578	26,313,430	27,249,570	28,744,725	30,736,514	33,512,220	36,403,399
Funding Not-at-Risk Liab (Inactive)	4,841,565	9,796,904	12,979,320	15,670,891	18,056,283	19,959,088	22,034,824
Funding Not-at-Risk Normal Cost	2,578,271	2,624,167	2,649,643	2,760,595	2,917,417	3,059,320	3,258,069
Funding Not-at-Risk Effective Interest Rate	0.0649	0.0649	0.0649	0.0649	0.0648	0.0648	0.0647
Funding At-Risk Liab	33,431,095	37,593,484	41,841,210	46,258,666	50,867,859	55,808,692	61,039,054
Funding At-Risk Liab (Active)	28,589,530	27,796,580	28,861,890	30,587,775	32,811,576	35,849,603	39,004,230
Funding At-Risk Liab (Inactive)	4,841,565	9,796,904	12,979,320	15,670,891	18,056,283	19,959,088	22,034,824
Funding At-Risk Normal Cost	2,729,402	2,781,675	2,812,880	2,944,584	3,120,197	3,281,878	3,500,937
Funding Vested Not-at-Risk Liab	29,908,344	33,947,833	38,043,418	41,918,095	46,130,508	50,579,521	55,314,892

Tables in formatted output feature **automatic freezing of column headings** when scrolling:

Year	Member Age	Service from Hire	Retirement Probability	Termination Probability	Death Probability	Disability Probability	Survival Probability
2052	63	42	0.249478	0.000000	0.003657	0.000000	0.746865
2053	64	43	0.249433	0.000000	0.003972	0.000000	0.746595
2054	65	44	1.000000	0.000000	0.000000	0.000000	0.000000

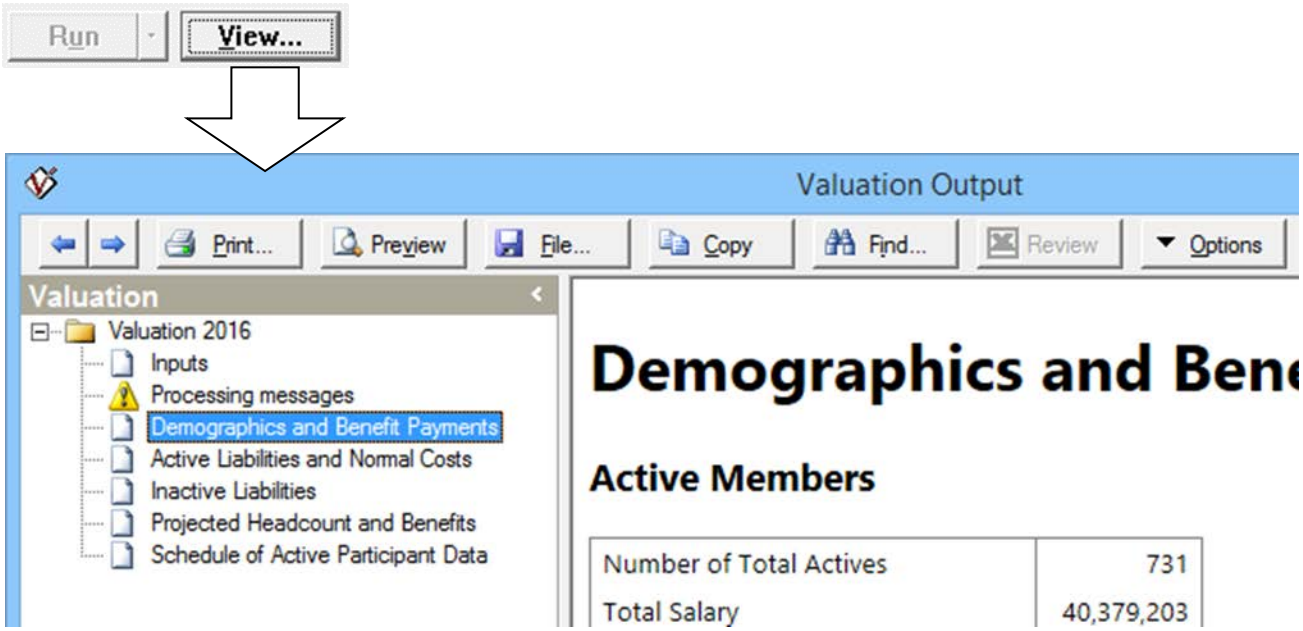
Also, **copy and paste** (using Ctrl+C) preserves formatting and lets you paste multiple values into Excel without the need to parse text into columns. (Note that the Copy button, which copies the entire report to the clipboard, remains unchanged and does not include formatting.)

- **Hyperlinks in sample lives.** Links now appear in column headings of many sample life reports (e.g., components in a benefit formula), to let you instantly drill down for more detail without having to find the report in the tree.

Year	Age	Valuation Salary	NRBFT Component	ERF Component	Formula Benefit
2010	21	30,511.63	173.82	0.550000	95.60
2011	22	32,526.92	631.49	0.550000	347.32

The back (and forward) button  lets you easily get back to reports you visited, e.g., before clicking a link.

- **Tree in summary output.** Summary output (View button within a run) now uses a tree to let you easily navigate among sections of the output. All summary output is shown automatically – you no longer have to preselect sections you want to see. Customizations, such as selecting inputs, are still available using the Options button.



When Processing Messages contain warnings, a ⚠ appears beside it as a visual clue that there's something important to read.

In addition, for Valuations and Valuation Sets, summary output is now presented in a table, rather than with "label . . . value" formatting. This means it saves (and copy and pastes) to Excel without the need to parse text into columns. Also, numbers are now right-aligned instead of left-aligned, making it easier to compare numbers of varying magnitude.

Forecasting

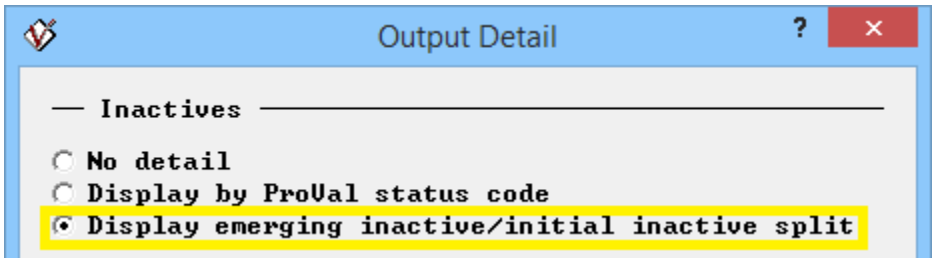
- **Turnkey capital market simulations** are now available (for an additional cost) from WinTech in partnership with Ortec Finance. If you haven't offered stochastic forecasting to your clients because of the hurdle of simulating capital markets, these simulations may be perfect for you. They include:
  - 20 years and 2,000 trials of inflation, full government and corporate yield curves, and 12 pre-selected asset classes.
  - Documentation which details the underlying capital market assumptions and related methodologies, suitable for sharing with your clients and/or incorporating into your work products.

  Please contact us with any questions, or to arrange a 14-day free trial.

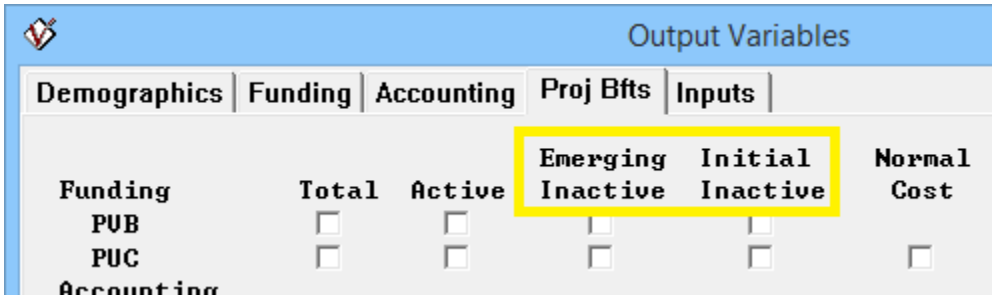
- **Inactive splits in cores.** In core projection output, inactive results can now be split between emerging inactives and initial inactives. This applies to both liabilities and projected benefit payments. Previously, emerging inactives were added in with inactives for liabilities and added in with actives for projected benefit payments.

  In addition, projected benefit payments are now scaled in the same way as the corresponding liability so that they can be directly compared. Note that splits for projected benefit payments require running the core projection in 3.10 or later.

  - In pension modes, an option under Details lets you view the splits.



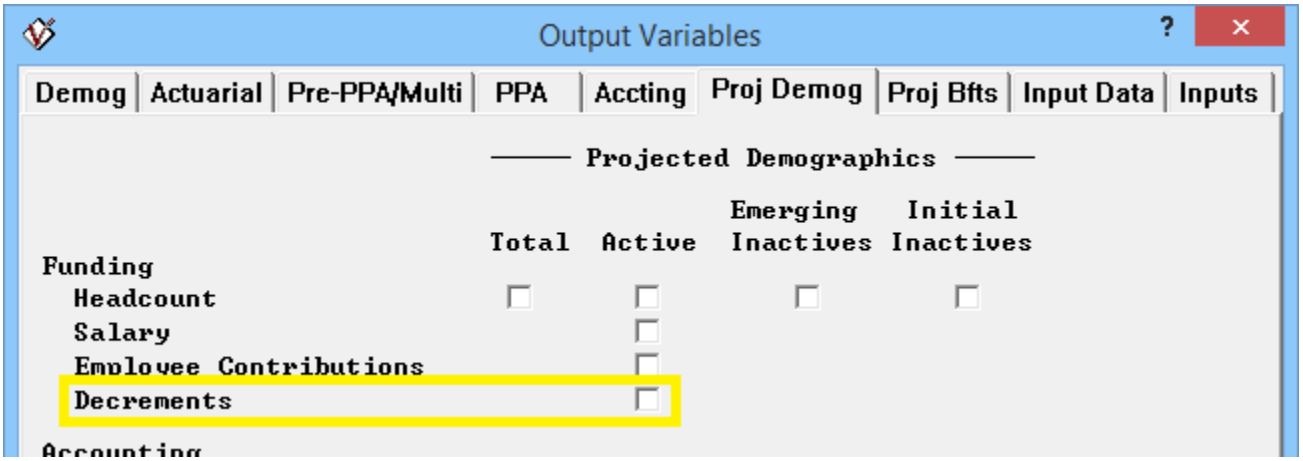
  - In OPEB mode, new checkboxes let you split inactive projected benefit payments by emerging inactive and initial inactive. (These splits were already available for OPEB liabilities.)



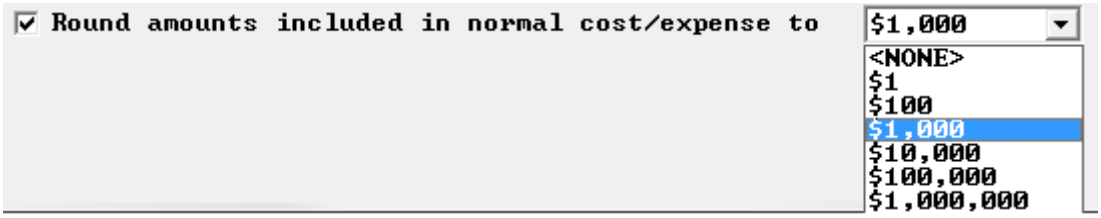
- When saving Stochastic Forecast trial detail (to a .csv file), the valuation date, measurement date, and name of capital market simulation are now included in the file header.

All Plans

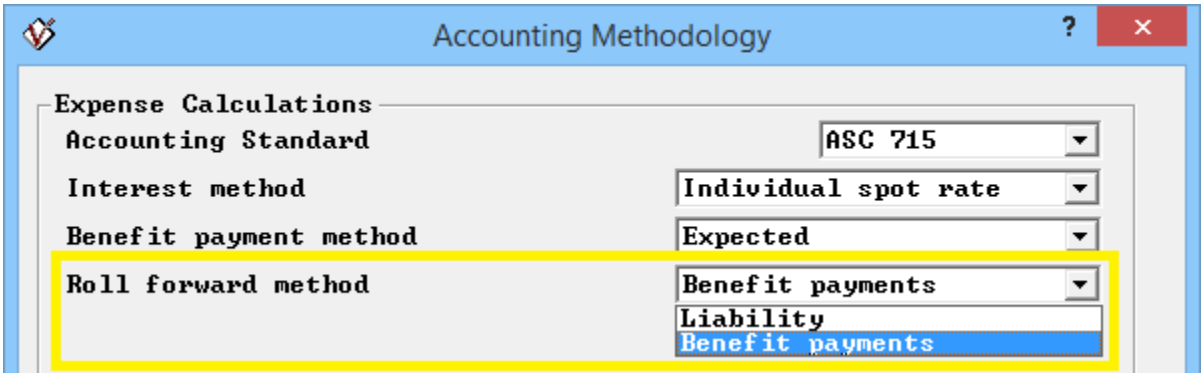
- **Projected decrements.** In Valuation Output, the number of actives exiting due to retirement, termination, disability, and death is now available on a valuation assumption basis (separately for funding and accounting). Previously, projected decrements were only available in Core Projections on an experience basis.



- **Expense load rounding.** A new rounding option in Asset & Funding Policies lets you round the expense load on normal cost separately from other elements. In addition, $10,000 and $100,000 have been added as rounding options.



- **Accounting roll forward methods.** If you are using the Individual Spot Rate interest method and the accounting measurement date is after the valuation date, you can now choose the method to roll forward to the measurement date.



  - If you choose "Liability", the liability is rolled forward as in previous versions of ProVal. First, the liability is rolled forward based on the traditional actuarial technique:

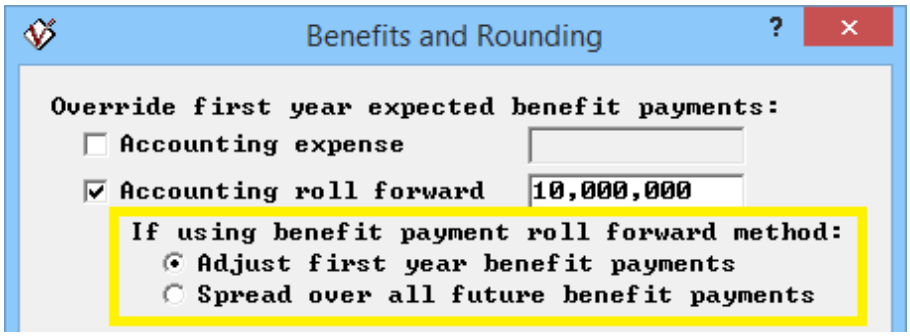
    PBO at end of year = (PBO+SC)×(1+i) - BPs×(1+i)^1/2

    Then, the percent change in liability is applied to the corresponding benefit payment stream to get the projected benefit payments at the measurement date.

  - If you choose "Benefit payments", the benefit payment stream is rolled forward first. Then, the liability at the measurement date is determined by discounting the resulting stream.

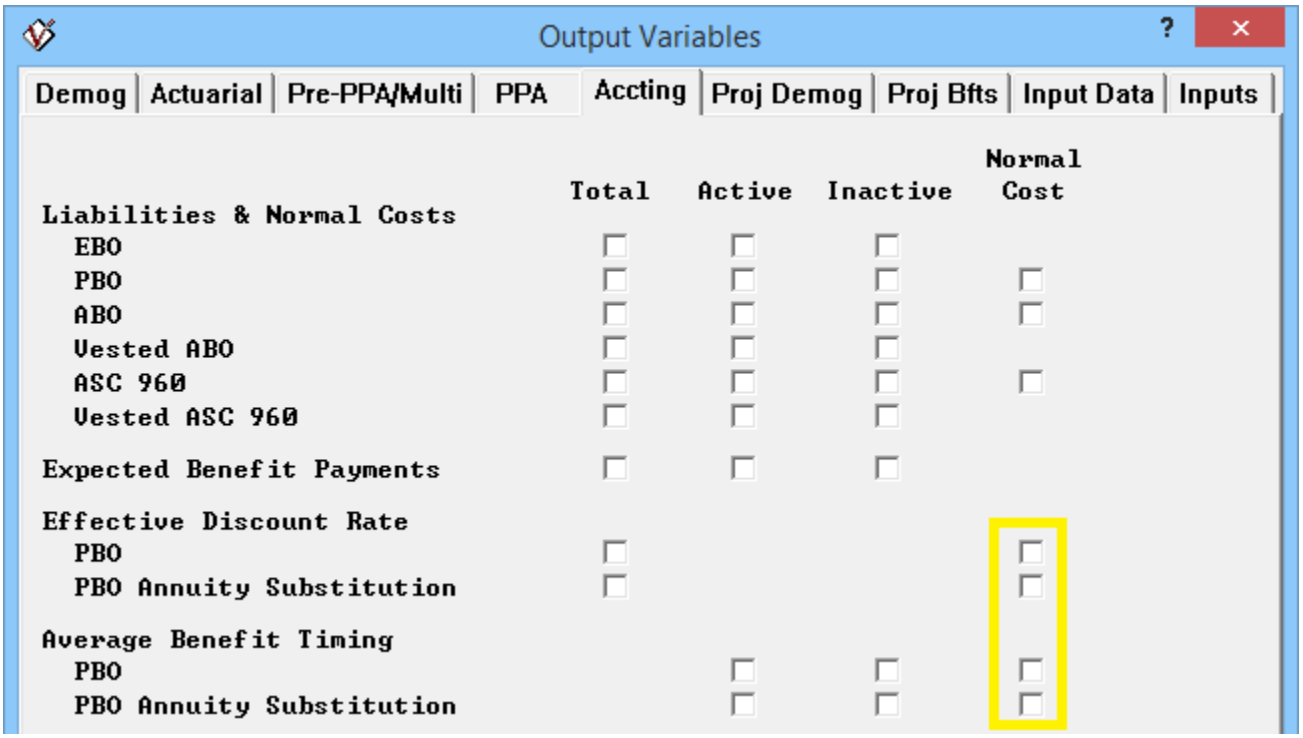
    A new exhibit "Measurement Date Benefit Payments" has been added to Valuation Sets and Forecasts when using the "Benefit payments" method. This exhibit details the benefit payments underlying the PBO and PBO normal cost.

    You can also select how to use the first year benefit payment override in rolling forward benefit payments. You can either adjust the first year (the default) or spread over all future payments (e.g., might be appropriate if a plan pays a large percentage of lump sums but the valuation assumes a large percentage of annuities). Note that the benefit payment override is expected to be an annualized amount.



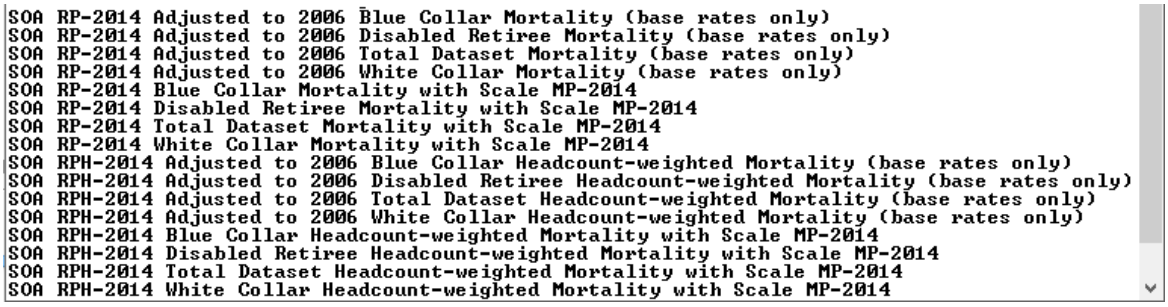
For more, see Accounting Roll Forwards on page 11.

- **Effective Discount Rate and Average Benefit Timing** are now available in Valuation and Core Output for the PBO/APBO and PBO Annuity Substitution normal cost.



US Qualified Pension Plans

- **SOA mortality improvement scale MP-2016** has been added to ProVal's Mortality Improvement Scales library. To use MP-2016 in one of the ways published by the SOA:
  - Create a new, blank Mortality Rates table
  - Check "Link mortality base rates" and draw rates from one of the eight "SOA RP-2014…" or eight "SOA RPH-2014…" tables.

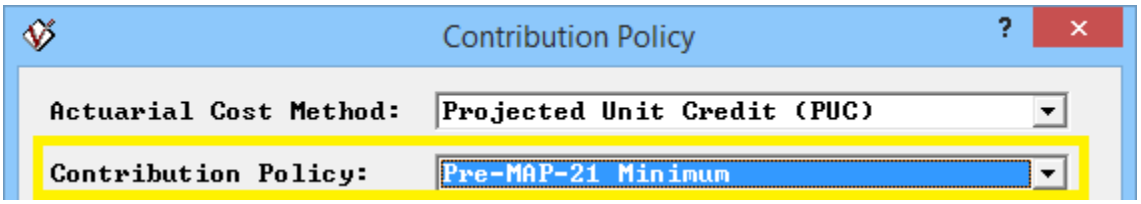


  - Check "Apply Improvement Scale" and select SOA Scale MP-2016.
  - Specify the base year corresponding to the base rates you picked, either 2006 for the "… Adjusted to 2006 …" tables or 2014 otherwise.
  - Name the table and save it.

  Alternatively, you can import the desired table from the MP-2016 Mortality Tables Template available on our website.

  Note that the eight mortality tables which are adjusted to 2006 (base rates only) *should not be used directly.* They are provided only as a source table from which the *Link base rates* feature can draw relevant mortality base rates.

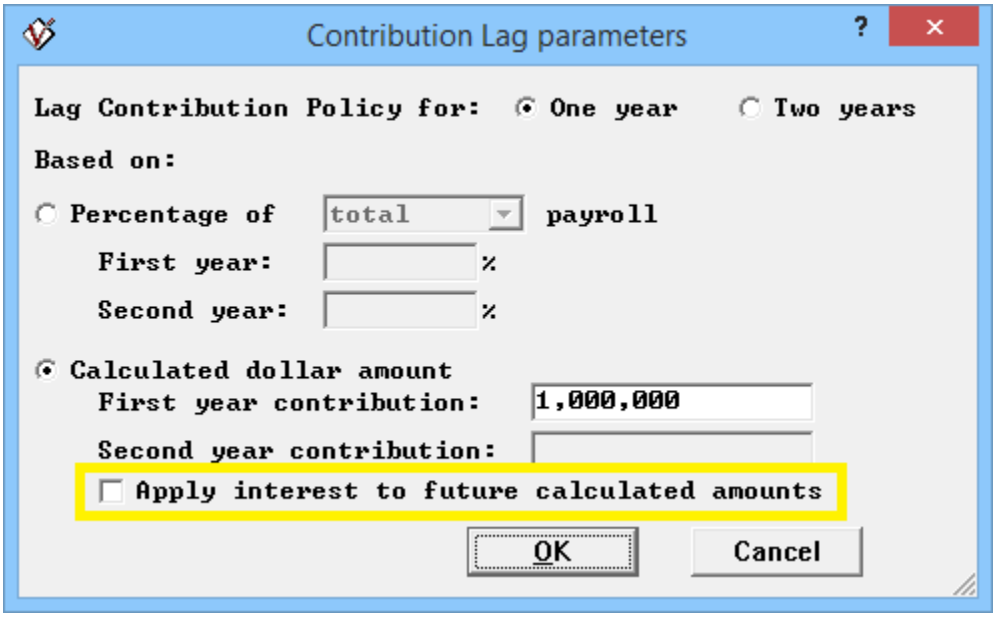
- **Pre-MAP-21 Minimum Contribution.** A new "Development of Pre-MAP-21 Minimum" exhibit calculates the minimum contribution with Pre-MAP-21 rates as required for Annual Funding Notices. The Pre-MAP-21 Minimum is also available as a contribution policy.



- **Avoiding 4010 reporting.** A new End of Year Additional Contribution option lets you avoid 4010 reporting by meeting an 80% Max Tax UC Not-At-Risk funded ratio in addition to another metric.
- New vested inactive liabilities have been added for Vested ASC 960, Vested ABO, and Vested RPA Current Liability to allow for more cases where the vested inactive liability doesn't match the inactive liability. In addition, the option in Inactive Benefit Definitions to "exclude from vested liabilities" has been generalized to exclude from all vested liabilities. This includes the Multiemployer Vested liability.

US Public Pension Plans

- **GASB 68/75 modifications.** ProVal's expense methodology has been modified to be in compliance with Implementation Guide 2015-1 question 5.142.6. Asset and liability gains and losses are now calculated at the end of the measurement period, not the beginning of the period, and actual benefit payments, contributions, and expenses are reflected instead of their respective expected amounts.
- **Experience employee contribution override.** The first year experience employee contribution amount can be overridden in the Asset & Funding Policy > Forecast Analysis topic. For GASB 68/75, this enhancement avoids having to scale results to get both the correct service cost (offset by expected employee contributions) and expected return on actual employee contributions. This feature is available in all pension modes except German.
- **Contribution lag without interest.** When lagging the application of a contribution policy based on a dollar amount, you can now carry it forward *without* interest by unchecking this box.



Canadian Registered Pension Plans

- **Expected future service on a funding basis.** Average and total expected future service is now available from funding Valuations and Core Projections. This feature is also available in U.S. Public Pension, Universal Pension, and U.K. Pension modes.

German Pension Plans

- **Risk benefits – Rückrechnungsmethode.** A new option in Valuation Assumptions > Decrements lets you compute risk benefits (death & disability) using the Back-calculation method, in other words, on the same dates as old age retirement benefits rather than averaged at mid-year.
- **Tax rules for orphan benefits.** Tax valuations now reflect special rules for inactive orphan records:
  - If the orphan is younger than the "normal age" (e.g., 18), value a temporary annuity to the normal age
  - If the orphan is older than the "normal age", value a 1-year temporary annuity.
  - If the orphan is older than 25, value no benefits.

  Inactive orphan records (and their normal age) are identified in Census Specifications > Inactive Data.
- **Selectively including benefits in tax liability.** A new checkbox in active and inactive Benefit Definitions lets you specify whether the benefit should be included in the tax liability (Teilwert). For example, death benefits for female employees might be excluded if they are not explicitly stated in the legal benefit promise, regardless of whether they are paid in practice.
- **Individual method for spouses.** A new checkbox in Census Specifications lets you apply the Individual Method for Spouses if the spouse date of birth is available. Look for the checkbox in the Active Data, Terminated Vested Data, and Inactive Data topics.

Austrian Pension Plans

- **Gegenwartswert.** Unchecking "Apply German statutory rules" in German Valuation Assumptions has been extended to more calculations to be consistent with Austrian valuation methods. These changes were released as updates to version 3.09, but mentioned here in case you missed them.
  - For Jubilee benefits, these German rules do not apply:
    - 1992 Teilwert adjustment
    - Exclusion of members with less than 10 years of Benefit Promise Service
    - Exclusion of benefits with eligibility of less than 15 years
    - Use of rounded, rather than exact, ages
  - For Teilwert, the result of subtracting Transfer Value from PVBe is not limited to zero.
  - The Gap calculation (difference between Teilwert and Tax Reserve) is omitted.

Swiss Pension Plans

- **Asset transfers for new entrants.** In Core Projections, the new entrant parameters now include an optional asset transfer amount to be added to the plan's assets at entry. This lets you model new entrants that transfer from another plan with both a liability and an asset. A new topic was added to the Increase & Crediting Rates of Projection Assumptions that allows you to define the rate at which the asset transfer amount is assumed to increase to future entry dates. This feature is available in all Pension modes.
- **Funding reserves.** A new checkbox in active and inactive Benefit Definitions lets you value a benefit as a funding reserve. That is, only include it in funding liabilities, with no impact on accounting liabilities or experience payouts.

OPEB Plans

- **Fraction married by coded field.** The fraction married can now be entered as a "table". Under "table", the fraction married can be specified either by a single table (for example, variable by age) or as <varies by coded database field>. These options appear in both the Valuation Assumptions and Projection Assumptions in OPEB mode (pension modes already had them).

Pension Plans

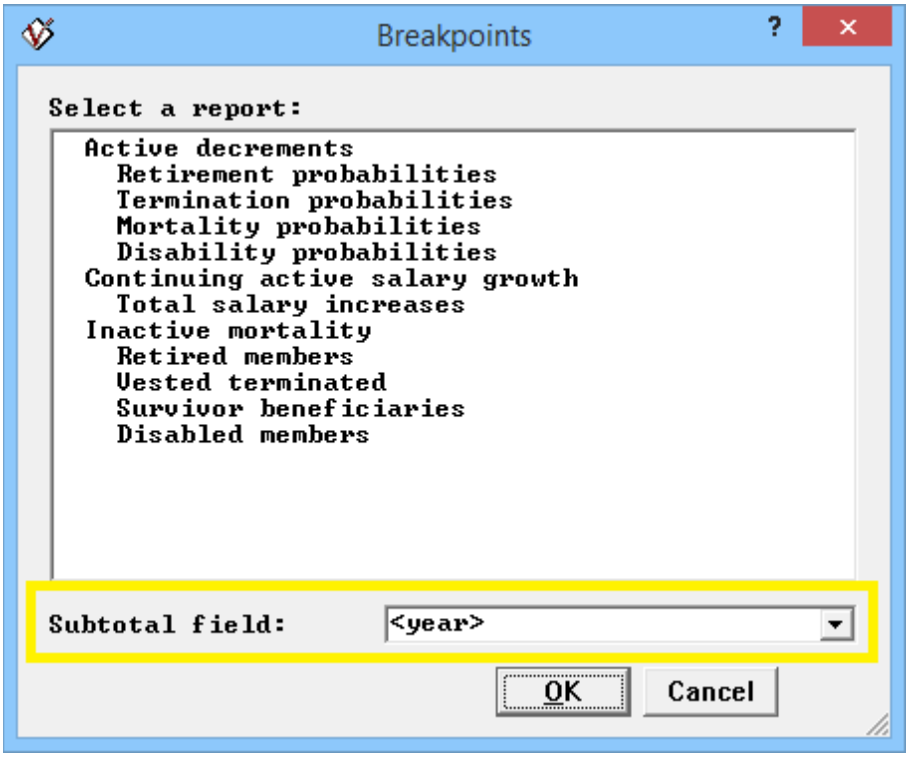
- For U.S. Covered Compensation custom operators, users can now specify how many years prior to decrement wage bases should be frozen.
- For post-decrement death benefit payment forms, you can now specify when coverage commences. This allows you to split the spouse benefit into different coverage periods, e.g., one for deaths before age 65 (coverage ceases at age 65) and another for deaths on or after age 65 (coverage commences at age 65).

Gain/Loss Analysis

- The gain/loss for decrements is now shown separately for Active and Vested Valued Through Active members. This makes it easier to analyze and explain the gain/loss for these participants.

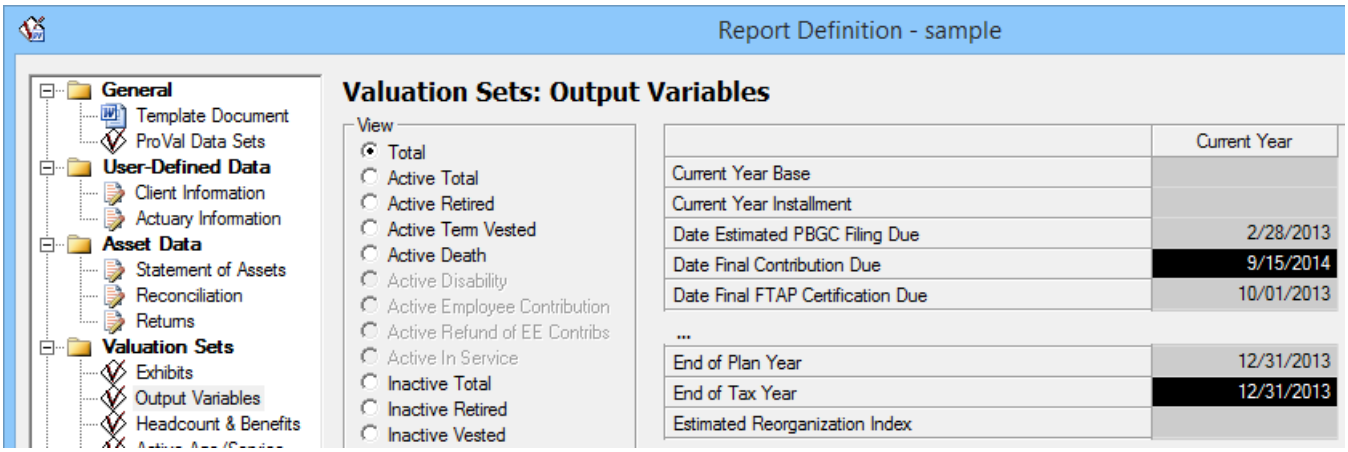
Experience Studies

- **Year by year results.** You can see year-by-year results by selecting <year> as the subtotal field.



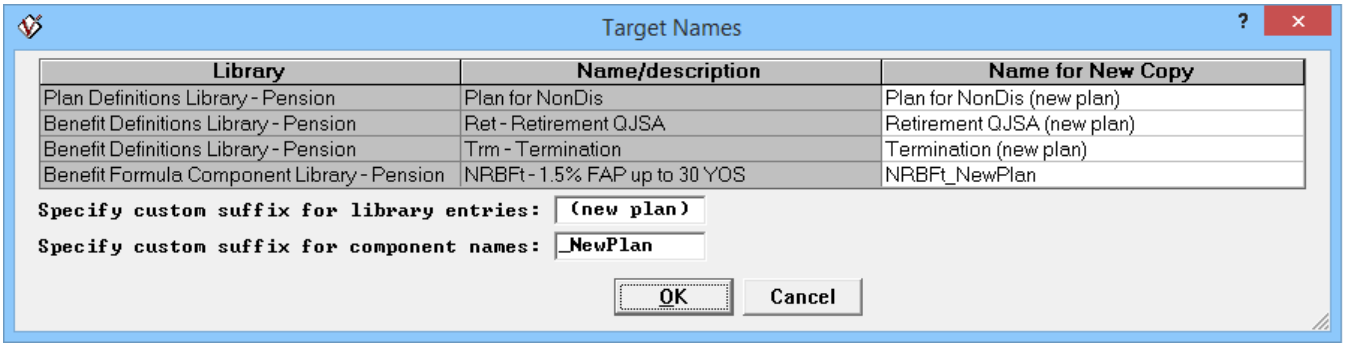
Report Writer

- In the report writer for US Qualified plans, the Valuation Set output variables now include two additional dates: when the final contribution is due and the end of the tax year.



System

- **Custom suffixes for deep copy.** You can now supply your own custom suffix in deep copy, for example, " (new plan)" instead of " #2" for library entries and "_NewPlan" instead of "_2" for components.



- **Faster Browse button.** In File > Open Client, the Browse button now launches instantaneously, rather than having a multi-second lag on first invocation.
- **Saving sample life reports**
  - Saving lots of sample life reports to Excel is now *much* faster – on par with saving to comma delimited (*.csv) files.
  - There is now a single header at the top of the file and single header at the bottom of the file. Previously, the header and footer were repeated for each report (plus the cover page).
- The "error paginating table" message has been eliminated and pagination improved. When a table would otherwise be too wide, ProVal now suppresses row titles if they won't fit on the page and spreads columns that are wider than the page onto multiple pages.
- Batch runs will no longer abort because of errors related to irrelevant Custom Regulatory data.
- In the Custom Regulatory Table Library, a type column has been added so you can easily distinguish between compensation and wage base entries.
- When using the populate button in Valuation Assumptions, Projection Assumptions or Core Projections, you can now select Name to be populated, in which case the name will be "Populated from…" and end with the name of the copied entry.

Website

- A knowledge base on resolving installation and system issues is now available on our website at http://www.winklevoss.com/knowledge-base/ (Support > Knowledge Base).

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.

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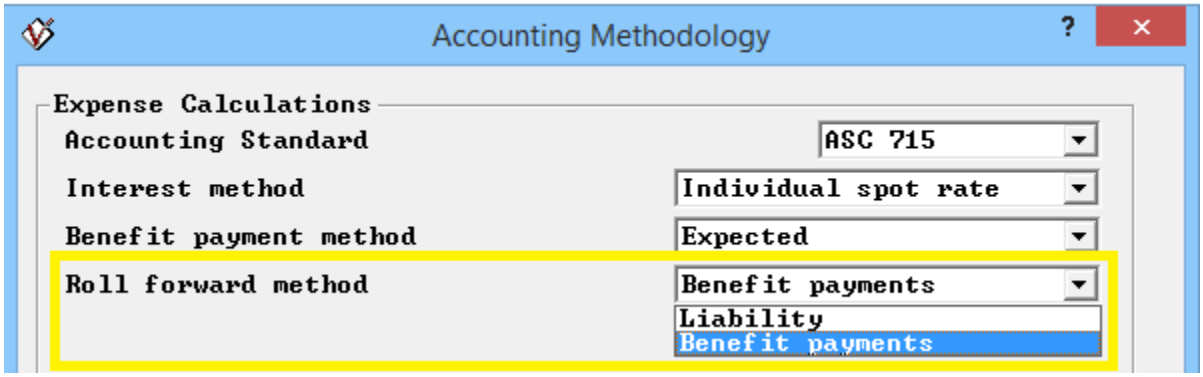
Accounting Roll Forwards

This enhancement adds a new option for performing the roll forward when using the spot rate interest method under the ASC 715 & IAS 19 accounting standards.



Previously, accounting roll forwards always used the "liability" method. Under this method, the liability is rolled forward based on the traditional actuarial technique:

PBO at end of year = (PBO+SC)×(1+i) - BPs×(1+i)^1/2

Then, the percent change in liability is applied to the corresponding benefit payment stream to get the projected benefit payments at the measurement date.

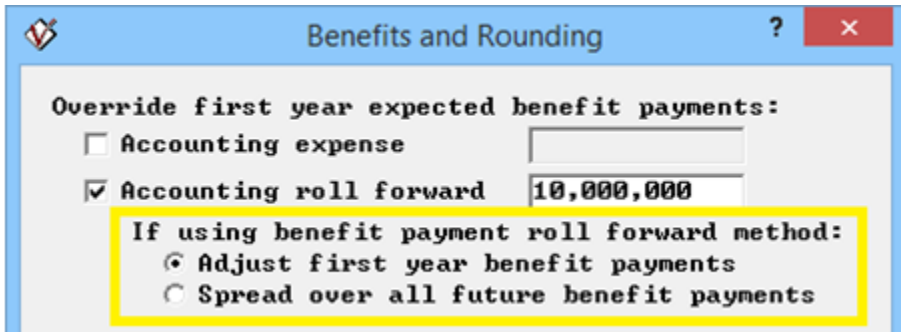
The new roll forward method is "benefit payments". Under this method, ProVal first rolls forward the underlying projected benefit payment streams to the measurement date. These measurement date benefit payment streams are then discounted to calculate the PBO and PBO NC as of the measurement date, and, these streams are also used to determine the interest on the PBO and PBO NC for purposes of expense.

Benefit Payment Roll Forward

The following formula is how ProVal rolls forward the PBO projected benefit payments from the valuation date to the measurement date. Let z=fraction of year between valuation date and measurement date (i.e., ((md – vd)/365)), assuming year has 365 days), then:

BPt+z = {(BPt × (1 – z)) + (BPt+1 × z)} + {[(BPNCt × (1-z)) + (BPNCt+1 × z)] × z}

The benefit payment stream is further refined if you have specified an accounting roll forward override for the first year expected benefit payments. (If no override is entered, no adjustment is necessary). ProVal supports two options:



Adjust first year benefit payments: This is the default setting. Only BP0+z reflects an offset. The offset is:

[(AFP BPs to be used for roll-forward) – ((BP0 + BPNC0) × z)]

Spread over all future benefit payments: Cash flows in all years reflect an offset. The offset is:

$(BPt+z \div \sum_{0+z=z}^{\infty} BP_{0+z}) \times$

[(AFP BPs to be used for roll-forward– ((BP0 + BPNC0) × z)]

Note: in both equations the AFP BP override will be adjusted as follows: BP override × z × (1+spot0)^-.5. This is consistent with how the override is adjusted when not using the individual spot rate.

PBO & Interest Cost Calculations

The PBO is calculated as of the measurement date by discounting projected benefit payments at the measurement date:

$$\text{PBO} = \sum_{t+z=z}^{\infty} \left(BP_{t+z} \left(\frac{1}{1+spot_t} \right)^{t+k} \right)$$

Assume average payment timing k at measurement date is the same as at valuation date

Calculate Interest on PBO at the measurement date:

$$\text{Interest on PBO} = \sum_{t+z=z}^{\infty} \left(BP_{t+z} \left(\frac{1}{1+spot_t} \right)^{t+k} \times spot_t \right)$$

Interest Cost = Interest on PBO at the measurement date – interest on expected benefits (using spot rate at time 0)

EIR Calculations

ProVal calculates the EIR as of the measurement date, reflecting the PBO and PBO cash flows as of the measurement date.

Service Cost Calculations

ProVal rolls forward the PBO NC projected benefit payments from the valuation date to the measurement date. Let z=fraction of year between valuation date and measurement date (i.e. ((md – vd)/365)), assuming year has 365 days), then:

BPNCt+z = {(BPNCt × (1 – z)) + (BPNCt+1 × z)}

ProVal calculates PBO NC as of the measurement date by discounting projected benefit payments at the measurement date:

$$\text{PBO NC} = \sum_{t+z=z}^{\infty} \left(BPNC_{t+z} \left(\frac{1}{1+spot_t} \right)^{t+k} \right)$$

Assume average payment timing k at measurement date is the same as at valuation date

Calculate Interest on PBO NC at the measurement date:

$$\text{Interest on PBO NC} = \sum_{t+z=z}^{\infty} \left(BPNC_{t+z} \left(\frac{1}{1+spot_t} \right)^{t+k} \times spot_t \right)$$

Service Cost = PBO NC at the meas. date + Interest on PBO NC at the meas. date

Calculation of Other Liabilities at the Measurement Date

- ABO and EBO, for which projected benefit payments are available, are rolled forward in the same manner as described for PBO above.
- Since there are no projected benefit payments available for VBO, the active participant VBO at the measurement date is assumed to remain in the same proportion to the active participant ABO as it bore to it on the valuation date.
- The benefit payment roll forward calculation is not applied to plan change liabilities or assumption change liabilities.
- Component pieces of results at the measurement date are assumed to bear the same relationship to their corresponding result at the valuation date as the total. The benefit

payment roll forward calculations are done in total, and therefore, the split of projected benefit payments between actives and inactives is an estimate.

- Expected benefit payments at the measurement date are assumed to be equal to the first projected benefit payment at the measurement date (as calculated above)
- Other liabilities for which separate projected benefit payments are not available, such as OPEB liabilities for fully eligible participants are rolled forward proportionately in a reasonable manner generally using the closest liability proxy for which the benefit payment roll forward calculation could be applied.
    - As an example, the active fully eligible APBO is determined by first calculating the total APBO at the measurement date, and then assuming that active fully eligible APBO at the measurement date bears the same ratio to the total APBO at the measurement date as it did at the valuation date.
- Employee contributions are approximated at the measurement date by assuming they are equal to the value at the valuation date.