# What's New! ProVal®

## ProVal version 2.26 February 2007

ProVal version 2.26 reflects the new U.S. pension funding rules under the **Pension Protection Act of 2006** and accounting rules under **FAS 158**. You'll find details about these and other enhancements below.

### Pension Protection Act of 2006

- You can now perform valuations and forecasts that reflect the new U.S. pension funding rules, even transitioning from the old rules to the new rules during a single forecast.

See Pension Protection Act of 2006, page 6

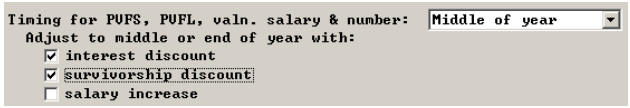
### FAS 158

- Runs can now reflect the FAS 158 accounting standard by selecting the FAS 87/158 or FAS 106/158 accounting methodology.

See FAS 158, page 14

### Public Pension Plans

- Valuation Assumptions now let you control how the Present Value of Future Salaries and Valuation Salary (or Present Value of Future Lifetimes and Valuation Number) are computed. Varying methods are common in the public arena, and the chosen method can have a material effect on Entry Age Normal calculations.




### Canadian Pension Plans

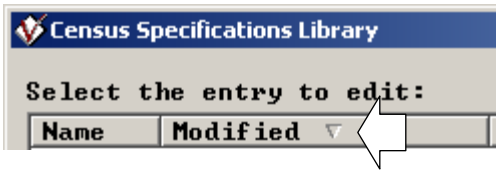
- A new checkbox in Valuation Assumptions lets you directly turn the ITA Maximum Pension limit on and off.

### Valuation & Projection Assumptions

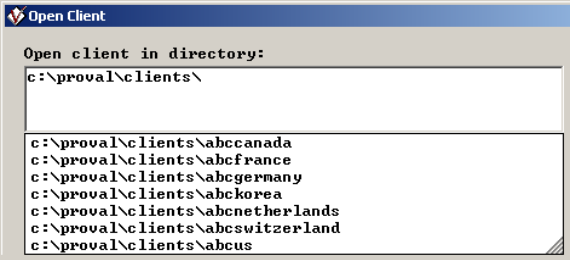
- Assumptions that do not affect results can now be added or changed without deleting results. This applies to the following assumptions:
  - Increase & Crediting Rates
  - Post-decrement Probabilities
  - Lump Sum Interest & Mortality
  - Valuation Assumption Sensitivities
  - Plan Amendments

### Interface

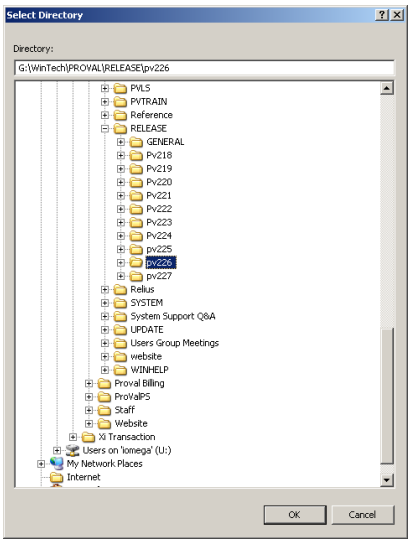
- If you resize a dialog, ProVal now remembers its size for next time. Sizes are user-specific and persist across ProVal clients and sessions.
- ProVal now remembers your preferred sort order. For example, if you sort Valuations by Modified date, then Census Specifications will also be sorted by Modified date. Sorting is user-specific and persists across ProVal clients and sessions.




- ProVal now remembers which entry was selected the last time you visited a library (until you close the client).
- When (only) renaming an entry, ProVal now leaves the modified date unchanged.
- When typing a path name (e.g., to open a client), ProVal now offers an autofill option (i.e., a list of choices consistent with what you've typed.)




- When browsing for a path (e.g., after clicking Browse... to open a client), the window is now taller and wider, making it easier to navigate lengthy paths.




## Sample Lives

- Liability sample life reports (e.g., EAN – Level Percentage, Pure Unit Credit, etc.) are now available for employee contributions, so you can see how the offset to normal cost is developed.
- Entry Age Normal sample life reports are now available in OPEB mode.

## Individual Results

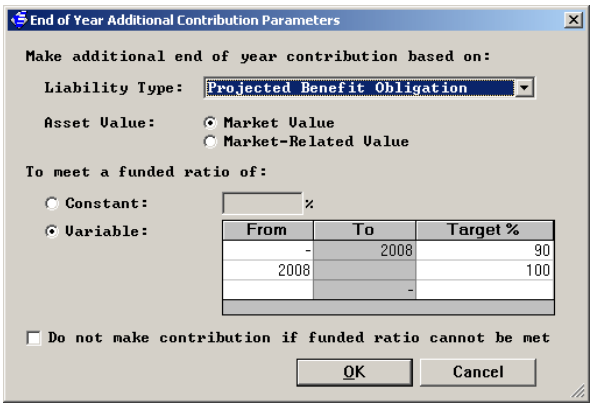
- Before running a valuation, ProVal now asks whether it's ok to overwrite previous individual results to prevent inadvertent changes.
- Individual results parameters are now included when viewing a valuation's parameters. This extends to everywhere this listing is displayed, e.g., List Objects.
- Multiple key fields are now allowed when saving individual results.

## Core Projections

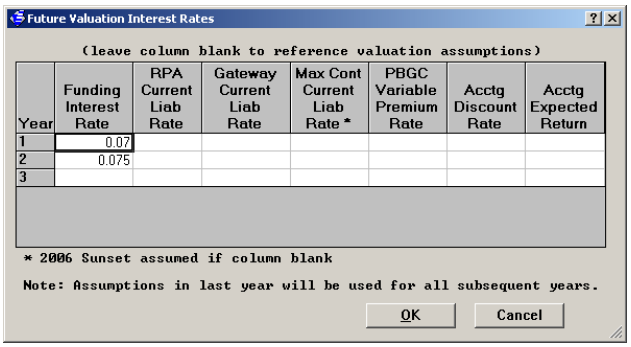
- ProVal now provides a warning if plan amendments are specified for benefits that are not in the selected Plan Definition (these amendments will continue to be ignored).

## Deterministic & Stochastic Forecasts

- In the Asset & Funding policy, a variable funded ratio can now be specified when calculating an end of year additional contribution.

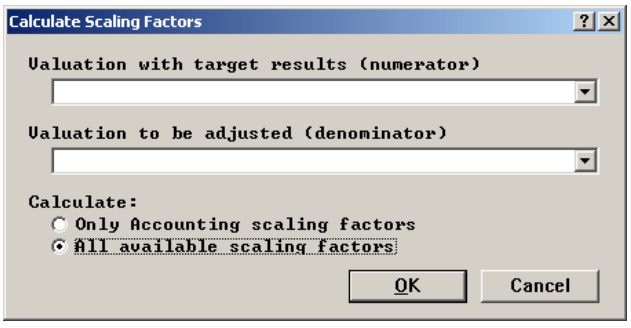



- In Deterministic Assumptions, now only interest rates that differ from the valuation rate need to be entered (previously, if you filled in one rate, you had to fill them all in).




## Scaling Factors

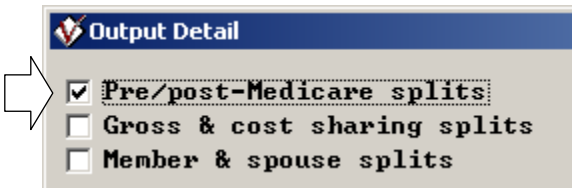
- The calculate button in each scaling factor topic now lets you populate all scaling factors, not just the factors in that topic.



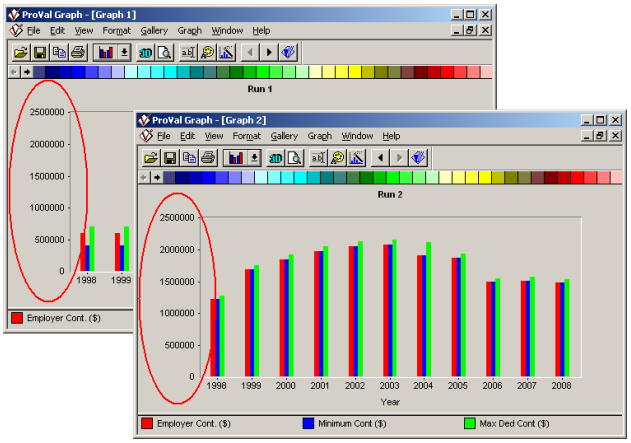

## Output & Reporting

- In OPEB mode, pre/post-Medicare splits are now available in Valuation Output and Core

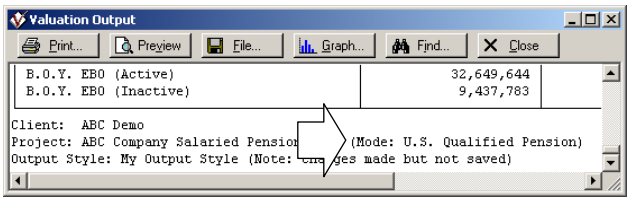
Projection Output (these were previously only available in Execute > Valuation/Core > View).



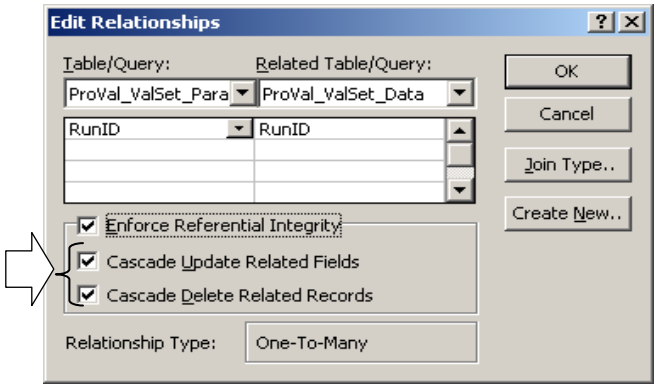

- When creating several charts for the same set of variables, the y axis range is now set consistently on the corresponding charts.




- In output commands, ProVal now denotes the mode if it's ambiguous because you're working within a project.

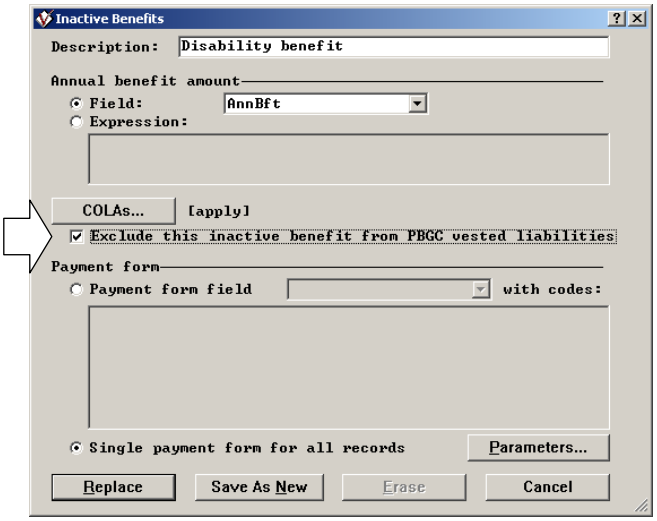



- When saving results to an Access database (through Valuation Set or Deterministic Forecast Exhibits), ProVal now turns on the "cascading" relationship options. This makes it easier to manage databases that contain multiple runs. For example, you can delete a run from the main ProVal_ValSet_Params table and it will be deleted from all other tables in the database.



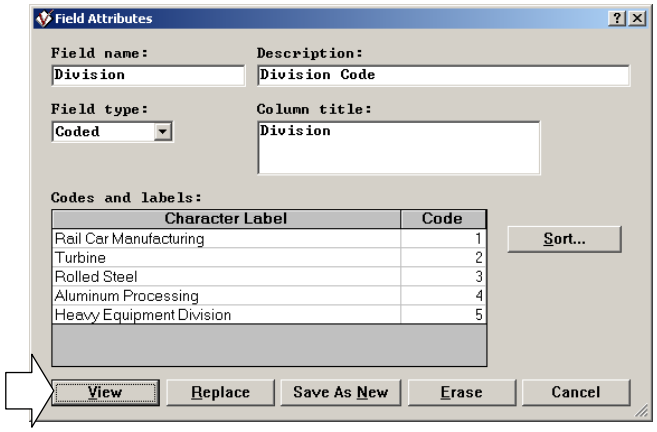

## Inactive Pension Benefits

- In U.S. Qualified Pension mode, you can now exclude selected inactive benefits from PBGC vested liabilities. For example, you might exclude REA death benefits on the grounds that the plan could charge participants for coverage.




## Census Data

- You can now "view" individual fields, rather than having to "view" the entire Data Dictionary. This is especially useful for coded fields with a lot of codes.




- After importing data, the confirmation message now includes the name of the file being imported, the name of the schema (if any), and any Selection Expression used in the import. In addition, the Selection Expression now appears in the Database Properties (along with the file name).

- When saving Frequency Tables to file (e.g., Excel), the client, database, and output style name are also included to make it easier to trace back to the source (similar to how Descriptive Statistics works).

**Gain / Loss Analysis**

- If inactive payment form codes are added in this year's (end-of-year) valuation, you no longer have to edit and rerun last year's (beginning-of-year) valuation before running Gain / Loss Analysis. New inactive payment form codes that are not mapped in Census Specifications will be treated as <not applicable>.

**System**

- When closing a client (or opening another one), ProVal now prompts you to pack the client files if unused space exceeds certain thresholds. For system administrators who would like to use different thresholds than the default (shown below), you can edit provalw.ini and adjust:

  [Config]
  PackPercent=0.2
  PackLow=1000000
  PackHigh=200000000

  In this example, a prompt appears if unused space exceeds 1,000,000 bytes and is more than 20% of the total, or 200,000,000 bytes regardless of the percent of the total.

- Users who have read-only access to a ProVal folder (e.g., through network permissions) are now allowed to use the Change Project / Mode command on the File menu.

- The user name used for the #user keyword in headers/footers, for reporting who has a client open, etc. can be now derived from the Windows login rather than from provalw.ini's "user=" setting. System administrators who wish to utilize this can simply remove "user=" from provalw.ini.

- ProVal API enhancements.

  - The new 'RunVal' function executes a Valuation.
  - The 'ImportCSVData', 'MergeUpdate', and 'RunVal' functions now let you (optionally) ignore certain error codes and continue to completion rather than aborting.
  - The 'PrintData' function now saves "field names" instead of "column titles" in the first row of the exported data file.

  (This was actually released as a special update to version 2.25 but is mentioned here in case you missed it.)

  For more information, see "ProVal API Users Guide.pdf" in the ProVal folder.

- Custom code written by WinTech developers and commissioned by a ProVal user (typically for one-time forecasting projects) can now be run directly by the user.

**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 Members of the ProVal Team

**Joanne Ouchterloney** recently joined the ProVal team. She is an experienced consulting actuary and, among other responsibilities, will be working in WinTech's Virtual Back Office (see sidebar below). Be sure to say hello to her if you reach her at ProVal support.

**Annalisa Davis** recently joined the ProVal team as a client service representative. Among other responsibilities, she will be handling ProVal keys and billing. If you need additional ProVal keys, need a ProVal CD, or have billing questions, Annalisa will be happy to take your call.

## WinTech's Virtual Back Office

Need help bringing up new clients, converting cases, or experienced help in a ProVal area that's new to you? 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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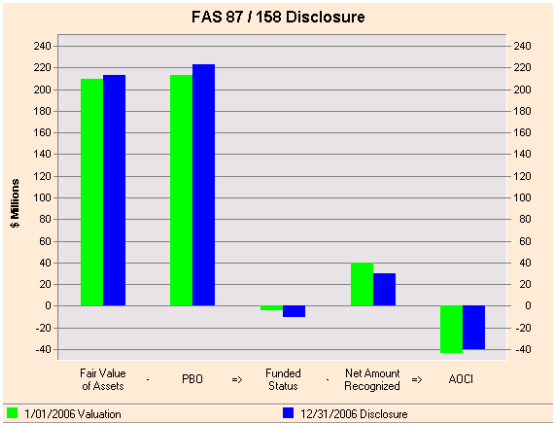
ProVal PS, a desktop toolkit for the financial management of pension and retiree medical plans, now reflects the provisions of the **Pension Protection Act of 2006** and **FAS 158**.

ProVal PS updates are available by using Options > Download Program Updates within ProVal PS.

### Disclosure & Budgeting

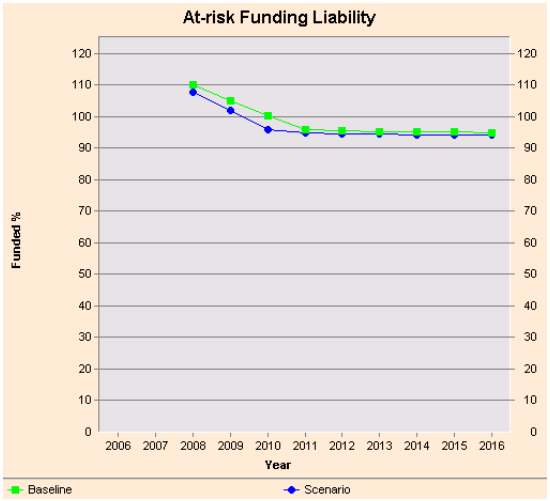
- FAS 158 accounting is now supported in the Disclosure tool. To reflect, when populating ProVal PS, select a forecast that includes the "FAS 87/158" or "FAS 106/158" accounting methodology in the Asset & Funding Policy.




- PPA is now supported in the Budgeting Contributions tool. To calculate contributions for the coming year under PPA, select a forecast that includes an appropriate law type and transition year in ProVal's Asset & Funding Policy. Note the most likely candidate is a "Pre-PPA and PPA" law type and a transition year of 2008.

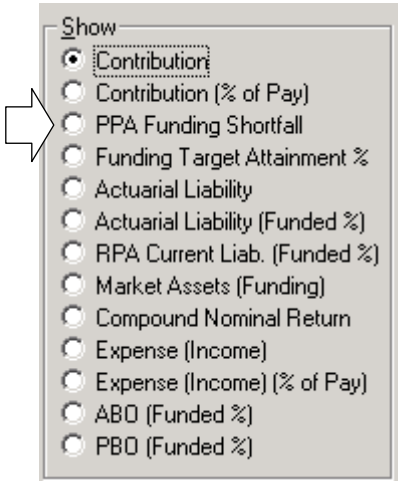

### Financial Sensitivities

- The available metrics and details now include several new items reflecting PPA.




### Asset Allocation

- The available metrics now include two new items reflecting PPA.




## Try ProVal PS for yourself

Go to **ProValPS.com** and download ProVal PS (at no cost). Several demo files are available for download including sample corporate, public and multiemployer plans.

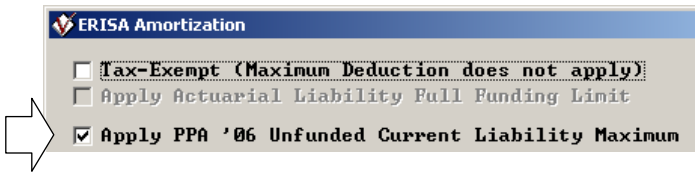
Or, to arrange for a live demonstration via WebEx, call Joe Gilbert at (203) 861-5514.

# Pension Protection Act of 2006 (PPA)

PPA was signed into U.S. law on August 17, 2006 and represents the most comprehensive revisions to ERISA and related IRC sections in 30 years. As a result, version 2.26 includes the most sweeping changes since ProVal's inception. The changes described below are specific to U.S. Qualified Pension mode, except where noted.

The following PPA changes for 2006 and 2007 plan years are already in ProVal (released in late August 2006 as an update to 2.25):

- **150% (140% for multiemployer plans) unfunded current liability maximum.** A checkbox in the Bases Supporting Maximum Contribution topic of Asset & Funding Policies controls whether the maximum is 100% of current liability (the old rule) or 150/140% (the new rule).

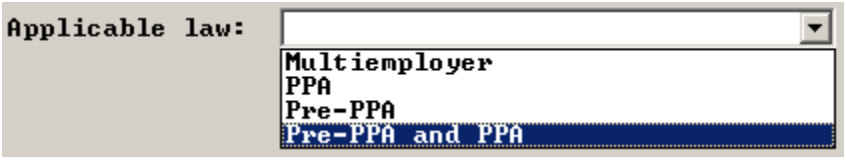



- **2006 & 2007 extension of Corporate Bond index for Current Liabilities and PBGC liabilities.** The appropriate rates can be looked up within Valuation Assumptions.

- **Permanence of EGTRRA maximum benefit and compensation limits** (actuarial equivalence and rounding provisions). The option to select the pre-EGTRRA provisions for these limits was removed from Valuation Assumptions. Existing Valuation Assumptions with the pre-EGTRRA provisions can still be used. (Also applies to SERP mode.)

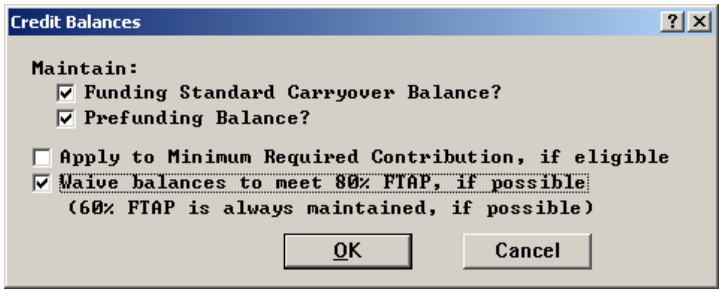
The following PPA changes and features are new with version 2.26:

- **Forecasting the transition from pre-PPA rules to PPA rules.** Both old and new liabilities can be calculated in a single "Pre-PPA and PPA" Core Projection. These liabilities can then be used to run a Deterministic/Stochastic Forecast that switches from the old rules to the new rules (typically in 2008). See discussion of Applicable Law Choices on page 8 for more information on how to set up "Pre-PPA and PPA" runs.



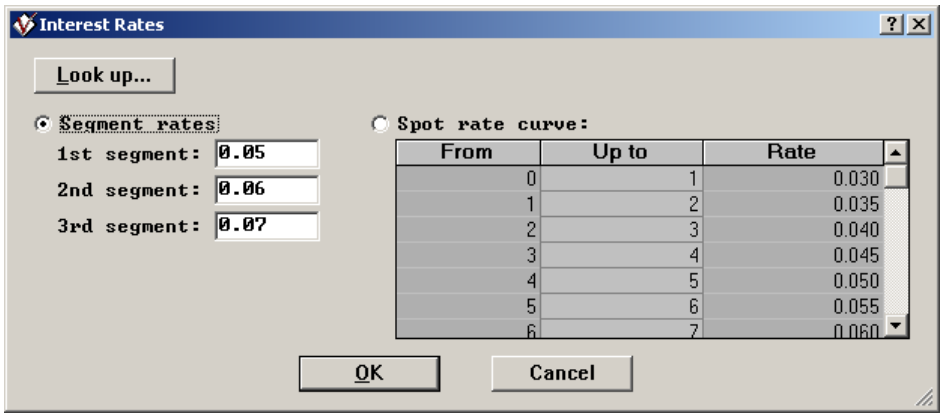

  In "Pre-PPA and PPA" forecasts, the shortfall amortization transition targets (92%, 94%, and 96% in the first 3 years) and eligibility (i.e., no 2007 DRC and target met each year) are applied automatically.

- **Ability to waive credit balances.** The Credit Balances topic of the Asset & Funding Policy includes an option to automatically waive any existing credit balance to attain an 80% Funding Target Attainment Percentage. ProVal will always waive the credit balance if a 60% FTAP can be attained.




Note with respect to the initial year of PPA application in a "Pre-PPA and PPA" forecast, we are awaiting guidance from the IRS regarding the use of prior year funded ratios to determine the plan's at-risk status (i.e., "at-risk" in the first year if (a) prior year's Not-at-Risk funded ratio < 65%[1] and (b) prior year's At-Risk funded ratio < 70%) and eligibility to spend the credit balance (i.e., eligible if prior year's funded ratio >=80%). ProVal is currently estimating the prior year funded ratio (for both At-Risk and Not-at-Risk) using a fraction (entered by the user – see screen pictured below under "Ability to specify the PPA effective date") of the prior year's Gateway Current Liability funded ratio. ProVal's calculations may change when additional guidance is issued.

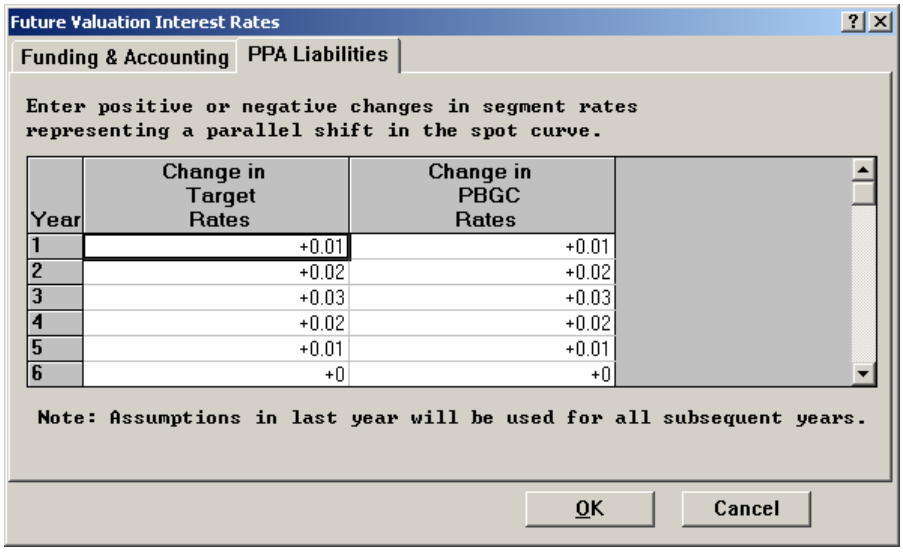
- **Discounting plan obligations using segment rates or a full spot rate curve.** Either type may be entered in Valuation Assumptions. The "Look up" button will let you access the appropriate rates shortly after they are published by the respective agencies.




See Discounting with Segment Rates on page 15 for details.

- **Forecasting parallel shifts in interest rate curves.** Under Deterministic Assumptions, you can specify parallel shifts directly by entering the desired change in rates. For example, starting with segment rates of 3/4/5%, you can forecast future segments of 4/5/6% (+0.01) in year 1, 5/6/7% (+0.02) in year 2, 6/7/8% (+0.03) in year 3, 5/6/7% (+0.02) in year 4, 4/5/6% (+0.01) in year 5, and 3/4/5% (+0) thereafter.

[1] A 65% funded ratio is used in 2008, 70% in 2009, 75% in 2010, and 80% in 2011 and later.




In Stochastic Assumptions, you can create a link between the bond yields generated by a Capital Market Simulation and the interest rates used to measure Target liabilities.

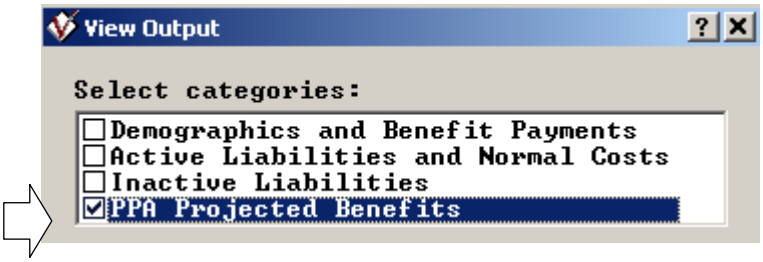
Both deterministic and stochastic forecasts are based on a core projection of liabilities that use the segment rates (or spot rate curve) directly. Thus, a 0.01 shift in the spot rate curve will have a different effect on different liabilities, depending on their duration.

- **Ability to specify the PPA effective date**, which may be delayed under sections 104, 105, 106 and 114 of PPA. For example, you can delay the effective date for rural electric, agricultural, and telephone multiple employer plans until 2017, defense contractors until the earlier of when the CAS Board allows recovery of the new contribution rates or 2011, and until 2014 plans of employers that took over sponsorship of the plan so that PBGC did not have to terminate the plan. The PPA effective date is entered under the Transition topic of "Pre-PPA and PPA" Asset & Funding Policies.


You could also enter an earlier year to see what effect PPA would have if it were to take effect earlier (e.g., in 2007).

- New §420 transfer rules for current health liabilities. The new rules will be applied in a forecast as of the PPA effective date. In general, the new rules are the same as the existing rules except surplus assets (lesser of Plan Assets and Market Assets reduced by Credit Balances) are now those in excess of 125% of the Funding Target + Target Normal Cost. Note that ProVal assumes, but does not check, that the required funded ratio of 120% is maintained.

- Also, projected benefit payments (at each future valuation date) are available in Core Projections to facilitate further analysis, e.g., analyzing the impact of non-parallel shifts in the spot rate curve.




Note that several forecasting issues introduced by PPA are not included in 2.26:

- Direct reflection of benefit restrictions which are keyed to funded percentages, e.g. 80% or 60%. Under these scenarios ProVal will presume that the benefit provisions continue unchanged.

- Ability to forecast the liability impact of spot rate curve changes *other than parallel shifts.* As mentioned above, projected benefit payments (at each future valuation date) are available in Core Projections to facilitate further analysis of non-parallel shifts in the spot rate curve.

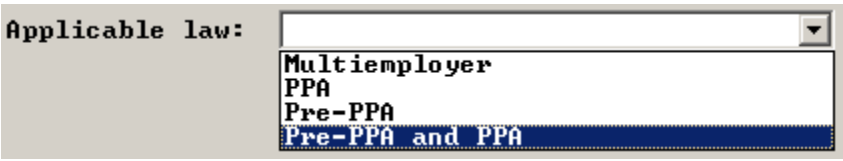
- Ability to change an asset valuation method during a forecast (e.g. switch to 2-year smoothing from 5-year smoothing effective 1/1/2008). To work around this, run a preliminary forecast with the pre-PPA smoothing method (e.g., over 5 years) and note the contributions in pre-PPA years. Then, run a forecast with the PPA smoothing method (e.g., over 2 years) and add in additional contributions (positive or negative) for the difference in the pre-PPA years – assuming the revised minimum or maximum contribution limit does not prevent you from doing so.

- Explicit recognition of the transition rules for lump sum interest rates per §417(e) in a stochastic forecast. The lump sum interest rate transitions from the 30 Year Treasury Securities Rate to the spot rate curve at 20% per year from 2008 (starts at 20%) to 2012 (reaches 100%). You may be able to approximate this transition by exporting the capital market simulation data, modifying the lump sum benchmark yield, and re-importing it as a custom simulation.

- Direct reflection of the rules permitting a 3-year phase-in of the segment rates in a forecast. To reflect a sponsor's election to use the phased-in rates in a stochastic forecast, see "Stochastic Assumptions" below. For a deterministic forecast, first enter the segment rates (reflecting the phase-in) into your Valuation Assumptions. Then, in Deterministic Assumptions, enter parallel shifts in the yield curve that result in the same effective rate as the desired segment rates in each year of the forecast.

**Applicable Law Choices**

The most fundamental change to U.S. Qualified Pension mode is the requirement to specify the law that will be used, since that mode now encompasses three distinct sets of funding rules. This affects Valuation Assumptions, Asset & Funding Policy, Deterministic Assumptions and Stochastic Assumptions. Each library entry will be tagged with one of the following:




- Multiemployer. Use for valuations and forecasts of multiemployer plans.

- PPA. Use for valuations and forecasts based on PPA rules only. This option probably won't be used until 2008 valuations are run. However, you could use it to find out what contributions would be today if PPA were already effective.

- Pre-PPA. Use for valuations based on qualified plan rules in effect prior to passage of PPA.

- Pre-PPA and PPA. Use for forecasts that span both law types (typically, pre-PPA rules before 2008 and PPA rules thereafter).

Runs require coordination of law types:

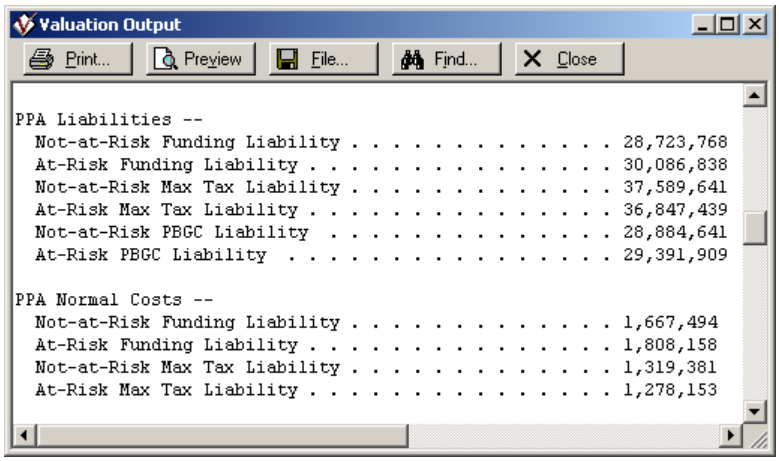
- Valuations/Cores must have the same law type (specified in Valuation Assumptions) to be combined for a Valuation Set/Forecast.

- For Forecasts, the law type of the Asset & Funding Policy controls the requirements for Deterministic/Stochastic Assumptions and Core Projections. Deterministic/Stochastic Assumptions must *share the same* law type as the Asset & Funding Policy. Core projections must *include the necessary liabilities* for the law specified in the Asset & Funding Policy. As an example, a Core Projection based on Pre-PPA and PPA law could be used in conjunction with any Asset & Funding Policy law type since it contains all possible liabilities. However a PPA Core Projection is not allowed with a Pre-PPA and PPA law type since many required liabilities (e.g. current liability) would not be available for years prior to the application of PPA.

Down the road, the "Pre-PPA" and "Pre-PPA and PPA" choices may be taken off the screen once they are obsolete (but not actually removed, for upward compatibility). Also, multiemployer may be removed from U.S. Qualified Pension mode and given its own mode.

**Target Liabilities**

PPA requires four (4) target liabilities: a minimum (UC) basis calculation and a maximum (PUC) basis calculation, both under Not-at-Risk and At-Risk assumptions. PPA also requires PBGC liabilities (vested UC) calculated under Not-at-Risk and At-Risk assumptions, for a total of six (6) new liability measurements and four (4) associated normal costs.




The Not-at-Risk and At-Risk assumptions differ in two important ways:

(1) At-Risk assumptions use a modified retirement age assumption. ProVal makes the retirement age adjustment automatically by replacing the retirement rates as follows:

| From | To | Retirement Rate |
|---|---|---|
| -- | ValYear | Valuation Assumption |
| ValYear+1 | ValYear+10 | 100% |
| ValYear+11 | -- | Valuation Assumption |

Thus, retirements occur as usual during the first year and 100% upon first eligibility for the 10 years following. Timing of decrements is the same as for the Not-at-Risk liability. Thus, if you assume that decrements occur at the middle of the year, then retirement at first eligibility will occur at the middle of the year (not at beginning of year, like ProVal's treatment of the 100% retirement age, unless first retirement eligibility happens to coincide with the actuary's 100% retirement age).

Assuming a 1/1/2008 valuation date and a mid-year decrement assumption:

- Participants already eligible for retirement will decrement according to the valuation assumptions on 7/1/2008, and any remaining participants from this group will all retire on 7/1/2009 (or 1/1 if at actuary's 100% retirement age).

- Participants becoming eligible during the following 10 year period (2009 through 2018) will retire on 7/1 in the year they first become eligible (or 1/1 if at actuary's 100% retirement age).

- Participants not becoming eligible for retirement during that time period decrement according to the valuation assumptions.

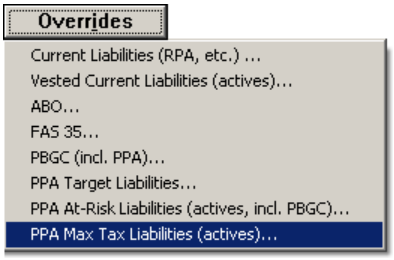
(2) At-Risk assumptions require valuing benefits that produce the highest possible Funding Target. ProVal presumes that the Plan Definition and Valuation Assumptions have been set up to measure the benefits that produce the highest present value – it does nothing automatically in this regard. Thus it is important for the user to consider the treatment of subsidized early retirement, subsidized optional forms, etc. to be sure the At-risk valuations satisfy this requirement.

If different payment forms are desired for Not-at-Risk and At-Risk calculations, you can create multiple Valuations or Core Projections to carry out all of the required calculations. In these cases, override the Valuation (for a Valuation Set) or Core Projection (for a forecast) using the Override button to replace liabilities selectively.

The four (4) Target liabilities are required when PPA is reflected. They can be measured using either segment rates or the full spot curve option. PBGC liabilities, which are always optional, reference their own set of published segment rates. In all cases, rates will be readily accessible through a Lookup button, shortly after they are published by the respective agencies.

Actuarial liabilities, which were required Pre-PPA, are optional under PPA. This is because PPA removed sponsor discretion regarding the actuarial cost method for minimum contribution purposes. For PPA years, Actuarial Liabilities are only needed in the case where the sponsor uses a contribution policy of "Normal Cost + Supplemental Cost" in the Asset & Funding Policy. In all other cases the Target Liabilities are all that's needed.

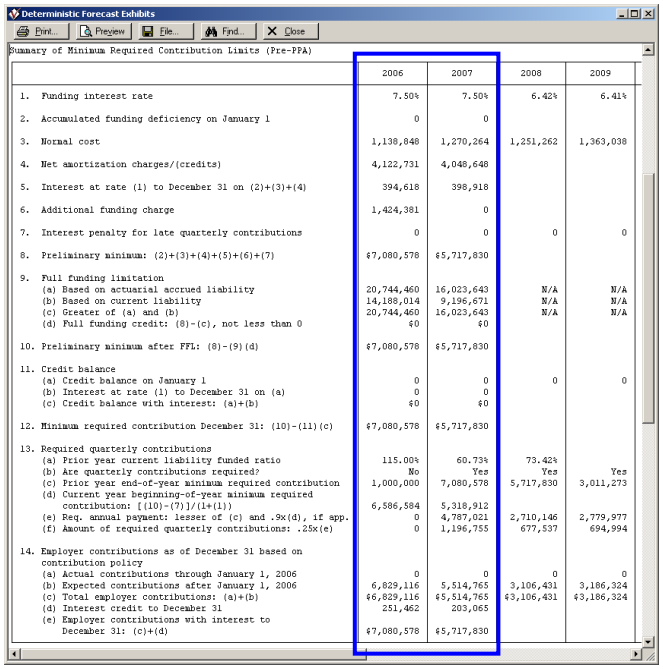
Per 404(o)(3)(B)(ii), plans covered by the PBGC may project increases in the maximum benefit and compensation limits for purposes of determining the Target liabilities for the maximum deductible contribution limit. Thus, the desired increase might be 0% for some liabilities (e.g., pre-PPA Actuarial liabilities and PPA Target liabilities for the minimum required contribution) and x% for others (e.g., PPA Target liabilities for the maximum deductible contribution limit). ProVal only allows you to specify a single increase rate for the 415(b) maximum benefit limit. The same is true for the 401(a)(17) maximum compensation limit. If this is material, the PPA Max Tax Target liabilities may be run in a separate Valuation or Core Projection and inserted into a Valuation Set or Forecast via the Overrides button.




## Exhibits

Valuation Set exhibits will develop pre-PPA or PPA min/max limits per the Asset & Funding Policy and plan year. Deterministic Forecast exhibits that span Pre-PPA and PPA periods will have both old and new minimum contribution exhibits, for example, with the old becoming "empty" and the new starting empty.

Summary of Minimum Required Contribution Limits (Pre-PPA)



Deterministic Forecast Exhibits

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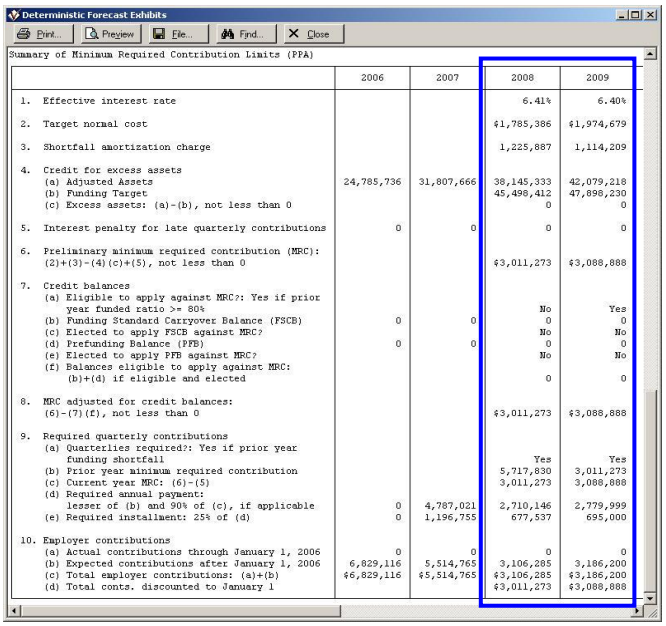
Summary of Minimum Required Contribution Limits (Pre-PPA)

| | 2006 | 2007 | 2008 | 2009 |
|---|---|---|---|---|
| 1. Funding interest rate | 7.50% | 7.50% | 6.42% | 6.41% |
| 2. Accumulated funding deficiency on January 1 | 0 | 0 | | |
| 3. Normal cost | 1,138,848 | 1,270,264 | 1,251,262 | 1,363,038 |
| 4. Net amortization charges/(credits) | 4,122,731 | 4,048,648 | | |
| 5. Interest at rate (1) to December 31 on (2)+(3)+(4) | 394,618 | 398,918 | | |
| 6. Additional funding charge | 1,424,381 | 0 | | |
| 7. Interest penalty for late quarterly contributions | 0 | 0 | 0 | 0 |
| 8. Preliminary minimum: (2)+(3)+(4)+(5)+(6)+(7) | $7,080,578 | $5,717,830 | | |
| 9. Full funding limitation | | | | |
| (a) Based on actuarial accrued liability | 20,744,460 | 16,023,643 | N/A | N/A |
| (b) Based on current liability | 14,188,014 | 9,196,671 | N/A | N/A |
| (c) Greater of (a) and (b) | 20,744,460 | 16,023,643 | N/A | N/A |
| (d) Full funding credit: (8)-(c), not less than 0 | $0 | $0 | | |
| 10. Preliminary minimum after FFL: (8)-(9)(d) | $7,080,578 | $5,717,830 | | |
| 11. Credit balance | | | | |
| (a) Credit balance on January 1 | 0 | 0 | 0 | 0 |
| (b) Interest at rate (1) to December 31 on (a) | 0 | 0 | | |
| (c) Credit balance with interest: (a)+(b) | $0 | $0 | | |
| 12. Minimum required contribution December 31: (10)-(11)(c) | $7,080,578 | $5,717,830 | | |
| 13. Required quarterly contributions | | | | |
| (a) Prior year current liability funded ratio | 115.00% | 60.73% | 73.42% | |
| (b) Are quarterly contributions required? | No | Yes | Yes | Yes |
| (c) Prior year end-of-year minimum required contribution | 1,000,000 | 7,080,578 | 5,717,830 | 3,011,273 |
| (d) Current year beginning-of-year minimum required contribution: [(10)-(7)]/(1+(1)) | 6,586,584 | 5,318,912 | | |
| (e) Req. annual payment: lesser of (c) and .9x(d), if app. | 0 | 4,787,021 | 2,710,146 | 2,779,977 |
| (f) Amount of required quarterly contributions: .25x(e) | 0 | 1,196,755 | 677,537 | 694,994 |
| 14. Employer contributions as of December 31 based on contribution policy | | | | |
| (a) Actual contributions through January 1, 2006 | 0 | 0 | 0 | 0 |
| (b) Expected contributions after January 1, 2006 | 6,829,116 | 5,514,765 | 3,106,431 | 3,186,324 |
| (c) Total employer contributions: (a)+(b) | $6,829,116 | $5,514,765 | $3,106,431 | $3,186,324 |
| (d) Interest credit to December 31 | 251,462 | 203,065 | | |
| (e) Employer contributions with interest to December 31: (c)+(d) | $7,080,578 | $5,717,830 | | |

Summary of Minimum Required Contribution Limits (PPA)



Deterministic Forecast Exhibits

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Summary of Minimum Required Contribution Limits (PPA)

| | 2006 | 2007 | 2008 | 2009 |
|---|---|---|---|---|
| 1. Effective interest rate | | | 6.41% | 6.40% |
| 2. Target normal cost | | | $1,785,386 | $1,974,679 |
| 3. Shortfall amortization charge | | | 1,225,887 | 1,114,209 |
| 4. Credit for excess assets | | | | |
| (a) Adjusted Assets | 24,785,736 | 31,807,666 | 38,145,333 | 42,079,218 |
| (b) Funding Target | | | 45,498,412 | 47,898,230 |
| (c) Excess assets: (a)-(b), not less than 0 | | | 0 | 0 |
| 5. Interest penalty for late quarterly contributions | 0 | 0 | 0 | 0 |
| 6. Preliminary minimum required contribution (MRC): (2)+(3)-(4)(c)+(5), not less than 0 | | | $3,011,273 | $3,088,888 |
| 7. Credit balances | | | | |
| (a) Eligible to apply against MRC?: Yes if prior year funded ratio >= 80% | | | No | Yes |
| (b) Funding Standard Carryover Balance (FSCB) | 0 | 0 | 0 | 0 |
| (c) Elected to apply FSCB against MRC? | | | No | No |
| (d) Prefunding Balance (PFB) | 0 | 0 | 0 | 0 |
| (e) Elected to apply PFB against MRC? | | | No | No |
| (f) Balances eligible to apply against MRC: (b)+(d) if eligible and elected | | | 0 | 0 |
| 8. MRC adjusted for credit balances: (6)-(7)(f), not less than 0 | | | $3,011,273 | $3,088,888 |
| 9. Required quarterly contributions | | | | |
| (a) Quarterlies required?: Yes if prior year funding shortfall | | | Yes | Yes |
| (b) Prior year minimum required contribution | | | 5,717,830 | 3,011,273 |
| (c) Current year MRC: (6)-(5) | | | 3,011,273 | 3,088,888 |
| (d) Required annual payment: lesser of (b) and 90% of (c), if applicable | 0 | 4,787,021 | 2,710,146 | 2,779,999 |
| (e) Required installment: 25% of (d) | 0 | 1,196,755 | 677,537 | 695,000 |
| 10. Employer contributions | | | | |
| (a) Actual contributions through January 1, 2006 | 0 | 0 | 0 | 0 |
| (b) Expected contributions after January 1, 2006 | 6,829,116 | 5,514,765 | 3,106,285 | 3,186,200 |
| (c) Total employer contributions: (a)+(b) | $6,829,116 | $5,514,765 | $3,106,285 | $3,186,200 |
| (d) Total conts. discounted to January 1 | | | $3,011,273 | $3,088,888 |

## Stochastic Assumptions

Stochastic forecasts are a useful tool to analyze the volatility of key financial metrics like funded status, contributions and expense. To model Target liabilities and resultant costs stochastically there are a few things to bear in mind:

- A simulated Corporate Bond Benchmark Yield (CBBY) is required. Note as always we recommend you prepare a capital market simulation using the Multi-Factor Term Structure model, not the Mean/Variance model, since it does a superior job coordinating bond yields and returns.

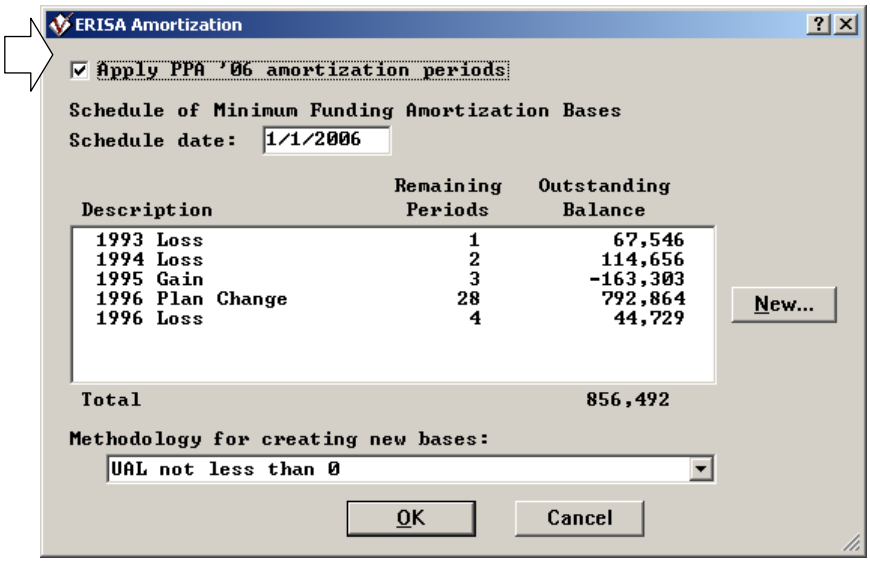
- ProVal's spot rates (for Target & PBGC liabilities) are assumed to shift with change in simulated CBBY. Thus if the CBBY increases 0.01 in a particular trial, all liability rates (each of the three segments, or alternatively, each spot yield if the full curve is specified) will increase 0.01 too.

- ProVal does not automatically handle the transition rules permitting a 3-year phase-in for segment rates. To reflect a sponsor's election to use the phased-in rates, create and export CBBY data, manually adjust the 2008 and 2009 rates in Excel, and then re-import the yields back into the simulation.

**Multiemployer Plans**

The process for valuing multiemployer plans is generally the same as before. A new applicable law choice, "Multiemployer", explicitly identifies these plans.


A new option was also added in Assets & Funding Policies to apply the PPA '06 amortization periods (which generally changed to 15 years).



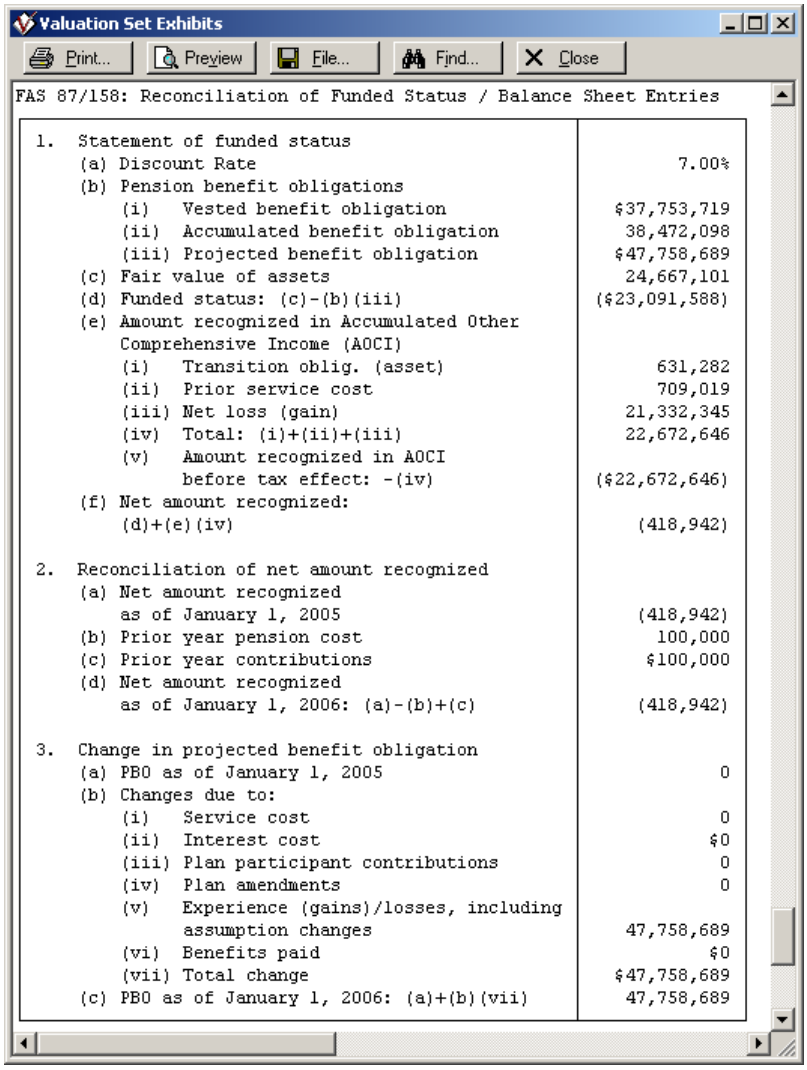

One new PPA requirement for multiemployer plans is to forecast whether the plan is expected to have a funding deficiency in the next 6 years. To do this, run a Deterministic Forecast and look for the first year where the credit balance is 0 (e.g., 2010). The prior year (e.g., 2009) is the year that a deficiency would have occurred (had ProVal not stepped in to force the minimum contribution). The same technique can also be applied to a Stochastic Forecast (e.g., to determine the likelihood of having a deficiency) by setting up a Custom Stochastic Variable for the credit balance.

# FAS 158

In September 2006 FASB issued Statement No. 158, *Employers Accounting for Defined Benefit Pension and Other Postretirement Plans, an amendment of FASB Statements No. 87, 88, 106 and 132(R).* The statement aims to improve financial reporting by requiring the recognition of the funded position of each plan on the sponsoring entities' balance sheet. Note however that the statement did not change the rules for determining annual pension cost under FAS 87.

ProVal includes the option to determine balance sheet entries according to FAS 158 under Asset & Funding Policy | Accounting Methodology, using a new accounting methodology called "FAS 87/158" in U.S. Qualified Pension, SERP (Non-Qualified) Pension, and Canadian Registered Pension modes and "FAS 106/158" in OPEB (Retiree Medical) mode.

When FAS 87/158 or FAS 106/158 is selected, ProVal will display new exhibits that comport with the new accounting rules.




FAS 87/158: Reconciliation of Funded Status / Balance Sheet Entries

| | |
|---|---|
| 1. Statement of funded status | |
| (a) Discount Rate | 7.00% |
| (b) Pension benefit obligations | |
| (i) Vested benefit obligation | $37,753,719 |
| (ii) Accumulated benefit obligation | 38,472,098 |
| (iii) Projected benefit obligation | $47,758,689 |
| (c) Fair value of assets | 24,667,101 |
| (d) Funded status: (c)-(b)(iii) | ($23,091,588) |
| (e) Amount recognized in Accumulated Other Comprehensive Income (AOCI) | |
| (i) Transition oblig. (asset) | 631,282 |
| (ii) Prior service cost | 709,019 |
| (iii) Net loss (gain) | 21,332,345 |
| (iv) Total: (i)+(ii)+(iii) | 22,672,646 |
| (v) Amount recognized in AOCI before tax effect: -(iv) | ($22,672,646) |
| (f) Net amount recognized: (d)+(e)(iv) | (418,942) |
| 2. Reconciliation of net amount recognized | |
| (a) Net amount recognized as of January 1, 2005 | (418,942) |
| (b) Prior year pension cost | 100,000 |
| (c) Prior year contributions | $100,000 |
| (d) Net amount recognized as of January 1, 2006: (a)-(b)+(c) | (418,942) |
| 3. Change in projected benefit obligation | |
| (a) PBO as of January 1, 2005 | 0 |
| (b) Changes due to: | |
| (i) Service cost | 0 |
| (ii) Interest cost | $0 |
| (iii) Plan participant contributions | 0 |
| (iv) Plan amendments | 0 |
| (v) Experience (gains)/losses, including assumption changes | 47,758,689 |
| (vi) Benefits paid | $0 |
| (vii) Total change | $47,758,689 |
| (c) PBO as of January 1, 2006: (a)+(b)(vii) | 47,758,689 |

Importantly, the actual amount of Accumulated Other Comprehensive Income (AOCI) to be recorded by the employer is to be adjusted for deferred tax effects. ProVal does <u>not</u> calculate the tax adjustment; all amounts within ProVal are <u>before</u> any such tax adjustment.

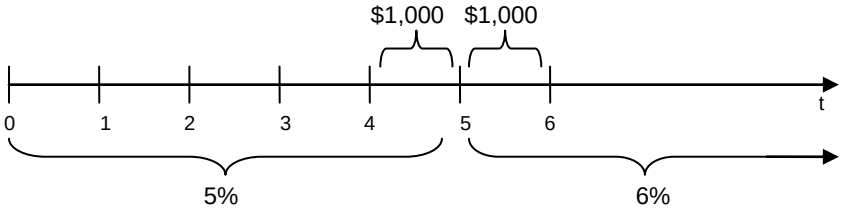
# Discounting with Segment Rates

The Pension Protection Act of 2006 (PPA) requires use of variable interest rates. These interest rates may change every year ("spot rate curve") or just at the 5- and 20-year marks ("segment rates"). Paraphrasing IRC 430(h)(2)(B):

- the first segment rate is applied to benefits payable during the first 5-year period (beginning on the first day of the plan year -- or valuation date in this context),
- the second segment rate is applied to benefits payable during the next 15-year period, and
- the third segment rate is applied to benefits payable thereafter.

**Calculating Liabilities**

Suppose you are valuing a $1,000 annuity that is deferred for 4 years and temporary for 2 years with segment rates of 5% (first 5 years), 6% (next 15 years), and 7% (thereafter).



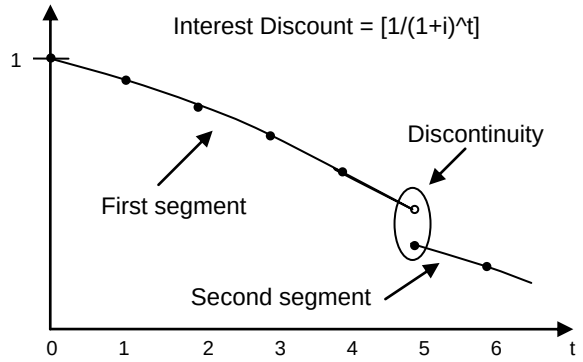

If the benefit is payable annually, at the beginning of each year, then the present value is:

$$pv = \left[\frac{1}{1.05^4} \cdot {}_4p_x \cdot 1{,}000\right] + \left[\frac{1}{1.06^5} \cdot {}_5p_x \cdot 1{,}000\right]$$

If the benefit is payable monthly, at the beginning of each month, we need to adjust for monthly payments (sometimes known as the "13/24 adjustment"). The present value becomes:

$$pv = \left[\frac{1}{1.05^4} \cdot {}_4p_x \cdot \left(\frac{13}{24} + \frac{11}{24} \cdot \frac{1}{1.05} \cdot p_{x+4}\right) \cdot 1{,}000\right] + \left[\frac{1}{1.06^5} \cdot {}_5p_x \cdot \left(\frac{13}{24} + \frac{11}{24} \cdot \frac{1}{1.06} \cdot p_{x+5}\right) \cdot 1{,}000\right]$$

Note that the interest rate curve is discontinuous. That is, there are discounts of 1.05^5 and 1.06^5 both at work in the equation above. Rather than a contradiction, this is merely a result of using an approximate, rather than exact, discounting of monthly benefit payments. The objective is satisfied: the first 12 payments are discounted at 5% and the other 12 payments at 6%. Graphically, the discontinuity looks like this:



The discontinuity is a nuance based on a literal interpretation of PPA. Because of this, PPA calculations cannot be exactly duplicated by using "equivalent" calendar year rates.

Interest rate:
○ Constant
Pre-decrement:
Post-decrement:
◉ Variable by calendar year

| From | To | Rate |
|---|---|---|
| - | 2009 | 0.050000 |
| 2010 | 2011 | 0.100961 |
| 2012 | 2024 | 0.060000 |
| 2025 | 2025 | 0.278981 |
| 2026 | - | 0.07 |

**Checking Sample Lives: Inactives**

Assuming segment rates of 5%, 6%, and 7%, "RP-2000 Combined Mortality" projected to 2006 using Scale AA, and an inactive age 67 entitled to an immediate single life annuity (paid monthly, at the beginning of each month),

Sample Life Output 1 of 1

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PPA basis (Inactive)
Benefit: life annuity

RecID: 1 <Life Annuity>

| Year | Member Age | Interest Discount | Member Survival Discount | Payment Frequency Adjustment | Annuity Amount | Present Value |
|---|---|---|---|---|---|---|
| 2006 | 67 | 1.000000 | 1.000000 | 0.971688 | 10,000.00 | 9,716.88 |
| 2007 | 68 | 0.952381 | 0.985139 | 0.971007 | 10,000.00 | 9,110.25 |
| 2008 | 69 | 0.907029 | 0.968962 | 0.970232 | 10,000.00 | 8,527.15 |
| 2009 | 70 | 0.863838 | 0.951331 | 0.969322 | 10,000.00 | 7,965.84 |
| 2010 | 71 | 0.822702 | 0.932037 | 0.968379 | 10,000.00 | 7,425.43 |
| 2011 | 72 | 0.747258 | 0.911122 | 0.963283 | 10,000.00 | 6,558.45 |
| 2012 | 73 | 0.704961 | 0.888420 | 0.962056 | 10,000.00 | 6,025.37 |
| 2013 | 74 | 0.665057 | 0.863764 | 0.960669 | 10,000.00 | 5,518.59 |
| ... | ... | ... | ... | ... | ... | ... |
| 2059 | 120 | 0.027711 | 0.000001 | 0.541667 | 10,000.00 | 0.00 |
| Total | | | | | | 99,482.98 |

the values in the "Present Value" column above for ages 67 (first year) and 72 (sixth year) are derived as follows:

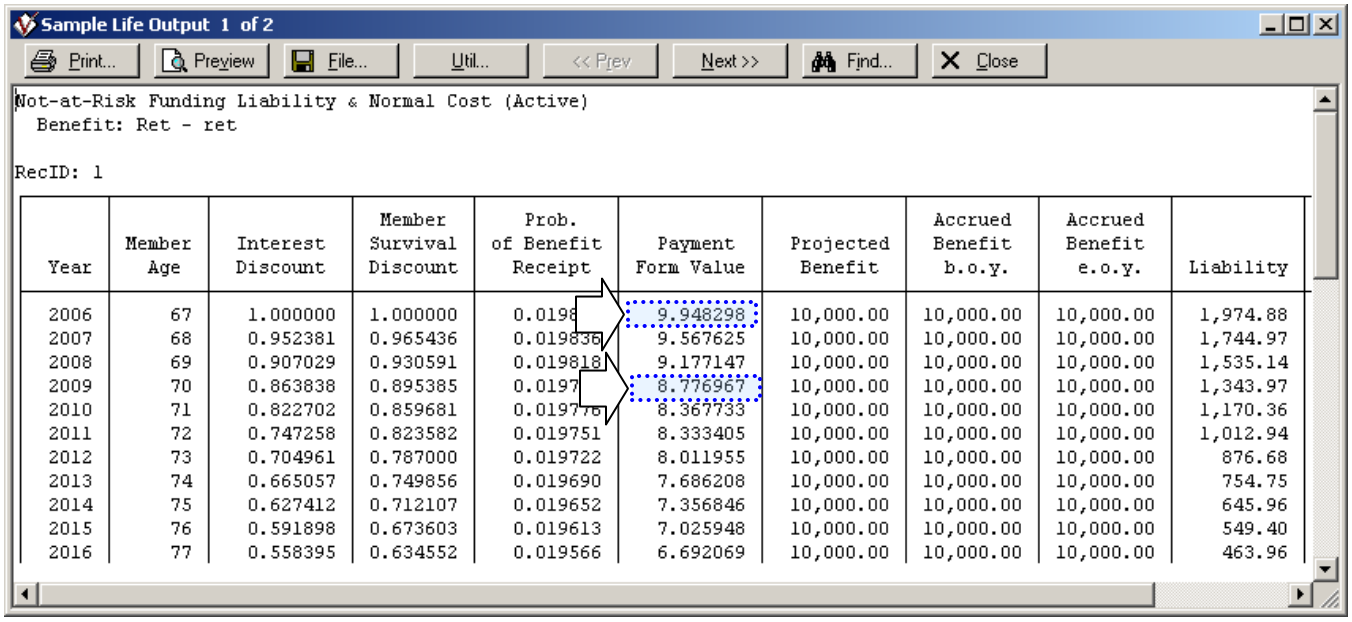
- age 67: $\frac{1}{1.05^{0}} \cdot 1.000000 \cdot \left( \frac{13}{24} + \frac{11}{24} \cdot \frac{1}{1.05} \cdot \frac{0.985139}{1.000000} \right) \cdot 10{,}000.00 = 9{,}716.88$
- age 72: $\frac{1}{1.06^{5}} \cdot 0.911122 \cdot \left( \frac{13}{24} + \frac{11}{24} \cdot \frac{1}{1.06} \cdot \frac{0.888420}{0.911122} \right) \cdot 10{,}000.00 = 6{,}558.45$

**Checking Sample Lives: Actives**

*Beginning of year decrements*

The "Payment Form Values" (sometimes known as annuity factors) used to develop active liabilities are equal to the present value at decrement of future payments divided by the accrued benefit at decrement. Assuming segment rates of 5%, 6%, and 7%, "RP-2000 Combined Mortality" projected to 2006 using Scale AA, and an

active age 67 entitled to a 10,000 immediate life annuity upon decrement at any age (paid monthly at the beginning of each month):




Not-at-Risk Funding Liability & Normal Cost (Active)
Benefit: Ret - ret

RecID: 1

| Year | Member Age | Interest Discount | Member Survival Discount | Prob. of Benefit Receipt | Payment Form Value | Projected Benefit | Accrued Benefit b.o.y. | Accrued Benefit e.o.y. | Liability |
|---|---|---|---|---|---|---|---|---|---|
| 2006 | 67 | 1.000000 | 1.000000 | 0.0198 | 9.948298 | 10,000.00 | 10,000.00 | 10,000.00 | 1,974.88 |
| 2007 | 68 | 0.952381 | 0.965436 | 0.019836 | 9.567625 | 10,000.00 | 10,000.00 | 10,000.00 | 1,744.97 |
| 2008 | 69 | 0.907029 | 0.930591 | 0.019818 | 9.177147 | 10,000.00 | 10,000.00 | 10,000.00 | 1,535.14 |
| 2009 | 70 | 0.863838 | 0.895385 | 0.0197 | 8.776967 | 10,000.00 | 10,000.00 | 10,000.00 | 1,343.97 |
| 2010 | 71 | 0.822702 | 0.859681 | 0.019776 | 8.367733 | 10,000.00 | 10,000.00 | 10,000.00 | 1,170.36 |
| 2011 | 72 | 0.747258 | 0.823582 | 0.019751 | 8.333405 | 10,000.00 | 10,000.00 | 10,000.00 | 1,012.94 |
| 2012 | 73 | 0.704961 | 0.787000 | 0.019722 | 8.011955 | 10,000.00 | 10,000.00 | 10,000.00 | 876.68 |
| 2013 | 74 | 0.665057 | 0.749856 | 0.019690 | 7.686208 | 10,000.00 | 10,000.00 | 10,000.00 | 754.75 |
| 2014 | 75 | 0.627412 | 0.712107 | 0.019652 | 7.356846 | 10,000.00 | 10,000.00 | 10,000.00 | 645.96 |
| 2015 | 76 | 0.591898 | 0.673603 | 0.019613 | 7.025948 | 10,000.00 | 10,000.00 | 10,000.00 | 549.40 |
| 2016 | 77 | 0.558395 | 0.634552 | 0.019566 | 6.692069 | 10,000.00 | 10,000.00 | 10,000.00 | 463.96 |

- For decrement age 67, the payment form value is 99,482.98 / 10,000 = 9.948298. The 99,482.98 is derived above for an inactive.

- For decrement age 70, the payment form value is 87,769.67 / 10,000 = 8.776967. The 87,769.67 is derived in the same way it was derived above for an inactive:

| Member Age | Interest Discount | Member Survival Discount | Payment Frequency Adjustment | Annuity Amount | Present Value |
|---|---|---|---|---|---|
| 70 | 1.05^3/1.05^3 | 1.000000 | (13/24)+(11/24)/1.05*(0.932037/0.951331) | 10,000.00 | 9,693.22 |
| 71 | 1.05^3/1.05^4 | 0.979719 | (13/24)+(11/24)/1.05*(0.911122/0.932037) | 10,000.00 | 9,035.62 |
| 72 | 1.05^3/1.06^5 | 0.957734 | (13/24)+(11/24)/1.06*(0.888420/0.911122) | 10,000.00 | 7,980.64 |
| 73 | 1.05^3/1.06^6 | 0.933871 | (13/24)+(11/24)/1.06*(0.863764/0.888420) | 10,000.00 | 7,331.96 |
| … | … | … | … | … | … |
| 120 | 1.05^3/1.07^50 | 0.000001 | (13/24)+(11/24)/1.07*0 | 10,000.00 | 0.00 |
| Total | | | | | 87,769.67 |

Note that the Interest Discount is normalized at decrement (i.e., made equal to 1) by multiplying by 1.05^3 (i.e., interest from the valuation date to decrement). While the denominator of the Interest Discount is based on 5%, 6%, or 7% depending on the year the payment is expected to be paid, the numerator is a single value. The value to be used is the reciprocal of the pre-decrement Interest Discount above (0.863838 for age 70), so that the two cancel out when determining the liability. By convention, ProVal uses the segment rate applicable to the year of decrement.

*Middle of year decrements*

Under a middle of year decrement assumption in pension modes, present values for actives use average benefits, average payment form values, and an extra half-year interest discount.

m.o.y. present value = $v^t \cdot {}_tp_x \cdot q_{x+t} \cdot \left( \frac{B_{x+t} + B_{x+t+1}}{2} \right) \cdot \left( \frac{PV_{x+t} + PV_{x+t+1}}{2} \cdot v^{1/2} \right)$

as compared to b.o.y. present value = $v^t \cdot {}_tp_x \cdot q_{x+t} \cdot PV_{x+t} \cdot B_{x+t}$

where:

$v^t$ is the pre-decrement interest discount from the decrement age to the valuation date.

${}_t p_x$ is the probability of remaining active from age x to age x+t.

$q_{x+t}$ is the probability of decrement at age x+t.

$B_{x+t}$ is the benefit amount at age x+t.

$PV_{x+t}$ is the present value at decrement age x+t of payments per the specified payment form (e.g. an immediate annuity). For spot rates, each payment is brought back to the valuation date at the spot rate appropriate for the payment, and then brought forward to the decrement age at the spot rate appropriate for the decrement age. For a payment due at time x+u, the interest adjustment for this payment is $[(1+s_{x+t})^{x+t}]/[(1+s_{x+u})^{x+u}]$, where $s_t$ is the spot rate in effect for a payment at time t.

$PV_{x+t+1}$ is the present value at decrement age x+t+1 of payments per the specified payment form. With a minor exception, the same interest rate assumption as for the $PV_{x+t}$ (beginning of year) calculation is used. For spot rates, each payment is brought back to the valuation date at the spot rate appropriate for the payment, but with the payment assumed to be at the end of the year, and then brought forward to the decrement age at the spot rate appropriate for the decrement age.

When spot rates are assumed in conjunction with lump sums deferred for a period, the beginning of year spot interest rate curve is shifted forward one year for purposes of the $PV_{x+t+1}$ calculation. This is done in order that the present value of a lump sum payable in the middle of the year is calculated using the spot rate applicable to that year, rather than the spot rate that would be applicable if the lump sum were payable at the beginning of the following year.

$v^{1/2}$ is $1/(1+i)^{1/2}$, where i is generally the interest rate in the year of decrement. When spot interest rates are assumed, the interest discount factor at the end of the year of decrement is brought back to the valuation date, and then brought forward to the beginning of the year of decrement. At decrement age x+t, v is $[(1+s_{x+t})^{x+t}]/[(1+s_{x+t+1})^{x+t+1}]$. There are minor exceptions to the general rule when spot rates are assumed in conjunction with certain lump sum payment forms. Please see the technical reference article "Decrements: beginning of year vs. middle of year" for further details.

**Discounting Projected Benefit Payments vs. Liabilities**

On a related note, you may wonder how to discount the projected benefit payments (available in a Valuation or Valuation Set) to match a liability. A simple method of discounting is as follows:

Discount = 1 / [ (1 + i) ^ (t+0.5) ], where t=0,1,2,3,….

For example, to discount the payments described above:

| Year | Projected Benefit Payments (produced by ProVal) | Discount |
|---|---|---|
| 1 | 0 | $1/1.05^{0.5}$ |
| 2 | 0 | $1/1.05^{1.5}$ |
| 3 | 0 | $1/1.05^{2.5}$ |
| 4 | 0 | $1/1.05^{3.5}$ |

| | | |
|---|---|---|
| 5 | $_4p_x \cdot \left(\frac{13}{24} + \frac{11}{24} p_{x+4}\right) \cdot 1{,}000$ | $1/1.05^{4.5}$ |
| 6 | $_5p_x \cdot \left(\frac{13}{24} + \frac{11}{24} p_{x+5}\right) \cdot 1{,}000$ | $1/1.06^{5.5}$ |

Note that the discounted benefit payments are close to, but not exactly equal to the liability. While some variance will be caused by payment timing, decrement timing and scaling factors, you should generally be able to match to within a fraction of 1 percent.

# Effective Interest Rates

The Pension Protection Act of 2006 (PPA) requires use of variable interest rates. Gone is the single interest rate – almost. PPA requires the calculation of the Funding Target's Effective Interest Rate (EIR). Per IRC 430(h)(2), this is "the single rate of interest which, if used to determine the present value of the plan's accrued or earned benefits …, would result in an amount equal to the funding target of the plan for such plan year".

Essentially, ProVal solves for a constant EIR, i, such that discounting a liability's projected benefits $\{B_n\}$ with either variable interest rates $\{i_n\}$ or with i gets the same result. That is:

$$B_0 + B_1/(1+i) + B_2/(1+i)^2 + \ldots + B_n/(1+i)^n$$

$$= B_0 + B_1/(1+i_1) + B_2/(1+i_2)^2 + \ldots + B_n/(1+i_n)^n$$

$$\approx \text{liability}$$

In the equation above, the discounted payments are close to, but don't exactly match the liability. This is due to timing of benefits, which can vary due to payment form (annuities vs. lump sums vs. life insurance), annuity payment timing, annuity payment frequency, middle of year decrements, and timing of claims (in OPEB mode). To adjust for this, ProVal first solves for k in the range [0,1] such that the discounted payments exactly equal the relevant liability:

$$B_0/(1+i_0)^{0+k} + B_1/(1+i_1)^{1+k} + B_2/(1+i_2)^{2+k} + \ldots + B_n/(1+i_n)^{n+k}$$

$$= \text{liability}$$

The equation to determine the EIR, i, then becomes

$$B_0/(1+i)^{0+k} + B_1/(1+i)^{1+k} + B_2/(1+i)^{2+k} + \ldots + B_n/(1+i)^{n+k}$$

$$= B_0/(1+i_0)^{0+k} + B_1/(1+i_1)^{1+k} + B_2/(1+i_2)^{2+k} + \ldots + B_n/(1+i_n)^{n+k}$$

$$= \text{liability}$$

Notes:

1. All benefits are summed together before computing the EIR.

2. If multiple runs are summed, the projected benefits $\{B_n\}$ from the runs are summed before computing the EIR. This way, you'll get the same answer if you split your valuation into two or more runs. (Note that the variable interest rates $\{i_n\}$ must be consistent across runs.)

3. For At-Risk plans, the Funding Target can be a weighted average of Not-At-Risk and At-Risk liabilities. ProVal uses the following formula to blend the Not-At-Risk and At-Risk EIRs:

   Blended EIR = [(EIR1 * Weight1 * Liab1) + (EIR2 * Weight2 * Liab2)]

   / [(Weight1 * Liab1) + (Weight2 * Liab2)]

   Where Liab1 and Liab2 are the Not-At-Risk liability and At-Risk liability before loads, respectively.

4. Even when adjusting for timing (k), you won't exactly match the liability if you re-run at the EIR. In empirical tests, the EIR was generally found to be accurate to four decimals (e.g., 0.0567 or 5.67%), but was sometimes off by 0.0001 or 0.0002 (0.01% or 0.02%).