Probability of Withdrawing Contributions

What is the Probability of Withdrawing Contributions Assumption and How Do We Use it?

The Probability of Withdrawing Contributions assumption represents the likelihood that members who leave employment (terminate) will elect to receive a refund of their defined-benefit contributions. Alternatively, a vested member could terminate and choose to receive their earned retirement annuity when eligible.

We use the probability of withdrawing contributions assumption in combination with our termination assumptions to estimate who will or will not collect a deferred lifetime retirement benefit. The probability of withdrawing contributions assumption is generally based on how long a member served, with longer service members less likely to withdraw their contributions. Inherently, this assumption does not apply to members of the Plans 3 since a withdrawal from their defined contribution account will not impact their employer-funded defined benefit.

This assumption was previously referred to as "Percent Vested". For information about the prior assumption, please see the *2007-2012 Demographic Experience Study*. The "Probability of Withdrawing Contributions" simply equals one minus our previous "Percent Vested" assumption. This is because there are only two options an eligible member can take when leaving employment, (1) withdraw their contributions or (2) select an annuity.

High-Level Takeaways

We continue to see members less likely to withdraw contributions after termination as years of service increase. For example, approximately 40 percent of members who terminated with five to nine years of service withdrew their contributions, compared to around 25 percent of members with 20-25 years of service.

We generally found that our actual experience was reasonably similar to our old assumptions. However, we chose to modify the structure of the assumption to improve credibility across service levels.

Data and Assumptions

Data

We record a termination in the valuation year it occurs. A withdrawal will also be counted in the year the member terminated, even if the withdrawal occurs years later. As noted in the next subsection on assumptions, we structured the data in this manner based upon how we model these benefits in our valuation software.

We began with 21 years of experience study records, from 1995-2015. No special data was added for this assumption, but some data was removed. We removed 2001 and 2007 data for all systems and plans due to unequal length valuation periods. While we recognize the Great Recession may have impacted member behavior, we chose to include that data as part of the analysis. As summarized above, our updated analysis is still in line with our old assumptions. We don't believe that the addition of post-recession experience was significantly different than what occurred during the Great Recession.

We also made the following exclusions for specific systems:

❖ We chose to remove SERS data in the year 2000 due to a much shorter-than-normal valuation cycle.

    o SERS opened September 1, 2000, and that valuation period was only four months long. We eliminated that year's data to ensure it did not overly influence the overall result.

❖ We removed 2007 from PERS due to the creation of PSERS for similar reasons as noted with the advent of SERS.

❖ Finally, 1998 was excluded from TRS when Plan 3 was created.

MISCELLANEOUS ASSUMPTIONS

Assumptions

We assume that members who are eligible to retire immediately upon leaving employment will not withdraw their contributions, instead choosing to collect a lifetime benefit. As such, the probability of withdrawing contributions assumption is focused on members who are not eligible for retirement when they terminate.

As we mentioned previously, when a member leaves employment (or rather, terminates) they can take a refund of their contributions or receive their earned retirement annuity at a later date. This decision can occur anytime between when they terminate and when they retire.

For purposes of modeling these benefits in our valuation software, we assume this choice is made immediately upon termination. The probability of withdrawing contributions assumption informs how many members we expect to take their contributions immediately. The remaining eligible members are assumed to defer their retirement annuity.

We do not apply this assumption to current terminated vested members. Instead, we assume that all current terminated vested members will elect to receive their earned retirement annuity at a later date. We may revisit this assumption as part of future experience studies.

General Methodology

To determine the actual rate at which members withdraw contributions, we divided the number of members who withdrew their contributions by the overall number of terminations. This gives us an observed, or actual, probability of withdrawing contributions. We performed this calculation for each Plan 2 by years of service. The exception to this is WSPRS, in which we assume the same rate for Plans 1 and 2. We then compare actual historical experience to our old assumptions. After taking into consideration our expectations for the future, we select our new assumption for the Probability of Withdrawing Contributions and again compare the fit with actual experience.

We only considered terminations and withdrawals through 2015, consistent with the data used as part of our analysis on **Termination Rates**; please see that section of this report for additional details. As noted above, terminated vested members may take a refund of their contributions after they leave service. Because we record withdrawals in the year the member terminated, the actual withdrawal counts for terminations through 2015 will increase over time. To address this issue, we analyzed the sensitivity of the probability of withdrawing contributions assumption with respect to its overall impact on the retirement system liabilities. That analysis suggested changes to the current assumption generally do not make a significant difference.

Law Changes

Since the last study, no law changes have impacted our analysis of this assumption.

MISCELLANEOUS ASSUMPTIONS   *continued*

Analysis and Results

Analysis

Past Experience

The following tables show the Actual and Expected counts of members who withdrew their contributions after termination, along with the A/E Ratio. The Expected counts are based upon our old assumptions.

PERS 2 Members Withdrawing Their Contributions After Termination			
Service	**Actual***	**Expected**	**A/E**
5-9	11,647	11,290.8	1.03
10-14	4,553	4,773.3	0.95
15-19	1,812	1,945.6	0.93
20-24	374	319.9	1.17
25+	66	58.4	1.13
Total	18,452	18,387.8	1.00

TRS 2 Members Withdrawing Their Contributions After Termination			
Service	**Actual***	**Expected**	**A/E**
5-9	685	632.8	1.08
10-14	196	214.9	0.91
15-19	62	73.1	0.85
20-24	7	3.5	2.00
25+	1	0.6	1.74
Total	951	924.8	1.03

SERS 2 Members Withdrawing Their Contributions After Termination			
Service	**Actual***	**Expected**	**A/E**
5-9	2,185	2,379.9	0.92
10-14	895	1,050.5	0.85
15-19	285	368.5	0.77
20-24	34	28.5	1.20
25+	4	3.5	1.16
Total	3,403	3,830.8	0.89

PSERS 2 Members Withdrawing Their Contributions After Termination			
Service	**Actual***	**Expected**	**A/E**
5-9	195	191.6	1.02
10-14	56	61.9	0.91
15-19	24	28.7	0.84
20-24	8	5.0	1.60
25+	0	0.4	0.00
Total	283	287.5	0.98

LEOFF 2 Members Withdrawing Their Contributions After Termination			
Service	**Actual***	**Expected**	**A/E**
5-9	654	682.6	0.96
10-14	390	401.3	0.97
15-19	178	190.0	0.94
20-24	33	48.4	0.68
25+	4	2.2	1.82
Total	1,259	1,324.5	0.95

WSPRS 1/2 Members Withdrawing Their Contributions After Termination			
Service	**Actual***	**Expected**	**A/E**
5-9	41	42.5	0.96
10-14	18	17.3	1.04
15-19	9	9.9	0.91
20-24	1	0.4	2.50
25+	0	0.0	0.00
Total	69	70.2	0.98

*Based upon historical experience from 1995-2015; see the **Data** sub-section above for exclusions.*

THREE: APPENDICES

Methods and Format of Assumptions

We considered but did not adopt other alternate formats for the assumption. For reference, we considered:

❖ Separate rates by gender but believe that both genders' experience is reflected well in the data (a natural weighted average based on plan membership).

❖ Blended analysis for PERS 2, TRS 2, and SERS 2, and setting a single set of assumptions for the three plans; however, the actual experience of the plans suggests materially different behavior. We also considered how well PSERS 2 experience matched these plans.

❖ Deferred withdrawal of contributions, instead of assuming all withdrawals are done immediately after termination. Given a member's contributions earn 5.5 percent per year in interest and the discount rate is 7.5 percent, assuming only immediate withdrawals is slightly conservative. We do not believe this is material enough to create a more complex assumption for the timing of the withdrawal.

Results

All-Plan Summary

We generally found that our actual experience for the Plans 2 (and WSPRS 1) was reasonably similar to our old assumptions. However, we chose to make small modifications to the assumptions to improve credibility across service levels and simplify the overall structure. Specifically, we set this assumption in five-year service increments. Given the small remaining number of non-retirement eligible actives in the Plans 1, we determined this assumption is immaterial for the Plans 1 and decided to assume all future terminations will elect a deferred annuity. The following table shows A/E counts before and after the assumption changes.

Summary of A/E Ratios		
	Under Old Rates	**Under New Rates**
PERS 2	1.00	1.00
TRS 2	1.03	1.00
SERS 2	0.89	0.99
PSERS 2	0.98	0.98
LEOFF 2	0.95	0.97
WSPRS 1/2	0.98	0.99

As stated previously, we know that more terminated vested members will withdraw their contributions in the years to come. At that point, these A/E ratios will increase. Given the relatively small impact of testing the sensitivity of this assumption, we think targeting an A/E close to 1.00 is a reasonable approach.

By System Considerations

Here are a few comments for specific plans:

❖ PSERS 2 opened in 2007, and as a result experience data is fairly limited. The few observations available suggest similar behavior to PERS 2, so for this experience study we updated our probability of withdrawing contributions assumption to match PERS 2; we'll continue to monitor this assumption in future experience studies.

❖ LEOFF 2 exhibited higher rates of withdrawing contributions than other systems. Primarily, we believe this is due to the subsidized withdrawal benefit available to members with at least 10 years of service. According to RCW 41.26.540, members will receive 150 percent of their accumulated member contributions if they decide to forego their vested annuity. The other systems provide 100 percent of the member's accumulated contributions.

MISCELLANEOUS ASSUMPTIONS   *continued*

❖ WSPRS has less experience data than PSERS but is a much more mature system. As a result, we felt the historical experience was sufficient to select a unique assumption for WSPRS.

❖ We reviewed this assumption as it applies to PERS 1, TRS 1, and LEOFF 1 and determined it was reasonable to assume that no remaining active members (who are not retirement-eligible) would elect to withdraw their contributions. From a liability standpoint, there's no impact to TRS 1 and LEOFF 1, and the impact to PERS 1 is immaterial. Please see the **Termination Rates** section of this report for supporting headcount data.

New Probability of Withdrawing Contributions

The following tables show a summary of old, actual, and new probabilities of withdrawing contributions by years of service. Please note that the old assumption varied by each individual year of service, so the following tables represent an average over the service ranges. Please see our *2007-2012 Demographic Experience Study* report for additional detail.

PERS 2 Probability of Withdrawing Contributions			
Service	Old	Actual*	New
0-4**	1.00	1.00	1.00
5-9	0.45	0.46	0.45
10-14	0.39	0.38	0.40
15-19	0.34	0.32	0.30
20-24	0.23	0.28	0.30
25+	0.16	0.19	0.15

TRS 2 Probability of Withdrawing Contributions			
Service	Old	Actual*	New
0-4**	1.00	1.00	1.00
5-9	0.28	0.31	0.30
10-14	0.21	0.20	0.20
15-19	0.13	0.14	0.15
20-24	0.05	0.18	0.10
25+	0.04	0.25	0.05

SERS 2 Probability of Withdrawing Contributions			
Service	Old	Actual*	New
0-4**	1.00	1.00	1.00
5-9	0.33	0.30	0.30
10-14	0.29	0.25	0.25
15-19	0.23	0.18	0.20
20-24	0.17	0.23	0.20
25+	0.12	0.27	0.15

PSERS 2 Probability of Withdrawing Contributions			
Service	Old	Actual*	New
0-4**	1.00	1.00	1.00
5-9	0.45	0.47	0.45
10-14	0.39	0.36	0.40
15-19	0.34	0.31	0.30
20-24	0.19	0.50	0.30
25+	0.12	0.00	0.15

LEOFF 2 Probability of Withdrawing Contributions			
Service	Old	Actual*	New
0-4**	1.00	1.00	1.00
5-9	0.65	0.62	0.65
10-14	0.61	0.59	0.60
15-19	0.53	0.52	0.50
20-24	0.30	0.31	0.30
25+	0.08	0.30	0.15

WSPRS 1/2 Probability of Withdrawing Contributions			
Service	Old	Actual*	New
0-4**	1.00	1.00	1.00
5-9	0.53	0.53	0.50
10-14	0.51	0.56	0.50
15-19	0.47	0.51	0.50
20-24	0.11	1.00	0.25
25+	N/A	N/A	N/A

Note: WSPRS members are eligible to retire with 25 years of service.

*Based upon historical experience from 1995-2015; see the **Data** sub-section above for exclusions.*

**Terminated not vested members are not required to withdraw their contributions when they quit, but eventually they will. To simplify our valuation model, we assume this occurs at that time.*