COMPREHENSIVE ACTUARIAL REVIEW OF THE 2018 EXPERIENCE STUDY OF THE LOUISIANA STATE EMPLOYEES' RETIREMENT SYSTEM

ACTUARIAL SERVICES
PRESENTED TO THE PUBLIC RETIREMENT SYSTEMS' ACTUARIAL COMMITTEE
DECEMBER 18, 2019

December 2, 2019

Ms. Cindy Rougeou, Executive Director
Louisiana State Employees' Retirement System
Post Office Box 44213
Baton Rouge, Louisiana 70804-4213

Re: Comprehensive Actuarial Review of the 2018 Experience Study

Dear Ms. Rougeou:

The Louisiana Legislative Auditor (LLA) has conducted a Comprehensive Actuarial Review (CAR) for the Louisiana State Employees' Retirement System (LASERS or System).

The remainder of this letter contains the results of our comprehensive review of your June 30, 2018 Experience Study prepared by Fosters & Foster and dated January 23, 2019. More specifically, we have evaluated for reasonableness the actuarial assumptions proposed by the System's actuary.

I would like to thank you and your staff for your cooperation and assistance with this review.

Sincerely,

Daryl G. Purpera, CPA, CFE
Legislative Auditor

DGP:LPG:JJR:ch

cc: Foster & Foster

LLA's CAR of LASERS 2018 Experience Study

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Scope of Review

The June 30, 2018, Experience Study Report for the Louisiana State Employees' Retirement System (LASERS or System) was prepared by the actuary for LASERS' retirement board, Foster & Foster, and dated January 23, 2019.

This Comprehensive Actuarial Review (CAR) of that report was prepared by Lowell Good, Actuary for the Louisiana Legislative Auditor (LLA) and James J. Rizzo, actuary employed by Gabriel, Roeder, Smith and Company (GRS), and includes evaluations for appropriateness of certain methods and key actuarial assumptions recommended by LASERS' actuary. This CAR should be considered in connection with another CAR prepared by Mr. Good and Mr. Rizzo in review of the 2019 Actuarial Valuation report prepared by LASERS' actuary.

Inflation

The assumed rate of future inflation is a component of the assumed return assumption and the salary increase assumption. The 2018 Experience Study report indicates that the current assumption of 2.75% exceeded the historical inflation over the last 20- and 30-year periods by 25 to 55 basis points. The system actuary based the inflation assumption recommendation on estimates from the following sources:

- NEPC, the System's investment consultant. The long-term inflation assumption used by NEPC is 2.75%.
- The Horizon Actuarial Services, LLC, 2018 Survey of other consulting firms (Survey), which is based upon the capital market assumptions of 34 investment advisors. For the Survey, all advisors provided short-term assumptions, while 13 provided both short-term and long-term assumptions. The average short-term inflation for all advisors was 2.24%. For the 13 advisors that provided both short-term and long-term assumptions, the average short-term inflation was 2.41%, and the average long-term inflation was 2.47%.
- A survey of the Society of Professional Forecasters conducted by the Federal Reserve Bank of Philadelphia. An average inflation over the next 10 years is forecasted to be 2.21%.
- The Philadelphia Fed's Livingston Survey. The December 2018 report showed an average 10-year inflation expectation of 2.23%.
- The Social Security Administration's 2018 Trustees Report included an intermediate cost inflation assumption of 2.60%.

The experience study report also included information about the spread between the nominal yield on treasury securities and the inflation indexed nominal yield on inflation protected treasury bills (TIPS), called the breakeven rate of inflation, and information about historical inflation. The breakeven rate of inflation is 2.38% for short-term and long-term horizons

LASERS' actuary ultimately recommended a reduction from 2.75% to 2.50% for the assumed long-term rate of inflation.

Conclusion – The Actuary for the LLA finds LASERS' 2.5% inflation assumption to be exceptionally high considering the plan's benefit cash flows (for short-term, mid-term and long-term cash flow) and the mainstream of economists' forecasts. Based on the GRS Survey of 17 inflation forecasts from 10 different independent professional sources, the Actuary for the LLA identified an inflation assumption of 2.16% as the average inflation rate expected over the mid-term horizon (next 10 years) and 2.25% as the average inflation rate expected over the long-term horizon (27-30 years). We would be pleased to provide the backup research in this GRS Survey, if requested.

Investment Return and Discount Rate

The methodology employed by LASERS' actuary for developing the assumed investment return and discount rate includes the following elements.

Future Investment Performance (forward-looking forecasts)

A forward-looking perspective should drive the determination of an assumed rate of return for pension actuarial valuations.[1] LASERS' actuary obtained forward-looking forecasts from a survey of multiple consultants conducted by the Horizon Actuarial Services to supplement inputs from the System's investment consultant, NEPC. Those expectations were applied to the System's own asset allocation resulting in a forward-looking assumption.

The capital market assumptions developed by the investment consulting firms in the survey used to develop LASERS' actuary' recommendations are believed to be net of investment expenses; therefore, no adjustments for these expenses were made.

Conclusion – The Actuary for the LLA continues to advocate for the use of forward-looking forecasts rather than allowing past performance (whether favorable or not favorable) to inform our opinions about appropriate return assumptions. Past performance is not an indicator of future performance. While the past performance of the fund was also reviewed by the System's actuary , the supporting evidence in the experience study for this year's return assumption did not rely on past returns.

One exception to this is in the forecasts of private equity returns. A few references in the experience study (on pages 3 and 10) indicate the use of expectations for private equity from System's own investment staff. The System's actuary points to historical returns on private equity (page 10 of the experience study) in support of the in-house investment staff's 13% expectation:

> "*NEPC and LASERS investment staff utilize a private equity return assumption of 13%. This compares to LASERS' historical 15- and 25-year returns for this asset category of 11.95% and 13.92%, respectively. Using LASERS' target portfolio allocation, NEPC's 30-year capital market assumptions for all but private equity and our recommended 2.50% inflation assumption the long-term (30-year) expected return of the portfolio is 7.97% . . .*"

Consideration as to the Time Horizon of Future Expectations

LASERS' actuary used capital market assumptions from the Horizon Actuarial Services, LLC, 2018 Survey of other consulting firms (Survey). In the Survey, different sets of assumptions were provided for a short timeframe (i.e., 5 to 15 years) and also a long time-frame (i.e., 20 to 30 years). However, LASERS' actuary only used the long-term set of assumptions in the analysis. LASERS' actuary supports that decision by referring to the Survey, which states that the longer-term horizon is more appropriate for a mature ongoing pension plans without solvency issues.

We have a different opinion: A mid-term horizon (or arguably, in between mid-term and long-term) is more appropriate for LASERS and for most other retirement systems. Currently, long-term expectations from reputable forecasting experts are generally higher than mid-term expectations, creating a pattern that actuaries sometimes call a select-and-ultimate expectation. This resembles a yield curve in the fixed income field. A lower rate expected during the select period followed by a higher rate for the ultimate period. Following are reasons not to adopt a long-term forecast horizon without regard to the mid-term forecasts:

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[1] Refer to Actuarial Standards of Practice (ASOPs) No. 27 sections 3.4, 3.6.1 and 3.8.3.

1. *Underperformance in the mid-term is not sustainable.* Consider if the experts are right, and LASERS adopts a higher long-term assumption for valuation purposes, while the next 10-15 years produce lower returns. LASERS would be expecting regular experience actuarial losses due to underperformance for the next 10-15 years.

2. *Over-reliance on reversion to mean returns.* Methodologies employed by forecasters for their long-term expectations are heavily influenced by "reversion to mean returns". That does not make them useful, but suspect. Statistically speaking, "reversion to mean returns" is valid only when the future is just like the past.

3. *Return forecasts over a longer-term horizon are less reliable.* Many more unanticipated events ("unknown unknowns") in the economy can happen during the next 20 or 30 years than can happen during the next 10 years. That makes 20-30-year forecasts less reliable.

4. *LASERS' own cash flow demands.* It is fundamental in setting or supporting actuarial assumptions to incorporate (explicitly so) a retirement system's own characteristics into the process. In the language of ASOP No. 27 section 3.8.3, "The actuary should address factors specific to each measurement in selecting an investment return assumption. Examples of such factors are as follows:"

   - The portfolio's target asset allocation, per section 3.8.3(a) of ASOP No. 27 and
   - The plan's expected cash flow timing, per section 3.8.3(f) of ASOP No. 27.

   Based the information provided to the Actuary for the LLA by LASERS and its actuary and in the experience study report, LASERS and its actuary did incorporate the portfolio's target asset allocation but did not incorporate the plan's expected cash flow timing, which would cause the final time horizon to be in between the mid-term and long-term horizon.

   LASERS' fund has been in a negative cash flow state (more benefits and expenses are leaving the fund than contributions coming in) for a number of years. This is true of most public retirement systems. For example, according to LASERS' 2019 actuarial valuation report, during 2018-2019, benefits and administrative expenses leaving the LASERS' fund were $1,397 million, while contributions coming in were only $920 million, requiring the use of current investment earnings just to pay current benefits rather then re-invest them to pay future benefits.

   Based on last year's valuation by the Actuary for the LLA, the majority of LASERS's current assets will be paid out during the next 10 years – and will not be there to experience a higher return expected in the later years.

   Gravitating toward a long-term time horizon may help justify a higher return assumption, but LASERS' substantial negative cash flow (a) raises concern over the fund's ability to generate sufficient earnings to replace depleted assets and (b) is a sound actuarial reason to employ a time horizon between the mid-term and long-term horizons. The liability's duration is a good proxy for the calculation of a single equivalent return assumption across the first 10 years and the next 20 years.

Conclusion – These are compelling reasons not to simply use forecasters' long-term expectations (to the exclusion of mid-term forecasts) to develop or support a retirement system's return assumption. We believe the investment horizon should be a mid-term horizon, no more than 10 or 15 years. A retirement system is not necessarily better-served by consistently setting their return expectations based on a long-term time horizon; in our opinion, it is better served by setting the horizon based on a mid-term time

horizon (or between mid-term and long-term as adjusted for cash flow) for the four reasons described above.

Gain-Sharing

LASERS' actuary used a forward-looking model based on one-hundred 30-year projections of annual market returns provided by NEPC to determine the appropriate gain-sharing adjustment. The projections were developed using LASERS' current target portfolio allocation and the 2016 capital market assumptions from NEPC. It was also assumed that the full permanent benefit increases will always be granted when there are sufficient funds and the other requirements under the law are satisfied.

LASERS' resulting 30-year projection has a mean of 39 basis points of investment earnings that is expected to be allocated to the experience account. Therefore, LASERS's actuary believes the current 40 basis point adjustment for gain-sharing is still reasonable.

<u>Conclusion</u> – The Actuary for the LLA agrees with LASERS' actuary in recognizing the reasonable likelihood of future gain-sharing COLAs for funding purposes. It is a fundamental requirement of any actuarial valuation to measure reasonably-expected future plan benefits and, thereby, work toward attaining and maintaining actuarial soundness. However, there are other actuarial methods that are more explicit (as opposed to implicit) and more transparent, yet will recognize gain-sharing COLAs with more advantages.

Implicit Assumptions

LASERS' *actuarial method* of reducing the return assumption by some number of basis points to approximate the cost of future COLAs is an "implicit" approach to recognizing future COLAs. Even though the implicit method is permitted by ASOPs, implicit approaches to assumption-setting are generally not favored by actuaries. During the late 1970s and the 1980s, the actuarial profession actually changed its standards to require assumptions to be explicit and transparent, with each assumption being reasonable individually.

For example, there was a time when actuaries routinely supported the use of no salary increases in valuations because the return assumption was deliberately set lower than expected as a separate individual assumption. The practice of adjusting one assumption to cover another has almost been eradicated. Granted, this method of lowering the return assumption to recognize gain sharing COLAs is not as egregious as the salary scale/return assumption example, because the frequency and amount of gain sharing COLAs are indeed directly related to investment earnings. Nevertheless, a lesson from the history of actuarial practice speaks to setting each assumption on its own and guides us toward an alternate *actuarial method* of recognizing gain sharing COLAs in advance.

Implicit assumptions lack transparency.

A more appropriate approach would be to the set the investment return assumption first, using a disciplined forecasting *process,* and use that as the discount rate, so that the return assumption equals the discount rate thereby removing some confusion. Under this more appropriate approach, gain-sharing transfers are recognized in advance using one of two alternate explicit and transparent *actuarial methods* described below.

Gain-sharing Recognition Methods

The System and its actuary assume that future gain-sharing COLAs are sufficiently likely to occur. Based on that assumption, LASERS and its actuary recognize a liability in advance for funding purposes. Or, in

other words, the incidence of a gain-sharing COLA being granted has actuarially measurable probabilities. And as a result, taxpayers will be required to contribute in advance for benefits that are actuarially likely to occur in the future. We agree with the LASERS' board and actuary's decision to recognize the likelihood of future gain sharing COLAs in their funding valuations.

As discussed above, the *actuarial method* currently used to recognize the cost of future COLAs is to reduce the return assumption by 40 basis points to obtain a discount rate. The 40 basis points is estimated to be the average annual amount of plan assets transferred to the Experience Account each year. Of course, such a transfer is not expected to occur every year. Some years will have none; some years will have a smaller amount; and some years will have a larger amount transferred. Regular and consistent granting of COLAs by the Legislature whenever permitted by the template causes the Experience Account to be emptied, leaving room for more transfers in future years.

However, there are two other *actuarial methods* that are more transparent and explicit (as opposed to implicit) that will recognize gain-sharing COLAs without the confusion and inconsistencies described above. Each of these two methods use the same type of Monte Carlo stochastic simulation as was needed to estimate the 40 basis points.

1. *Single equivalent annual COLA assumption.* The simulation captures information about the frequency and magnitude of each year's potential transfer to the Experience Account. The mean (average) transfer amount can be considered a benefit stream. Solving for *x*, an annual equivalent COLA having the same actuarial present value over the next 30 years as the average simulated transfer amount can be determined.

2. *Single equivalent benefit load assumption.* Dividing that same mean (average) transfer stream for each year by its regular benefits payable for that year, as captured from the open group forecast valuation, provides an estimate of the load on benefits that approximates the average transfer amount.

Either of these two alternative *actuarial methods* is acceptable and preferable, in our opinion, to LASERS' current method. There are various benefits of adopting either of these two alternative methods in lieu of the current method:

- Both of these alternative methods allow the return assumption to equal the discount rate, which will greatly improve the public disclosures. Refer to the Comprehensive Actuarial Review LASERS' 2019 actuarial valuation for more focus on transparency, consistency, and simplicity by LASERS.

- Both of these alternatives are transparent and explicit *actuarial methods* for recognizing the actuarially measurable likelihood of future gain-sharing COLAs for funding purposes.

- Both of these alternatives would solve some confusion with respect to the statutes' reference to "assumed rate of return" or "assumed valuation rate" or "actuarially assumed rate of return" or "valuation rate," etc. Currently, LASERS applies its discount rate (not the assumed rate of return) whenever the statute refers any of these terms. The statute does not contemplate a discount rate different from the return assumption. Both of these two alternative *actuarial methods* eliminate the broad range interpretations applied under the current method.

  Moving to either of these two alternative actuarial methods of recognizing gain-sharing COLA benefits would synchronize the return assumption with the discount rate and, thereby, comply more simply with the statutes. That is a much better solution than a legislative fix to

conform to the statutes to the way LASERS and its actuary are employing a separate return assumption from the discount rate

- The *first alternative method* above is more preferable because it actually incorporates a specific equivalent annual COLA as the approximation rather than a mere load-factor. This provides useful information to management and legislators as to how much COLA is expected out of the current complex statutory template. According to our research and analysis, an annual fixed COLA that is equivalent to the expectations of the current complex statutory template is slightly less than a half percent annual COLA.

Conclusion – The Actuary for the LLA recommends the use of the first alternative actuarial method mentioned above when performing funding valuations for LASERS in order to recognize future gain-sharing COLAs that are reasonably expected. This method is more transparent and less confusing to stakeholders and other interested parties.

Investment Return Forecasts from LASERS' Own Staff

LASERS' actuary relied on the capital market assumptions from its own investment consultant (NEPC) to support the investment return assumption. That is common practice.

However, according to the experience study report, LASERS also relied on its own investment staff for the forecasted returns for private equity.

Based on the Board's target asset allocation and 2018 capital market assumptions provided by NEPC, LASERS' Investment Consultant, and LASERS Investment staff, which manages private equity investments, the target portfolio produces an expected return of 7.97%, when based on our recommended 2.50% inflation assumption. [page 3]

NEPC and LASERS investment staff utilize a private equity return assumption of 13%. [page 10]

In response to our assumption data request to LASERS, we were provided with a document titled "LASERS Support for 2018 Discount Rate for Experience Study." The footnote on page 1 states:

" Private Equity - NEPC's general 30-year outlook for private equity is 9.5%. LASERS assumes that their private equity investments will return 400-500 basis points over public equity markets over the long term. The lack of liquidity and less efficiency in the private markets accounts for this premium. The 30-year average annual return of the S&P 500, a commonly used proxy for public equity returns, from December 31, 1987 - December 31, 2017 is 8.3%. Thus, LASERS expects a private equity return of approximately 13% over the long term. NEPC has indicated agreement with this assumption change relative to their general assumptions for this asset class.*

We surveyed the 2018 forecasts of four (4) major national investment forecasters' long-term expectation for private equity and found the average expected return for private equity was 255 basis points over their respective large cap equity market expectation. One of the four was NEPC, LASERS' own investment consultant. NEPC's 2018 long-term expectation for private equity exceeded their large cap equity expectation by 200 basis points. Horizon Actuarial Services was cited as a resource by LASERS' actuary. Their 2018 Survey indicates the average expectation among their investment forecaster-participants for private equity exceeded their large cap equity expectation by 210 basis points. LASERS' staff of 13.0% exceeds NEPC's large cap equity expectation by 550 basis points.

A Pensions & Investment article[2] dated November 26, 2018, shortly before the release of the LASERS experience study, states:

> *Last year, CalPERS lowered its private equity benchmark to 150 basis points over the public markets from 300 basis points. "We think the 150 basis points is a real expectation."*

Conclusion: (1) We believe it is not appropriate to set the return assumption for a retirement system based, in such a large part (15% asset allocation), on the expectations of the system's own staff. It opens the door for management bias and agency risk. (2) The expected return used (13% geometric mean) is significantly higher than independent reputable forecasters. ASOP No. 27 section 3.8.3(d) states that the actuary should not assume superior returns will be achieved (another way of referring to what investment professionals call "alpha"). In other words, the expectations used to develop or support a return assumption should reflect the expectations of the broad market, not to include any expectation of superior returns.

Investment Return Forecasts from Multiple Independent Consultants and Investment Firms

The Survey used by LASERS' actuary is based upon the capital market assumptions of 34 investment advisors. It is important to obtain forecasts and expectations from more than one expert, as LASERS' actuary did.

All investment forecasters have different sets of asset classes. Based on the information provided, it appears that LASERS' actuary used the standardized asset classes from the Survey. That internal process has two mapping steps:

1. There is never a one-to-one mapping of the portfolio's asset class allocation to each investment forecaster's asset classes because each forecaster publishes expectations based in different sets of asset classes. This is a source of what is called "mapping error" in the process. This does not mean there was a mistake made; it is a statistical modelling term, similar to the term "margin of error."

2. The Survey employed by the System's actuary uses a standardized set of asset classes for convenience. This is a second source of "mapping error" introduced early in the process. A mapping of all investment forecasters' asset classes to a standardized set of asset classes creates initial mapping errors, even before mapping LASERS' asset classes as expressed in its Investment Policy Statement into the standardized set of asset classes developed by the Survey.

   An imperfect mapping of each investment forecaster's asset classes into these standardized asset classes accounts for some classes but leaves others empty. That causes the average for each asset class not to remain true to the original investment consultant's expectations. The standardized mapping has more challenges when creating a single set of correlation coefficients, because each of the firms has a whole set of its own correlation coefficients among its own set of asset classes.

Further details were not requested or provided in the 2018 Experience Study as to exactly how the mapping was accomplished. The combined effect of these two sources of "mapping error" for this process; however, is not considered substantial, but worth possibly 10-40 basis points in either direction (plus or minus).

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[2] https://www.pionline.com/article/20181126/PRINT/181129939/new-calpers-private-equity-model-keys-on-staff-delegation

<u>Conclusion</u> – The primary observation for this step, however, is that LASERS' actuary sought the professional opinions of other investment consultants in formulating the recommended return assumption. That is considered a best practice.

LASERS' Return Assumption for Funding

LASERS' return assumption for 2019 is 8.0%. This has been attested by LASERS' actuary:

1. LASERS' actuary has been asked in recent years' PRSAC meetings what the total investment return assumption was, for providing all plan benefits. The response was 8.05%, 8.25%, etc., not 7.60%, 7.75%, etc.

2. In an email response to the 2018 annual data/assumption request from the Actuary for the LLA, LASERS' Executive Director stated, "<u>Rate of future investment return</u>: *8.05% (7.65% discount rate plus 0.40% for gain-sharing)."*

3. In the section on assumptions, LASERS' funding valuation report indicates the return assumption for the June 30, 2019, valuation is 8.0%.

4. Furthermore, in response to PRSAC's request last year, LASERS' actuary included all the relevant return assumptions and discount rates (four of them) on page 1 of LASERS' 2019 valuation report. We see that the expected rate of return assumption for the current year is 8.0%.

5. The experience study was dated January 23, 2019, and provides a defense for the then-current 8.05% and the related discount rate of 7.65%, as applicable to the 2018 actuarial valuation return assumption, moving from 8.05% (=7.65%+ 40 bps) in 2018 down to 7.90% (=7.50%+40bps), incrementally over time.

This rate of earnings (8.0%) together with the employer and employee contributions is expected in the 2019 valuation to finance (on an actuarial basis) <u>all</u> plan benefits -- gain-sharing COLAs, retirement, death, disability, etc.

<u>Conclusion</u> – Eight percent (8.0%) is the fund's assumed investment return for 2019. This is the assumption of what the LASERS portfolio will earn over time. Our independent research and process indicates the most appropriate return assumption for funding LASERS is <u>7.04%</u>. This is portfolio's expected earnings over an actuarially-appropriate time horizon.

Refer to the *Comprehensive Actuarial Review for LASERS' 2019 Actuarial Valuation report prepared by the Actuary for the LLA* for an important discussion of the lack of transparency in public disclosures about the System's 8.0% return assumption, and for results of our research and analysis that lead to our 7.04% most appropriate return assumption.

LASERS' long-term rate of return for GASB reporting

The experience study includes a subsection on Recommended Discount Rate for GASB Reporting:

GASB statements 67 and 68 generally require the discount rate to be determined based on the long-term expected rate of return. In discussions with LASERS' executive and investment staff, and external auditor, it was agreed that it was preferable to use the same discount rate for funding and GASB reporting, as long as the assumptions used are reasonable for each purpose, despite the inherent differences in the total return expectation of each. There is no reason to require that each be

based on a single overall long-term expected rate of return. The LASERS Board agreed and has maintained the same discount rate for funding and GASB reporting.

ASOP 27 regarding the Selection of Economic Assumptions for Measuring Pension Obligations specifically addresses this in paragraph 3.6.2. which addresses the "Range of Reasonable Assumptions". The paragraph states "The actuary should recognize the uncertain nature of the items for which assumptions are selected and, as a result, may consider several different assumptions reasonable for a given measurement. The actuary should also recognize that different actuaries will apply different professional judgment and may choose different reasonable assumptions. As a result, a range of reasonable assumptions may develop both for an individual actuary and across actuarial practice."

We continue to believe this is a reasonable approach. Given that staff and external auditors are comfortable with this approach, and actuarial standards of practice specifically allow it, we recommend continued use of the same discount rate as that used for funding purposes to be used for GASB reporting purposes. Specifically, we believe that a 7.65% discount rate with the goal of reducing the discount rate to 7.50% by June 30, 2021 to be reasonable for GASB reporting purposes. This is more conservative than the funding assumptions, but still reasonable in our opinion.

LASERS and its actuary adopted significantly different return assumptions as of June 30, 2019, for funding as compared to accounting.
- For funding: An 8.0% return assumption.
- For accounting: A 7.60% return assumption.

LASERS and its actuary recognize different future benefit projections as of June 30, 2019, for funding as compared to accounting.
- For funding: All plan benefits are recognized for actuarial advance-funding (including gain-sharing COLAs), as they should be. LASERS and its actuary recognize that future gain-sharing COLA benefits are reasonably likely to be paid in the future. They have estimated that the future COLA benefits will cost the fund approximately 40 basis points each year, and incorporate that into their funding valuation.
- For accounting: Future gain-sharing COLAs are not recognized (excluded) in the measurement of costs and liabilities. Even though they consider them reasonably likely to be paid in the future and are doing the responsible thing by advance-funding them in the funding valuation, they are excluding any projection of future gain-sharing COLAs from the accounting valuations.

Conclusion – Even if one accepts the exclusion of future COLAs (which we believe should not be done), the return assumption should still be the same, at 8.0%. At the end of the day, the 8.0% rate was declared by LASERS and its actuary to be the expectation for the portfolio as a whole. They had already stated that was the expected return of the portfolio. The expected return of the portfolio is just that, whether it is for funding or accounting purposes.

The experience study states, "*There is no reason to require that each be based on a single overall long-term expected return assumption.*" In our opinion, the default should be that they are the same, i.e., the return assumption should be the same for both funding and accounting unless there is a compelling reason they should not.

One reason LASERS might have a different rate of return assumption for funding compared to accounting is that GASB rules can be interpreted to require a long-term return horizon assumption, rather than a mid-term horizon or somewhere in between.

GASB prohibits gain-sharing COLAs from being recognized by reducing the return assumption by 40 basis points or any other amount. We believe any future COLAs that are reasonably likely to be granted should be projected using either the first or second alternative actuarial method described above.

Refer to the *Comprehensive Actuarial Review for LASERS' 2019 Actuarial Valuation report prepared by the Actuary for the LLA* for an important discussion of the lack of consistency between funding and accounting.

Conclusion of the Actuary for the LLA

In the opinion of the Actuary for the LLA: (a) the 2.50% inflation assumption is exceptionally high (causing the return expectations to be exceptionally high), compared to the mainstream of economists' forecasts; (b) the 8.0% return assumption is also at the highest end of the mainstream of investment forecasters' expectations for LASERS' portfolio considering its own asset allocation and its own cash flow; (c) the first alternative actuarial method of recognizing future COLAs (incorporating a single equivalent COLA) described above is more explicit, more transparent, and is compliant with GASB standards; and (d) the return assumption should be consistent for funding and accounting.

Rates of Salary Increase

Salary increase experience studies can be undertaken using a few approaches. A robust and explicit approach is:

1. The actuary can separate the actual raw salary increase rates:

    a. By age during the experience period so that each age has its own actual raw salary increase rate and assumed rate, or
    b. By years of service, without regard for age; a non-actuarial advantage of this separation prevents the salary increases from showing a decline as members age, or
    c. By select and ultimate; this is built using separate rates by service for the first X years of service, then aggregated by age thereafter, or built using separate rates by age for the first X years of age, then aggregated by service thereafter, or
    d. A single rate, regardless of ages or years of service.

    An actuarial analysis for deciding which of these three approaches is preferable would be to examine the least squares or other measure of statistical best-predictors, i.e., which method does the best job of predicting (back-testing) the actual raw rates with the least statistical error. There may be other not-so-actuarial considerations.

    The first three methods require a minimum threshold number of members in each category for actuarial credibility. LASERS has a sufficiently large number of members to partition the data in these ways.

2. For each year in the experience period, the actuary can separate the salary increases (under any of the four methods above) into two components:

    a. The actual inflation rate for that given year and
    b. The excess of the actual total rate over the actual inflation rate. This represents the "real salary increase rate," or the portion of the increase representing merit and productivity increase, under the theory that a workers' salary increases occur to keep up with inflation, promotions and improvements in personal skills, and general productivity in the workforce.

    By separating the total increases experienced into these two components, the actuary can (a) decide on the most appropriate salary scale for merit and productivity then (b) decide separately on an a future inflation component over a mid-term horizon of future working lifetimes that is consistent with the inflation component of the investment return assumption and any other inflation-related assumptions.

    In the experience study report, LASERS' actuary indicated that the inflation component and the merit and productivity component were separated, with a recommended inflation component of 2.50%.

The 2018 Experience Study report analyzed the actual raw rates by service (approach 1b, above) for all the members. There was no mention of analyzing salary experience by age alone or by a select and ultimate scale.

Rank and File

The actual salary increases during the experience period were lower than the rates currently assumed for all durations of service except the first year. The proposed salary increases are also lower than the rates

currently assumed at all durations of service except the first year. The aggregate salary increase was 4.66%, while a rate of 5.65% had been currently assumed or expected. The aggregate real wage increase was 3.12% (with an average annual inflation of 1.54%), while a rate of 2.90% was expected. The aggregate proposed salary increase is 5.04%, which corresponds to a reduction in the inflation component of 0.25% and a reduction in the merit component of 0.36%. The proposed salary increase is less than the current experience since it also accounts for a compensation program implemented by civil service which is expected to lower future salary increases in aggregate.

Conclusion – The Actuary for the LLA considers that the approach and results for the salary scale for the Rank and File Plan are appropriate.

Judges

The actual salary increases during the experience period were generally lower than the rates currently assumed or expected. The aggregate salary increase was 2.68%, while a rate of 3.06% was expected. The proposed salary increases are the same as the rates currently assumed. Since the inflation was lowered by 0.25%, this corresponds to an increase in merit component of 0.25%.

Conclusion – The Actuary for the LLA considers that the approach and results for the salary scale for Judges are appropriate.

Corrections/Hazardous Duty

The actual salary increases during the experience period were generally lower than the rates currently assumed or expected. The aggregate salary increase was 5.67%, while a rate of 6.94% was expected. The aggregate real wage increase was 3.73% (with an average annual inflation of 1.54%), while a rate of 2.90% was expected. The proposed salary increases are lower at all durations of service. The aggregate proposed salary increase is 6.05%, which corresponds to a reduction in the inflation component of 0.25% and a reduction in the merit component of 0.64%.

Conclusion – The Actuary for the LLA considers that the approach and results for the salary scale for Corrections/Hazardous Duty are appropriate.

Mortality Rates

The methodology employed for developing the mortality assumption recommended by LASERS' actuary in the experience study report is an improvement from the methodology employed in prior years. We commend this improvement by LASERS' actuary, since the experience study incorporates the most recently developed broad-based and relevant mortality tables in the analysis and the mortality assumption is based on reasonable applications of actuarial credibility principles.

Credibility

Actuarial credibility pertains to the statistical confidence in the results of an experience study for projecting future mortality rates.

For the purpose of the experience study, the credibility was assessed separately for males and females, for actives and retirees, and also for General and Public Safety members (for disabled retirees, the General and Public Safety experience was combined). In order to be fully credible, the experience study for each group for which rates are developed is required to have at least 1,082 deaths during the exposure period.

Based on the information in the experience study report, the LASERS experience study data is fully credible for the general retiree subgroups (males and females) since their respective numbers of deaths are more than 1,082 each. The credibility factors are therefore 100% for the general male members and general female members. This means that 100% of the experience study results can be used in the determination of the mortality assumption for these two subgroups.

Based on the information in the experience study report, the data is insufficient to be fully credible for the general active subgroups (145 male deaths and 165 female deaths), the public safety active subgroups (24 male deaths and 15 female deaths), the public safety retiree subgroups (175 male deaths and 26 female deaths), and the disabled retiree subgroups (250 male deaths and 307 female deaths) since their respective numbers of deaths are less than 1,082 each. This means the experience study results for these groups are only partially credible. The credibility factors were determined to be 36.6% for general active males, 39.1% for general active females, 14.9% for public safety active males, 11.8% for public safety active females, 40.2% for public safety retiree males, 15.5% for public safety retiree females, 48.1% for disabled male retirees, and 53.3% for disabled female retirees.

Base Mortality Tables

The RP-2014 Mortality Tables were issued by the Retirement Plans Experience Committee (RPEC) of the Society of Actuaries and published in October 2014. They were considered the most recently developed broad-based mortality tables at that time.

The Pub-2010 Public Retirement Plans Mortality Tables, now the most recently developed broad-based mortality tables, were issued by the Retirement Plans Experience Committee (RPEC) of the Society of Actuaries and published in January 2019. While these tables now constitute the most recent and reliable standard reference tables available for purposes of national estimates of mortality for public pension plans, they were not finalized until just before the date of this experience study and we do not expect them to be explicitly used therein..

In preparing the experience study, LASERS' actuary compared the actual plan experience to the RP-2014 Mortality Tables for White Collar; Blue Collar; the Total Data Set for employees and annuitants, as applicable; and to the applicable Pub-2010 Mortality Tables. According to the experience study report, each of these tables was projected to 2015 (the central year of the experience study) using improvement scale MP-2018.

The experience study report presents the mortality information for active (General and Public Safety), annuitant (General and Public Safety), and disabled members separately. For active members, the RP-2014 Blue Collar Employee Tables were used as the standard reference tables (for General and Public Safety). For General annuitant members, the RP-2014 Blue Collar Healthy Annuitant Table was used as the standard reference table for males and the RP-2014 White Collar Healthy Annuitant Table was used as the standard reference table for females. For Public Safety annuitant members, the RP-2014 Blue Collar Annuitant Tables were used as the standard reference tables. For disabled retiree members, the RP-2000 Disabled Retiree Tables, which are the current tables, were retained as the standard reference tables.

LASERS-derived Adjustment Factors

LASERS-derived adjustment factors to be applied to the RP-2014 mortality tables (and RP-2000 mortality tables for disabled retirees) were calculated separately for each subgroup. These tables became the new standard reference table so as to line up with the central year of the experience study.

The LASERS-derived adjustment factors were developed by comparing the total observed number of deaths for each subgroup from the experience study to the total number of deaths expected from application of the base reference mortality table for each subgroup projected to 2015, the central year of the experience study.

a. For general active members, the LASERS-derived adjustment factor is 97.8% for males and 114.4% for females.

b. For public safety active male members, the LASERS-derived adjustment factor is 100.5% for males and 112.9% for females.

c. For general retiree members, the LASERS-derived adjustment factor is 128.0% for males and 141.7% for females.

d. For public safety retiree members, the LASERS-derived adjustment factor is 118.5% for males and 101.7% for females.

e. For disabled retiree members, the LASERS-derived adjustment factor is 100.9% for males and 104.3% for females.

We were not able to independently verify all of the details pertaining to the selection of the mortality table. However, based on the exhibits presented in the 2018 Experience Study report, these adjustment factors are deemed reasonable for use in actuarial valuations for LASERS.

Mortality Improvement Scale

The 2018 Experience Study report used the Society of Actuaries recommended approach – application of the generational mortality improvement scale MP-2018. We commend this decision by LASERS' actuary. The improvement scale projects the mortality rates to future years to account for future improvement in the mortality rates. The experience study did not specify which year was the base year for projecting. The MP-2018 improvement scale, released in October 2018, is the most recent improvement scale available as of the June 30, 2019 valuation date. In addition, no future mortality improvement was used for disabled retirees since the experience did not show any improvement in recent years.

Conclusion – The Actuary for the LLA considers the approach and results for the mortality rates appropriate.

Rates of Disability

Rank and File

The current assumptions vary based on age. The actual disability rates during the experience period were lower than the rates currently assumed for almost all ages. The aggregate disability rate for all ages was 0.09%, while a rate of 0.16% was expected. The proposed rates of disability are lower than the current rates of disability for most ages, although not to the level of the actual experience since the prior experience study was also considered and showed a greater aggregate disability rate of 0.17%.

Conclusion – The Actuary for the LLA considers that the approach and results for the rates of disability for the Rank and File Plan are appropriate.

Judges

The current assumptions vary based on age. There were no disabilities during the experience period while the aggregate disability rate was expected to be 0.02% (which was based on the actual experience of the prior experience study). Since there was no experience during the experience period, the proposed rates are the same as the current rates.

Conclusion – The Actuary for the LLA considers that the approach and results for the rates of disability for Judges are appropriate.

Corrections/Hazardous Duty

The current assumptions vary based on age. The actual disability rates during the experience period were greater than the rates currently assumed. The aggregate disability rate for all ages was 0.23% while a rate of 0.19% was expected. The proposed rates of disability were increased at most ages to better reflect the actual experience.

Conclusion – The Actuary for the LLA considers that the approach and results for the rates of disability for the Corrections/Hazardous Duty Plan are appropriate.

Rates of Retirement

As with most other decrements, rates of retirement from active employment can be undertaken using a few approaches. An entry to a Deferred Retirement Optional Plan (DROP) is a form of retirement, as the eligibility for entering the DROP is often conditioned on meeting eligibility for retirement and, like retirement, it results in cessation of benefit accruals. Many retirement systems including LASERS evaluate DROP entry and retirement together because they have similar effects on benefit accruals and liability buildup.

As is the case with other decrements, studies of rates of retirement/DROP can be undertaken using a few approaches. A robust and explicit approach would start by determining which rate is most likely to be the best predictor of future experience, and by analyzing the rates:

     a. By age, during the experience period, so that each age has its own actual raw retirement/DROP rate and assumed rate, or
     b. By years of eligibility, without regard for age, or
     c. By a combination of age and years of service, or
     d. By select and ultimate; this is built using separate rates by year of eligibility the first X years, then aggregated by age thereafter, or built using separate rates by age for the first X years of age, then aggregated by year of eligibility thereafter, or
     e. A single retirement/DROP age, sometimes expressed in terms of eligibility for retirement/DROP (this approach is less and less common with advancements in valuation systems).

It appears that LASERS' actuary focused attention on analyzing the plan retirement/DROP experience by age and years of service. Although the System actuary did not find any significant evidence for preference to retire at the first eligibility, we did not find any documentation of more extensive analysis of retirement/DROP pattern by year of eligibility.

In addition, while the analysis and data provided in the 2018 Experience Study report showed the actual experience and current and proposed assumptions as percentages, we would prefer a level of detail that also shows the total number of exposures, the actual number retiring, the assumed number retiring per the current assumption, the ratio of actual to expected, the proposed number retiring per the proposed assumption, the ratio of actual to proposed, and the actual rate of retirement/DROP.

Rank and File

The current assumptions vary based on age and based on five separate service levels. The actual retirement/DROP rates during the experience period were generally lower than expected for members less than age 60 and greater than expected for members greater than age 60. The proposed rates of retirement/DROP were adjusted to better reflect the experience.

Additionally, the service categories were reviewed and were retained since it still provides a good match of the experience. The five levels of service based are: less than 10 years of service, 10-19 years of service, 20-24 years of service, 25-29 years of service, and 30 or more years of service.

Conclusion – The Actuary for the LLA considers that the approach and results for the rates of retirement/DROP for the Rank and File Plan are appropriate.

Judges

The current assumptions vary based on age and based on three separate service levels. The actual retirement/DROP rates during the experience period were generally greater than expected. The proposed rates of retirement/DROP were adjusted to better reflect the experience in each proposed service category.

Additionally, the service categories were reviewed and restructured to better match the experience. The current assumption has three levels of service based: less than 15 years of service, 15-19 years of service, and 20 or more years of service. The proposed assumption has also three levels of service, but based on updated years of service: less than 12 years of service, 12-17 years of service, and 18 or more years of service.

Conclusion – The Actuary for the LLA considers that the approach and results for the rates of retirement/DROP for Judges are appropriate.

Corrections/Hazardous Duty

The current assumptions vary based on age and based on two separate service levels. The actual retirement rates during the experience period were lower than the rates currently assumed. The actual retirement rates during the experience period were generally greater than expected for members less than age 50 and lower than expected for members greater than age 50. The proposed retirement/DROP rates are reflective of the current experience in each proposed service category.

Additionally, the service categories were reviewed and restructured to better match the experience. The current assumption has two levels of service based: less than 25 years of service, and 25 or more years of service. The proposed assumption has also two levels of service, but based on updated years of service: less than 10 years of service and 10 or more years of service.

Conclusion – The Actuary for the LLA considers that the approach and results for the rates of retirement/DROP for the Corrections/Hazardous Duty Plan are appropriate.

Rates of Withdrawal

Withdrawal rate experience studies can be undertaken using a few approaches. In a robust and explicit approach the actuary can separate the actual raw withdrawal rate:

  a. By age during the experience period, so that each age has its own actual raw withdrawal rate and assumed rate, or
  b. By years of service, without regard for age, or
  c. By a combination of age and years of service, or
  d. By select and ultimate; this is built using separate rates by service for the first X years of service, then aggregated by age thereafter, or built using separate rates by age for the first X years of age, then aggregated by service thereafter, or
  e. A single rate, regardless of ages or years of service (this is rarely used for withdrawal rate assumptions).

An actuarial analysis for deciding which of these approaches is preferable would be to examine the least squares or other measure of statistical best-predictors, i.e., which method does the best job of predicting (back-testing) the actual raw rates with the least statistical error. There may be other not-so-actuarial considerations.

The first four approaches require a minimum threshold number of members in each category for actuarial credibility. LASERS has a sufficiently large number of members to "slice and dice" these ways.

In addition, while the analysis and data provided in the 2018 Experience Study report showed the actual experience and current and proposed assumptions as percentages, we would prefer a level of detail that also shows the total number of exposures, the actual number terminating, the assumed number terminating per the current assumption, the ratio of actual to expected, the proposed number terminating per the proposed assumption, the ratio of actual to proposed, and the actual rate of withdrawal.

Rank and File

The current assumptions vary based on age and based on nine separate service levels. The actual withdrawal rates during the experience period were higher than the rates currently assumed for every service category. The aggregate withdrawal rate for all ages and for the nine service levels was 13.3%, while a rate of 10.9% was expected. The proposed rates of withdrawal are higher than the current rates of withdrawal for most ages and service durations.

Additionally, the service categories were reviewed and restructured to better match the experience. The current assumption has nine levels of service based: less than one year, one year, two to three years, four to five, six, seven, eight, nine, and ten or more years of service. The proposed assumption has six levels of service based: less than one year, one year, two to three years, four to six years, seven to nine years, and ten or more years of service.

Conclusion – The Actuary for the LLA considers that the approach and results for the rates of withdrawal for the Rank and File Plan are appropriate.

Judges

The current assumptions vary by years of service. The actual withdrawal rates during the experience period were lower than the rates currently assumed. The aggregate withdrawal rate for all service was 1.2%, while a rate of 1.7% was expected.

Since there was minimal experience during the experience period (only nine withdrawals in five years), the proposed rate of withdrawal is now a single rate (method e, above) and the single rate was set at 1.2%, which is the same rate as the actual aggregate experience during the experience period.

Additionally, we note that no data by years of service was provided to support the aggregate withdrawal experience.

Conclusion – The Actuary for the LLA considers that the approach and results for the rates of withdrawal for Judges are appropriate.

Corrections/Hazardous Duty

The current assumptions vary based on age and based on two separate service levels. The actual withdrawal rates during the experience period were slightly higher than the rates currently assumed for every service category. The aggregate withdrawal rate for all ages and for the two service levels was 17.2% while a rate of 16.7% was expected. The proposed rates of withdrawal are higher than the current rates of withdrawal in aggregate and are equivalent in aggregate to the actual withdrawal rate of 17.2%.

The service categories were also reviewed and restructured to better match the experience. The current assumption has two levels of service based: less than ten years and greater than or equal to ten years of service. The proposed assumption has seven levels of service based: less than one year, one year, two years, three to four years, five to seven years, eight to nine years, and ten or more years of service.

Additionally, the analysis for the Corrections/Hazardous Duty Plan excluded the Wildlife experience since that group continues to exhibit patterns of withdrawal that are different than the remaining Hazardous Duty Plans.

Conclusion – The Actuary for the LLA considers that the approach and results for the rates of withdrawal for the Corrections/Hazardous Duty Plan are appropriate.

Wildlife

The current assumptions vary by years of service. With only eight withdrawals in five years, there was minimal experience during the experience period. However, the service categories were reviewed and restructured to better match the experience. A difference in withdrawal patterns was observed for members with less than six years of service (with an aggregate withdrawal rate of 7.6%) and members with six or more years of service (with an aggregate withdrawal rate of 0.5%). Therefore, the proposed assumption has now two levels of service based: less than six years of service and six or more years of service.

Conclusion – The Actuary for the LLA considers that the approach and results for the rates of withdrawal for Wildlife are appropriate.

Other Assumptions

The 2018 Experience Study report also includes the following assumptions:

- Deferral and refund assumption for Deferred Vested members
- Dependent/minor children statistics
- Spouse's age
- Marital status
- Unisex mortality rates for actuarial equivalence and service transactions
- Inputs for development of option factors
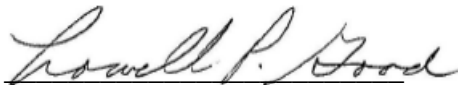- Unused annual leave service credit adjustments

We reviewed the sections of the 2018 Experience Study report relating to the assumptions mentioned above and found them to be described with reasonable detail and careful recognition of relevant experience. Therefore, we find these assumptions mentioned appropriate.

Actuarial Certification

This Actuarial Review report constitutes a Statement of Actuarial Opinion. It has been prepared by actuaries who have substantial experience valuing public employee retirement systems. To the best of our knowledge the information contained in this report is accurate and fairly presents information it is purported to present. All calculations have been made in conformity with generally accepted actuarial principles and practices and with the Actuarial Standards of Practice issued by the Actuarial Standards Board.

Lowell P. Good and James J. Rizzo are members of the American Academy of Actuaries. These actuaries meet the Academy's Qualification Standards to render the actuarial opinions contained herein.

The signing actuaries are independent of the Louisiana State Employees' Retirement System.

November 27, 2019

Lowell P. Good, ASA, EA, MAAA   Date
Actuary for the Louisiana Legislative Auditor

November 27, 2019

James J. Rizzo, ASA, EA, MAAA   Date
Senior Consultant and Actuary
Gabriel, Roeder, Smith & Company